BAYPORT-BLUE POINT UNION FREE SCHOOL DISTRICT
BAYPORT, NEW YORK

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Math 3-5

Summer 1999

Writers

Robert Dunn
Jill Schneck
Dorothy Weidenaar

1999-2000

BAYPORT-BLUE POINT UNION FREE SCHOOL DISTRICT
BAYPORT, NEW YORK

MATH 3-5 CURRICULUM
SUMMER 1999

1999-2000

TABLE OF CONTENTS

Math Curriculum

With correlation to the Learning Standards

Grade 3 - 5

With suggested time frames

Addition , Subtraction

Skills	Date	P I	Pg
Skip Counting	January	2B	44
Use of commutative, associative, distributive, inverse properties.	January	3B & 3C	45
Break problem into parts.	January	3B	45
Special role of zero.	January	3C	45
Application of identity elements of addition in learning and understanding numbers facts.	January	3C	45
Develop a variety of strategies for estimating addition and subtraction.	January	6D	48

Addition / Subtraction

Skills	Date	P I	Pg
Investigate relationships between addition and subtraction.	January	7B	50
Use counters to explore or explain commutative and associative properties of addition.	January	7D	50
Explore the capabilities and terminology of a calculator.	January	6E	49

Number Concepts

Skills	Date	P I	Pg
Recognize odd and even numbers through 20.	January	2B	44
Look for patterns	January	3B	45
Number patterns and sequence.	January	7A	50
Repeat patterns (abab, etc.).	January	7A	50
Design patterns.	January	7A	50

Number Concepts

Skills	Date	P I	Pg
Make different combinations of coins and bills for a given money amount.	January	2B	44

Pla value

Skills	Date	P I	Pg
Place value concepts extended to thousands.	January	2C	44
Read and write whole numbers to the thousands.	January	2A	44
Order whole numbers from least to greatest.	January	2A	44
Manipulative: base 10 blocks, abaci, chip trading for place value to thousands.	January	2B	44
Make coin collections that are equal in value	January	2C	44

Orga e Data

Skills	Date	P I	Pg
Use number lines to graph coordinates.	January	2B	44
Graphs and charts of real-world data and data in other subject areas.	January	4B	46
Graphs of statistical data drawn from newspapers, magazines, polls charts surveys etc.	January	5D	47
Make frequency tables from tallied data.	January	5D	47
Organize data with graphs, models, pictures, lists.	January	5D	47
Recognize events that are certain and events that have no chance of occurring.	January	6F	49

Orga e Data

Skills	Date	P I	Pg
Explain why a game is fair or unfair.	January	6F	49
Collect statistical data from newspapers, magazines, polls.	January	6G	49
Use spinners, drawing colored blocks from a bag, etc.	January	6G	49
Explore informally the conditions that must be checked in order to achieve an unbiased random sample (i.e., a set in which every member has an equal chance of being chosen) in data gathering and its practical use in television ratings,	January	6G	49
Determine the number of ways an event can occur.	January	6H	49
Explore problems that involve a systematic identification of order arrangements, using models, pictures, lists, or tree diagrams.	January	6H	49

Orga...ze Data

Skills	Date	P I	Pg
Find range of a set of data.	January	7F	51
Compare frequencies within a bar graph or histogram.	January	7F	51
Describe trends in bar graphs and line graphs.	January	7F	51
Use diagrams charts and tables to help understand problem information.	June	3B	45
Ordered pairs on a grid (coordinate plane).	June	4B	46
Draw conclusions and make predictions from graphs.	June	4B	46

Multiplication

Skills	Date	P I	Pg
Skip Counting	January	2B	44
Use of inverse properties.	January	3B & 3C	45
Special role of zero.	January	3C	45
Commutative property of multiplication.	January	3D	45
Associative property.	January	3D	45
Application of identity elements of multiplication in learning and understanding number facts.	January	3D	45

Mul ication

Skills	Date	P I	Pg
Develop a variety of strategies for estimating multiplication.	January	6D	48
Investigate relationships between addition and multiplication.	January	7B	50
Use open multiplication sentences in situations of equality and inequality.	January	7C	50
Use counters to explore or explain commutative properties of multiplication.	January	7D	50
Use manipulative or calculators to skip count and relate to multiplication.	January	7E	51
Multiplication facts through 144.	June	3C	45

Multiplication

Skills	Date	P I	Pg
Explore the capabilities and terminology of a calculator.	June	6E	49

D sion

Skills	Date	P I	Pg
Use of inverse properties.	January	3B & 3C	45
Look for patterns.	January	3B	45
Special role of zero.	January	3C	45
Develop a variety of strategies for estimating division.	January	6D	48
Estimate strategies for multiplication and division such as: when the divisor is greater than one, the quotient will be less than the dividend; and when it is less than one, the quotient is greater than the dividend.	January	6E	49
Use counters to solve division problems to find the number of groups possible when each group is a given size, and the number of objects in each group when the number of groups is known.	January	7D	50

Skills	Date	P I	Pg
Division facts through 144.	June	3C	45
Present division facts in more than one way, such as, 18 : 3 = 18/3.	June	7B	50
Investigate relationships between subtraction and division.	June	7B	50
Investigate relationship between multiplication and division.	June	7B	50
Use division sentences in situations of equality and inequality.	June	7C	50
Explore the capabilities and terminology of a calculator.	June	6E	49

Geometry

Skills	Date	P I	Pg
Coordinates with positive and negative numbers.	June	2B	44
Look for patterns.	June	3B	45
Designs and patterns with geometric patterns.	June	4A	46
Terms: line segment, point, parallel, and angle.	June	4E	46
Common plane and solid geometric figures in the environment and drawings.	June	4E	46
Lines of symmetry.	June	4E	46

Geometry

Skills	Date	P I	Pg
Use formulas to find perimeter and area of geometric shape.	June	7C	50
Use counters to explore number patterns like triangular numbers and square numbers.	June	7D	50
Use manipulative or computer programs that allow students to manipulate geometric shapes such as tangrams and pattern blocks.	June	7E	51
Use manipulative materials and relevant computer software to explore symmetry.	June	7E	51
Identify the geometric shapes of the faces of prisms, pyramids, cones and cylinders,	June	7G	51
Identify different types of prisms and pyramids.	June	7G	51

G metry

Skills	Date	P I	Pg
Find examples of tessellations in the real world.	June	7H	5 1
Identify examples of symmetry in nature, art, and music.	June	7H	5 1

F tions

Skills	Date	P I	Pg
Identify use of fractions and decimals in daily life.	June	2A	44
Manipulative: base 10 blocks abaci ship trading for place value in fractions to tenths.	June	2B	44
Various ways a figure can be divide into equal parts, using terms numerator and denominator.	June	2B	44
Order unit fractions and use < and > signs utilizing concrete materials.	June	2B	44
Find equivalent fractions.	June	2B	44
Use fractional notation to express the probability of an occurrence.	June	6H	49

Fractions

Skills	Date	P I	Pg
Relate fractional notation for tenths to decimal faction.	June	7B	50
Relate the concept of fractions to beat value of notes in music (whole note = one beat, half note = one-half beat, etc.).	June	7H	51

Decimals

Skills	Date	P I	Pg
Manipulative: base 10 blocks abaci, ship trading for place value decimals to tenths.	June	2B	44
Skip Counting	June	2B	44
Order decimals and use < and > signs utilizing concrete materials.	June	2B	44

Measurement

Skills	Date	P I	Pg
Look for patterns.	January	3B	45
Skip Counting	June	2B	44
Break problem into parts.	June	3B	45
Perimeter, area and volume by counting units.	June	4C	46
Volume by "filling space" with standard-size objects to build a foundation for the volume formula.	June	4C	46
Compare temperatures and heights over time.	June	4D	46

Me rement

Skills	Date	P I	Pg
Identify equivalent measures with in the metric system of measure.	June	5E	47
Relate the clock face to fractions of a circle.	June	5E	47
Study time to five-minute, one-minute and one-second intervals.	June	5C	47
Find the area and volume of specific figures by counting units.	June	5C	47
Measurement problems related to other areas such as literature, science, and social studies.	June	5C	47
Select and use appropriate metric measurement tools.	June	5D	47

Measurement

Skills	Date	P I	Pg
Compare equivalent measures within the metric system.	June	5D	47
Rounding numbers, using number lines and measuring instruments (meter stick, thermometer).	June	6A	48
Estimate measurements before measuring.	June	6A	48
Develop strategies for estimating measurements.	June	6D	48

Proble. Solving

Skills	Date	P I	Pg
Use open sentences to model problems.	January	3B	45
Break problem into parts.	January	3B	45
Estimate the outcomes of problems/experiments, complete the task, and compare the results with the prediction.	January	6B	48
Discuss real-world examples of when estimating would be acceptable and when it would not.	January	6C	48
Develop a variety of strategies for estimating quantities.	January	6D	48
Develop orderly ways to determine the number of possible arrangements and combinations (e.g., tree diagram).	January	6E	49

Probl Solving

Skills	Date	P I	Pg
Estimate the result of computations before using a calculator, especially in computations with decimals.	January	6E	49
Make generalizations about the difference between products of numbers greater than one and when one number is less than one.	January	6E	49
Conduct and predict outcomes of various experiments, using unequally as well as equally likely outcomes.	January	6F	49
Solve open sentences with missing information.	January	7C	50
Use counters to help solve problems that can be summarized with open sentences.	January	7D	50
Relate examples of children's literature to mathematics for motivation, explanation, and problem solving.	January	7H	51

Probl Solving

Skills	Date	P I	Pg
Make change for money amounts up to $5.00.	January	7C	50
Use open sentences to model problems.	June	3B	45

Third Grade

Math Curriculum

With suggested time frames

Curriculum Arrang . by Grade and Time

Grade	Area	Skills	Date	P I
3	Addition/Subtraction	Skip Counting	Janua	2B
3	Addition/Subtraction	Use of commutative, associative, distributive, inverse properties.	Janua	3B
3	Addition/Subtraction	Break problem into parts.	Janua	3B
3	Addition/Subtraction	Special role of zero.	Janua	3C
3	Addition/Subtraction	Application of identity elements of addition in learning and understanding numbers facts.	Janua	3C
3	Addition/Subtraction	Develop a variety of strategies for estimating addition and subtraction.	Janua	6D
3	Addition/Subtraction	Investigate relationships between addition and subtraction.	Janua	7B
3	Addition/Subtraction	Use counters to explore or explain commutative and associative properties of addition.	Janua	7D
3	Addition/Subtraction	Explore the capabilities and terminology of a calculator.	Janua	6E
3	Division	Use of inverse properties.	Janua	3B
3	Division	Look for patterns.	Janua	3B
3	Division	Special role of zero.	Janua	3C
3	Division	Develop a variety of strategies for estimating division.	Janua	6D
3	Division	Estimate strategies for multiplication and division such as: when the divisor is greater than one, the quotient wil	Janua	6E
3	Division	Use counters to solve division problems to find the number of groups possible when each group is a given size, a	Janua	7D
3	Measurement	Look for patterns.	Janua	3B
3	Multiplication	Skip Counting	Janua	2B
3	Multiplication	Use of inverse properties.	Janua	3B
3	Multiplication	Special role of zero.	Janua	3C
3	Multiplication	Commutative property of multiplication.	Janua	3D
3	Multiplication	Associative property.	Janua	3D
3	Multiplication	Application of identity elements of multiplication in learning and understanding number facts.	Janua	3D
3	Multiplication	Develop a variety of strategies for estimating multiplication.	Janua	6D
3	Multiplication	Investigate relationships between addition and multiplication.	Janua	7B
3	Multiplication	Use open multiplication sentences in situations of equality and inequality.	Janua	7C
3	Multiplication	Use counters to explore or explain commutative properties of multiplication.	Janua	7D
3	Multiplication	Use manipulative or calculators to skip count and relate to multiplication.	Janua	7E
3	Multiplication	Look for patterns.	Janua	3B

Curriculum Arranged by Grade and Time

Grade	Area	Skills	Date	P I
3	Number Concept	Explore the meaning of large numbers through such activities as estimating the grains of rice in a coffee can, t	Janua	6C
3	Number Concept	Use symbols <,>,.	Janua	7B
3	Number Concept	Terms at most and at least.	Janua	7B
3	Number Concept	Describe number sequence.	Janua	7B
3	Number Concept	Consider, discuss and predict whether the sum, difference, or product of two numbers is odd or even.	Janua	7B
3	Number Concept	Rewrite a number expressed in expanded form to a thousand.	Janua	2A
3	Number Concept	Rewrite a number expressed in word form to a thousand.	Janua	2A
3	Number Concepts	Recognize odd and even numbers through 20.	Janua	2B
3	Number Concepts	Look for patterns	Janua	3B
3	Number Concepts	Number patters and sequence.	Janua	7A
3	Number Concepts	Repeat patterns (abab, etc.).	Janua	7A
3	Number Concepts	Design patterns.	Janua	7A
3	Number Concepts	Make different combinations of coins and bills for a given money amount.	Janua	2B
3	Organizing Data	Use number lines to graph coordinates.	Janua	2B
3	Organizing Data	Graphs and charts of real-world data and data in other subject areas.	Janua	4B
3	Organizing Data	Graphs of statistical data drawn from newspapers, magazines, polls charts surveys etc.	Janua	5D
3	Organizing Data	Make frequency tables from tallied data.	Janua	5D
3	Organizing Data	Organize data with graphs, models, pictures, lists.	Janua	5D
3	Organizing Data	Recognize events that are certain and events that have no chance of occurring.	Janua	6F
3	Organizing Data	Explain why a game is fair or unfair.	Janua	6F
3	Organizing Data	Collect statistical data from newspapers, magazines, polls.	Janua	6G
3	Organizing Data	Use spinners, drawing colored blocks from a bag, etc.	Janua	6G
3	Organizing Data	Explore informally the conditions that must be checked in order to achieve an unbiased random sample (i.e., a s	Janua	6G
3	Organizing Data	Determine the number of ways an event can occur.	Janua	6H
3	Organizing Data	Explore problems that involve a systematic identification of order arrangements, using models, pictures, lists.	Janua	6H
3	Organizing Data	Find range of a set of data.	Janua	7F
3	Organizing Data	Compare frequencies within a bar graph or histogram.	Janua	7F
3	Organizing Data	Describe trends in bar graphs and line graphs.	Janua	7F

Curriculum Arran by Grade and Time

Grade	Area	Skills	Date	P I
3	Place Value	Place value concepts extended to thousands.	Janua	2C
3	Place Value	Read and write whole numbers to the thousands.	Janua	2A
3	Place Value	Order whole numbers from least to greatest.	Janua	2A
3	Place Value	Manipulative: base 10 blocks, abaci, chip trading for place value to thousands.	Janua	2B
3	Place Value	Make coin collections that are equal in value	Janua	2C
3	Problem Solving	Use open sentences to model problems.	Janua	3B
3	Problem Solving	Break problem into parts.	Janua	3B
3	Problem Solving	Estimate the outcomes of problems/experiments, complete the task, and compare the results with the predicti	Janua	6B
3	Problem Solving	Discuss real-world examples of when estimating would be acceptable and when it would not.	Janua	6C
3	Problem Solving	Develop a variety of strategies for estimating quantities.	Janua	6D
3	Problem Solving	Develop orderly ways to determine the number of possible arrangements and combinations (e.g., tree diagram)	Janua	6E
3	Problem Solving	Estimate the result of computations before using a calculator, especially in computations with decimals.	Janua	6E
3	Problem Solving	Make generalizations about the difference between products of numbers greater than one and when one number	Janua	6E
3	Problem Solving	Conduct and predict outcomes of various experiments, using unequally as well as equally likely outcomes.	Janua	6F
3	Problem Solving	Solve open sentences with missing information.	Janua	7C
3	Problem Solving	Use counters to help solve problems that can be summarized with open sentences.	Janua	7D
3	Problem Solving	Relate examples of children's literature to mathematics for motivation, explanation, and problem solving.	Janua	7H
3	Problem Solving	Make change for money amounts up to $5.00.	Janua	7C
3	Decimals	Manipulative: base 10 blocks abaci, ship trading for place value decimals to tenths.	June	2B
3	Decimals	Skip Counting	June	2B
3	Decimals	Order decimals and use < and > signs utilizing concrete materials.	June	2B
3	Division	Division facts through 144.	June	3C
3	Division	Present division facts in more than one way, such as, 18 : 3 = 18/3.	June	7B
3	Division	Investigate relationships between subtraction and division.	June	7B
3	Division	Investigate relationship between multiplication and division.	June	7B
3	Division	Use division sentences in situations of equality and inequality.	June	7C
3	Division	Explore the capabilities and terminology of a calculator.	June	6E
3	Fractions	Identify use of fractions and decimals in daily life.	June	2A

Curriculum Arran by Grade and Time

Grade	Area	Skills	Date	P I
3	Fractions	Manipulative: base 10 blocks abaci ship trading for place value in fractions to tenths.	June	2B
3	Fractions	Various ways a figure can be divide into equal parts, using terms numerator and denominator.	June	2B
3	Fractions	Order unit fractions and use < and > signs utilizing concrete materials.	June	2B
3	Fractions	Find equivalent fractions.	June	2B
3	Fractions	Use fractional notation to express the probability of an occurrence.	June	6H
3	Fractions	Relate fractional notation for tenths to decimal faction.	June	7B
3	Fractions	Relate the concept of fractions to beat value of notes in music (whole note = one beat, half note = one-half bea	June	7H
3	Geometry	Coordinates with positive and negative numbers.	June	2B
3	Geometry	Look for patterns.	June	3B
3	Geometry	Designs and patterns with geometric patterns.	June	4A
3	Geometry	Terms: line segment, point, parallel, and angle.	June	4E
3	Geometry	Common plane and solid geometric figures in the environment and drawings.	June	4E
3	Geometry	Lines of symmetry.	June	4E
3	Geometry	Use formulas to find perimeter and area of geometric shape.	June	7C
3	Geometry	Use counters to explore number patterns like triangular numbers and square numbers.	June	7D
3	Geometry	Use manipulative or computer programs that allow students to manipulate geometric shapes such as tangrams a	June	7E
3	Geometry	Use manipulative materials and relevant computer software to explore symmetry.	June	7E
3	Geometry	Identify the geometric shapes of the faces of prisms, pyramids, cones and cylinders,	June	7G
3	Geometry	Identify different types of prisms and pyramids.	June	7G
3	Geometry	Find examples of tessellations in the real world.	June	7H
3	Geometry	Identify examples of symmetry in nature, art, and music.	June	7H
3	Measurement	Skip Counting	June	2B
3	Measurement	Break problem into parts.	June	3B
3	Measurement	Perimeter, area and volume by counting units.	June	4C
3	Measurement	Volume by "filling space" with standard-size objects to build a foundation for the volume formula.	June	4C
3	Measurement	Compare temperatures and heights over time.	June	4D
3	Measurement	Identify equivalent measures with in the metric system of measure.	June	5E
3	Measurement	Relate the clock face to fractions of a circle.	June	5E

Curriculum Arranged by Grade and Time

Grade	Area	Skills	Date	P I
3	Measurement	Study time to five-minute, one-minute and one-second intervals.	June	5C
3	Measurement	Find the area and volume of specific figures by counting units.	June	5C
3	Measurement	Measurement problems related to other areas such as literature, science, and social studies.	June	5C
3	Measurement	Select and use appropriate metric measurement tools.	June	5D
3	Measurement	Compare equivalent measures within the metric system.	June	5D
3	Measurement	Rounding numbers, using number lines and measuring instruments (meter stick, thermometer).	June	6A
3	Measurement	Estimate measurements before measuring.	June	6A
3	Measurement	Develop strategies for estimating measurements.	June	6D
3	Multiplication	Multiplication facts through 144.	June	3C
3	Multiplication	Explore the capabilities and terminology of a calculator.	June	6E
3	Number Concept	Explore quantitative information that will help relate personal experiences to the meaning of million.	June	6C
3	Number Concept	Use manipulative or relevant computer software to explore linear patterns.	June	7E
3	Organizing Data	Use diagrams charts and tables to help understand problem information.	June	3B
3	Organizing Data	Ordered pairs on a grid (coordinate plane).	June	4B
3	Organizing Data	Draw conclusions and make predictions from graphs.	June	4B
3	Problem Solving	Use open sentences to model problems.	June	3B

Exemplars

Grade 3

Related to

Performance Indicators (PI)

Courtesy of

Spring Math 1999 Exemplars (3-5)
Underhill, VT.

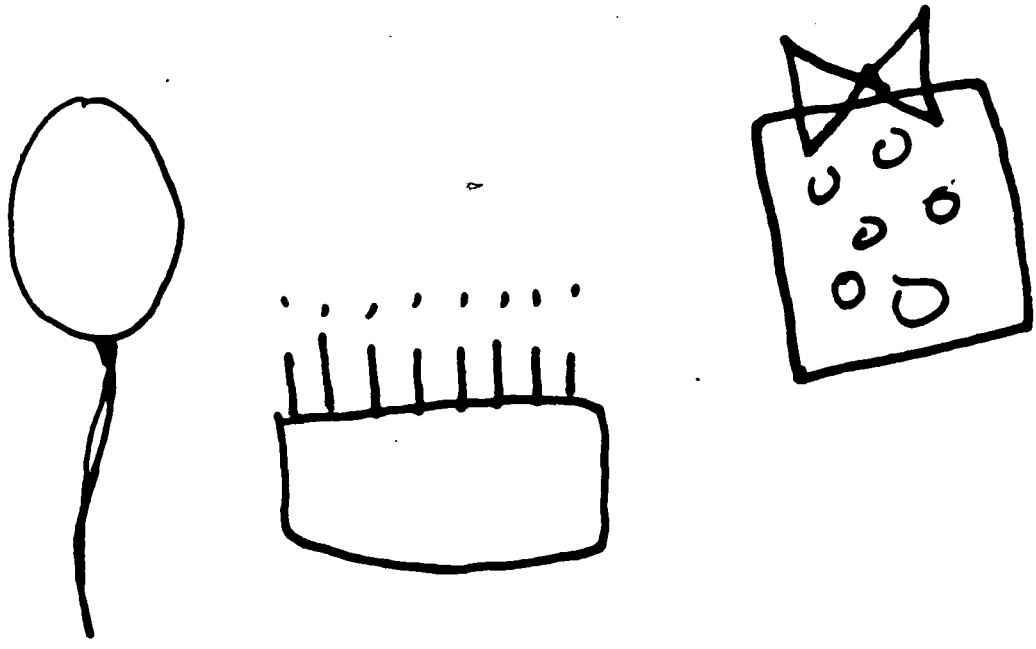
NAME _____ **DATE** _____

Level 3

P.I. - 3B, 3C, 5C, 5D, 5E, 7C

A Celebration

Mrs. Green's class is going to have a party to celebrate reading a total of 100 books. The party will begin when school starts at 8:30. It will take Mrs. Green 15 minutes to set a table with food, cups, plates, forks, and napkins. She will need 30 minutes to set up some party games. Mrs. Green wants to arrive at school 30 minutes before she begins preparing for the party because she has other things to do. At what time should Mrs. Green arrive at school?



Adopted From: Spring Math Exemplars 1999 Grade 3-5, Underhill, VT.

Grade Level 3-5

A Celebration

Mrs. Green's class is going to have a party to celebrate reading a total of 100 books. The party will begin when school starts at 8:30. It will take Mrs. Green 15 minutes to set a table with food, cups, plates, forks, and napkins. She will need 15 minutes to decorate the classroom. She will need 30 minutes to set up some party games. Mrs. Green wants to arrive at school 30 minutes before she begins preparing for the party because she has other things to do. At what time should Mrs. Green arrive at school?

Context

This task was originally given to a class of second graders and it was too difficult. The benchmarks came from grade three student solutions. This task was also part of a menu of tasks for a school-wide problem-solving theme of parties!

What This Task Accomplishes

This task allows the teacher to see which students are able to manipulate concepts of time to solve a problem.

What the Student Will Do

Students who understand the task will either use a strategy of working backwards, or will find the total time needed, and then will subtract that from the party time. They may chart the different time totals to organize their strategy.

Time Required For the Task

This task takes one 45-minute period.

Interdisciplinary Links

This task has no real curriculum links, but it does link to a menu of tasks featured in this issue of Exemplars all with the theme of parties. These can be used K-5 throughout your school building.

21 Poker Hill Rd., Underhill, VT 05489

Expert

The expert will have a correct solution to the problem. The expert will use math language and math representations to explain the approach and reasoning used. The expert may verify the solution, or will make other mathematically relevant comments or observations.

Author

This task was written by **Deb Armitage**, K-8 Mathematics Assessment Consultant at the Vermont Department of Education.

271 Poker Hill Rd., Underhill, VT 05489
Phone: (802)-899-4050

Apprentice

A Celebration

Mrs. Green's class is going to have a party to celebrate reading a total of 100 books. The party will begin when school starts at 8:30. It will take Mrs. Green 15 minutes to set a table with food, cups, plates, forks, and napkins. She will need 15 minutes to decorate the classroom and 30 minutes to plan and set up some party games. Mrs. Green wants to arrive at school 30 minutes before she begins preparing for the party because she has other things to do. What time should Mrs. Green arrive at school?

Mrs. Green does a lot of stuff before the party. The party starts at 8:30, She sets the table - 15 she puts up stuff - 15. She makes games - 30 she does othr work - 30 Add up the time

15
15
30
- 30
90 she needs 90 minotes todo the jobs

Part of the solution is present and correct.

Some math language is used.

No representations are attempted.

271 Poker Hill Rd., Underhill, VT 05489
Phone: 800-450-4050

Expert

A Celebration

Mrs. Green's class is going to have a party to celebrate reading a total of 100 books. The party will begin when school starts at 8:30. It will take Mrs. Green 15 minutes to set a table with food, cups, plates, forks, and napkins. She will need 15 minutes to decorate the classroom and 30 minutes to plan and set up some party games. Mrs. Green wants to arrive at school 30 minutes before she begins preparing for the party because she has other things to do. What time should Mrs. Green arrive at school?

ool. I have to find when Mrs. Green get sat so

15 + 15 + 30 = 60 - 8:30 = 7.30 - 30 = 7.00

What Mrs Green does

job	minutes
table	15
decorate	15
plan	30
work	30

30 → 1 hour

8:30
- 30
8:00
1hr
7:00

check

30 minutes $\frac{1}{2}$ hour
60 minutes 1 hour
90 minutes in all

The student verifies her/his solution.

Mrs. Green should get at school at 7:00

Accurate math language is used throughout.

A labeled representation is created.

A correct answer is achieved.

271 Poker Hill Rd., Underhill, VT 05489
Phone 802-899-4050

NAME _____ **DATE** _____

Level 3

P.I. - 1A, 2A, 3B, 5D, 7C

A Party Cake

Billy's mom told Mrs. Green that she would bake a cake for the class party. Part of the recipe stated that she would need 4 1/2 cups of flour and 7 eggs. Billy's mom took all the flour out of her flour jar and it measured 2 1/4 cups. She looked in the refrigerator and saw 1/2 dozen eggs. She told Billy that she had to go to the store before she could finish the cake. What did billy's mom have to buy at the store before she could finish the cake. What did Billy's Mom have to buy at the store and how much did she need to finish making the cake?

Adopted From: Spring Math Exemplars 1999 Grade 3-5, Underhill, VT.

Grade Level 3-5

A Party Cake

Billy's mom told Mrs. Green that she would bake a cake for the class party. Part of the recipe stated that she would need 4 1/2 cups of flour and 7 eggs. Billy's mom took all the flour out of her flour jar and it measured 2 1/4 cups. She looked in the refrigerator and saw 1/2 dozen eggs. She told Billy that she had to go to the store before she could finish the cake. What did Billy's mom have to buy at the store and how much did she need to finish making the cake?

Context

This task was given to third grade students who had just started a unit on measuring. This task was also part of a menu of tasks for a school-wide problem-solving theme of parties!

What This Task Accomplishes

This task allows the teacher to assess students' understanding of fractions and of measurement. Since this class had little experience with fractions, it was a problem for them to solve. This would not be considered a problem solving activity for students who have had more experience with fractions and who can directly arrive at an answer.

What the Student Will Do

Most students begin by making diagrams. Some students are able to attach fractional amounts to their diagrams. Others will manipulate diagrams and numbers until a solution is achieved.

Time Required For the Task

This task took 45-minutes to complete.

Interdisciplinary Links

This task has no real curriculum links, but does link to a menu of tasks featured in this issue of Exemplars with the theme of parties that can be used K-5 throughout your school building.

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the solution using decimals, or make other mathematically relevant comments or observations.

Author

This task was written by **Deb Armitage**, K-8 Mathematics Assessment Consultant at the Vermont Department of Education.

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Phone: (802)-[illegible]

Apprentice

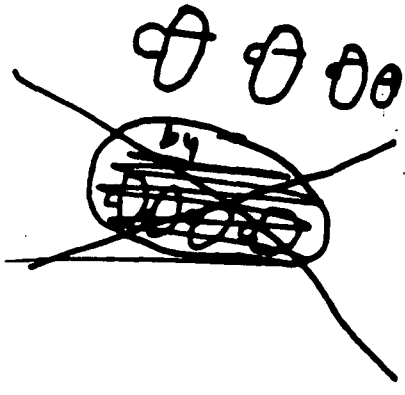
A Party Cake

Billy's mom told Mrs. Green that she would bake a big cake for the class party. Part of the recipe stated that she would need 4 1/2 cups of flour and 7 eggs. Billy's mom took all the flour out of her flour jar and it measured 2 1/4 cups. She looked in the refrigerator and saw 1/2 dozen eggs. She told Billy that she had to go to the store before baking the class party cake. What did Billy's mom have to buy at the store and how much did she need to finish baking the cake?

to find out how many things I need to buy she need and

She has 6 eggs she needs 7 eggs.

000000 + 0 = 7 eggs



she need

The second part of the solution is unsuccessfully attempted.

One part of the solution is correct.

Little math language is used.

Some work is present showing some understanding.

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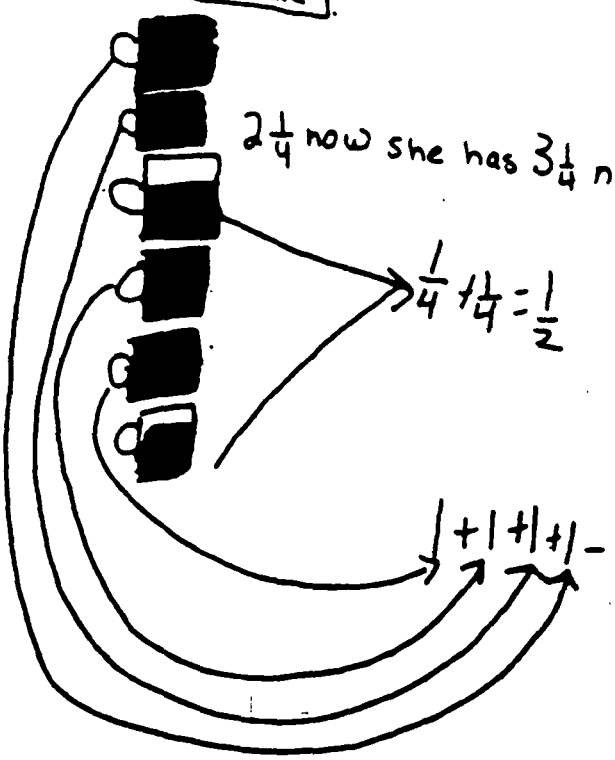
Expert

A Party Cake

Billy's mom told Mrs. Green that she would bake a big cake for the class party. Part of the recipe stated that she would need 4 1/2 cups of flour and 7 eggs. Billy's mom took all the flour out of her flour jar and it measured 2 1/4 cups. She looked in the refrigerator and saw 1/2 dozen eggs. She told Billy that she had to go to the store before baking the class party cake. What did Billy's mom have to buy at the store and how much did she need to finish baking the cake?

I now II dozen is 12 half of 12 is 6 so 7

She has to bye 1 half of a dozon because you can't bye 1 egg at the store



$2\frac{1}{4}$ now she has $3\frac{1}{4}$ now she has $\frac{41}{4} = 4\frac{1}{2}$

$\frac{1}{4} + \frac{1}{4} = \frac{1}{2}$

She has to buy enough flour for 2 and 1 fourth more cups of flour

1+1+1+1=4 cups

$1+1+1+1+\frac{1}{4}+\frac{1}{4} = 4\frac{1}{2}$

check -
4
4.50
-2.25
2.25 ← same

Labeled diagrams are used.

Math language is used throughout.

A correct answer is achieved.

The student verified her/his solution.

Name _____ **Date** _____
Level 3

P.I. 1B, 3A, 3B, 1D, 5E, 6E, 7C

Penny a Day

You have just won a contest! You must choose between 2 prizes. You may choose 75 cents a day for 15 days or you may choose a penny the first day which doubles every day for 15 days. Find out which prize you would choose.

Please do a writing (using good math language and symbols) which tells how and why you made your choice. Include a chart, graph or table that helped you to solve the problem.

Adopted From: Spring Math Exemplars 1994 Grade 3-5, Underhill,VT.

4-5/98

Penny a Day

Grade Level (3) 5

Task

You have just won a contest! You must choose between 2 prizes. You may choose 75 cents a day for 15 days or you may choose a penny the first day which doubles every day for 15 days. Find out which prize you would choose.

Please do a writing (using good math language and symbols) which tells how and why you made your choice. Include a chart, graph or table that helped you solve the problem.

Context

This was an interesting experience for me. I originally wrote this task with lots of scaffolding for my students. I wrote the money using a decimal point (to show them how to write the money in their write-up) and I gave an example of exactly how the money was going to be doubled. I also wrote directions to "find the total amount of money using the 75 cent choice and the total amount of money using the penny a day doubled choice". I prompted them to use correct money symbols. I think I was afraid to let my students think on their own and struggle with the problem. I found I couldn't use this as an assessment piece, because I had given them most of the strategy to solve the task and it no longer was a problem for them. I talked with a colleague and we came up with this version. She tried it on her students and came up with more interesting solutions and we could better assess the students' ability to problem solve.

What this task accomplishes

This task uses multiplication and addition to solve a problem that for most kids has quite an amazing solution. They have fun comparing the two choices. Many think they wanted the 75 cents a day prize until they realize and appreciate the doubling effect).

What the student will do

Most students used multiplication to figure out the first prize. Students used a variety of ways of finding out the second prize. Many will forget to add all the 15 days for a final solution for the second prize.

Time required for task

About 45 minutes

Interdisciplinary links

This problem works nicely with discussions of money. It can also be used along with a discussion of contests and prizes. How likely are we to win different kinds of contests.

Teaching Tips

I still wanted to make sure that kids understood the doubling choice. We talked about that choice a bit so everyone was clear that each previous day's money got doubled. Calculators were helpful.

Concepts to be assessed and skills to be developed

Problem Solving
Reasoning
Communication
Whole number operations
Money

Suggested Materials

Graph paper, calculators, calendars available if necessary.

Possible Solutions

The first choice is 15 days X $.75 = $11.25
The second choice is
$.01+.02+.04+.08+.16+.32+.64+1.28+2.56+5.12+10.24+20.48+40.96+81.92+163.84 = $327.67

Rubrics and Benchmarks

Novice

This student used inappropriate concepts in choosing the first prize. S/he decided s/he did not want pennies and so chose the $.75 a day prize. There is no evidence of mathematical reasoning.

Apprentice

This student did not complete the solution which indicates that part of the problem was not understood. S/he failed to add the amount of money received each day for the 15 days. There is some evidence of mathematical reasoning (but not a lot of work shown) in that the student knew that the amount of money for the second choice was going to be greater even though they could not completely carry out the mathematical procedure (there also is a discrepancy with the solutions 16328 and $163.84).

Practitioner

This student uses a strategy that leads to a solution and uses effective mathematical reasoning. The explanation is clear and the use of mathematical notation is accurate.

Expert

The solution and comments show a deep understanding of the problem. This student comments about knowing after the eleventh day that the total for the second prize would be greater. There is a clear and effective explanation of the solution. The student also indicates s/he verified the solution with a calculator.

AUTHOR

Karen Fiske is a third grade teacher.

NOVICE

I don't like a lot of pennies. I want the 75¢ a day.

APPRENTICE

Using a calculator, I did 15×75, 15 for 15 days, 75 for 75 cents. The answer was that I would get $11.25 if I got 75¢ for 15 days. For the second part, getting pennies that double for 15 days, I used this strategy: I added 1+1 and got 2. Then I added 2+2 and got 4. Everytime I added two numbers together, I put a tally mark. I kept adding the numbers I got until I had 15 tallies, for 15 days. The number I had then was 16328. I put it into money and found out that it was actually $163.84. $163.84 is my answer to getting pennies that double for 15 days. I would take the pennies.

Penies writing

1. I made a tabble with 15 sqaurs (see tabble) Each sqaur represents 1 day.

2. I wrote the amount of money I would get on each sqaur on my tabble. I got my ansir by adding the ansir before with a calculator I started with one.

3. then I added all the money from everyday together because the money on the last day is money from one day I got for my ansir *

.75 writing

1. I multpled 75¢ by 15 days to find out how much money I would get if I chose the 75¢ prize. The 75¢ comes from how much money a day the 15 comes from how money days I would get 75.¢ The ansir just kind of falls in place. I got $11.25

Total amount of money I would get if I chose 75¢ prize is

The total amount of money I would get if I chose the penny prize.

.01	.02	.04	.08	.16
.32	.64	1.28	2.56	
10.24	20.48	40.96	81.92	5.12
				163.84
10.57	21.14	42.28	84.56	169.12

1 1 ✓
10.57
21.14
42.28
84.56
169.12
$327.67

First I did is payment x 75¢ for each payments and that was $11.25 and thats the answer. And for the pennys dubbeld first I put the 15 sets of numbers that are dubbeld and added them together because that will be all the payments and my answer is $323.67 and I chouse the dubbeld penny one I knew after the 11 day that the penny dubbeld would be better because it was already $10.24. I check my work with a calalater.

```
    1
    2
    4
    8
   16
   32
   64
  128
  256
  512
 1024
 2048
 4096
 8192
+16384
-------
$327.67
```

Name _____ **Date** _____

Level 3

P.I. 3B, 3C, 5D, 6B, 6D, 6E, 6H, 7C, 7D, 7H

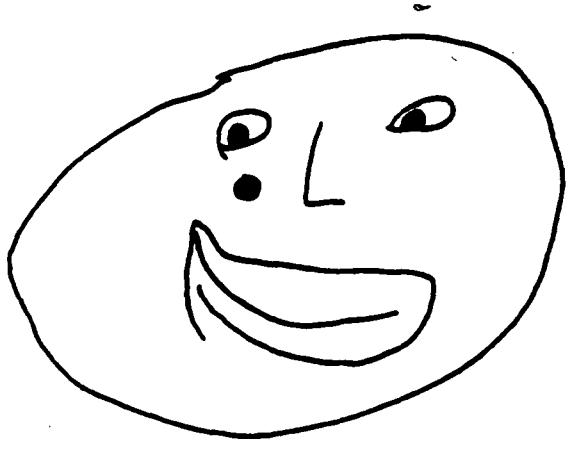
Freckle Fun

Some kids have 10 freckles.

Some kids have 5 freckles.

Some kids have 2 freckles.

How many ways can you show 20 freckles?



Adopted From: April Math Exemplars 1998 Grade 3-5, Underhill, VT.

Grade Level K-2

Freckle Fun!

Some kids have 10 freckles.

Some kids have 5 freckles.

Some kids have 2 freckles.

How many ways can you show 20 freckles?

Context

This task can be given to children who are investigating the number 20.

What this task accomplishes

This task allows the teacher to assess how well students can use combinations of 2, 5 and 10, to equal the sum of 20.

What the student will do

Most children will use drawings to solve this problem, but some will require manipulatives. A few students will use equations.

Time required for task

It will take approximately 30 minutes to complete this task.

Interdisciplinary links

This task can be used in conjunction with Social Studies units on similarities and differences among human beings. There are many children's books that have a theme of freckles such as *Freckle Juice* and *Chocolate Fever!*

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Teaching Tips

When children are done solving this task, have them list their solutions on a class chart. Ask students look to see how many different solutions they can come up with. This can lead to a great discussion of the commutative property of addition: 5 + 5 + 10 is the same as 10 + 5 + 5. It can also open students' minds to the concept that problems can have more than one correct solution. After this discussion, a similar task can be given to students (same task, different numbers) to see if students can achieve all correct combinations.

Suggested Materials

Manipulatives that can represent freckles

Possible Solutions

2 + 2 + 2+ 2 + 2 + 2 + 2 + 2+ 2 + 2 = 20
2 + 2 + 2+ 2 + 2 + 5 + 5 = 20
2 + 2 + 2+ 2 + 2 + 10 = 20
5 + 5 + 5 + 5 = 20
+ 5 + 10 = 20
10 + 10 = 20

Benchmark Descriptors

Novice

The novice will not become engaged in solving the task, or will not have any idea how to begin. If there is some evidence at an attempt, it will be random or weak. No math language will be used to communicate, and little or no mathematical reasoning will be present.

Apprentice

The apprentice will attempt to solve the task, but will not arrive at a correct solution for several reasons. The apprentice may ignore the need to show the number 20, or will ignore the numbers of freckles each person can have. Little or no math language will be used to communicate, and diagrams will lack labels.

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Practitioner

The practitioner will achieve at least one correct solution, and will use accurate and appropriate math language to communicate. Some practitioners may show more than one correct solution, but the approach will be random, not methodical, relying more on guess and check than on number sense.

Expert

The expert will achieve all correct solutions using number sense or logic. The expert will use correct mathematical notation, and correct reasoning will be evident throughout. The expert will also make mathematically relevant observations, such as two people with five freckles equals one person with 10 freckles. Students might even comment that you need to use an even number of odd freckled people to equal 20 freckles, so you have to use two or four people with five freckles, because one and three people with five freckles won't work.

Authors

The authors of this task are **Sandra Silverman** a primary grade teacher in the Oceanview School District, Huntington Beach, CA, and **Darlene Johnson**, a primary grade teacher in the Oceanview School District, Huntington Beach, California.

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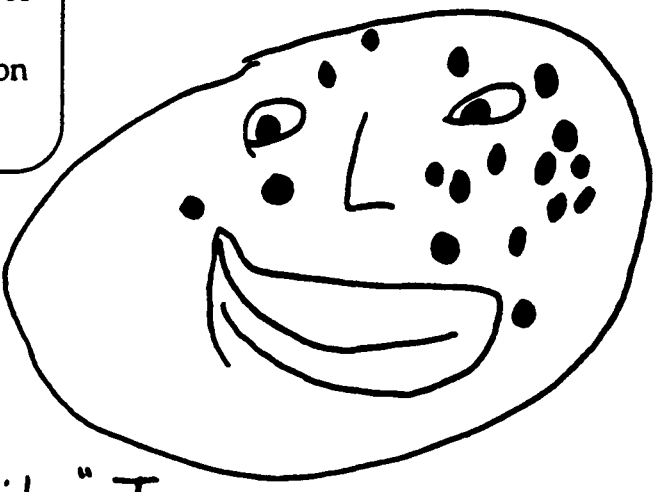
Novice

There is no evidence of understanding the mathematical situation in the task.

No math language is used.

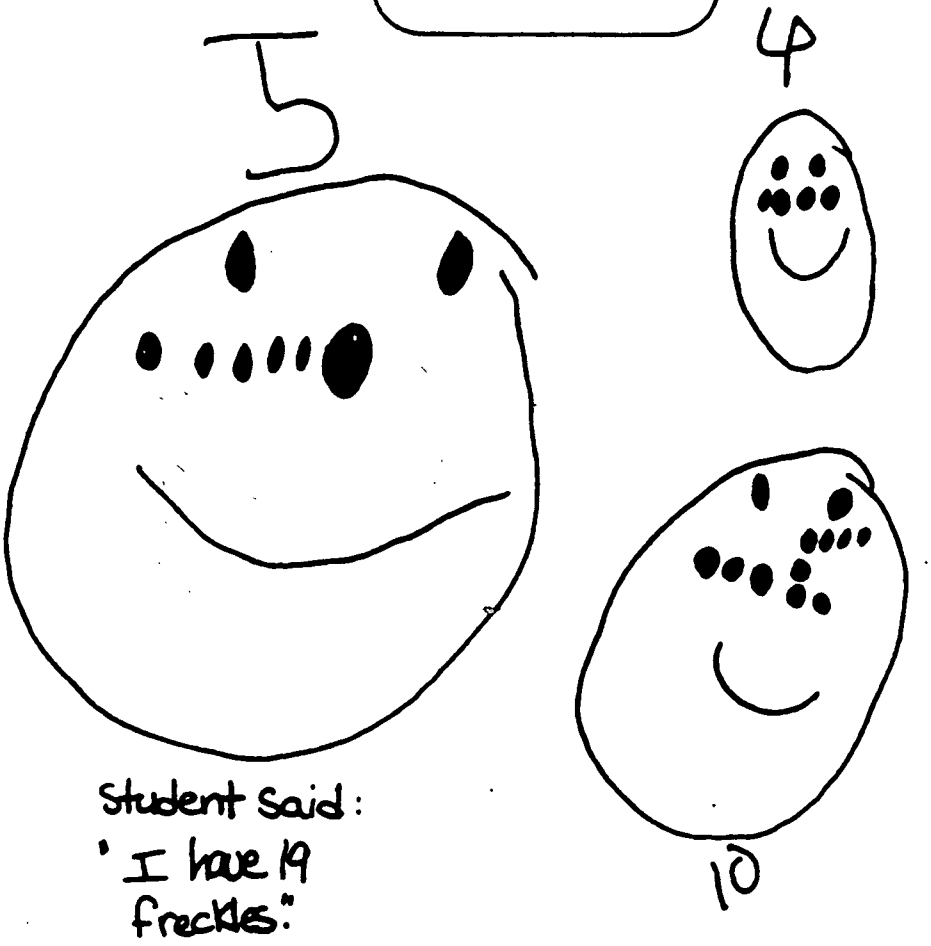


Student said: "I put it altogether and it made 19."

The solution does not match the student's diagram.

Apprentice

Diagrams match the student's solution.



No math language is used.

Only parts of the problem are understood.

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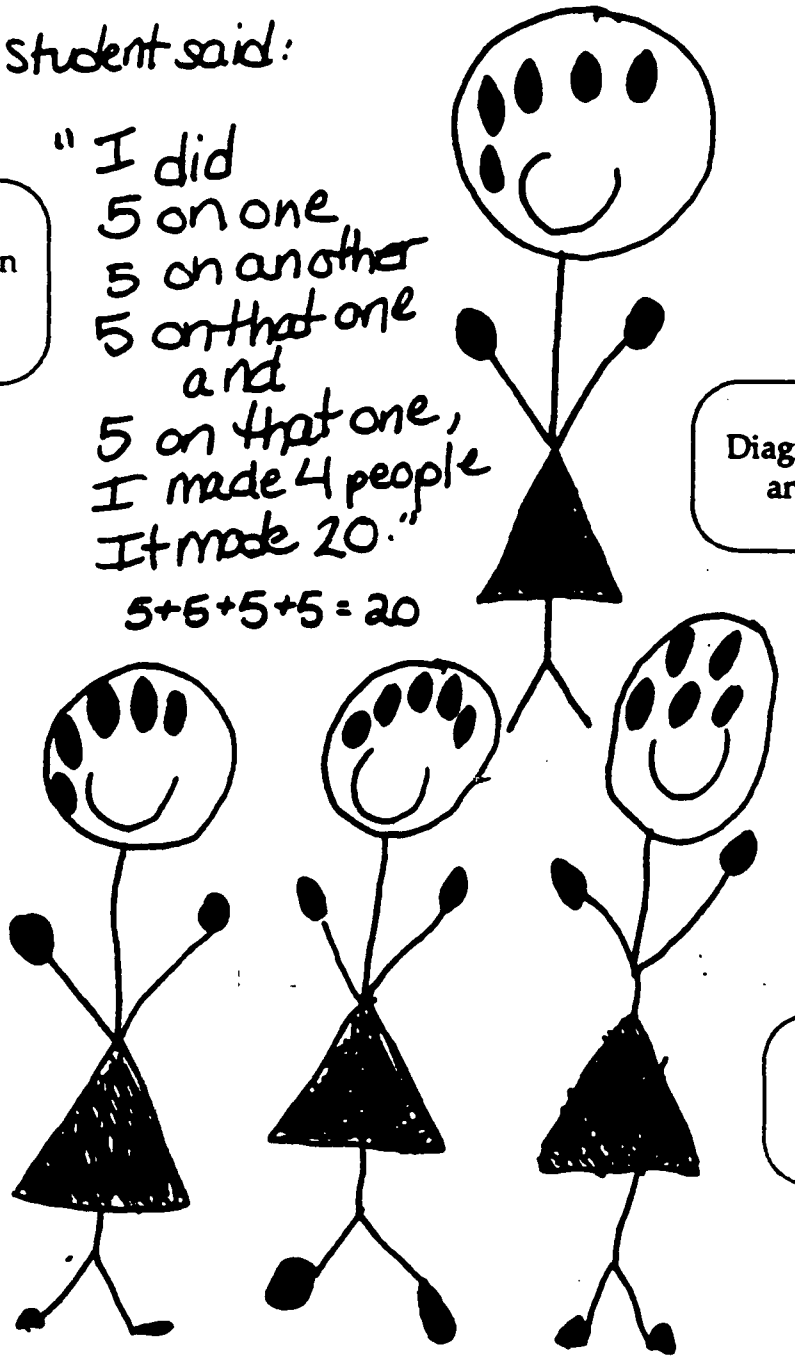
Practitioner



A correct solution is achieved.

Diagrams are accurate and appropriate.

Accurate math language is used.

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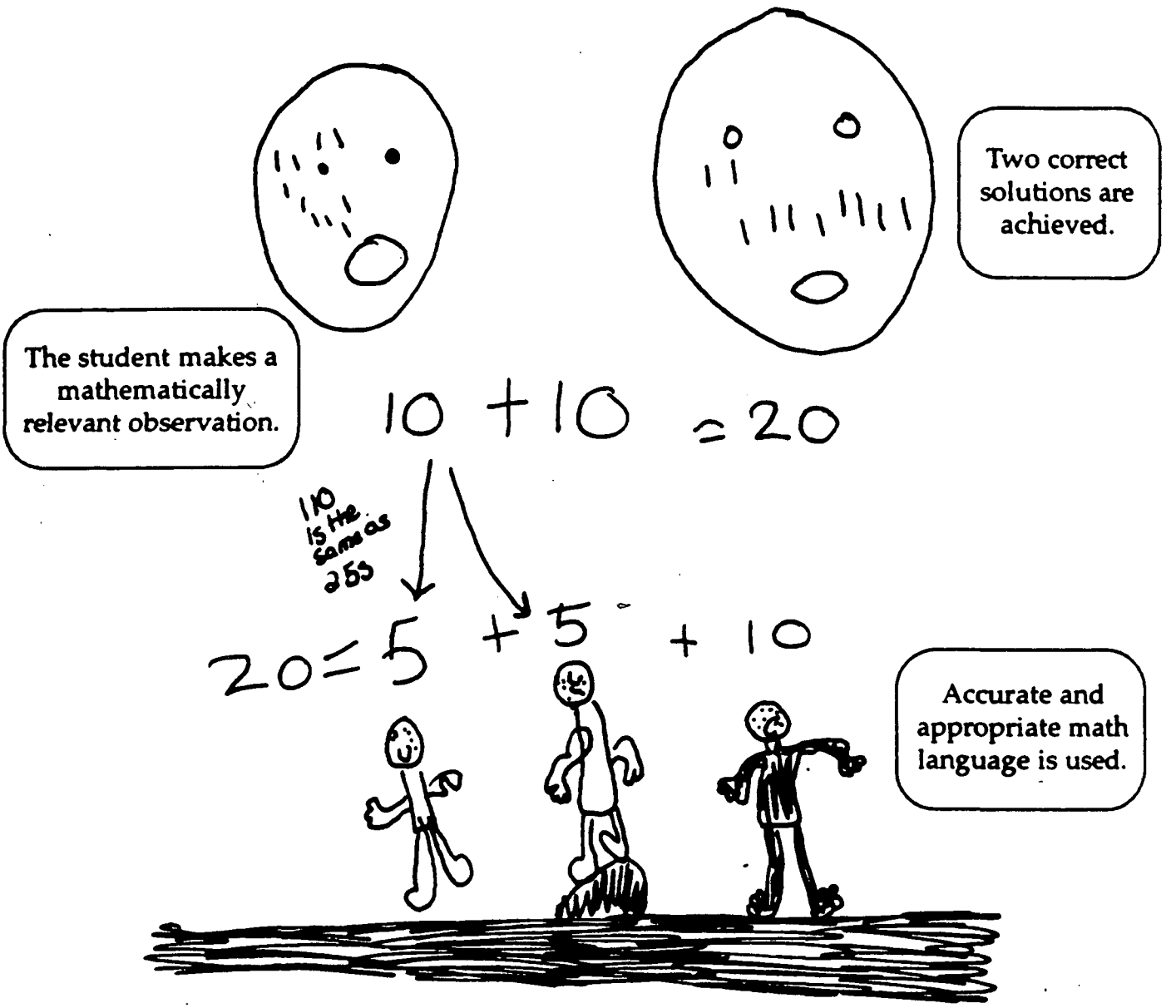
Expert



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Name _____ **Date** _____
Level 3

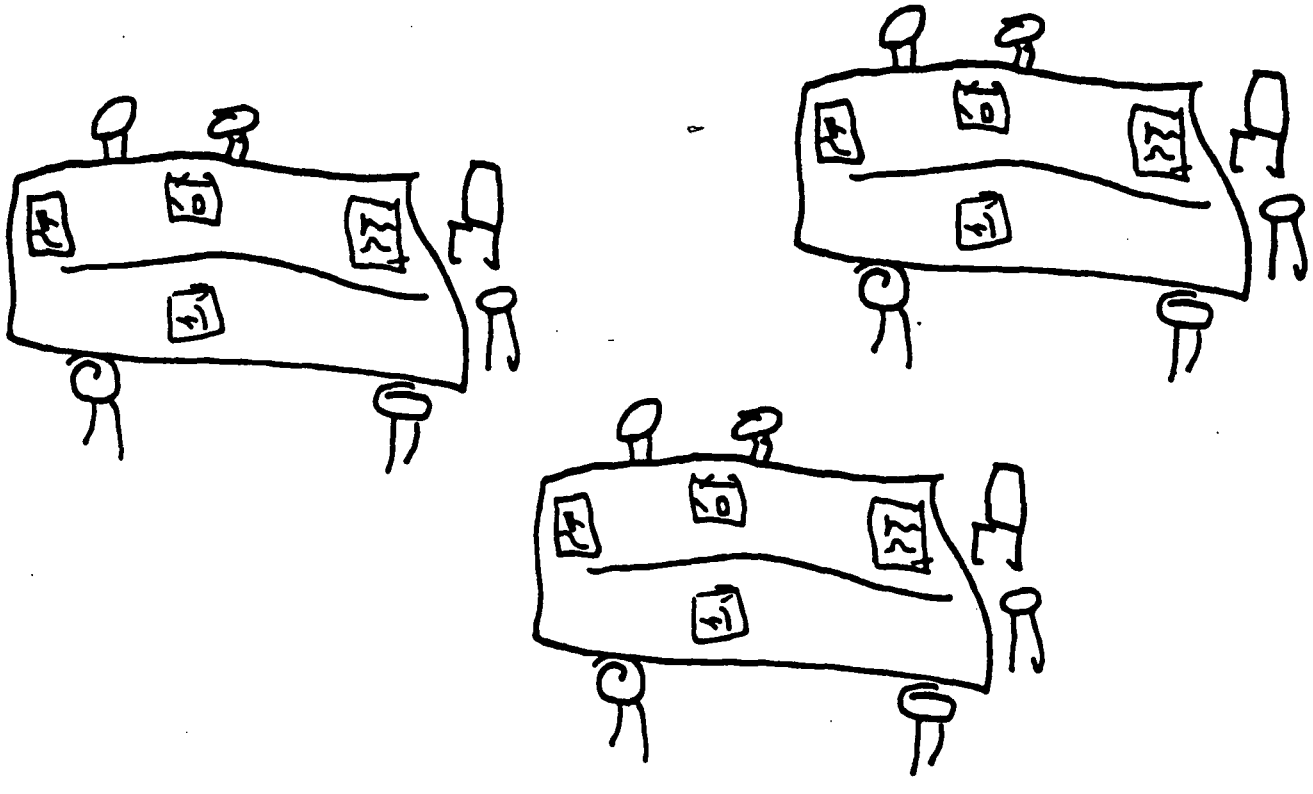
P.I. 3B, 3C, 5D, 6H, 6E, 7A, 7C, 7D

Setting Up the Classroom

School is starting , and one of the teachers wants to set up a classroom so that 16 children can sit at tables. There is a closet full of tables. Thee is a closet full of tables.

Some tables have space for 2 children.
Some tables have space for 4 children.
Some tables have space for 6 children.

What tables can she use to set up her classroom, so that there are exactly 16 spaces to sit?



Adopted From: January Math Exemplars 1998 Grade 3-5, Underhill, VT.

Grade Level K-2

Setting Up the Classroom

School is starting, and one of the teachers wants to set up a classroom so that 16 children can sit at tables. There is a closet full of tables.

Some tables have space for 2 children.
Some tables have space for 4 children.
Some tables have space for 6 children.

What tables can she use to set up her classroom, so that there are exactly 16 spaces to sit?

Context

This task can be given to students at any time during the school year. It can be adapted to be given at the end of a school year to say "I am thinking about how I can set up my classroom for students who will be in my class next year ...". No prerequisite skills are needed by students since it is open-ended, and can be solved in many different ways, although having a concept of the number 16 is helpful. See "teaching tips" for further ideas on introducing the task at different times of the school year, and ideas for making the task more complicated.

What this task accomplishes

This task can assess students' problem-solving skills. Do students require the use of manipulatives to solve the task, or can they approach the task using diagrams or number sentences? This task allows students to solve a task in which there is more than one correct solution, broadening students' thinking about problem solving. The task can also be used to assess students' concept of the number 16 and the different combinations that equal 16 using the addends 2, 4, and 6.

What the student will do

Some students will need to get out manipulatives that represent sixteen students, and use them to determine possible combinations. Others may be able to work more abstractly and use diagrams with labels to solve the task. Still others may be able to work even more abstractly by simply using number sentences. Some students will be able to find only one solution, while others may be able to find multiple solutions.

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Time required for task

The time needed for the task will vary for individual children. Some students will begin slowly. Students who seek only one solution and stop may finish more quickly. Allow at least 30 minutes for the majority of the students to complete the task.

Interdisciplinary links

This task can be linked to activities that provide closure to the school year, or to introductory activities for the opening of school.

Teaching Tips

Depending on what time of the school year this task is being introduced to students, different objectives for the task might be emphasized, as well as the need for more or less scaffolding.

If the task is being introduced at the beginning of the school year and/or to younger children, more scaffolding may be required to allow students to access the task. For instance, the number 16 may need to be adapted if it is too large for students to manage. Or students may need to be given 16 manipulatives with which to start, and asked to sit the 16 children in groups of 2, 4 and/or 6 with no students left over.

A simpler version of the task can be introduced to and modeled with students beforehand to give them an idea of the circumstantial situation of the task. Again, the degree to which you will need to scaffold the task will depend on when and to whom the task is being introduced. The task could also turn into a whole-group assignment where students manipulate 16 chairs into a variety of configurations, and record all of the different possibilities as a class on chart paper.

If the task is being introduced to students with more mathematical experience then the task may need to be adapted to provide a more appropriate challenge. For instance, students could be asked to determine all of the possible combinations, or to determine the combination that requires the greatest and fewest number of tables.

The number of students, and/or number of students per table could also be adapted. You may want to adapt the task to include both even and odd numbers of students per table so that students may construct their own rules about adding even and odd numbers. For instance, to sit an even number of students, you could never use an odd number of tables that have odd numbers of spaces because odd + even = odd.

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Suggested Materials: crayons, paper, and math manipulatives that can represent students, tables and/or chairs.

Possible Solutions

6+6+4
6+6+2+2
6+4+4+2
6+4+2+2+2
6+2+2+2+2+2
4+4+4+4
4+4+4+2+2
4+4+2+2+2+2
4+2+2+2+2+2+2
2+2+2+2+2+2+2+2

Benchmark Descriptors

Novice

The novice will use the wrong number of people, and/or the wrong number of people per table. Little or no math language will be used to communicate, and diagrams will lack labels.

Apprentice

The apprentice may have an approach that would work, but will achieve an incorrect solution for one of several different reasons. The apprentice may use the wrong number of students or the wrong number of students per table. The apprentice may count or add incorrectly. Little math language will be used, and diagrams will lack some labels.

Practitioner

The practitioner will achieve a correct solution. Diagrams will be labeled, and mathematics language or notation will be used to communicate.

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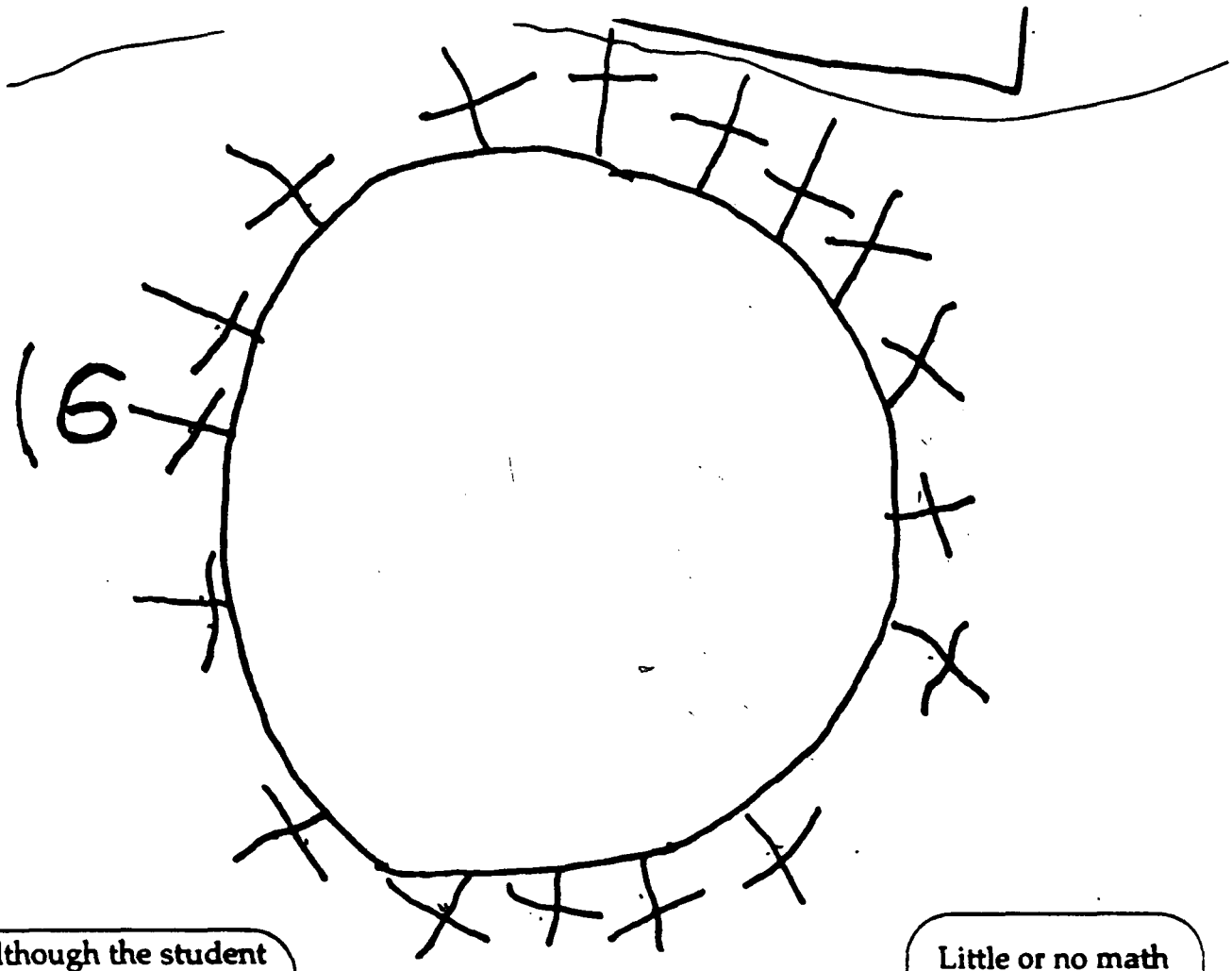
Expert

The expert will achieve at least one correct solution, and probably more than one. If only one correct solution is achieved, then the expert will make mathematically relevant observations about the solution such as, "One table of 6 is the same as using one table of 4 plus one table of 2." The expert will use mathematical notation, and mathematical representations will be labeled.

Authors

The authors of this task are **Sandra Silverman,** a primary-grade teacher in the Oceanview School District, Huntington Beach, CA., and **Darlene Johnson,** a primary-grade teacher in the Oceanview School District, Huntington Beach California.

Novice



Although the student states 16, presumably the number of students, the diagram indicates 17 students.

This student demonstrates understanding for finding for 16, but doesn't stay within the parameters of the task as far as the number of people allowed per table.

Little or no math language is used to communicate.

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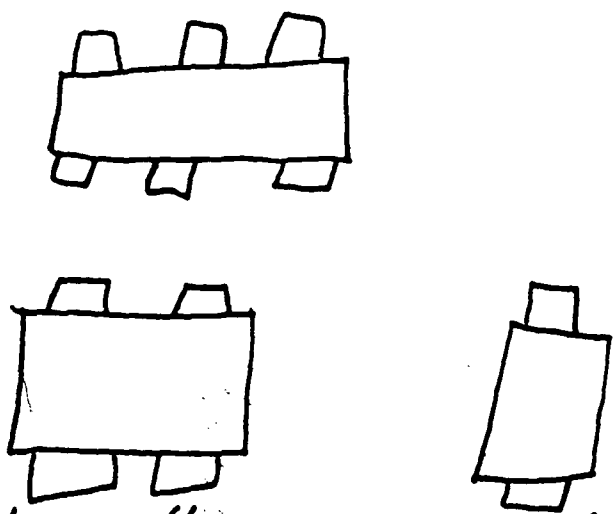
Apprentice



I chose this way because so it is easyer for the techer to see everyone in just three tabels

No math language is used to communicate.

The student follows the requirements in regard to the number of students that can be seated per table; but the number of tables used do not allow for sixteen students to be seated.

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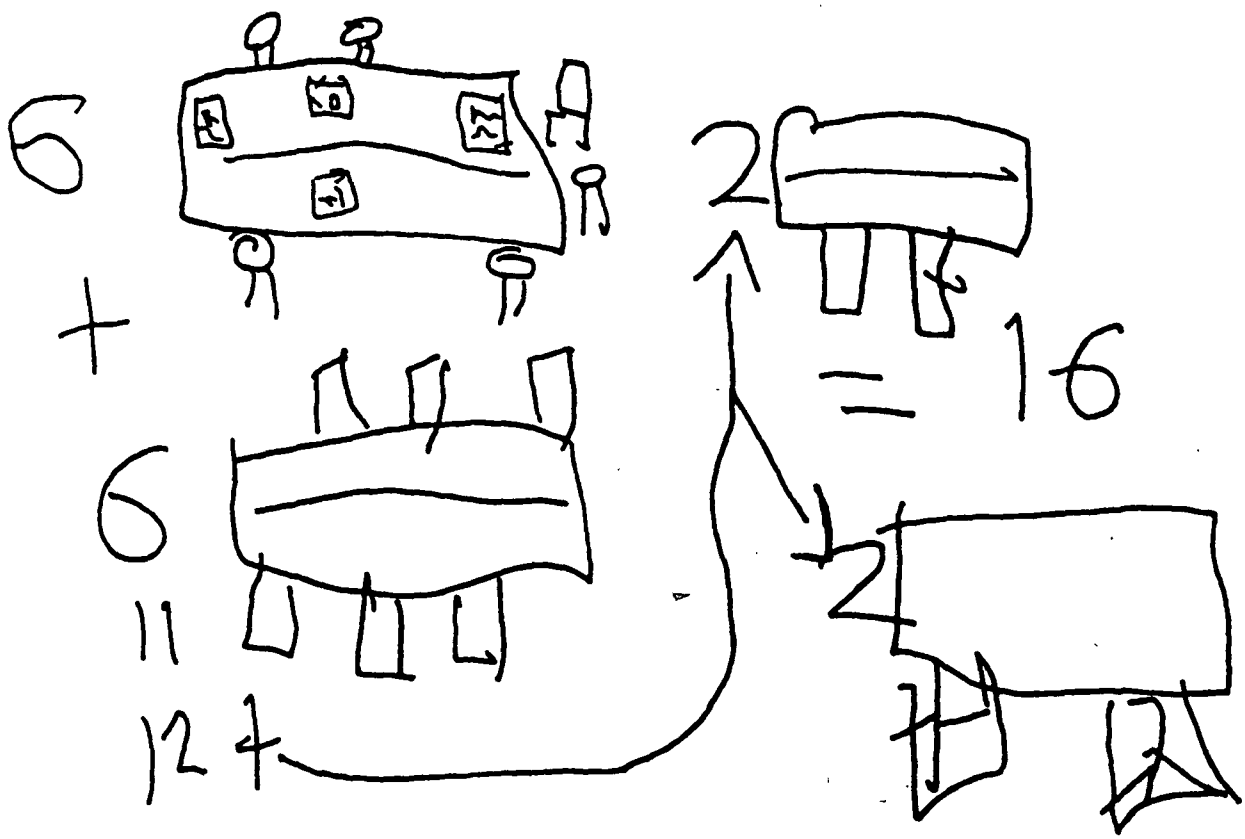
Practitioner

The student's diagrams are labeled.



Mathematical notation is used to communicate.

The student achieves a correct solution.

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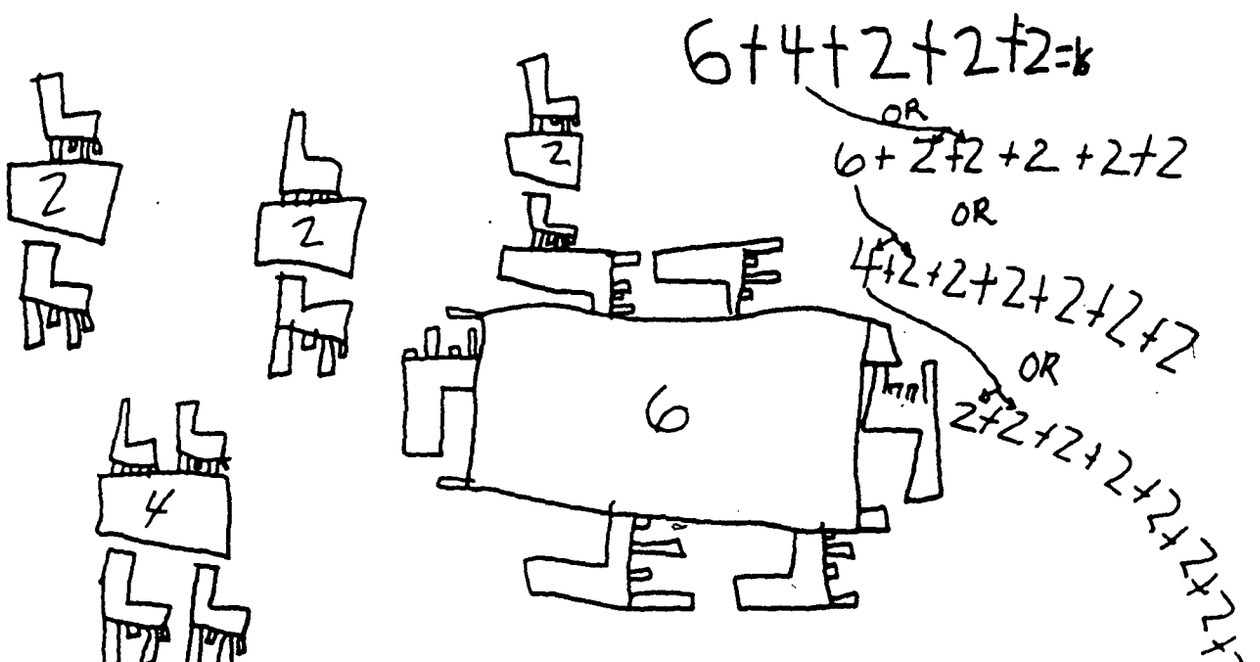
Expert

The student's diagrams are labeled.

Mathematical notation is used to communicate.

The student exhibits mathematical reasoning.



The student makes mathematically relevant comments about the solution.

The student achieves more than one solution.

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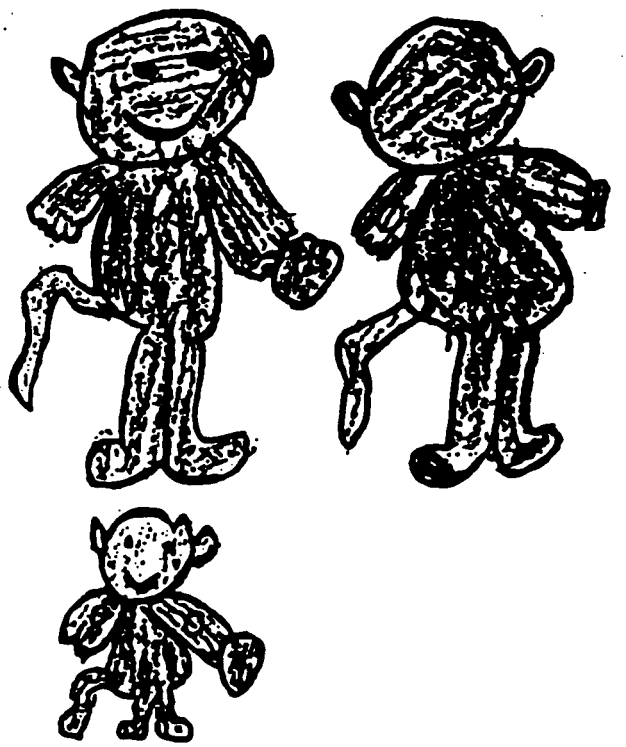
Name _____ **Date** _____
Level 3

P.I. 1A, 3B, 3C, 3D, 7C, 7D

Share and Share Alike

There are three gorillas at the zoo. They had two apples. How will they share them fairly?



Adopted From: Spring Math Exemplars 1997 Grade 3-5, Underhill, VT.

Grade Level K-2

Share and Share Alike!

There are three gorillas at the zoo. They had two apples. How will they share them fairly?

Context

This task can be introduced to students at any time, but may be a great pre-assessment of a student's concepts of division and fractions prior to instruction.

Just as we ask our students to revise their earlier work, we at Exemplars, from time to time, like to revisit work we have done earlier to see how it might be improved. This task was originally published in Volume 1. It offers a particularly nice opportunity for students to show diverse approaches to problem solving and applying their mathematical skills. We have wanted to revisit this problem for some time. We have added to the discussion, and annotated the student work.

What this task accomplishes

This task offers a concrete example of the abstract concepts of division and fractions. This problem allows students to investigate division and fractions, and also provides an opportunity for students to demonstrate their understanding of number sense and their concept of "equal" or "fair".

What the student will do

In solving this problem the student may use diagrams or mathematics manipulatives that show an understanding of fractions. A student may find one solution and stop, or find several different ways of representing that solution. The work will demonstrate the student's ability to apply mathematical concept (dividing) *and* to use problem solving strategies. Children may have strength or difficulty in either area.

Time Required for the Task

The time needed will vary greatly for individual children. Some may find one solution and stop. Others will search for many solutions. Others will begin slowly. Teachers will need time to interview students about their problem solving thinking or students will need time to write about their approach.

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The crucial element here is that teachers take the time to find out *how* children arrived at the answers they got. The thought and strategies are more important than the "correct answer", especially with this age group.

Interdisciplinary links

This problem can be integrated with science and social studies units that relate to community and sharing. Gorillas should be substituted by a more appropriate animal to match a unit you are doing in your classroom. Units on apples or zoos would also fit nicely. The book *Eating Fractions* by Bruce McMillan complements this task well.

Teaching Tips

Students should have some experience with the concept of sharing and therefore, division. They should also have been introduced to the concrete experience of dividing wholes into pieces. However, this assessment may reveal the student's informal and innate sense of division and fractions if the student has not had much experience with division.

The more the teacher "sets up the problem" for the student (by using dittos, teacher made drawings or extensive modeling) the less the teacher will know about a student's thinking. What does a child do to begin the problem solving process? Are errors related to inaccurate representations (e.g. drew too many gorillas) or related to immature mathematical thinking or incorrect mathematical process (add, subtract)? When you let the children draw or set up materials on their own, you see how they are interpreting the problem.

If the teacher wants to transform this activity from assessment to a teaching experience, then group processing activities can be used. Ask children to share their solutions and strategies. Allow ample time for this. As children hear and see strategies of their peers, they will begin to assimilate those strategies.

Suggested Materials

Mathematics manipulatives
Objects students can divide (apples or representations)
Scissors and paste

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It is possible to give students pictures of three gorillas, but often giving them pre-setup materials such as this steers their thinking in a particular direction. The integrity of problems like this are compromised when supplemented with handouts. They limit what we know about children's approaches to solving problems. To avoid providing part of a strategy, you may for instance want to provide a pile of gorilla pictures that the student can count out and use if s/he choose.

Possible Solutions

At the Practitioner and Expert levels, students may arrive at their solution in different ways, although each gorilla will receive one-third of each apple, or two-sixths of two apples. Students might suggest other acceptable forms of the answer, like one-half of one apple, plus one-third of one-half of another apple. Students may not know the fractional terms at these ages, but may be able to identify the right amounts by drawing or showing accurately.

Benchmark Descriptors

Novice

The novice solution will demonstrate no mathematical ideas, or no concept of fair sharing. The novice may add extraneous information, with little or no mathematical language or representations to communicate a mathematical solution.

Apprentice

The apprentice may have a beginning understanding of fractions or halves, although they may not have concept of fair share. Apprentices may divide the apples in half but ignore the extra piece (each gets one-half). Some math language may be used to communicate, and a representation to solve the problem or communicate the solution may be attempted.

Practitioner

The practitioner will have an approach to solving the problem, and will arrive at a correct solution that utilizes all parts of the apples. The practitioner will be able to communicate their strategy and solution, and will use appropriate and accurate math language and representations.

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Expert

The expert will have an approach to solving the problem, and will arrive at a correct solution that utilizes all parts of the apples. The expert may be able to communicate multiple ways of arriving at a solution, and will use precise math language in doing so. The expert will also make mathematically relevant observations or mathematical connections.

Author

The authors of this task are **Sandra Silverman** a primary-grade teacher in the Oceanview School District, Huntington Beach, CA., and **Darlene Johnson** , a primary-grade teacher in the Oceanview School District, Huntington Beach California. The task was revised and updated by **Carol McNair**, the editor of Exemplars.

Novice

The following was taken as dictation from the student.

At first it seems the child has an initial understanding of the task, but doesn't have a mathematical strategy for dealing with this dilemma which is the essence of the task.

The gorillas got 2 apples. He forgot to give them one more but it was the last one. The gorillas were unhappy because they needed one more. So now they are gonna get 3 bananas. I think they will buy more apples. So they might go back and get bananas and apples. One gets 2 apples, one gets 2 pineapples and one gets 20 bananas and that's all.

The student neglects to stay within the parameters of the task.

The student does not demonstrate an understanding of sharing.

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Apprentice

The student uses some math terms to communicate.

3 gorillas
2 apples
How do they eat?

The daddy gets the whole apple and the children get 1/2 each."

The student stays within the parameters of the task but is unable to arrive at a solution for equally sharing the apples. If the student were to think this a fair way to share, an explanation should have been present.

The student's diagram is not labeled and doesn't convey the student's solution.

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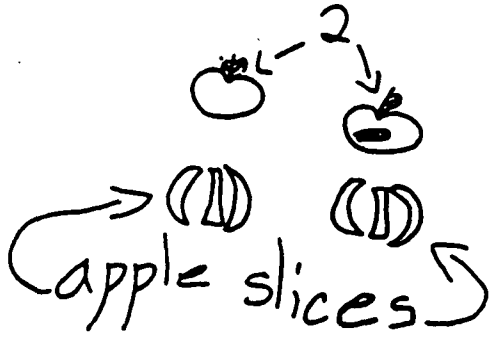
Expert

The student's labeled diagram communicates the student's solution.

Although the student doesn't use the language of fractions, the student does demonstrate understanding of the concept.

Problem — There are 3 gorillas at the zoo. They had 2 apples. How will they share them?



Give two slices to the 3 gorillas.

2+2+2=6 and two odd nember make a even nember

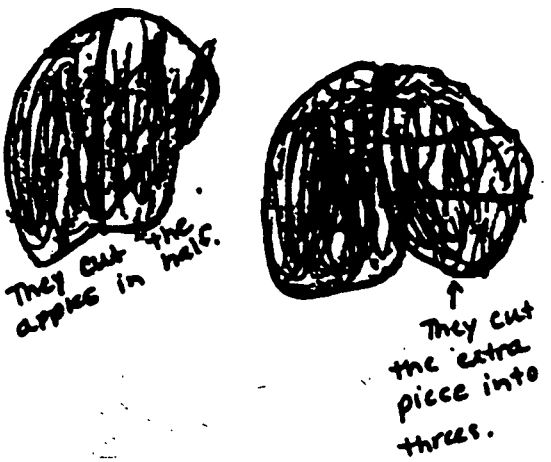
The student arrives at a correct solution for sharing the two apples equally.

The student uses good math language and notation.

The student makes a mathematical observation.

Practitioner

The student doesn't use the language of fractions to communicate, but does seem to understand the concept.



The student uses a diagram to communicate her/his solution.

3 gorillas
2 apples
How do they eat?

The student dictates correct math language to communicate the solution.

The student arrives at a correct solution for sharing the two apples equally.

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Name _____ Date _____

Level 3

P.I. 2B, 3B, 5D, 6D, 6E, 6H, 7A, 7B, 7C

Someone's Been Eating My Porridge

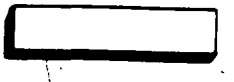
When Goldilocks sat down to eat the three bears' porridge,
She accidentally dumped the noodles onto the table.

There were 17 noodle on the table.

There were 3 different kinds of noodle.

There were thick rectangle noodles. 

There were narrow rectangle noodles. 

There were square noodles. 

Help Goldilocks get the noodles back in the right bowls before the 3 bears come home!

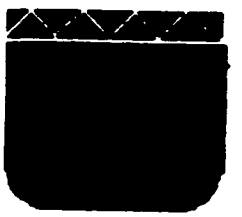
Goldilocks knew that Papa Bear had the <u>most</u> noodles. He only liked the wide, rectangle-shaped noodles.

Goldilocks knew that Baby Bear had the <u>fewest</u> noodles. He only liked the square-shaped noodles.

Goldilocks knew that Mama Bear wasn't fussy. She liked all three types of noodles.

Use these clues to help Goldilocks sort the three types of noodles in Papa, Mama, and Baby Bear's bowls.


Baby Bear's Bowl


Mama Bear's Bowl


Papa Bear's Bowl

Adopted From: January Math Exemplars 1998 Grade 3-5, Underhill, VT.

Context

This task was developed during a geometry unit. I was reading the story entitled *The Silly Story of Goldie Locks and the Three Squares* by Grace Maccarone and published by Scholastic, copyright 1996. This children's book combines a story of Goldilocks and the Three Bears with a geometric "slant" along with mathematics activities written by Marilyn Burns. This story allowed the students to use their prior knowledge of a familiar story, and the investigations they had been doing in class with pattern blocks to apply mathematics vocabulary and reasoning.

What this task accomplishes

This task provides the students with opportunity to explore the number 17, as well as become more familiar with the shapes of rectangles and squares. The task also allows the teacher to assess the students' concepts of "most" and "fewest".

What the student will do

Many students will use the picture of the 3 bowls to organize their solutions. Students will begin experimenting with different numbers of different size noodles to achieve a solution. Some students will do this using manipulatives, while others will use diagrams. Students who use manipulatives should be encouraged to record their solutions on paper as well.

Time required for task: 45 minutes.

Interdisciplinary links

This task obviously links well to reading the fairy tale Goldilocks and the Three Bears and other related activities presented in the book, *The Silly Story of Goldie Locks and the Three Squares.*

Teaching Tips

For students who need more of a challenge, you can add other requirements to the task. For example, Papa Bear could have twice as many noodles as Baby Bear, or you can change the number of noodles or shapes in the task to make it more complicated.

For students who would not be able to handle the number 17, using a smaller number may be more appropriate.

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The first time the children in my class explored the task, I provided the shapes of the noodles cut from yellow construction paper. Students were given no specific number of noodles, but used clues to glue their solutions to the top of their bowls.

I gave the task to students a second time a week later and asked students to draw the different shaped noodles. They used the same clues I presented the first time, but were given the number 17 to work with for their solutions. These pre-assessment activities helped all students access the task.

Suggested Materials: pictures of the 3 bowls that are presented in the task, manipulatives that can be used to represent noodles, pencils, paper, and coloring crayons.

Possible Solutions

This task is open-ended, because there are many possible combinations that will work for a total of 17 noodles. The children should label the bowls. Baby bear should have the fewest, and have only square noodles. Papa Bear should have the most and only have wide rectangle shaped noodles. Mama Bear should have a number of noodles in between the number that Papa Bear and Baby Bear have, and she should have a combination of all three types of noodles.

Benchmark Descriptors

Novice

The novice will use the wrong number of noodles, and/or ignore the limitations on the number of noodles per bear. The novice may also ignore the fact that the noodles are of different shapes. Little or no math language will be used to communicate, and diagrams will lack labels.

Apprentice

The apprentice may have an approach that would work, but will achieve an incorrect solution for one of several different reasons. The apprentice may use the wrong number of noodles, or may not account for the different shapes. The apprentice may count or add incorrectly. Little or no math language will be used, and diagrams will lack labels.

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Practitioner

The practitioner will achieve a correct solution, taking into account all aspects of the task. Diagrams will be labeled, and some mathematical language or notation will be used to communicate.

Expert

The expert will achieve at least one correct solution, and probably more than one. If only one correct solution is achieved, then the expert will make mathematically relevant observations about the solution such as, "There are no three numbers in a row that equal the sum of 17". The expert will use mathematical notation, and math representations will be labeled.

Author

Sandy Haddock teaches first grade at Bristol Elementary School in Bristol, Vermont. Sandy is also a contributor to Science Exemplars.

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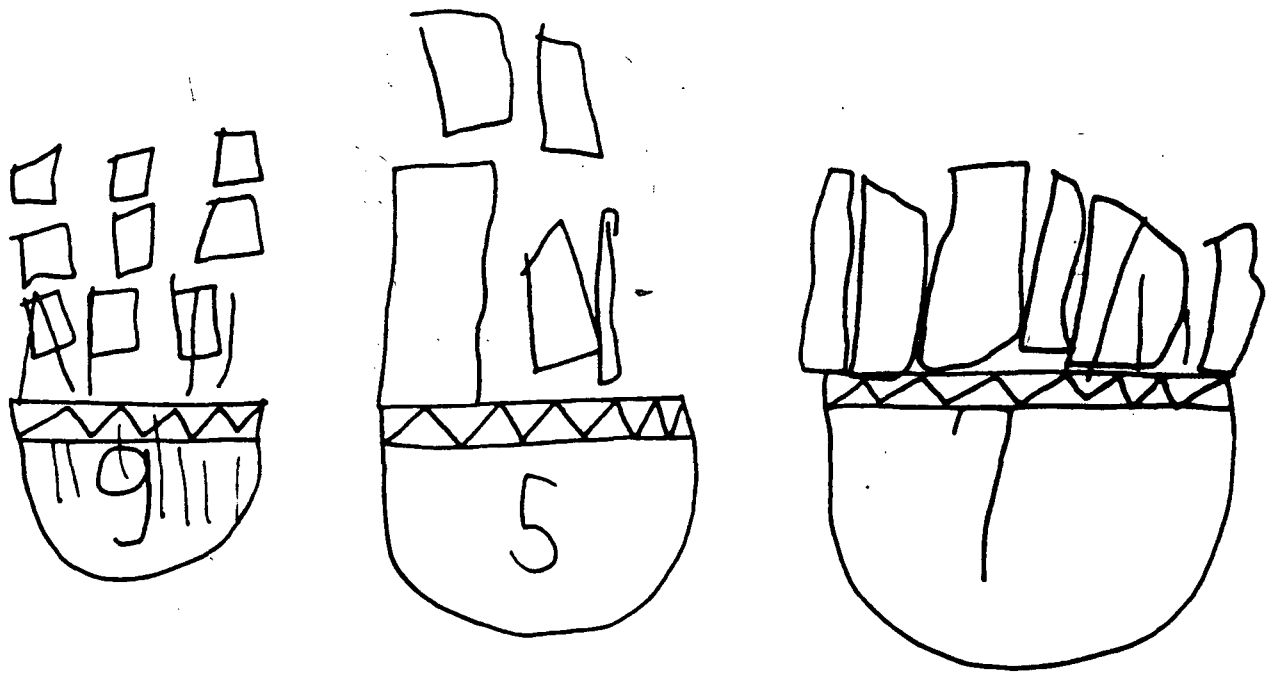
Novice

The student does not label whose bowl is whose, and the number of noodles per bowl doesn't seem to follow the parameters presented in the task.

3 Hungry Bears and the Noodles



The student shows no evidence of using seventeen noodles.

It does appear that the student can differentiate between rectangles and squares.

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Apprentice

3 Hungry Bears and the Noodles

Parts of the student's solution are correct.

The student doesn't carefully draw her/his diagrams so it is unclear whether or not the student addresses the shape requirement presented in the task.

It is unclear why the student does not address this inconsistency between this equation and the desired seventeen noodles.

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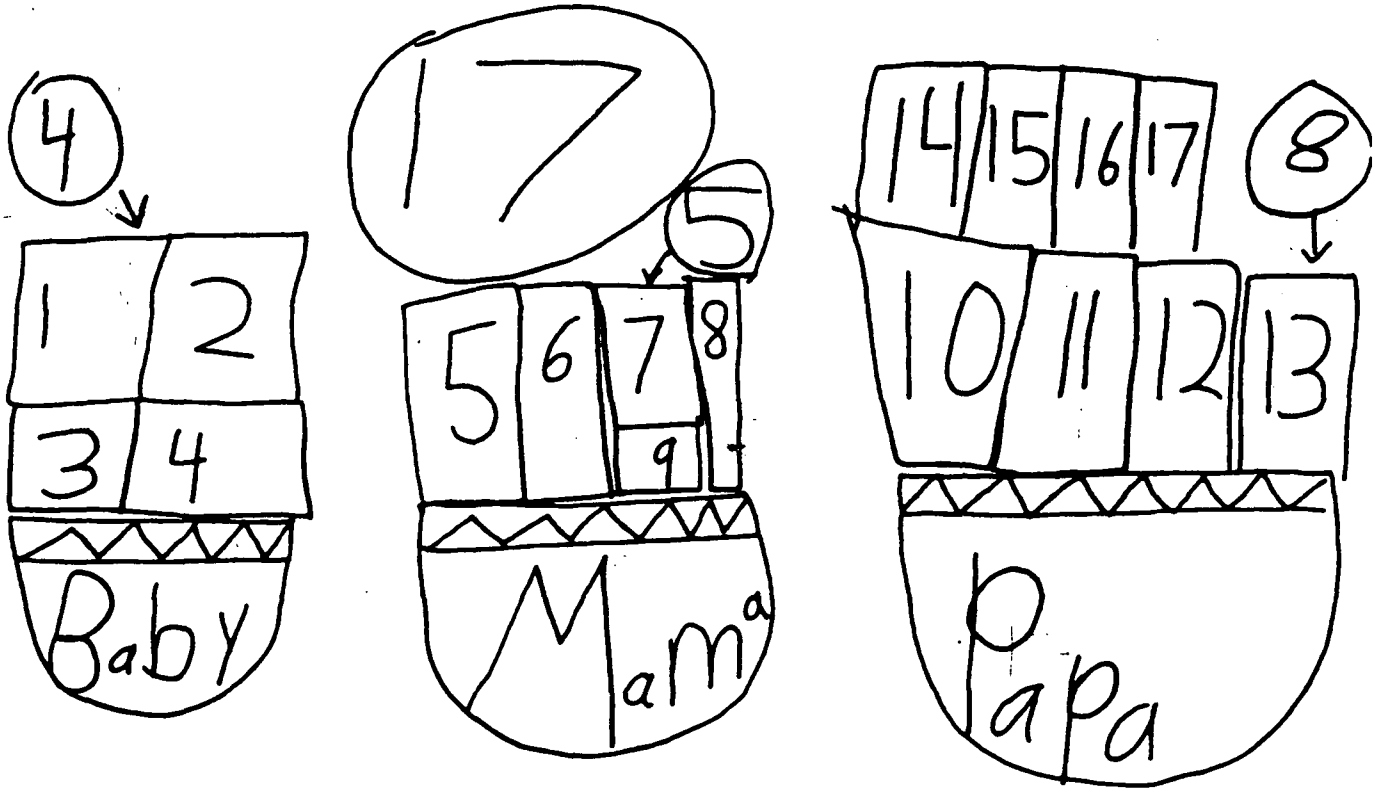
Practitioner

The student achieves a correct solution that addresses all aspects of the task.

The student verifies her/his solution by counting and by adding.

3 Hungry Bears and the Noodles



4 + 5 + 8 = 17 Noodles

The student's work is clearly labeled.

Mathematical notation is used.

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Expert

The student achieves a correct solution that addresses all aspects of the task.

Diagrams are labeled.

3 Hungry Bears and the Noodles

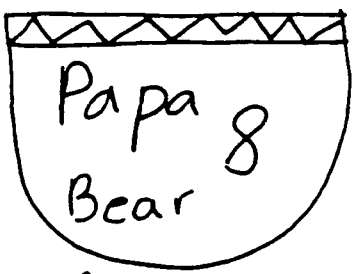
Papa has 4 More than Baby
Papa has 3 More than Mama
17 Noodles

4 + 5 + 8 = 17
even + odd + even = odd

least

Baby Bear has four Noodles.

Mama Bear has five noodles.



Papa Bear has eight Noodles.

Results are summarized.

The student uses accurate and appropriate mathematical language and notation.

The student matches mathematically relevant observations.

Name _____ **Date** _____
Level 3

P.I. 3B, 3C, 5D, 6H, 7C

Artful Colors

In the art room, there are 3 square tables. There are 4 students sitting at each table. Each student has 2 crayons.

In the space below, draw a diagram or model to represent this information.

Find the total number of crayons.

Answer _____ crayons

Name _____ **Date** _____

Problem Solver's Guide:

What is the problem?
To find the solution, try to understand what is going on in a problem.
Try an idea.
Look back, try again.

1. What information is given? (*What do I know?)*

2. Important words that tell math operations:

3. I need to find out:

4. Operation to find solution: ***SHOW ALL YOUR STEPS IN YOUR WORK!***

5. Explain using complete sentences and correct mathematical terminology how you arrived at your answer:

Classroom Ideas

Grade 3

Courtesy of

The University of the State of New York
The State Education Department

Mathematics Core Curriculum

Grades: 3–4

ASSESSMENT EXAMPLES

EXAMPLES FOR

GRADES 3 - 4

1A.

Alice started with 8 marbles. She lost 2 marbles. Then she bought 6 new marbles. Which of these statements is true about the number of marbles Alice has now?

A. Alice has fewer marbles than when she started.
B. Alice has 4 more marbles than when she started.
C. Alice has 6 more marbles than when she started.
D. Alice has the same number of marbles as when she started.

1B.

In these number sentences, the same shape always stands for the same number.

○ + ○ = 8
△ + □ = ○
△ + ○ = 5

Part A

Use the number sentences to find which numbers the △, □, and ○ stand for. Write the correct number in each shape above.

B

On the lines below, explain the steps you used to find the answer.

1C.

Tony and Mara saw 13 clowns at the circus. Each clown was wearing either red, yellow, or green shoes.

- Twice as many clowns were wearing red shoes as yellow shoes.
- There were 4 clowns wearing green shoes.

When they got home from the circus, Mara said there were 6 clowns wearing yellow shoes. Explain whether or not Mara is correct. Include the number of clowns wearing each shoe color.

1D.

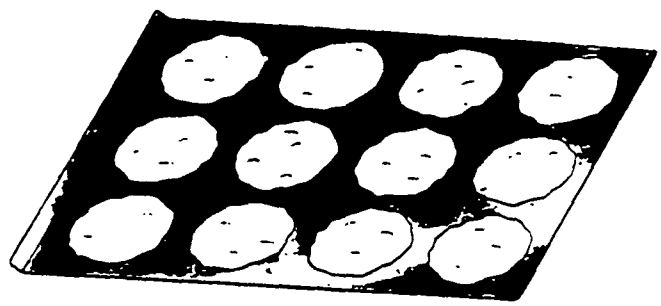
You may use counters to help you solve this problem.

na has 3 craft sticks. Tina and Dan together have 5 craft sticks. Dan and Sally together have 7 craft sticks. How many
t sticks does Sally have?

A. 5
B. 2
C. 3
D. 4

2A.

Label the cookies in the pan to show that
1/3 of them are Oatmeal (O)
1/2 of them are Butter (B), and
the rest are Sugar (S).
What fraction of the cookies on the pan are Sugar?

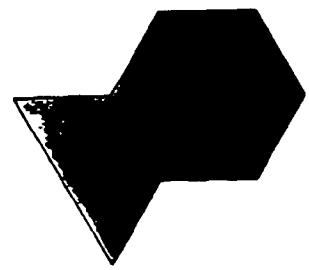


Answer_____

2B.

Use your pattern blocks to help you solve this problem.

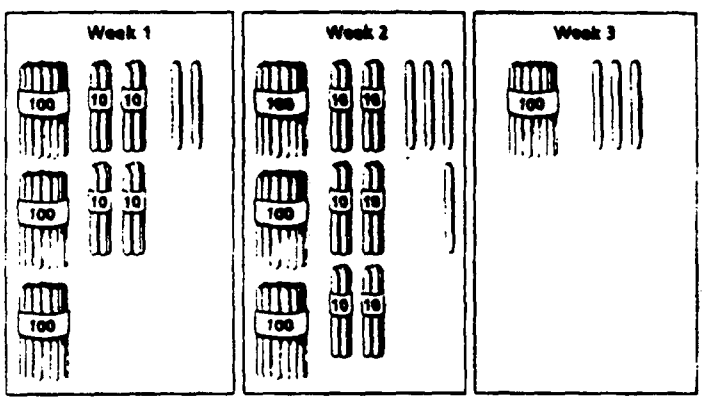
How many of the green triangles would be needed to cover exactly 2/3 of this shape?



A. 1
B. 3
C. 6
D. 9

2C.

The students are collecting craft sticks. The pictures below show the number of sticks they collected each week.



How many sticks do the students have after collecting them for 3 weeks?

A. 809
B. 890
C. 806
D. 980

2D.

Which number would be served next?

F

G

H

J

2E.

One hundred students were asked to name their favorite sport. The table below shows the results of the survey.

FAVORITE SPORT

ort	Number of Students
eball	20
asketball	15
Soccer	35
Football	30
TOTAL	100

What percent of students chose soccer as their favorite sport? **Answer**_____%

What percent of the total group of students did *not* choose soccer as their favorite sport? **Answer**_____

Show your work.

3A.

You may use counters to help you solve this problem.

The list shows how much of each item is needed to make one batch of Chocolate Chip Cookies.

2 c. flour
1 c. sugar
3 eggs
1 t. baking soda
6 oz. chocolate chips
4 T. butter

You want to make *2 batches* of Chocolate Chip Cookies.

Complete the list below to show how much of each item will be needed.

_____ c. flour

_____ c. sugar

_____ eggs

_____ t. baking soda

_____ oz. chocolate chips

_____ T. butter

Pat, Chris, and Jessica are skating to raise money for the school band. The table below shows how many laps each student skated and how much each student earned per lap.

SKATING FOR THE BAND

Student	Number of Laps Skated	Amount Earned Per Lap	Amount Raised
Pat	10	$0.75	
Chris	16	$0.50	
Jessica	13	$0.50	
Total raised by all 3 students			

Complete the table to show the amount of money each student raised and the amount of money the 3 students raised altogether.

3D.

Shelly, Mike, and Jason looked at the stars through a telescope every night for a week. Shelly saw 6 shooting stars, Mike saw 9, and Jason saw 11. They wondered in what order they should add up the numbers to get the highest total. Does it matter? On the lines below, explain why or why not.

_____

_____

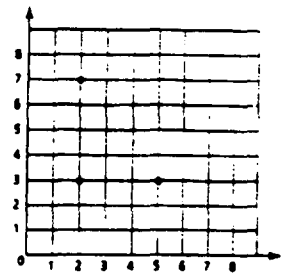
_____

4B.

Alissa plotted the first 3 corners of a rectangle on the grid.

What are the coordinates of the 4th corner?

F. (5, 7)
G. (5, 6)
H. (6, 5
J. (7, 5)



4C.

In the library, there are 2 round tables. There are 3 students sitting at each table. Each student has 4 books.

In the space below, draw a diagram or model to represent this information.

4E.

Use your pattern blocks to help you solve this problem.

In the space, trace aound two pattern blocks that show quadrilateral shapes.

On the lines below, explain what makes these shapes ***quadrilaterals.***

5C.

Use your pattern blocks to help you solve this problem.

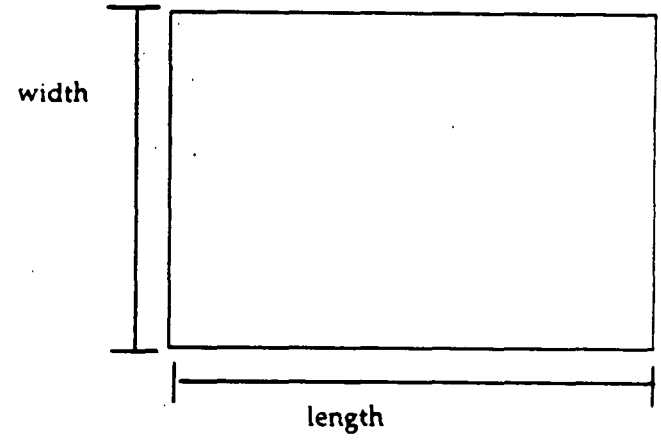
In the space below, trace one shape that has only **right** angles.

In the space below, trace all shapes that have any angle **larger** than right angles. Place an X on all of the angles larger **than** right angles.

5D.

Use your centimeter ruler to solve this problem.

Tim cut rectangles out of construction paper to make a picture. The first rectangle he cut is shown here.



art A
What is the perimeter in centimeters of Tim's first rectangle?

Show your work.

First Perimeter _____ centimeters

Part B
The second rectangle **Tim cut has the same** width as the first, but the length is 2 centimeters longer. What is the perimeter in centimeters of **Tim's second rectangle?**

Second Perimeter _____ centimeters

On the lines below, explain in words how you found the perimeter of Tim's second rectangle.

5E-F:

Mr. Jacobs asked his first-grade students to choose their favorite crayon colors. The results are shown in the table below.

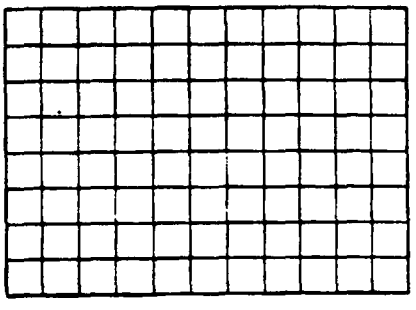
FAVORITE CRAYON COLORS

Eric	Red
Shannon	Purple
Jill	Yellow
Keisha	Red
Allison	Green
Christina	Blue
Nicole	Purple
Roosevelt	Blue
Stacy	Red
Mandy	Green
Mel	Blue
Peter	Green
Julie	Red
Lisa	Blue
Thomas	Blue
Paul	Red
Marcus	Blue
Al	Green
Ken	Blue
Lacey	Yellow

On the grid below, make a bar graph showing the number of students who prefer each crayon color. Use the information from the table to help you.

Be sure to:

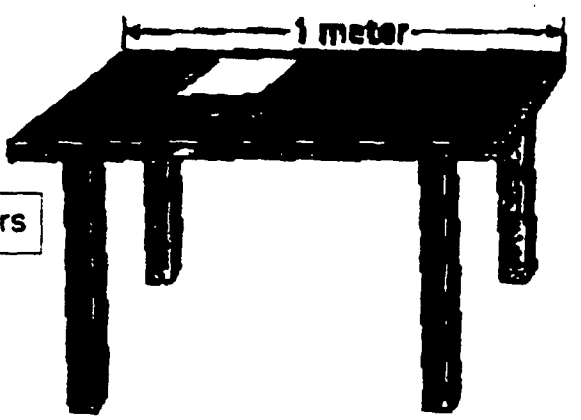
- title the graph
- label the axes
- graph all the data.



Using the information from your graph, write *one* statement comparing the crayon colors.

6A.

Look at the picture. The table is 1 meter long.
Estimate the width of the piece of paper in centimeters.



1 Meter = 100 centimeters

Estimate _____

6C.

The Lee family is standing in line for the Turtle Olympics. The family is trying to figure out the following four things:

- How much money will it cost to get in?
- How long will they have to wait in line?
- How many tickets will they need?
- What time will the Olympics start?

Which of these things will the Lee family most likely have to estimate?
Explain why you would use an estimate or why an estimate would not be used on the lines below.

_____

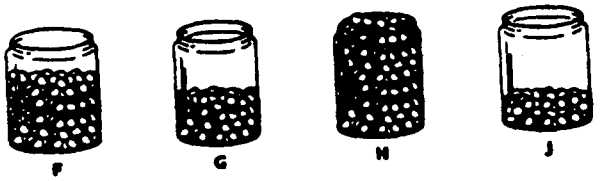
_____

_____

6D.

This jar has about 40 marbles in it.

Which of the jars has the amount closest to 120 marbles?



6E.

Amy says that a spaceship traveling at 7,200 miles per hour would go 15,000 miles in 8 hours. Sue disagrees and says that the spaceship would travel 56,000 miles in that amount of time.

Which student has the closer estimate to the actual distance? Explain why.

6F.

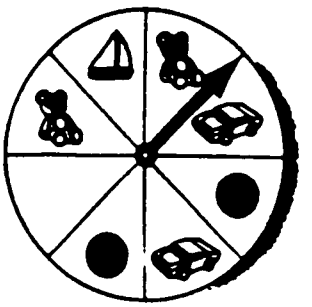
For the spinner to have an equal chance of landing on each prize, which prize should go in the blank space?

F.

G.

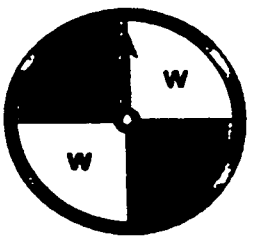
H.

J.

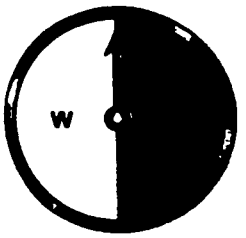


6G.

Kim and Lisa are playing a game. Each player will use a different spinner shown below. Each player will spin their own spinner 10 times and score 1 point each time the arrow on her spinner lands on R. The player with the most points wins.



Kim's Spinner



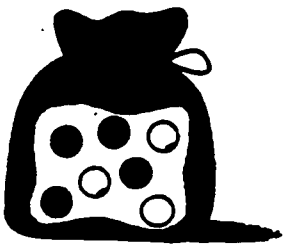
Lisa's Spinner

Use the two spinners to explain why both players do or do not have a fair chance of winning the game.

6H.

Jack will choose one marble from the bag without looking.
What is the probability he will choose a black marble?

A. 1/7
B. 2/7
C. 3/7
D. 4/7



ASSESSMENT EXAMPLES

EXAMPLES FOR

GRADES 3 - 4

Grades: 3-4

7A.

Study the pattern. 

What is the next shape in the pattern?


F

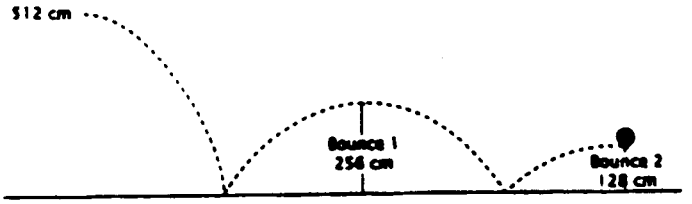

G


H


J

7B.

In a computer game, a ball was dropped from a height of 512 centimeters. The picture shows how high the ball bounced.



Part A

If the pattern continues, how high will Bounce 3 be?

Answer _____ cm

Part B

On the lines below, describe how the height changes from one bounce to the next.

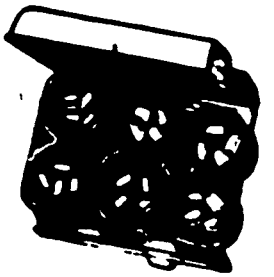
_____

_____

Part C

Predict how high Bounce 6 will be. **Answer** _____ cm

7C.



David put 4 beads in each section of the egg carton shown.

Which of these number sentences could not be used to find the total number of beads?

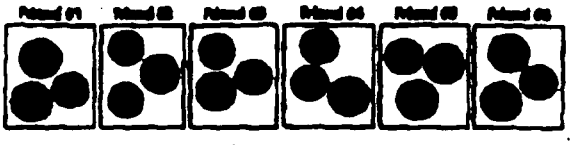
F. 4 X 6 = ❑ H. 4 + 4 + 4 + 4 + 4 + 4 = ❑

G. 6 X 4 = ❑ J. 6 + 6 + 6 + 6 + 6 + 6 = ❑

7D.

You may use your counters to help you solve this problem.

Erin has 18 cookies. She gave 3 to each of her 6 friends.



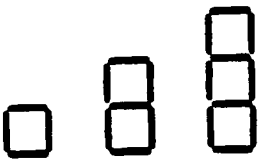
Al has 12 cookies, and wants to divide the cookies equally among each of his 3 friends. How many cookies will each of Al's friends receive?

F. 6 H. 3

G. 2 J. 4

7E.

Look at the pattern below. Each figure is made with craft sticks.



How many craft sticks are needed to make the next figure in this pattern?

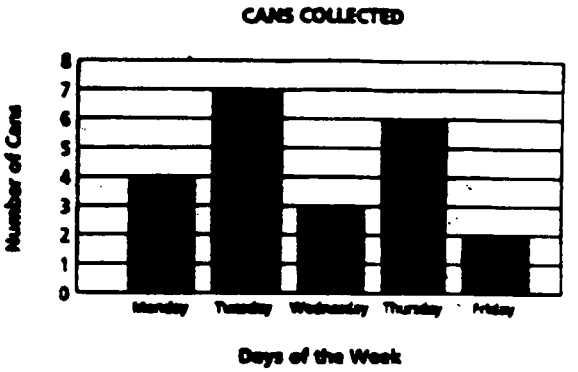
A. 3
B. 4
C. 12
D. 13

7F.

The graph shows the number of canned goods that Mr. Ruiz's class collected. Study the graph. Then answer the questions.

Part A

Mr. Ruiz promised to reward his class with animal stickers when the total number of cans reached 15. The bar graph shows the number of cans the class brought in each day.



What day did Mr. Ruiz give his class the animal stickers?

Tuesday
Wednesday
C. Thursday
D. Friday

rt B

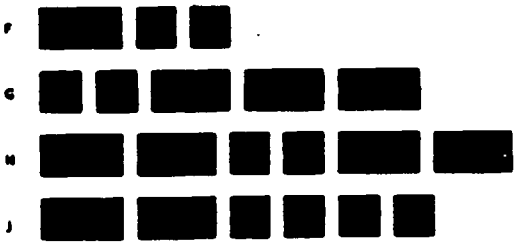
How many days did the students collect more than 5 cans?

F. 5
G. 2
H. 3
J. 4

7G.

Look at this rectangular solid (box).

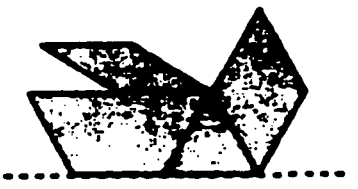
Which of these groups shows all the sides of the rectangular solid (box) above?



7H.

Use your pattern blocks to help you solve this problem.

Dan used pattern blocks to draw half of a design.



Complete the design below so that the dotted line is a line of symmetry. ıce around your pattern blocks to show the other half of the design.

CLASSROOM IDEAS

EXAMPLES FOR

GRADES 3 - 4

Grades: 3-4

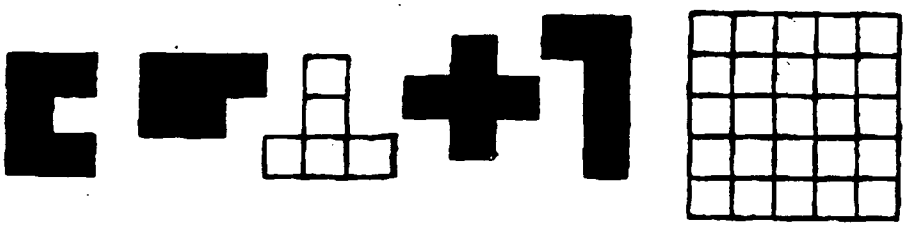
The following ideas for lessons and activities are provided to illustrate examples of each performance indicator. It is not intended that teachers use these specific ideas in their classrooms; rather, they should feel free to use them or adapt them if they so desire. Some of the ideas incorporate topics in science and technology. In those instances the appropriate standard will be identified. Some classroom ideas exemplify more than one performance indicator. Additional relevant performance indicators are given in brackets at the end of the description of the classroom idea.

3C.

Tell students, "Your classmate says that any number times zero starts with the number you are multiplying and ends with a zero (e.g., 5 x 0 would be 50)." Have students, with their partners, prepare an explanation for why this is not correct. Let students share their explanations and decide which correct explanation they feel is the clearest. [Also 1A., 1C.]

4A.

Show how these five puzzle pieces can be made to fit into the 5 x 5 grid below. Your final result will be a square. Keep moving the pieces until you can find an arrangement that works. Describe how you found the solution. [Also 1D.]



4D.

Thermometers placed outdoors on the north, south, east, and west walls of the building and also inside the building can be used to collect temperatures at different times of the day for several days. Students could be asked to choose a graph to display their recorded data. Topics for discussion include: comparisons of the warmest and coolest parts of the day, the warmest and coolest locations inside and outside, and reasons for these temperature differences. [Also 4B., 5C., 5E., 5F.]

5A.

Have students work in groups to create their own measurement scale, using as units handspan, book, length of string, etc. Have them measure different objects in the classroom with their measurement scale and also with metric measurements and compare the results. They could use marbles to develop a measurement scale in a cylinder and compare it to the graduated markings in milliliters as to its accuracy in measuring by displacement. [Also 5B., 5C., 5D., 6A.]

5B.

Give students magazines or catalogs. Have them cut out various pictures of objects and glue them to poster board. Underneath the picture they should write what unit of metric measure would be used to measure the object (millimeter, centimeter, meter, kilometer, milligram, gram, kilogram, milliliter, or liter) and write a sentence underneath explaining why they feel the unit of measure chosen is the most appropriate.

6A.

Students explore various methods of rounding numbers to estimate computation. For example, in addition or multiplication, round each number to the nearer thousand and add the rounded numbers. Or, use the numbers in the thousand place and add for a lower limit and then raise all the numbers to the next thousand for the upper limit. The actual sum will be between the two values. Have students compare the two methods. For example:

Method 1		Method 2	
3569	4000	3000	4000
+2712	+3000	+2000	+3000
	7000	5000	7000

The sum is greater than 5000 but less than 7000.

Testing Program

Mathematics Test Sampler Draft

Ever Upward . . .

Ever Upward . . .

4

THE STATE EDUCATION DEPARTMENT / THE UNIVERSITY OF THE STATE OF NEW YORK / ALBANY, N.Y. 12234

ASSISTANT COMMISSIONER FOR CURRICULUM, INSTRUCTION AND ASSESSMENT

January 1998

Dear Colleagues:

In April of last year, the State Education Department entered into a partnership with CTB/McGraw-Hill for the development of the elementary and intermediate assessments in English Language Arts and Mathematics. These tests will measure student progress toward achieving the learning standards in these areas. New York teachers, students, administrators, parents, and members of the community have assisted in the development process in a variety of ways. Committees have reviewed passages and test items; teachers and students have piloted questions for this Test Sampler Draft and will be involved in field testing this year. These Test Sampler Drafts, developed to provide information on the new assessments for you and your school community, represent the first products of this effort.

The Test Sampler Drafts for English Language Arts and Mathematics have been provided to each school. These Test Sampler Drafts provide examples of the types of questions, the formatting, and the scoring guides that we are developing for the actual tests that will be administered for the first time in 1999. Additional refinement of the tests will occur as a result of field tests that will be conducted over the next few months. These drafts may be duplicated for use in your classroom. Strategies for using the sample tests are included in the introductory materials.

Both the State Education Department and CTB/McGraw-Hill are interested in receiving your feedback on these preliminary materials. A Comment Sheet is included on the inside back cover of each Test Sampler so that you may forward your responses to us. The Comment Sheet may be faxed to (518) 486-1385 or mailed to the address listed below:

New York State Education Department
Office of Curriculum and Instruction
Room 671 EBA
Albany, New York 12234

Thank you for your assistance with this significant endeavor.

Sincerely,

Edward T. Lalor

CTB
McGraw-Hill

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Table of Contents

INTRODUCTION

The New York State Board of Regents has set higher learning standards for all students. To help students reach these standards, the New York State Testing Program's elementary school mathematics test will challenge students to demonstrate their ability to use mathematics.

This Test Sampler Draft for Grade 4 Mathematics provides examples of the format and types of questions that are now being field tested in preparation for the first administration of the actual test in 1999. Over the past few months, hundreds of individuals have worked with the State Education Department and CTB/McGraw-Hill staff in the development process. Committees of teachers and school administrators have reviewed the content of proposed test questions; committees of parents, business and community representatives, and members of professional organizations have also reviewed the questions. A panel of experts in mathematics is now reviewing the draft materials. You will be able to provide feedback through a comment sheet in the back of this booklet. All of this work has one goal: to ensure that the tests will be appropriate measures of student achievement of the learning standards in mathematics. Any further revisions will be based on all the information received.

The mathematics test requires students to demonstrate their ability to apply facts and definitions, solve problems, and show their understanding of mathematical procedures and problem-solving strategies. Beginning with the 1999 test administration, the assessment will provide the student, teacher, and parent/guardian with a report of individual student strengths and weaknesses.

How to Use the Sample Test

The sample test of Grade 4 mathematics may be administered in the classroom to familiarize students with the test format and the types of questions that are being planned. For the samp students may mark answers directly in the test book. For the test beginning in 1999, students use an answer sheet for multiple choice questions but will continue to write the answers to op ended questions in the test book. The test will be administered in three timed sessions over th days. Ample time has been provided for students to answer the questions.

Teachers and students can also review the scoring guide. Answer keys are provided for the mu choice questions. The rubrics describe characteristics of responses at each point level. The rub also may be applied to other problem-solving situations the students have worked on in the classroom. A complete and correct response and a sample student response are provided for e open ended (i.e., short and extended response) question. In addition, sample responses for eac point level are provided for one short response question and one extended response question.

After administering the practice test, the teacher may discuss with the students their performa Students will be able to consider how they might have responded differently or which specific changes they might make, such as providing additional work or explanations to support their solutions, to improve their performance.

Directions for Administering the Sample Test

Please read these directions carefully before administering the test. To administer the test, read aloud to the students the boldface directions preceded by the word **SAY**.

Materials needed:

- Sample Test Books (1 for each student and 1 for the teacher)
- extra pencils and paper
- copies of the Punch-Out Tools (see Appendix B) photocopied on cardstock and cut out, or similar class manipulatives (ruler, counters, and pattern blocks; 1 set for each student)
- envelopes (for storing manipulatives; 1 for each student)

This test will be administered in three consecutive daily sessions. The Sample Test Book is divide into three parts: Session 1, Session 2, and Session 3. Administer Session 1 on the first day, Session on the second day, and Session 3 on the third day. Each session will take approximately one hour administer.

SESSION 1

Distribute one Sample Test Book to each student. Also distribute cut-out copies of the tools, or similar class manipulatives, and one envelope to each student. Explain to the students that they will use these tools to help them do the questions in the test. Have each student put his or her name on the envelope for collecting and redistributing the tools.

SAY **This is your Sample Test Book. Do not open your book until I tell you to do so. First, write your name on the cover of your Sample Test Book.**

Pause for the students to write their names. Then ask if anyone has questions before moving on to the next instruction.

SAY **The test is divided into three sections: Session 1, Session 2, and Session 3. Today you will complete Session 1. Tomorrow you will complete Session 2, and the next day you will complete Session 3.**

Hold up your copy of the Sample Test Book. Point to the section with tips for taking the test on the front cover.

SAY **Look at the front cover. You will see sentences about taking the test. I will read the first three sentences aloud while you read along silently.**

Read aloud the first three tips for taking the test. (Do not read the tips for the open ended questions.) Then point to the box with the icons.

SAY **Now look at the box. You will see three pictures with a sentence next to each picture. I will read each sentence aloud while you read along silently.**

Read aloud the sentences next to the icons. Hold up the tools or class manipulatives for each icon.

After the information on the front cover has been read aloud,

SAY **This first section of the test contains multiple choice questions. Read each problem in the Sample Test Book carefully and answer the questions. Circle the letter next to the answer you choose. You may use your tools to help you solve any problem on the test.**

Remember to read all directions and information in the Sample Test Book. When you see the words *GO ON* at the bottom of the page, keep going. When you come to the word STOP, you have finished the multiple choice section of the test. You may go back and check the answers you just completed, but do not go on. When you have finished, sit quietly until I call time. You will have 45 minutes to complete this section of the test.

When you are sure everyone understands the directions,

SAY **Open your test book and find question Number 1. You may begin.**

On the board, write the time the students begin the test and the finish time. When 45 minutes have elapsed (or sooner, if you are sure everyone has finished),

SAY **Please stop working. This is the end of Session 1. Close your books. Put your tools in the envelope. We will take Session 2 of the test tomorrow. Now I will collect the Sample Test Books and the envelopes.**

Collect the Sample Test Books and envelopes. Keep the materials in a safe place until the next testing session.

SESSION 2

Distribute the Sample Test Books and tools to the students. Make sure students have their own Sample Test Book and envelope before beginning the test session.

Hold up your copy of the Sample Test Book. Point to the section with tips for taking the test on the front cover.

SAY **Look at the front cover. You will see sentences about taking the test. I will read all of the sentences aloud while you read along silently.**

Read aloud all the tips for taking the test, including the tips for the open ended questions, then point to the box with the icons.

SAY **Now look at the box. You will see three pictures with a sentence next to each picture. I will read each sentence aloud while you read along silently.**

Read aloud the sentences next to the icons. Hold up the tools or class manipulatives for each icon.

After the information on the front cover has been read aloud,

SAY **Today you will complete Session 2 of the test. In this session, you will write your answers on the lines provided instead of choosing from a list of possible answers. Read the directions and questions carefully. It is important to show all your work as well as your final answers in the Sample Test Book. You may use your tools to help you solve any problem on the test. Be sure to write clearly and legibly. Are there any questions?**

Pause to answer questions. When you are sure that the students understand the directions, continue.

SAY **You will have 1 hour to complete this section of the test. When you see the words *GO ON* at the bottom of the page, keep going. When you come to the word STOP, you have finished Session 2 of the test. You may go back and check today's work, but do not go on. When you have finished, sit quietly until I call time. Are there any questions?**

Pause to answer questions.

SAY **Turn to Page T-20 and find question Number 31. You may begin.**

You may record the time left on the chalkboard as the testing session progresses. When one hour has elapsed (or sooner, if you are sure everyone has finished),

SAY **Please stop working. This is the end of Session 2. Close your books. Put your tools in the envelope. We will take Session 3 of the test tomorrow. Now I will collect the Sample Test Books and envelopes.**

Collect the Sample Test Books and envelopes. Keep the materials in a safe place until the next testing session.

SESSION 3

Distribute the Sample Test Books and tools to the students. Make sure students have their own Sample Test Book and envelope before beginning the test session.

SAY **Today you will complete Session 3 of the test. As in Session 2, you will write your answers on the lines provided in your Sample Test Book. Be sure to write clearly and legibly. It is important to show all your work as well as your final answers in the Sample Test Book. You may use your tools to help you solve any problem on the test. Are there any questions?**

Pause to answer questions.

SAY **You will have 1 hour to complete this section of the test. When you see the words *GO ON* at the bottom of the page, keep going. When you come to the word STOP, you have finished Session 3 of the test. You may go back and check today's work only. When you have finished, sit quietly until I call time.**

Turn to Page T-32 and find question Number 40. You may begin.

You may record on the chalkboard the time left as the testing session progresses. When one hour has elapsed (or sooner, if you are sure everyone has finished),

SAY **Please stop working. This is the end of the test. Close your books.**

Collect all Sample Test Books.

SAMPLE TEST BOOK

TIPS FOR TAKING THE TEST

Here are some suggestions to help you do your best:

- Be sure to carefully read all of the directions and questions in the Sample Test Book.
- Ask your teacher to explain any directions you do not understand.
- You may use your tools to help you solve any problem on the test.

Tips for answering the open ended questions:

- Read each question carefully and think about the answer before writing a response.
- Be sure to show your work when asked. You may receive partial credit if you have shown your work.

This picture means that you will use your ruler.

This picture means that you will use your pattern blocks.

This picture means that you may use your counters.

STUDENT NAME _____

1 227
− 14

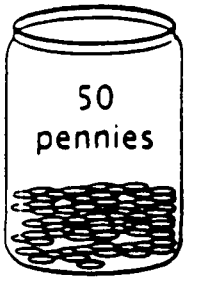
A 311
B 241
C 231
D 232
E None of these

2 4 × 116 =

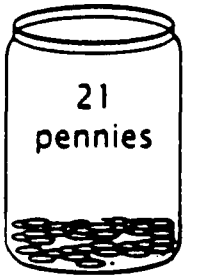
F 4424
G 664
H 444
J 464
K None of these

3 Which of these jars has an even number of pennies?

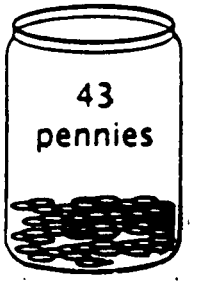
A



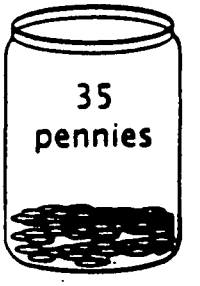
B



C



D



Go On

4

Which number will be served next?

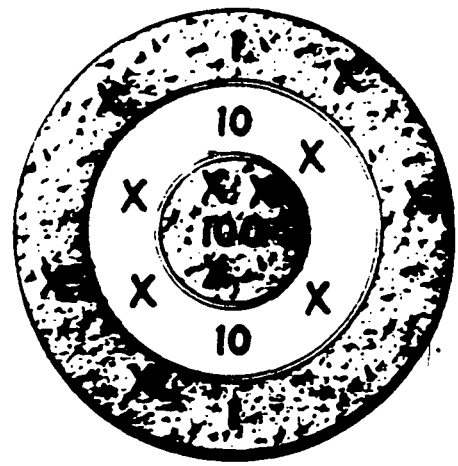
F

G

H

J

5 Harry played a game of darts. He threw 12 darts at the target. The numbers show how many points are earned for each dart that lands in that area. The X's on the target below show where the darts landed.

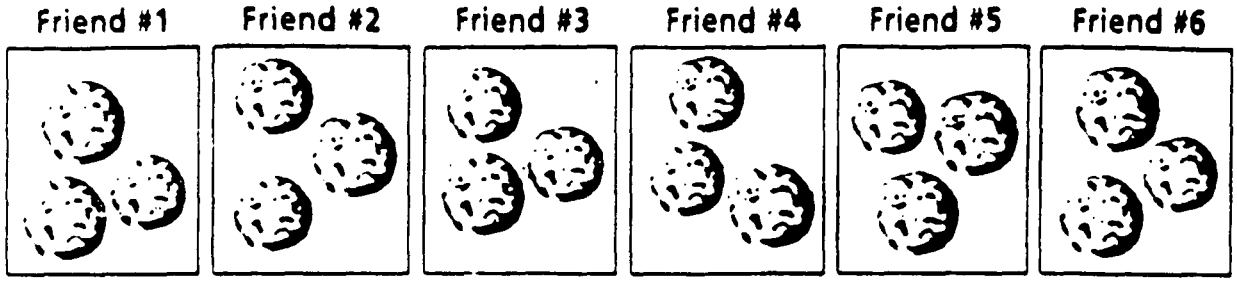


What was Harry's total score?

A 435
B 345
C 534
D 354

6 You may use your counters to help you solve this problem.

Erin has 18 cookies. She gave 3 to each of her 6 friends.

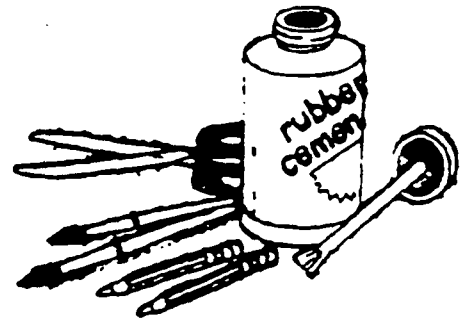


Al has 12 cookies, and wants to divide the cookies equally among each of his 3 friends. How many cookies will eacn of Al's friends receive?

F 6
G 2
H 3
J 4

Go On

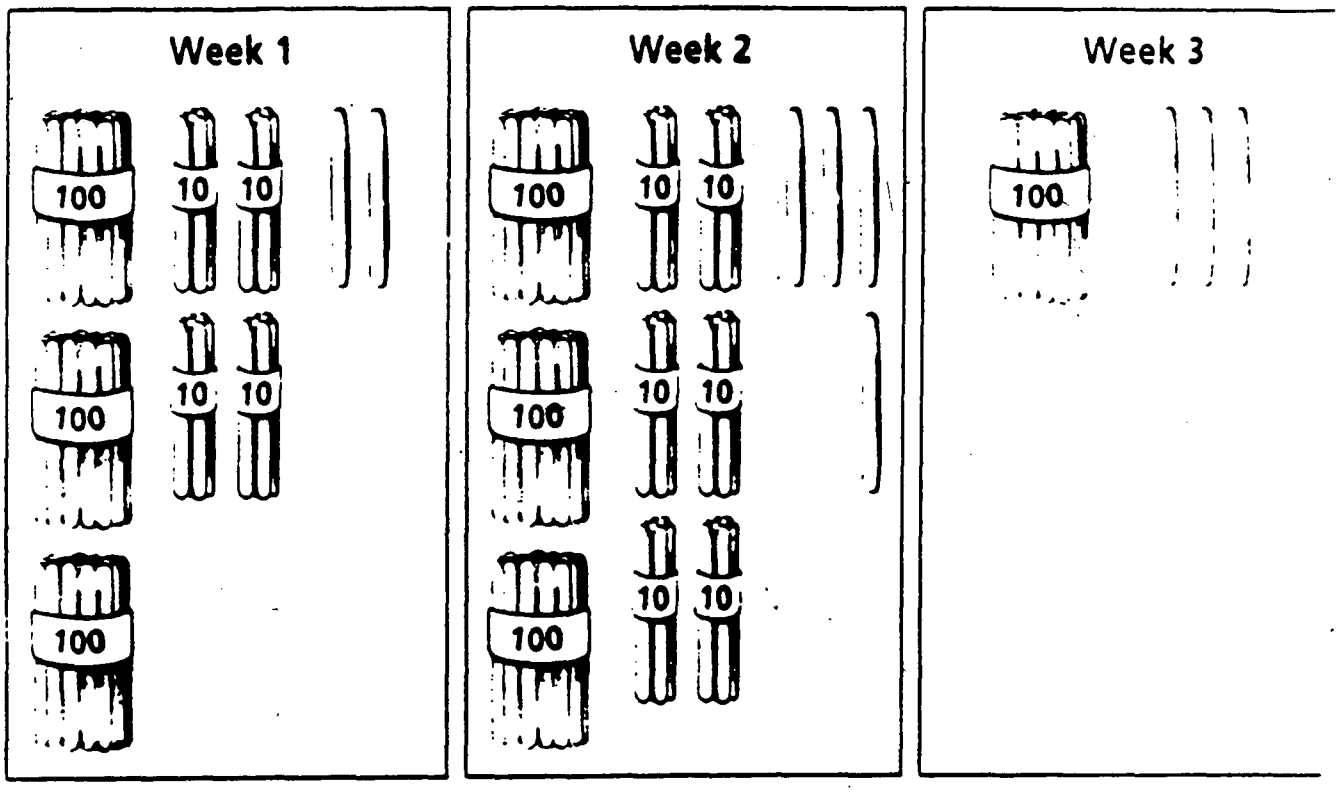
Art Project



Directions

The fourth grade is planning for an art project.
Do Numbers 7 through 12.

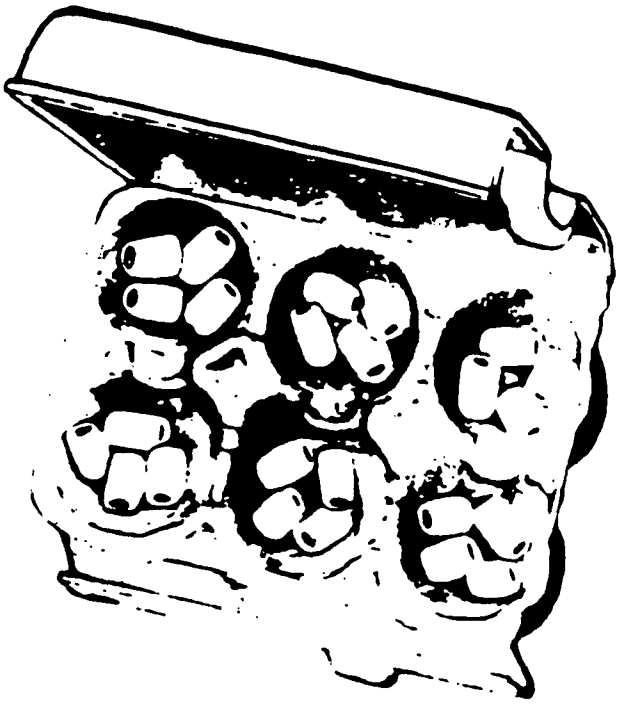
7 The students are collecting craft sticks. The pictures below show the number of sticks they collected each week.



How many sticks do the students have after collecting them for 3 weeks?

A 809
B 890
C 806
D 980

8 David put 4 beads in each section of the egg carton shown below.



Which of these number sentences could *not* be used to find the total number of beads?

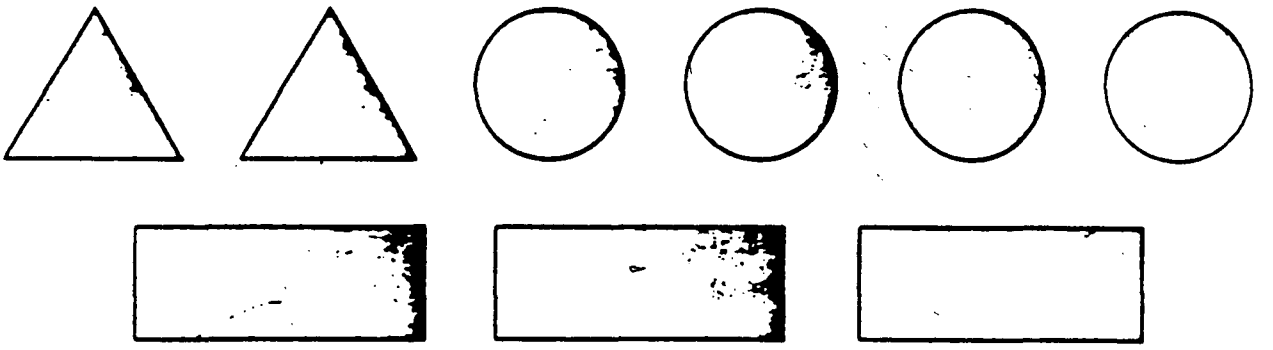
F $4 \times 6 = \square$

G $6 \times 4 = \square$

H $4 - 4 - 4 - 4 - 4 - 4 = \square$

J $6 - 6 - 6 - 6 - 6 - 6 = \square$

9 Billy cut out these shapes for his art project.



What fraction of the shapes are triangles?

A $\frac{2}{7}$

B $\frac{1}{3}$

C $\frac{7}{9}$

D $\frac{2}{9}$

10 John needs 100 buttons to complete his art project. He has 80 buttons. What percent of the 100 buttons does John have so far?

F 8%

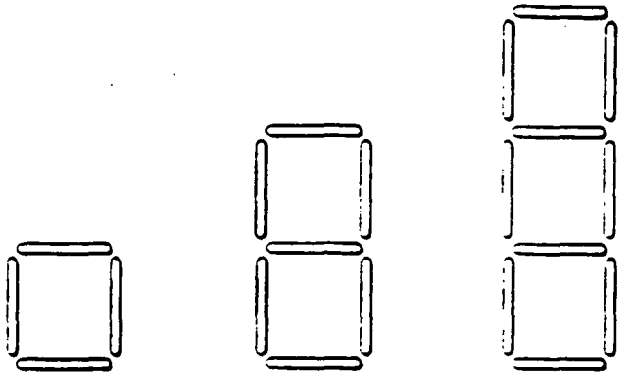
G 10%

H 20%

J 80%

Go On

11 Look at the pattern below. Each figure is made with craft sticks.



How many craft sticks are needed to make the next figure in this pattern?

A 3
B 4
C 12
D 13

12 You may use your counters to help you solve this problem.

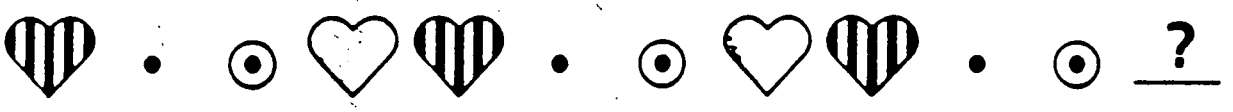
Tina has 3 craft sticks. Tina and Dan together have 5 craft sticks. Dan and Sally together have 7 craft sticks. How many craft sticks does Sally have?

F 5
G 2
H 3
J 4

13 Which shape below is closest to $\frac{1}{2}$ shaded?

A B C D

14 Study the pattern below.



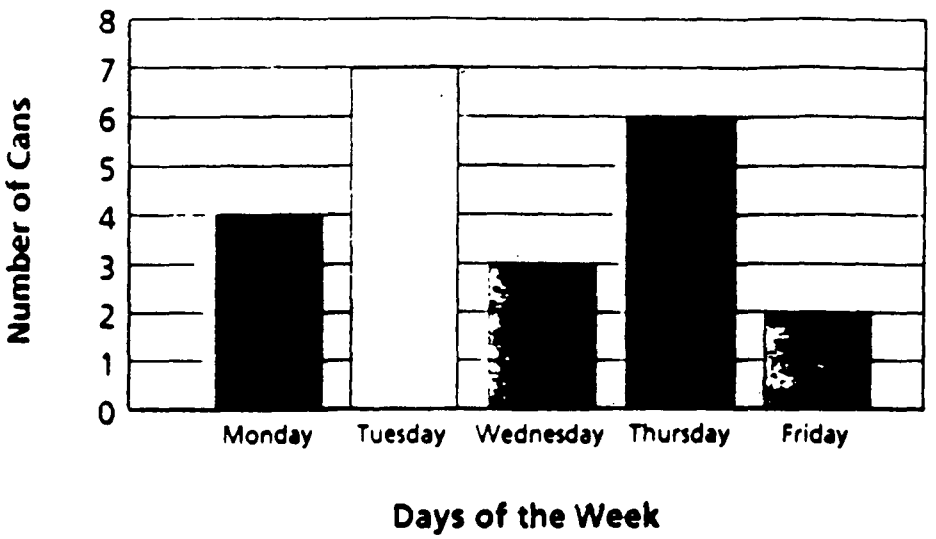
What is the next shape in the pattern?

F G H J

Go On

Directions

The graph below shows the number of canned goods that Mr. Ruiz's class collected. Study the graph. Then do Numbers 15 and 16.



15 Mr. Ruiz promised to reward his class with animal stickers when the total number of cans reached 15. The bar graph shows the number of cans the class brought in each day.

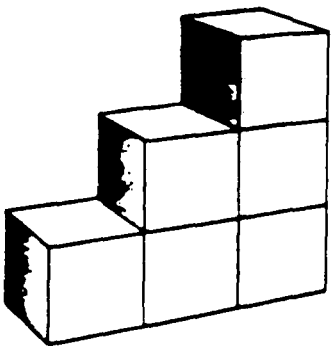
What day did Mr. Ruiz give his class the animal stickers?

A Tuesday
B Wednesday
C Thursday
D Friday

16 How many days did the students collect more than 5 cans?

F 5
G 2
H 3
J 4

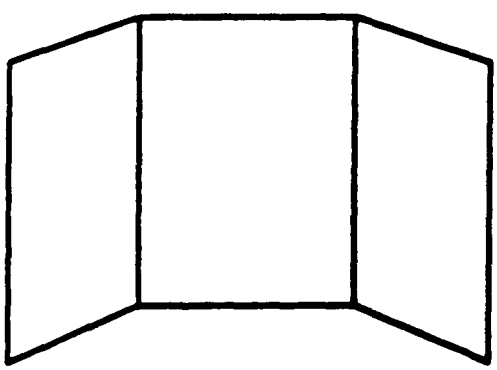
17 This staircase is 3 steps high.



What would be the total number of blocks in a staircase 5 steps high?

A 5
B 8
C 10
D 15

18 How many line segments are in the figure below?



F 9
G 10
H 11
J 12

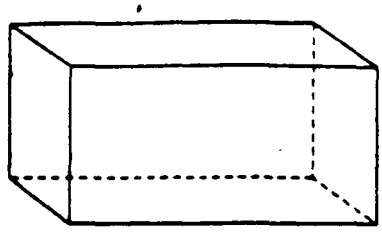
Which coins could Michael give Tara so that they both had the same amount of money?

Michael's Money

Tara's Money

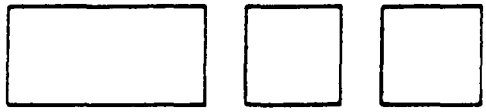
A 1 nickel and 1 penny
B 1 penny and 1 dime
C 1 nickel and 1 dime
D 1 quarter and 1 penny

20 Look at this rectangular solid (box).

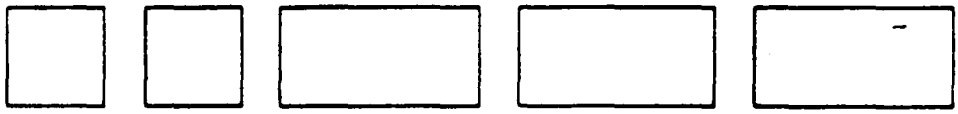


Which of these groups shows all the sides of the rectangular solid (box) above?

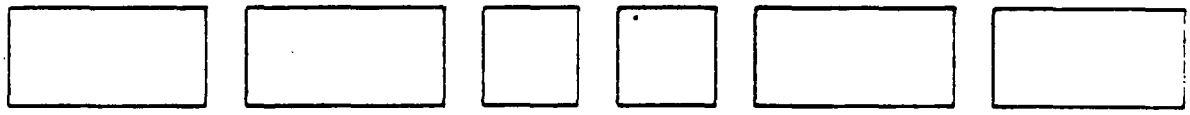
F



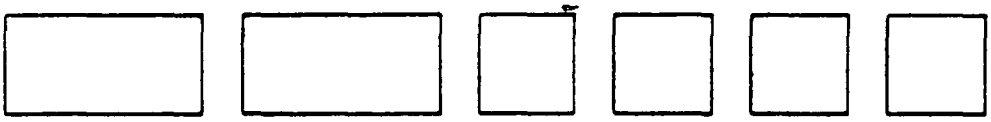
G



H



J



Go On

Directions

Do Numbers 21 through 23 about marbles.

21 Alice started with 8 marbles. She lost 2 marbles. Then she bought 6 new marbles. Which of these statements is true about the number of marbles Alice has now?

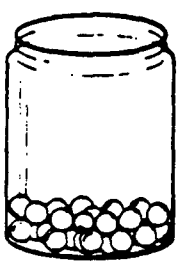
A Alice has fewer marbles than when she started.

B Alice has 4 more marbles than when she started.

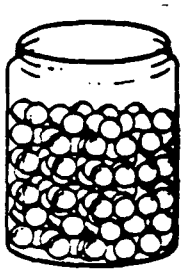
C Alice has 6 more marbles than when she started.

D Alice has the same number of marbles as when she started.

22 This jar has about 40 marbles in it.

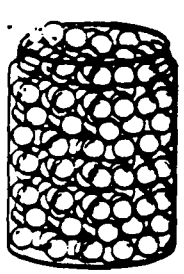


Which of these jars has the amount closest to 120 marbles?

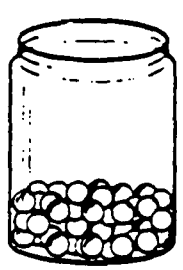


F

G

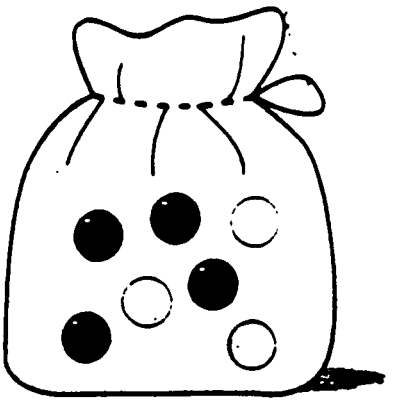


H



J

23 Jack will choose one marble from the bag without looking. What is the probability he will choose a black marble?



A $\frac{1}{7}$

B $\frac{2}{7}$

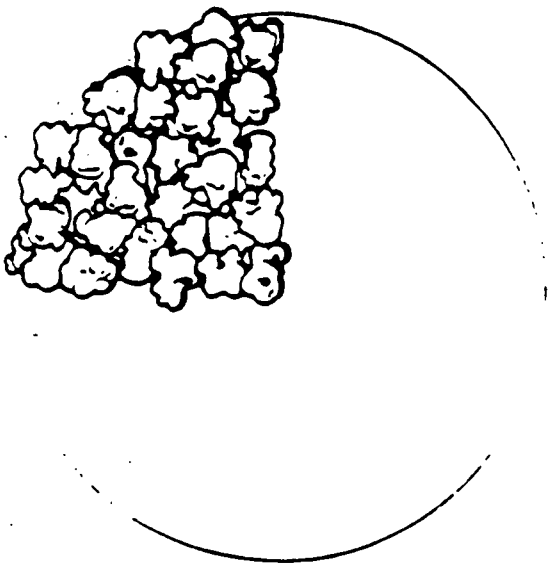
C $\frac{3}{7}$

D $\frac{4}{7}$

Go On

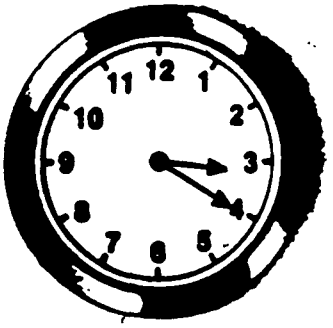
24 There are 32 pieces of popcorn on the plate below.
About how many pieces of popcorn will just cover the whole plate?

F between 115 and 124
G between 125 and 134
H between 135 and 144
J between 145 and 154

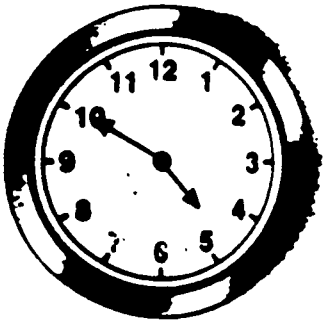


25 Sara and Jan are going to a movie that begins at 3:20 P.M. and ends at 4:50 P.M.
Look at the clocks below.

Movie Begins



Movie Ends



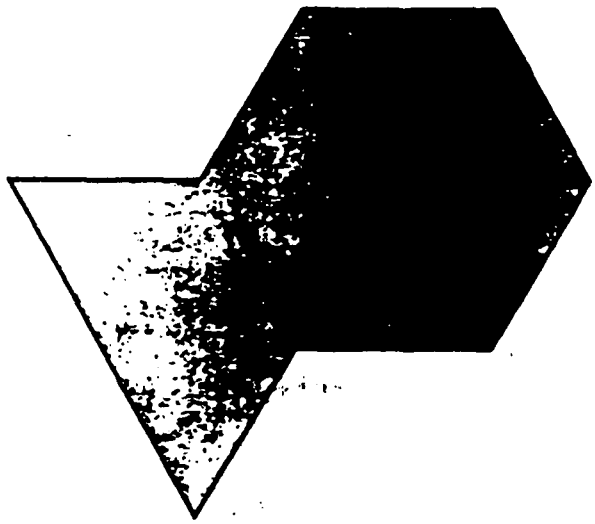
How long is the movie?

A 1 hour
B 1 hour, 20 minutes
C 1 hour, 30 minutes
D 1 hour, 35 minutes

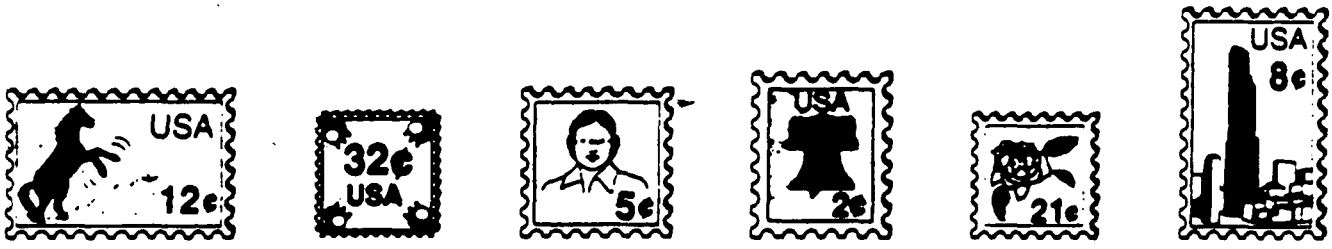
6 Use your pattern blocks to help you solve this problem.

How many of the green triangles would be needed to cover exactly $\frac{2}{3}$ of the shape below?

F 1
G 3
H 6
J 9



Anita has only one of each stamp shown below.



She needs $0.52 in postage to mail a letter. How many of the stamps shown above will Anita need to make exactly $0.52 ?

A 2
B 3
C 4
D 5

Go On

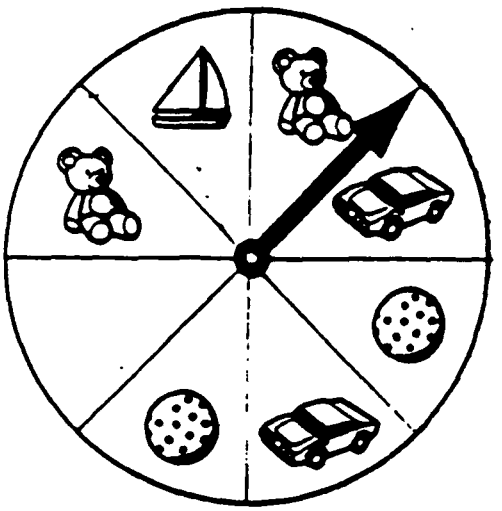
28 For the spinner to have an equal chance of landing on each prize, which prize should go in the blank space?

F 

G 

H 

J 



29 This piece of rope costs $2.00.

Which piece of rope below is *most* likely to cost $1.50 ?

A 

B 

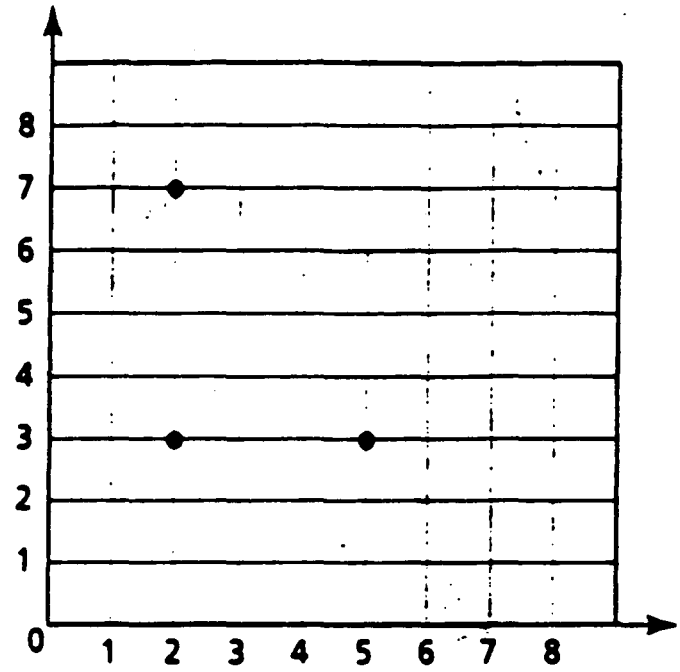
C 

D 

30 Alissa plotted the first 3 corners of a rectangle on the grid below.

What are the coordinates of the 4th corner?

F (5, 7)
G (5, 6)
H (6, 5)
J (7, 5)



STOP

31 Emma wants to practice playing her violin for a total of 90 minutes over 4 days. She practiced her violin for 30 minutes on Monday, 18 minutes on Tuesday, and 25 minutes on Wednesday. How many minutes should Emma practice on Thursday?

Show your work.

Answer _____

Use your ruler to help you solve this problem.

Part A

Measure each piece of chalk shown below to the nearest centimeter. Write the length in the space next to each picture.

____ centimeters

____ centimeters

____ centimeters

____ centimeters

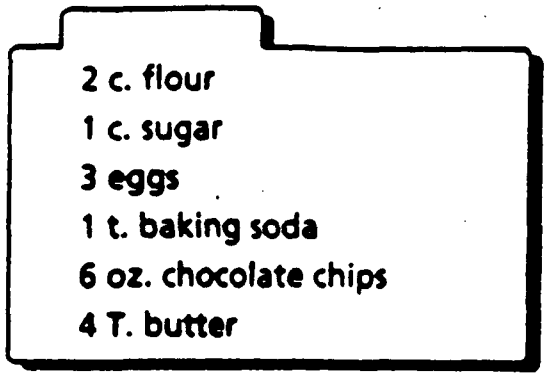
Part B

You want to keep only the pieces of chalk that are longer than 4 centimeters. Circle each piece of chalk above that is ***longer*** than 4 centimeters.

Go On

You may use your counters to help you solve this problem.

The list below shows how much of each item is needed to make one batch of Chocolate Chip Cookies.



You want to make ***2 batches*** of Chocolate Chip Cookies.
Complete the list below to show how much of each item will be needed.

_____ c. flour

_____ c. sugar

_____ eggs

_____ t. baking soda

_____ oz. chocolate chips

_____ T. butter

34 In the library, there are 2 round tables. There are 3 students sitting at each table. Each student has 4 books.

In the space below, draw a diagram or model to represent this information.

Find the total number of books.

Answer _____ books

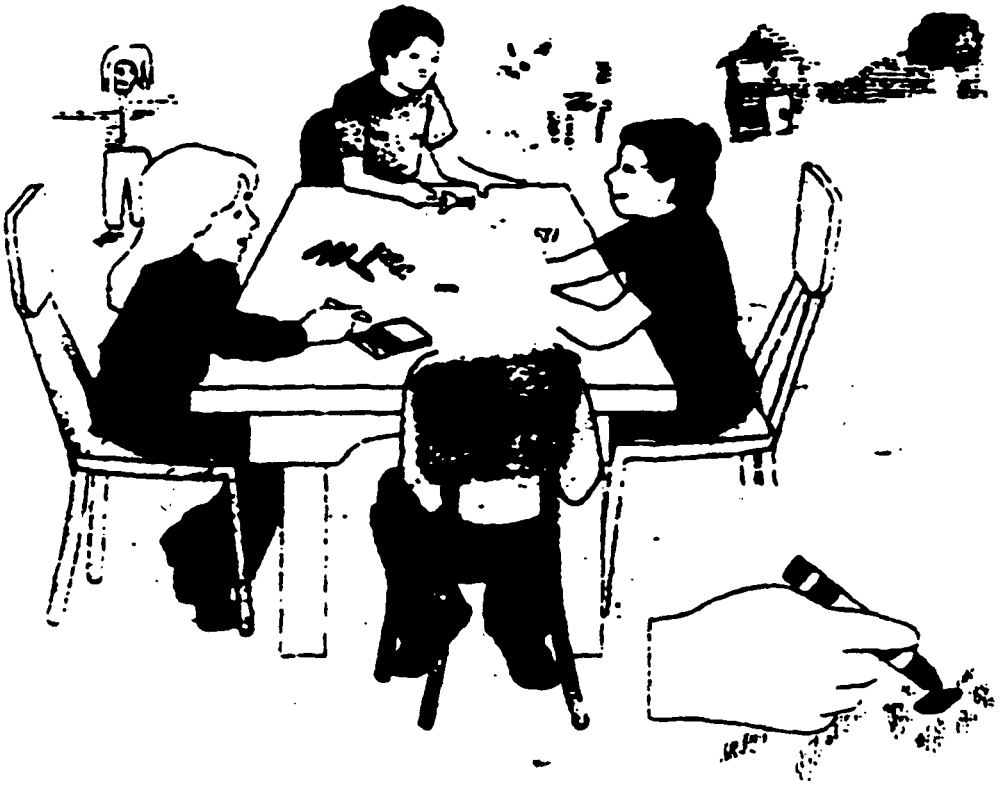
Go On


Use your pattern blocks to help you solve this problem.

In the space below, trace around two pattern blocks that show quadrilateral shapes.

On the lines below, explain in words what makes these shapes *quadrilaterals*.

CRAYONS

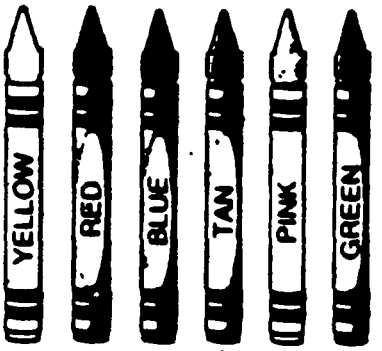


Directions

Do Numbers 36 through 38 about crayons on the following pages.

Go On

Bob reached in the supply box and grabbed these 6 crayons.



Bob used one of the crayons to color in a picture. Use the clues below to find the color of crayon Bob used.

CLUES

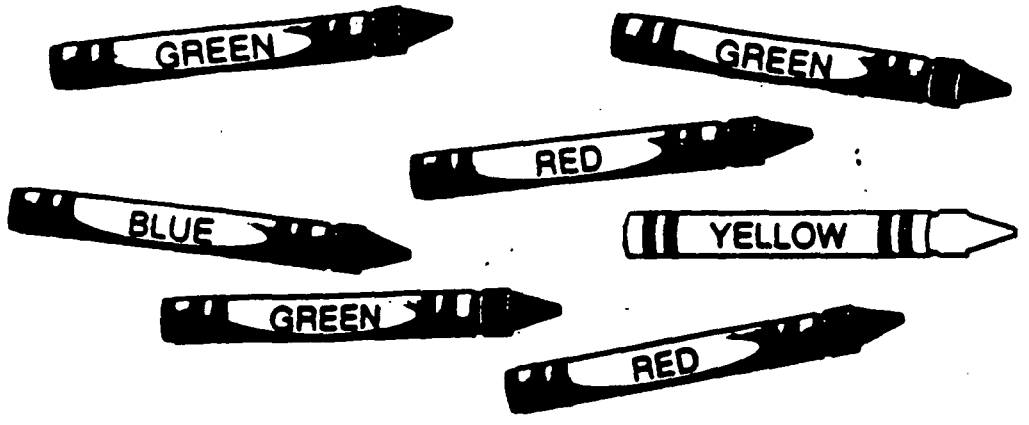
It has more than 3 letters, but less than 6 letters in its name.
It is *not* next to the red crayon.
It is *not* the last crayon.

What color was the crayon that Bob used?

Answer _____

Explain the steps you used to find your answer.

37 Amy puts these crayons in a bag and shakes the bag.



If Amy picks one crayon out of the bag without looking, which two colors have an ***equal chance*** of being chosen?

Answer _____ ***and*** _____

Explain your answer.

_____

_____

_____

_____

Go On

3. Mr. Jacobs asked his first-grade students to choose their favorite crayon colors. The results are shown in the table below.

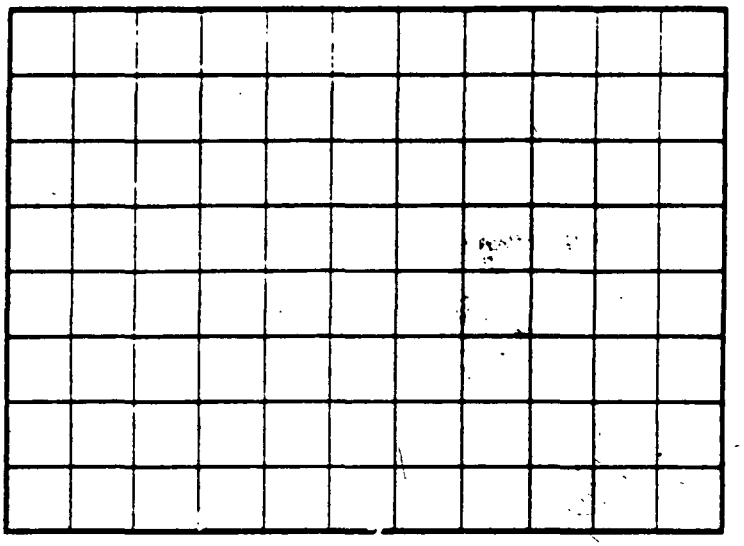
FAVORITE CRAYON COLORS

Student	Color
Eric	Red
Shannon	Purple
Jill	Yellow
Keisha	Red
Allison	Green
Christine	Blue
Nicole	Purple
Roosevelt	Blue
Stacy	Red
Marie	Green
Mel	Blue
Peter	Green
Julie	Red
Luis	Blue
Ramon	Blue
Paul	Red
Marcus	Blue
Ali	Green
Ken	Blue
Leon	Yellow

On the grid below, make a bar graph showing the number of students who prefer each crayon color. Use the information from the table on Page T-28 to help you.

Be sure to

- title the graph
- label the axes
- graph all the data



Using the information from your graph, write *one* statement comparing the crayon colors.

_____

_____

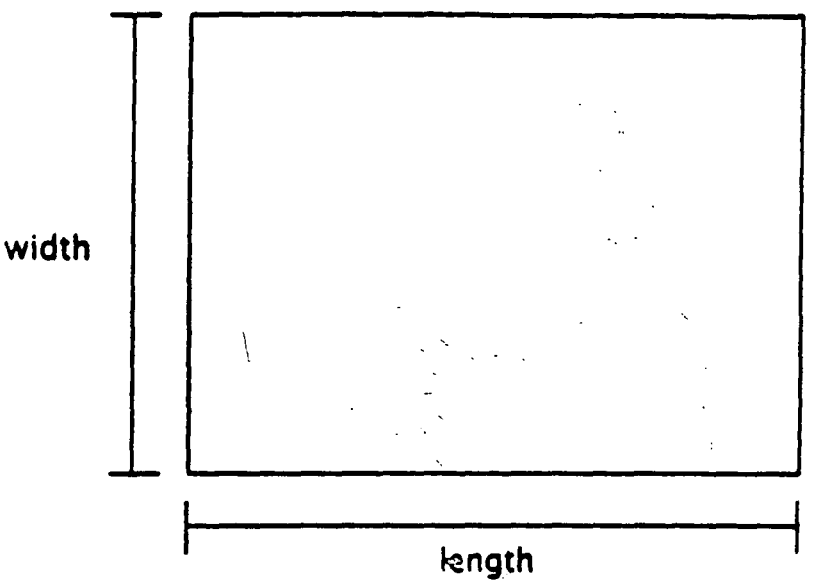
_____

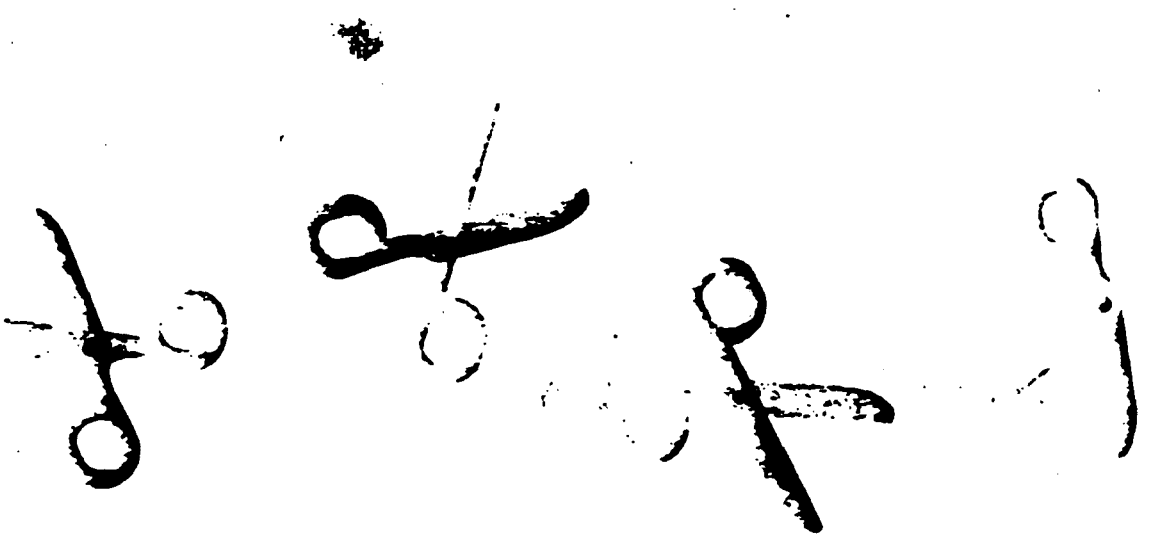
Go On

39 Use your centimeter ruler to solve this problem.

Tim cut rectangles out of construction paper to make a picture. The first rectangle he cut is shown below.

TIM'S FIRST RECTANGLE





Part A

What is the perimeter in centimeters of Tim's first rectangle?

Show your work.

First Perimeter _____ centimeters

Part B

The second rectangle Tim cut out has the same width as the first, but the length is 2 centimeters longer. What is the perimeter in centimeters of Tim's second rectangle?

Second Perimeter _____ centimeters

On the lines below, explain in words how you found the perimeter of Tim's second rectangle.

_____

_____

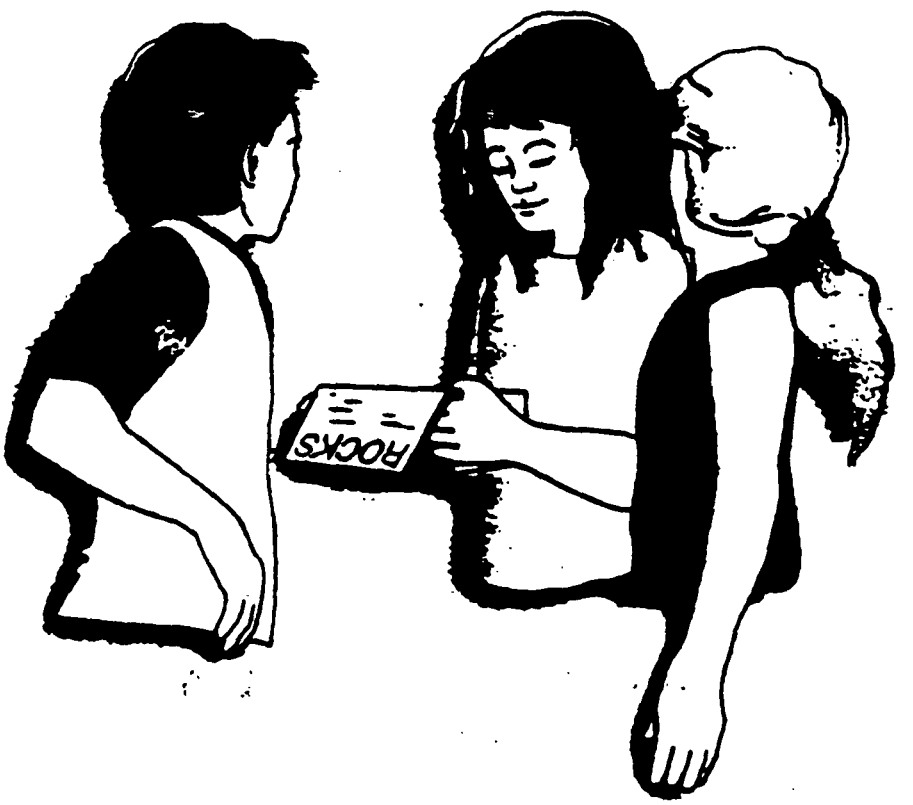
_____

STOP

40 Ann collects rocks. She had 4 boxes of rocks with 20 rocks in each box. Then she gave 6 of her rocks to a friend. How many rocks does Ann have left now?

Show your work.

Answer _____



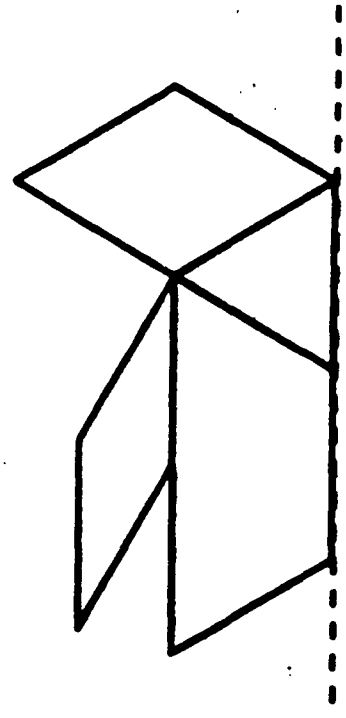
41 Shelly, Mike, and Jason looked at the stars through a telescope every night for a week. Shelly saw 6 shooting stars, Mike saw 9, and Jason saw 11. They wondered in what order they should add up the numbers to get the highest total. Does the order matter? On the lines below, explain why or why not.

Go On

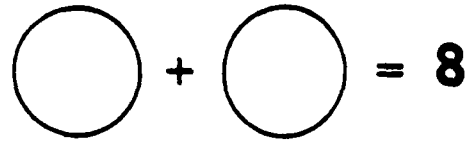
Use your pattern blocks to help you solve this problem.

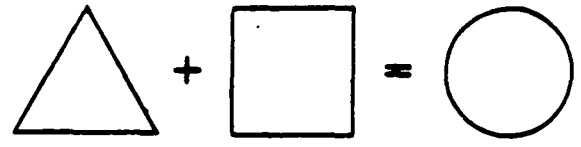
Dan used pattern blocks to draw half of a design.

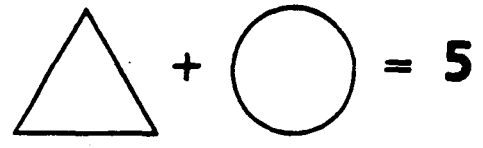
Complete the design below so that the dotted line is a line of symmetry. Trace around your pattern blocks to show the other half of the design.



3 In the number sentences below, the same shape always stands for the same number.







Part A

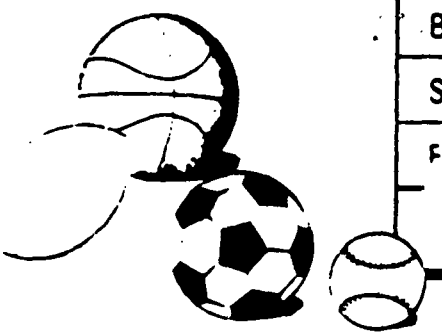
Use the number sentences to find which numbers the △, □, and ○ stand for.
Write the correct number in each shape above.

Part B

On the lines below, explain the steps you used to find the answer.

Go On

44 One hundred students were asked to name their favorite sport. The table below shows the results of the survey



FAVORITE SPORT

Sport	Number of Students
Baseball	20
Basketball	15
Soccer	35
Football	30
TOTAL	100

What percent of students chose soccer as their favorite sport?

Answer _____ %

What percent of the total group of students did *not* choose soccer as their favorite sport?

Show your work.

Answer _____ %

5 Sandra's mother gave her 2 quarters, 3 dimes, and 1 nickel. Sandra kept 55¢ and gave the rest of the coins to her sister. Which coins could Sandra have given to her sister?

Show your work.

Answer _____

On the lines below, explain the mathematics you used to find which coins Sandra gave away.

_____

_____

_____

Go On

Pat, Chris, and Jessica are skating to raise money for the school band. The table below shows how many laps each student skated and how much each student earned per lap.

SKATING FOR THE BAND

Student	Number of Laps Skated	Amount Earned Per Lap	Amount Raised
Pat	10	$0.75	
Chris	16	$0.50	
Jessica	13	$0.50	
		Total raised by all 3 students	

Complete the table to show the amount of money each student raised and the amount of money the 3 students raised all together.

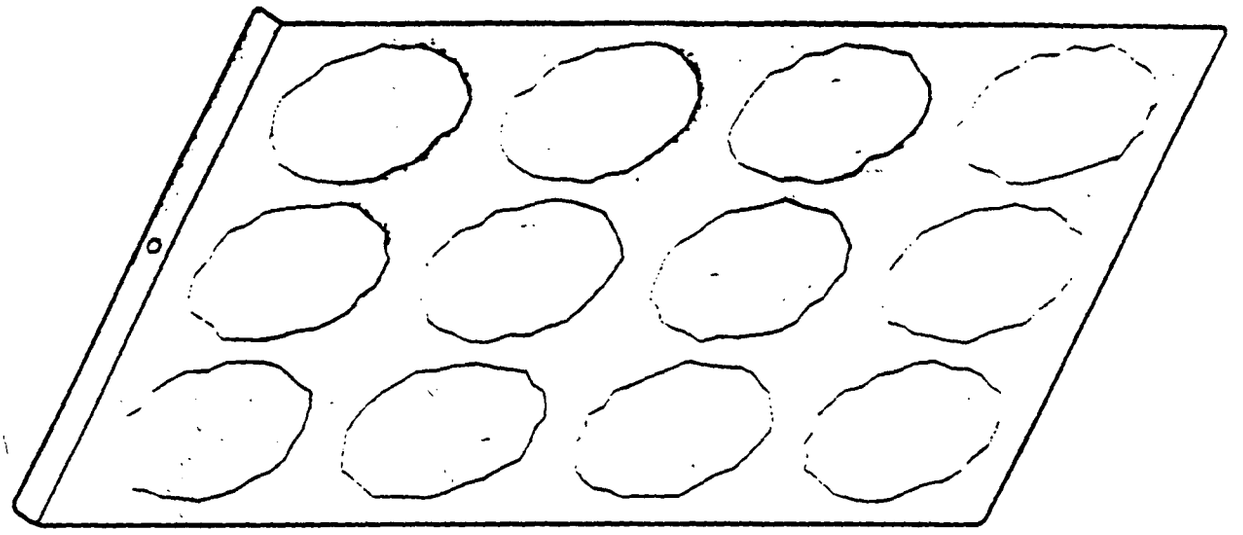
47 You may use your counters to help you solve this problem.

Label the cookies on the pan below to show that

$\frac{1}{3}$ of them are Oatmeal (O),

$\frac{1}{2}$ of them are Butter (B), and

the rest are Sugar (S).

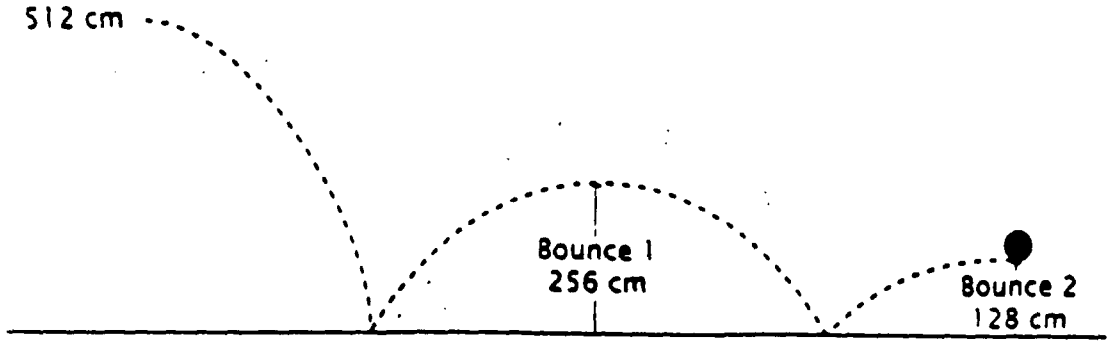


What fraction of the cookies on the pan are Sugar?

Answer _____

Go On

4 In a computer game, a ball was dropped from a height of 512 centimeters. The picture below shows how high the ball bounced.



Part A

If the pattern continues, how high will Bounce 3 be?

Answer _____ cm

Part B

On the lines below, describe how the height changes from one bounce to the next.

_____

_____

_____

Part C

Predict how high Bounce 6 will be.

Answer _____ cm

STOP

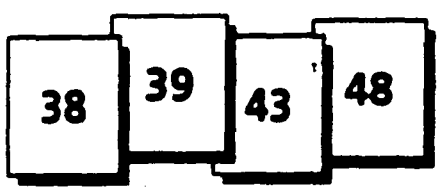
SCORING GUIDE

SCORING INFORMATION

The answer key for the multiple choice questions on the Sample Test can be found on page 8.

The 2-point holistic rubric is for scoring the short response questions and the 3-point holistic rubric is for scoring the extended response questions. These holistic rubrics can be found on pages 9 and 10.

Use the 3-point holistic rubric to score the following extended response questions:



Maximum: 3 points

All the other questions in Sessions 2 and 3 are short response and require the 2-point holistic rubric for scoring.

Holistic scoring will help you evaluate each student's achievement on the open ended questions. The score will represent an overall impression of the student's response. In addition to looking at the details of how the student solved the problem, you will look at the solution as a whole to see if the student fully understands the problem and is able to communicate that understanding.

A complete, correct response and a sample student response are provided for each open ended question. The complete and correct response shows one example of how to solve the problem. There may be other acceptable solutions. You may notice that some of the student responses include misspelled words or incorrect grammar and yet are still considered top student responses because the problem was solved correctly and communicated adequately.

For the short response question Number 36, sample student responses are given for each of the following score points: 2 points, 1 point, and 0 points. For the extended response question Number 48, sample student responses are given for each of the following score points: 3 points, 2 points, 1 point, and 0 points.

ANSWER KEY FOR MULTIPLE CHOICE QUESTIONS

1.	B
2.	J
3.	A
4.	J
5.	B
6.	J
7.	A
8.	J
9.	D
10.	J
11.	D
12.	F
13.	C
14.	F
15.	C
16.	G
17.	D
18.	G
19.	A
20.	H
21.	B
22.	F
23.	D
24.	G
25.	C
26.	H
27.	B
28.	J
29.	C
30.	F

2-POINT HOLISTIC RUBRIC
SHORT RESPONSE MATHEMATICS QUESTIONS

SCORE POINTS:

2 points A two-point response is complete and correct.

This response

- demonstrates a thorough understanding of the mathematical concepts and/or procedures embodied in the task
- indicates that the student has completed the task correctly, using mathematically sound procedures
- contains clear, complete explanations and/or adequate work when required

1 point A one-point response is only partially correct.

This response

- indicates that the student has demonstrated only a partial understanding of the mathematical concepts and/or procedures embodied in the task
- addresses some elements of the task correctly but may be incomplete or contain some procedural or conceptual flaws
- may contain an incorrect solution but applies a mathematically appropriate process
- may contain a correct solution with incorrect, unrelated, or no work and/or explanation when required

0 points A zero-point response is completely incorrect, irrelevant, or incoherent.

3-Point Holistic Rubric
Extended Response Mathematics Questions

Score Points:

3 points A three-point response is complete and correct.

This response

- demonstrates a thorough understanding of the mathematical concepts and/or procedures embodied in the task
- indicates that the student has completed the task correctly, using mathematically sound procedures
- contains clear, complete explanations and/or adequate work when required

2 points A two-point response is partially correct.

This response

- demonstrates partial understanding of the mathematical concepts and/or procedures embodied in the task
- addresses most aspects of the task, using mathematically sound procedures
- may contain an incorrect solution but applies a mathematically appropriate process with valid reasoning and/or explanation
- may contain a correct solution but provides faulty or incomplete procedures, reasoning, and/or explanations
- may contain a correct solution but lacks work when required
- may reflect some misunderstanding of the underlying mathematical concepts and/or procedures

1 point A one-point response is incomplete and exhibits many flaws but is not completely incorrect.

This response

- demonstrates only a limited understanding of the mathematical concepts and/or procedures embodied in the task
- may address some elements of the task correctly but reaches an inadequate solution and/or provides reasoning that is faulty or incomplete
- exhibits multiple flaws related to a misunderstanding of important aspects of the task, misuse of mathematical procedures, or faulty mathematical reasoning
- reflects a lack of essential understanding of the underlying mathematical concepts

0 points A zero-point response is completely incorrect, irrelevant, or incoherent.

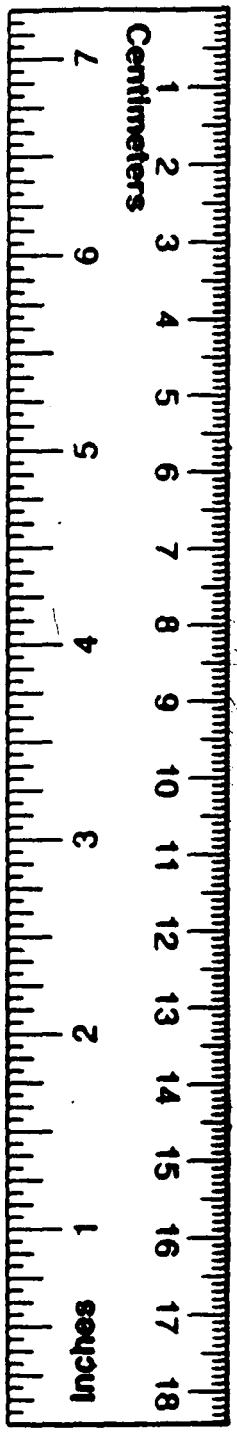
APPENDIXES

APPENDIX A: MAP TO LEARNING STANDARDS

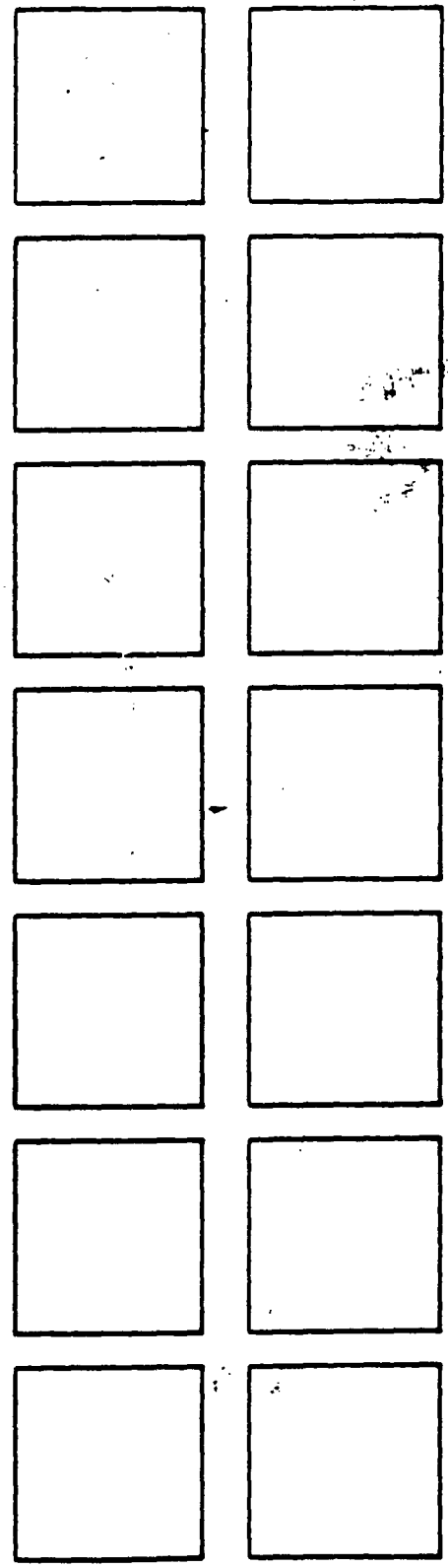
Key Idea	Multiple Choice Question Number	Short Response Question Number	Extended Response Question Number
Mathematical Reasoning	12, 19, 21	36	43
Number and Numeration	3, 4, 5, 7, 9, 10, 13, 26	44, 45, 47	
Operations	1, 2, 6, 8, 27	31, 33, 40, 41, 46	
Modeling/Multiple Representation	18, 30	34, 35	
Measurement	15, 16, 25, 29	32	38, 39
Uncertainty	22, 23, 24, 28	37	
Patterns/Functions	11, 14, 17, 20	42	48

Punch-Out Tools

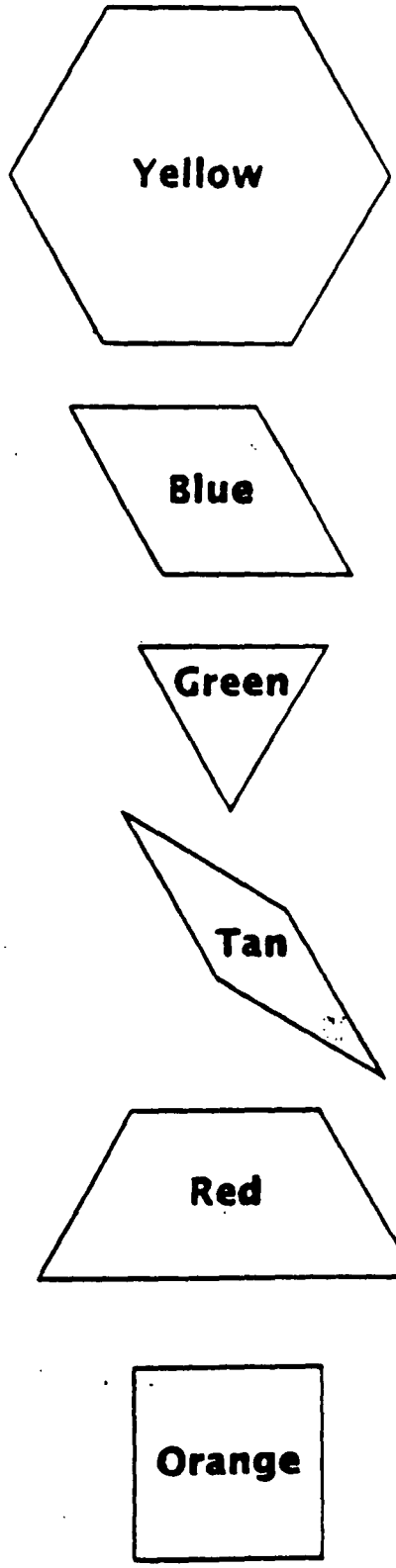
Ruler



Counters



Pattern Blocks



PAPER
CLIP

Third Grade

out

Math Assessment

Suggestions

Name Date

ASSESSMENT #1 Grade 3

PART 1

Part 1 of the test contains multiple choice questions. Read each problem carefully. Circle the correct answer of each question. If you make a mistake, erase it completely. You may use your tools to complete any problem on the test. Any scratch work may be completed on the test paper.

1. 96
+ 27

A. 123
B. 72
C. 111
D. 132

2. 5 X 7 =

A. 42
B. 40
C. 35
D. 48

3. 196
+ 42

A. 221
B. 211
C. 207
D. 212

4. Susan buys sheets of animal stickers. Each sheet has 3 rows of stickers. There are 5 stickers in every row. Which of these number sentences should be used to represent how many stickers are on a sheet.

A. $5 + 3 =$
B. $5 - 3 =$
C. $5 \times 3 =$
D. $5 \div 3 =$

5. $14 \triangle 6 \square 3 = 11$

In this problem, the number spaces are hidden by shapes. What operation sign is hidden under the triangle?

A. +
B. –
C. X
D. ÷

6. A group of elephants is called a herd. This picture shows a herd. About how many elephants would be in 5 herds?

Answer elephants

Directions: Luisa took a poll to find out what jobs students in his class would like to have. The results of his survey are shown on the graph. Study the graph. Then do numbers 7 – 9.

7. Which job would the greatest number of students like to have?

A. Actor
B Artist
C. Sports Star
D. Pilot

8. How many students would like to be sport stars?

A. 8
B. 10
C. 9
D. 11

9. How many students want to be actors?

A. 4
B. 5
C. 6
D. 7

10. By noon, Denise had made 6 posters for the art fair. At 1:00 A.M., after she had lunch, she continued her project. She could complete 1 poster every hour. How many did she have completed by 5:00 P.M.?

A. 9
B. 10
C. 11
D. 12

11. Molly bought a clip for her hair. Helen wanted to buy one that is twice as long as Molly's. How long would Helen's clip be? Use the centimeter side of your ruler to help you solve this problem.

A. 4 cm
B. 7 cm
C. 8 cm
D. 9 cm

12. What is missing from the pattern below?

66, 78, 90, _____, 114, 126

A. 98
B. 108
C. 106
D. 102

Directions: Use the table below to answer questions 13 and 14.

13. How many 10 – Speed Racers were rented on May 2?

A. 4
B. 7
C. 2
D. 8

14. Which bicycle is most popular?

A. Bike-built-for two
B. Mini Bike
C. 3-Speed Racer
D. 10-Speed Racer

15. Many people visit Children's World each day. Of these people 1350 take a ride on the Mississippi Riverboat. Which of these shows the number 1350?

A. one thousand three hundred fifty
B. one hundred and thirty-five thousand
C. one thousand and three hundred fifty
D. thirteen thousand fifty

16. Look at the pattern below.

What will the next two arrows look like in this pattern?

A. 

B. 

C. 

D. 

12. Which of these is the smallest fraction?

A. $\frac{2}{3}$

B. $\frac{2}{6}$

C. $\frac{2}{9}$

D. $\frac{2}{12}$

13. The graph below shows the students that are involved in the Running Relay Race.

Based on the graph above, which of these statements is true?

A. The first grade has half as many children in the relay race as the fourth grade.
B. Grades two, five and six have the same amount of children running.
C. There are more boys than girls running.
D. Grade two has more runners than grade three.

14. Which of these statements are true about squares.

A. A square has two equal sides.
B. A square has four right angles.
C. A square has only one set of parallel lines.
D. A square has two obtuse angles.

15. Which of these is the best estimate of 267 X 6 = ? You do not need to find the exact answer.

A. 1200
B. 200
C. 900
D. 2100

16. How many faces does the cube have?

A. 4
B. 5
C. 6
D. 7

17. Which shape does not have faces?

A. triangle
B. rectangle
C. circle
D. pyramid

18. Which of these shapes has only one line of symmetry.

A.

B.

C.

D.

Name Date

Assessment # 1 Grade 3

PART 2

Part 2 of the test contains questions in which you will have to write the answer.

Be sure to carefully read all the directions.

Ask your teacher to explain any directions you do not understand.

You may use your tools to help you solve any problem on the test.

Read each question carefully and think about the answer before writing a response.

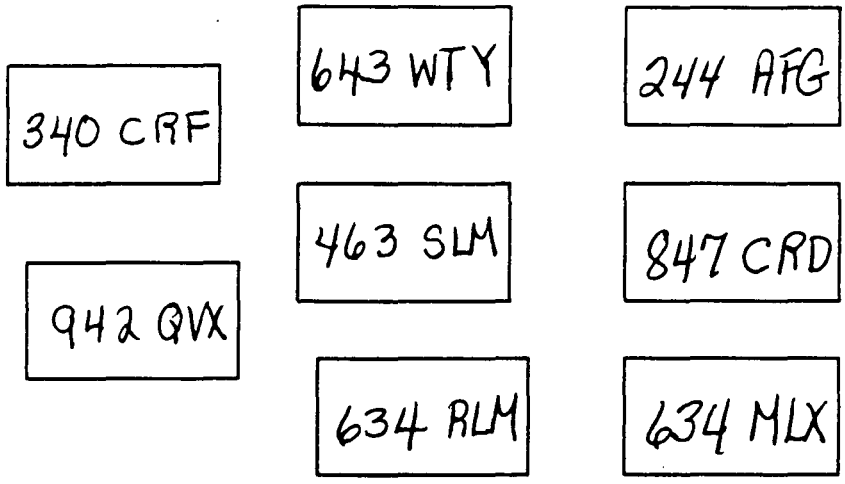
Be sure to show your work when asked. You may receive partial credit if you have shown your work.

This picture means that you use your ruler.

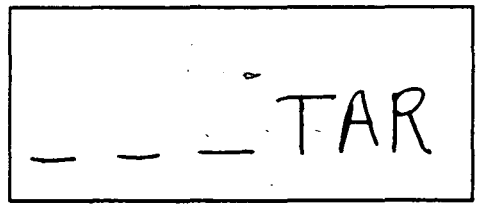
This picture means that you will use your pattern blocks.

This picture means that you may use your counters.

19. Mike counted 8 cars in the school parking lot. Each license plate had 3 digits and 3 letters. Draw a circle around all the license plates that had 4 in the hundreds place.



20. Write a different number in the license plate below that only has a 4 in the hundreds place.



21. What is the number that 1 /2 of the license plates represents?

Answer

22. What is the number that 1/4 of the license plates represents.?

Answer

Andrew was helping Dad lay a brick patio in the yard. They almost had it completed.

23. How many bricks are missing?

Answer

24. Circle all the figures below that could represent all the missing bricks from the patio.

Mary went to the ice cream parlor to buy an ice cream treat. There were 3 choices of cones, cake, sugar and waffle. Mary's four favorite ice creams were pistachio, chocolate, vanilla and rocky road.

25. In the space below, list all the possible ice cream combinations Mary could get using one cone one flavor. The first has been done for you.

Show your work.

V s

26. What is the total number of different ice cream cones that Mary can get?

Answer

You may use your counters to help you solve this problem.

In the box below there are some clues about the number of students in the Art Club.

There are 3 more boys than girls in the club.
There is a total of 11 students in the club.

27. How many girls are in the Art Club?

Answer

28. On the lines below, explain how you found your answer.

The Santos family vacationed in the mountains. They decide to go for a day hike. They left the lodge, passed the boat dock and walked to the athletic field. This was a total of meters they had walked:

1080

When they arrived at the picnic area in the mountains, this was the total number of meters they had hiked:

3615

29. If the Santos walked 110 meters from the lodge to the boat dock, how many meters did they hike from the boat dock to the athletic field.

Show your work.

Answer

Mario and Ramon went to the amusement center at the mall. The chart below shows how much it costs to play some of the games.

Welcome to Art's Amusement Center
Our machines take quarters only.

Super Mario Brothers	**$0.50**
Pack Man	**$0.25**
Virtuo Cop	**$0.75**
The Simpsons	**$0.50**

30. Mario and Ramon decided to play each game 2 times. Art's Amusement Center only takes quarters. Find how many quarters Mario and Ramon will need to play their games.

Show your work.

Answer

The chart shown below was hanging outside of the library.

Books Read

Day	**Amount**
Monday	
Tuesday	
Wednesday	
Thursday	

Key: Each = 4 books read

Part A

31. How many books were read in the library on Thursday?

Show your work.

Answer

Part B

32. How many more books were read on Tuesday than on Wednesday in the library?

Answer

Part C

33. There were _____ books read in the library on Friday.

34. Complete the chart below by drawing in the correct number of for Friday.

Books Read

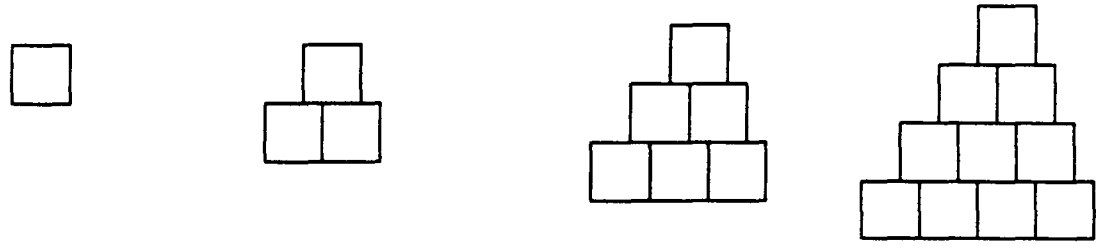
Day	**Amount**
Friday	

Key: Each = 4 books read

35. On the lines below, explain the mathematics you used to find the number of books read on Friday.

36. Tyrone is making a pattern using tiles. Here are the first four designs in his pattern.

Design 1 Design 2 Design 3 Design 4



Part A

37. In the space below, draw Design 5 in Tyrone's pattern.

Design 5

38. How many tiles total are there in design 5?

Answer

39. If Tyrone's pattern continues, how many tiles will there be in Design 6?

Show your work.

Answer

Use your pattern blocks to solve this problem.

40. One side of a design is shown below. The dotted line is a line is a line of symmetry. Trace around one pattern block to show the other side of the design.

41. Use the same pattern block to make a different symmetrical design below. Use the dotted line as a line of symmetry.

Look at lines A, B, and C.

42. Which line intersects line A?

Answer

43. On the lines below, explain how you know when a line intersects another line.

44. Which line is parallel to line A?

Answer

45. On the lines below, explain how you know when a line is parallel to another line.

46. Peter, Cory and Miguel are collecting baseball cards. Their goal is to collect 1,000 cans. So far, Peter has collect 389 cards, Cory 221 cards, and Miguel has collected 198 cards. How many more cards do they need to collect to reach their goal of 1,000 cards.

Show your work.

Answer

47. Melissa is buying a bag of balloons for $1.19. She will give the cashier 2 one-dollar bills. What amount should Melissa get back in change?

Show your work.

Answer

48. The cashier will give Melissa her change using the **fewest** coins possible. What coins will Melissa get back?

Answer

49. Alice wants to buy enough string to make 5 necklaces. She needs 30 centimeters of string for each necklace. Each ball of string is 100 centimeters long. How many ball of string will she need to buy to make all 5 necklaces?

Show your work.

Answer

50. On Friday Mom baked an apple pie. By Saturday, 1/2 of the pie was eaten. By Sunday, the 1/2 of the remaining piece was eaten. What fraction of the pie was left?

Show your work.

Answer

Mrs. Anton and her 3 children are going to the zoo.

51. How much will Mrs. Anton have to pay for tickets to take herself and her 3 children to the zoo?

Show your work.

Answer $

Greta started to make a number chart using number patterns.

Part A

52. Use the number patterns to help you complete Susan's chart. Write the correct numbers in each blank box in the chart below.

Part B

53. On the lines below, describe three of the patterns you found in the chart

Pattern 1

Pattern 2

Pattern 3

Mr. Bernstein is planning to design a flower garden in his backyard.

Part A

54. What is the perimeter in meter (m) of Design A?

Design A

Show your work.

Answer meters (m)

Part B

55. Find the missing lengths of the sides on Design B. Write your answers in each blank space next to the missing lengths on Design B.

Part C

56. What is the perimeter in meters (m) of Design B?

Show your work.

Answer meters (m)

Num Concepts

Skills	Date	P I	Pg
To know prime numbers and factor trees.	June	2B	44
To explore quantitative information that will help relate personal experiences to the meaning of million.	June	6C	48
To create number patterns and sequences.	June	7A	50
To create repeated patterns.	June	7A	50
To use symbols <, >, and, =.	June	7B	50

Grade 4

Skills	Date	P I	Pg
To define terms most and at least.	June	7B	50
To describe number sequences.	June	7B	50
To investigate relationships between numbers in addition, subtraction, multiplication, and division.	June	7B	50
To use manipulatives or relevant computer software to explore linear patterns.	June	7E	50
To use manipulative materials or relevant computer software to explore linear patterns.	June	7E	50
To create patterns and sequences of numbers such as triangular and square numbers.	June	1B	43

Grade 4

Skills	Date	P I	Pg
To recognize or create lines of symmetry or patterning in number tables.	June	1B	43

Pl Value

Skills	Date	P I	Pg
To order whole numbers from least to greatest up to 4 digits.	January	2A	4 4
To use ordinal numbers through 500th	January	2A	4 4
To read and write whole numbers to the hundred thousandths place.	January	2C	4 4
To round to the nearest tenth and hundredth whole number.	January	6D	4 8
To read and write whole numbers to the millions.	June	2A	4 4
To understand place value to the millions.	June	2C	4 4

Pl Value

Skills	Date	P I	Pg
To round whole numbers to the nearest thousand.	June	6D	4 8

Grade 4

Additio Subtraction

Skills	Date	P I	Pg
To use patterns and rules for addition and subtraction.	January	3D	45
To add and subtract whole numbers up to the hundred thousandths.	January	3A	45
To add and subtract up to 4 digit numbers with zeros.	January	3D	45
To verify an answer to a problem	January	1C	43
To use estimation, number relationships, and mathematical checks to justify answers. (Front- end estimation may be included)	January	1C	43
To draw pictures, diagrams, and charts to represent problems.	January	1B	43

Grade 4

Skills	Date	P I	Pg
To solve related problems in realistic settings and or estimate when possible.	January	6C	48
To use diagrams in problem solving.	January	3B	45
To make sense out of information and determine if solution is reasonable.	January	6C	48
To understand the role of zero.	January	3C	45
To look for patterns.	January	3B	45
To break the problem into parts.	January	3B	45

Additio : Subtraction

Skills	Date	P I	Pg
To develop a variety of strategies for estimating quantities	January	6D	48
To know relationships between addition, subtraction, multiplication, and division.	January	3C	45
To break a problem into parts.	January	3B	45
To clarify problems using discussion with peers.	January	1A	43
To use mental math	January	1D	43
To make change for amounts up to $20.00	January	7C	50

Addition Subtraction

Skills	Date	P I	Pg
To recognize odd and even numbers as a result of addition and subtraction.	June	2B	44

Grade 4

Organize Data

Skills	Date	P I	Pg
To analyze data in bar graphs, pictographs, line graphs, and circle graphs.	January	4B	46
To draw conclusions and make predictions from graphs.	January	4B	46
To organize data with graphs, models, pictures, and lists.	January	5E	47
To make frequency tables from tallied data.	January	5E	47
To use concrete materials to develop the concept of average or arithmetic mean.	January	5F	47
To find the range and the mean in a collection of organized data.	January	5F	47

Skills	Date	P I	Pg
To make predictions based on a sample experiment.	January	6F	49
To compare outcomes as a more likely or less likely; to express the probability of an event.	January	6F	49
To investigate arrangements by experimenting.	January	6F	49
To explain why a game is fair or unfair.	January	6F	49
To select unbiased random samples and record data.	January	6G	49
To discuss applications to marketing, television ratings, etc.	January	6G	49

Skills	Date	P I	Pg
To conduct and predict outcomes of various experiments, using unequally as well as equally likely outcomes.	January	6F	45
To recognize events that are certain and events that have no chance of occurring	January	6F	45
To use spinners, drawing colored blocks from a bag, etc.	January	6G	45
To determine the number of ways an event can occur.	January	6H	45
To explore problems that involve a systematic identification of ordered arrangements, using models, pictures, lists, or tree diagrams.	January	6H	45
To find mode, median, mean, and range of a set of data.	January	7F	51

Skills	Date	P I	Pg
To compare frequencies within a bar graph or histogram.	January	7F	51
To describe trends in bar graphs and line graphs.	January	7F	51
To develop orderly ways to determine the number of possible arrangements and combinations (e.g., tree diagrams).	June	6E	49

Mu ıcation

Skills	Date	P I	Pg
To relate multiplication facts to repeated addition.	January	1A	43
To write related multiplication sentences.	January	1A	43
To use the properties of multiplication (Commutative and Associative Properties)	January	3D	45
To know odd and even numbers as a result of multiplication	January	2B	44
To study factor and product relationships, using number lines and arrays.	January	1A	43
To know basic multiplication facts through 144.	January	3C	45

Skills	Date	P I	Pg
To determine multiples and common multiples.	January	3C	45
To apply and identify elements of multiplication in learning and understanding number facts.	January	3C	45
To multiply three-digit numbers by two-digit numbers including money. Multiplication by multiples of 10.	June	3A	45
To make generalizations about the differences between products of numbers greater than one and when one number is less than one.	June	6E	49
To use mental math to multiply multiples of 10, 100, and 1000 by 2-digit and 3-digit numbers and multiples of 10.	June	1C	43
To use open multiplication sentences in situations of equality and inequality.	June	7C	50

Skills	Date	P I	Pg
To write related division sentences.	January	1A	43
To know basic division facts to find products and quotients by recognizing number patterns.	January	3C	45
To divide three-digit dividends by one-and two-digit divisors (quotient and remainder).	January	3A	45
To use open sentences to model problems.	January	3B	45
To be able to divide through 144.	January	3C	45
To divide 3-and 4-digit dividends by 1-digit divisors with zeros in the quotient, including money.	January	3A	45

Grade 4

Skills	Date	P I	Pg
To use counters to solve division problems to find the number of groups possible when each group is given size, and the number of objects in each group when the number of groups is known.	January	7D	50
To find the average of a given number using at least 5 numbers.	January	7B	50
To present division facts in more than one way, such as 18 divided by 3 is the same as 18/3.	June	7B	50

G ıetry

Skills	Date	P I	Pg
To find the properties of plane figures.	June	4A	46
To find the properties of solid figures (vertices, line segments, edges, and angles).	June	4A	46
To identify the characteristics of right angles.	June	4a	46
To plot points on a grid with ordered pairs (coordinated plane).	June	4B	44
To find the area and volume of a figure.	June	4C	44
To find the circumference of a circle by measuring with string.	June	4C	44

Grade 4

Skills	Date	P I	Pg
To design patterns with geometric figures.	June	4A	44
To find the area of a circle by counting units on a grid.	June	4C	44
To define diameter and radius of a circle.	June	4C	44
To identify mirror images and congruent shapes.	June	4E	44
To define a line of symmetry.	June	4E	44
To define terms: polygon, chord, radius, face, edge, vertex, angle, line segment, point, parallel, perpendicular, intersecting.	June	4E	44

Skills	Date	P I	Pg
To recognize and name common plane and solid geometric figures in the environment and drawings.	June	4E	44
To utilize straightedge rulers, protractors, and compasses to construct circles, squares, etc.	June	4E	44
To use counters to explore number patterns like triangular numbers and square numbers.	June	7D	50
To use formulas to find perimeter and area of geometric shapes.	June	7C	50
To identify the geometric shapes of the faces of prisms, pyramids, cones, and cylinders.	June	7E	50
To identify different types of prisms and pyramids.	June	7E	50

G ...etry

Skills	Date	P I	Pg
To find two- and three-dimensional shapes in nature, art, and human-made environments.	June	7H	5 1
To find examples of tessellations in the real world (patterns and mosaics).	June	7H	5 1
To identify examples of symmetry in nature, art, and music.	June	7H	5 1

Skills	Date	P I	Pg
To relate fractions to the monetary system and to metric measurement.	June	2A	44
To identify the use of fractions in daily life.	June	2A	44
To find various ways a figure can be divided into equal parts, using terms numerator and denominator.	June	2B	44
To order unit fractions and use < and> signs utilizing concrete materials.	June	2B	44
To recognize and utilize fractions with denominators 2,3,4, 5, 6, 8, 10, 12.	June	2D	44
To write an equivalent fraction with a given denominator	June	2D	44

Skills	Date	P I	Pg
To compare and order up to four fractions.	June	2D	44
To write fractions in simplest form.	June	2D	44
To add and subtract fractions.	June	2D	44
To add and subtract two mixed numbers.	June	2D	44
To use concrete materials to find fractional parts of a group.	June	2D	44
To find fractional parts of a number	June	2D	44

Fractions

Skills	Date	P I	Pg
To relate a clock face to fractions of a circle	June	5B	47
To relate the concept of fraction to beat value of notes in music (whole note = one beat, half note = one half beat, etc.).	June	7H	51

Skills	Date	P I	Pg
To relate fractional notation for tenths, hundredths, thousandths to decimal fraction notation.	June	7B	51
To understand decimals to the hundredths.	June	2D	44
To perform functions of percents that are multiples of 5.	June	2E	44
To understand the concept of ratio in real-world situations.	June	2E	44
To relate fractional notation for tenths, hundredths, thousandths to decimal fraction notation.	June	7B	50
To write a decimal greater than one in word form.	June	2D	44

Decimals

Skills	Date	P I	Pg
To order up to four decimals through hundredths.	June	2D	44
To add and subtract up to three decimals through hundredths.	June	2D	44

Skills	Date	P I	Pg
To find volume by "filling space" with standard-sized objects to build a foundation for the volume formula.	June	4C	44
To compare temperatures and heights over time.	June	4D	44
To identify appropriate metric units for measuring the area, mass, perimeter, and volume of a variety of objects.	June	5A	47
To identify equivalent measures within the metric system of measure.	June	5B	47
To relate decimal concepts to metric measurement tools.	June	5B	47
To explore connections between factors and multiplication facts and area and volume	June	5C	47

Me u.ement

Skills	Date	P I	Pg
To practice using measurement problems related to other areas such as literature, science, and social studies.	June	5C	47
To select appropriate measurement tools.	June	5C	47
To compare equivalent measures within the metric system.	June	5C	47
To find perimeter of polygons.	June	5C	47
To measure a line segment to the nearest centimeter or millimeter.	June	6A	48
To make the best estimates for the length, capacity, weight, or mass of a given object.	June	6B	48

M L.ement

Skills	Date	P I	Pg
To develop strategies for estimating measurements.	June	6D	48
To relate area and volume formulas to counting squares.	June	7B	50
To read, write, and compare Fahrenheit and Celsius temperatures.	June	6A	48
To provide hands-on activities related to measurement and time.	June	5B	47
To measure using inch, foot, yard, and mile.	June	5C	47

Prob m Solving

Skills	Date	P I	Pg
To estimate outcomes of problems and compare the results with a prediction.	January	6B	48
To learn tips for problem solving by using the Problem Solver's Guide (1. Read and understand. 2. Take notes or draw pictures. 3. Try different things -make a plan, table, diagram, list, or guess and check. 4. Check if the answer makes sense.	January	1A, 1D	43
To make statements that use and , or, and not.	January	1A	43
To use symmetry or patterning in number tables	January	1B	43
To verify an answer to a problem.	January	1C	43
To use open sentences, patterns, relationships, and estimation as strategies to solve problems.	January	1D	43

Skills	Date	PI	Pg
To identify missing information in a story problem.	January	1D	43
To break a problem into parts.	January	3B	45
To discuss real-world examples of when estimating would be acceptable and when it would not.	June	6C	48

Fourth Grade

Math Curriculum

With suggested time frames

Curriculum Arran by Grade and Time

Grade	Area	Skills	Date	P I
4	Addition/Subtraction	To use patterns and rules for addition and subtraction.	Janua	3D
4	Addition/Subtraction	To add and subtract whole numbers up to the hundred thousandths.	Janua	3A
4	Addition/Subtraction	To add and subtract up to 4 digit numbers with zeros.	Janua	3D
4	Addition/Subtraction	To verify an answer to a problem	Janua	1C
4	Addition/Subtraction	To use estimation, number relationships, and mathematical checks to justify answers. (Front- end estimation m	Janua	1C
4	Addition/Subtraction	To draw pictures, diagrams, and charts to represent problems.	Janua	1B
4	Addition/Subtraction	To solve related problems in realistic settings and or estimate when possible.	Janua	6C
4	Addition/Subtraction	To use diagrams in problem solving.	Janua	3B
4	Addition/Subtraction	To make sense out of information and determine if solution is reasonable.	Janua	6C
4	Addition/Subtraction	To understand the role of zero.	Janua	3C
4	Addition/Subtraction	To look for patterns.	Janua	3B
4	Addition/Subtraction	To break the problem into parts.	Janua	3B
4	Addition/Subtraction	To develop a variety of strategies for estimating quantities	Janua	6D
4	Addition/Subtraction	To know relationships between addition, subtraction, multiplication, and division.	Janua	3C
4	Addition/Subtraction	To break a problem into parts.	Janua	3B
4	Addition/Subtraction	To clarify problems using discussion with peers.	Janua	1A
4	Addition/Subtraction	To use mental math	Janua	1D
4	Addition/Subtraction	To make change for amounts up to $20.00	Janua	7C
4	Division	To write related division sentences.	Janua	1A
4	Division	To know basic division facts to find products and quotients by recognizing number patterns.	Janua	3C
4	Division	To divide three-digit dividends by one-and two-digit divisors (quotient and remainder).	Janua	3A
4	Division	To use open sentences to model problems.	Janua	3B
4	Division	To be able to divide through 144.	Janua	3C
4	Division	To divide 3-and 4-digit dividends by 1-digit divisors with zeros in the quotient, including money.	Janua	3A
4	Division	To use counters to solve division problems to find the number of groups possible when each group is given size	Janua	7D
4	Division	To find the average of a given number using at least 5 numbers.	Janua	7B
4	Multiplication	To relate multiplication facts to repeated addition.	Janua	1A
4	Multiplication	To write related multiplication sentences.	Janua	1A

Curriculum Arranged by Grade and Time

Grade	Area	Skills	Date	P I
4	Multiplication	To use the properties of multiplication (Commutative and Associative Properties)	Janua	3D
4	Multiplication	To know odd and even numbers as a result of multiplication	Janua	2B
4	Multiplication	To study factor and product relationships, using number lines and arrays.	Janua	1A
4	Multiplication	To know basic multiplication facts through 144.	Janua	3C
4	Multiplication	To determine multiples and common multiples.	Janua	3C
4	Multiplication	To apply and identify elements of multiplication in learning and understanding number facts.	Janua	3C
4	Organizing Data	To analyze data in bar graphs, pictographs, line graphs, and circle graphs.	Janua	4B
4	Organizing Data	To draw conclusions and make predictions from graphs.	Janua	4B
4	Organizing Data	To organize data with graphs, models, pictures, and lists.	Janua	5E
4	Organizing Data	To make frequency tables from tallied data.	Janua	5E
4	Organizing Data	To use concrete materials to develop the concept of average or arithmetic mean.	Janua	5F
4	Organizing Data	To find the range and the mean in a collection of organized data.	Janua	5F
4	Organizing Data	To make predictions based on a sample experiment.	Janua	6F
4	Organizing Data	To compare outcomes as a more likely or less likely; to express the probability of an event.	Janua	6F
4	Organizing Data	To investigate arrangements by experimenting.	Janua	6F
4	Organizing Data	To explain why a game is fair or unfair.	Janua	6F
4	Organizing Data	To select unbiased random samples and record data.	Janua	6G
4	Organizing Data	To discuss applications to marketing, television ratings, etc.	Janua	6G
4	Organizing Data	To conduct and predict outcomes of various experiments, using unequally as well as equally likely outcomes.	Janua	6F
4	Organizing Data	To recognize events that are certain and events that have no chance of occurring	Janua	6F
4	Organizing Data	To use spinners, drawing colored blocks from a bag, etc.	Janua	6G
4	Organizing Data	To determine the number of ways an event can occur.	Janua	6H
4	Organizing Data	To explore problems that involve a systematic identification of ordered arrangements, using models, pictures,	Janua	6H
4	Organizing Data	To find mode, median, mean, and range of a set of data.	Janua	7F
4	Organizing Data	To compare frequencies within a bar graph or histogram.	Janua	7F
4	Organizing Data	To describe trends in bar graphs and line graphs.	Janua	7F
4	Place Value	To order whole numbers from least to greatest up to 4 digits.	Janua	2A
4	Place Value	To use ordinal numbers through 500th	Janua	2A

Curriculum Arran by Grade and Time

Grade	Area	Skills	Date	P I
4	Place Value	To read and write whole numbers to the hundred thousandths place.	Janua	2C
4	Place Value	To round to the nearest tenth and hundredth whole number.	Janua	6D
4	Problem Solving	To estimate outcomes of problems and compare the results with a prediction.	Janua	6B
4	Problem Solving	To learn tips for problem solving by using the Problem Solver's Guide (1. Read and understand. 2. Take notes	Janua	1A,
4	Problem Solving	To make statements that use and , or, and not.	Janua	1A
4	Problem Solving	To use symmetry or patterning in number tables	Janua	1B
4	Problem Solving	To verify an answer to a problem.	Janua	1C
4	Problem Solving	To use open sentences, patterns, relationships, and estimation as strategies to solve problems.	Janua	1D
4	Problem Solving	To identify missing information in a story problem.	Janua	1D
4	Problem Solving	To break a problem into parts.	Janua	3B
4	Addition/Subtraction	To recognize odd and even numbers as a result of addition and subtraction.	June	2B
4	Decimals	To relate fractional notation for tenths, hundredths, thousandths to decimal fraction notation.	June	7B
4	Decimals	To understand decimals to the hundredths.	June	2D
4	Decimals	To perform functions of percents that are multiples of 5.	June	2E
4	Decimals	To understand the concept of ratio in real-world situations.	June	2E
4	Decimals	To relate fractional notation for tenths, hundredths, thousandths to decimal fraction notation.	June	7B
4	Decimals	To write a decimal greater than one in word form.	June	2D
4	Decimals	To order up to four decimals through hundredths.	June	2D
4	Decimals	To add and subtract up to three decimals through hundredths.	June	2D
4	Division	To present division facts in more than one way, such as 18 divided by 3 is the same as 18/3.	June	7B
4	Fractions	To relate fractions to the monetary system and to metric measurement.	June	2A
4	Fractions	To identify the use of fractions in daily life.	June	2A
4	Fractions	To find various ways a figure can be divided into equal parts, using terms numerator and denominator.	June	2B
4	Fractions	To order unit fractions and use < and> signs utilizing concrete materials.	June	2B
4	Fractions	To recognize and utilize fractions with denominators 2,3,4, 5, 6, 8, 10, 12.	June	2D
4	Fractions	To write an equivalent fraction with a given denominator	June	2D
4	Fractions	To compare and order up to four fractions.	June	2D
4	Fractions	To write fractions in simplest form.	June	2D

Curriculum Arranged by Grade and Time

Grade	Area	Skills	Date	P I
4	Fractions	To add and subtract fractions.	June	2D
4	Fractions	To add and subtract two mixed numbers.	June	2D
4	Fractions	To use concrete materials to find fractional parts of a group.	June	2D
4	Fractions	To find fractional parts of a number	June	2D
4	Fractions	To relate a clock face to fractions of a circle	June	5B
4	Fractions	To relate the concept of fraction to beat value of notes in music (whole note = one beat, half note = one half b	June	7H
4	Geometry	To find the properties of plane figures.	June	4A
4	Geometry	To find the properties of solid figures (vertices, line segments, edges, and angles).	June	4A
4	Geometry	To identify the characteristics of right angles.	June	4A
4	Geometry	To plot points on a grid with ordered pairs (coordinated plane).	June	4B
4	Geometry	To find the area and volume of a figure.	June	4C
4	Geometry	To find the circumference of a circle by measuring with string.	June	5D
4	Geometry	To design patterns with geometric figures.	June	4A
4	Geometry	To find the area of a circle by counting units on a grid.	June	4C
4	Geometry	To define diameter and radius of a circle.	June	4C
4	Geometry	To identify mirror images and congruent shapes.	June	4E
4	Geometry	To define a line of symmetry.	June	4E
4	Geometry	To define terms: polygon, chord, radius, face, edge, vertex, angle, line segment, point, parallel, perpendicula	June	4E
4	Geometry	To recognize and name common plane and solid geometric figures in the environment and drawings.	June	4E
4	Geometry	To utilize straightedge rulers, protractors, and compasses to construct circles, squares, etc.	June	4E
4	Geometry	To use counters to explore number patterns like triangular numbers and square numbers.	June	7D
4	Geometry	To use formulas to find perimeter and area of geometric shapes.	June	7C
4	Geometry	To identify the geometric shapes of the faces of prisms, pyramids, cones, and cylinders.	June	7E
4	Geometry	To identify different types of prisms and pyramids.	June	7E
4	Geometry	To find two- and three-dimensional shapes in nature, art, and human-made environments.	June	7H
4	Geometry	To find examples of tessellations in the real world (patterns and mosaics).	June	7H
4	Geometry	To identify examples of symmetry in nature, art, and music.	June	7H
4	Measurement	To find volume by "filling space" with standard-sized objects to build a foundation for the volume formula.	June	4C

Curriculum Arrang by Grade and Time

Grade	Area	Skills	Date	P I
4	Measurement	To compare temperatures and heights over time.	June	4D
4	Measurement	To identify appropriate metric units for measuring the area, mass, perimeter, and volume of a variety of obje	June	5A
4	Measurement	To identify equivalent measures within the metric system of measure.	June	5B
4	Measurement	To relate decimal concepts to metric measurement tools.	June	5B
4	Measurement	To explore connections between factors and multiplication facts and area and volume	June	5C
4	Measurement	To practice using measurement problems related to other areas such as literature, science, and social studies.	June	5C
4	Measurement	To select appropriate measurement tools.	June	5C
4	Measurement	To compare equivalent measures within the metric system.	June	5C
4	Measurement	To find perimeter of polygons.	June	5C
4	Measurement	To measure a line segment to the nearest centimeter or millimeter.	June	6A
4	Measurement	To make the best estimates for the length, capacity, weight, or mass of a given object.	June	6B
4	Measurement	To develop strategies for estimating measurements.	June	6D
4	Measurement	To relate area and volume formulas to counting squares.	June	7B
4	Measurement	To read, write, and compare Fahrenheit and Celsius temperatures.	June	6A
4	Measurement	To provide hands-on activities related to measurement and time.	June	5B
4	Measurement	To measure using inch, foot, yard, and mile.	June	5C
4	Multiplication	To multiply three-digit numbers by two-digit numbers including money. Multiplication by multiples of 10.	June	3A
4	Multiplication	To make generalizations about the differences between products of numbers greater than one and when one num	June	6E
4	Multiplication	To use mental math to multiply multiples of 10, 100, and 1000 by 2-digit and 3-digit numbers and multiples of	June	1C
4	Multiplication	To use open multiplication sentences in situations of equality and inequality.	June	7C
4	Number Concepts	To know prime numbers and factor trees.	June	2B
4	Number Concepts	To explore quantitative information that will help relate personal experiences to the meaning of million.	June	6C
4	Number Concepts	To create number patterns and sequences.	June	7A
4	Number Concepts	To create repeated patterns.	June	7A
4	Number Concepts	To use symbols <, >, and, =.	June	7B
4	Number Concepts	To define terms most and at least.	June	7B
4	Number Concepts	To describe number sequences.	June	7B
4	Number Concepts	To investigate relationships between numbers in addition, subtraction, multiplication, and division.	June	7B

Curriculum Arran by Grade and Time

Grade	Area	Skills	Date	P I
4	Number Concepts	To use manipulatives or relevant computer software to explore linear patterns.	June	7E
4	Number Concepts	To use manipulative materials or relevant computer software to explore linear patterns.	June	7E
4	Number Concepts	To create patterns and sequences of numbers such as triangular and square numbers.	June	1B
4	Number Concepts	To recognize or create lines of symmetry or patterning in number tables.	June	1B
4	Organizing Data	To develop orderly ways to determine the number of possible arrangements and combinations (e.g., tree diagra	June	6E
4	Place Value	To read and write whole numbers to the millions.	June	2A
4	Place Value	To understand place value to the millions.	June	2C
4	Place Value	To round whole numbers to the nearest thousand.	June	6D
4	Problem Solving	To discuss real-world examples of when estimating would be acceptable and when it would not.	June	6C

Exemplars

Grade 4

Related to

Performance Indicators (PI)

Courtesy of

Spring Math 1999 Exemplars (3-5)
Underhill, VT.

NAME _____ **DATE**_____

LEVEL - 4

P.I. –1C, 1D, 5B, 6B,

Bridge Building on Lake Champlain

Bridges are made of trusses. Examples of Warren Trusses are shown below:

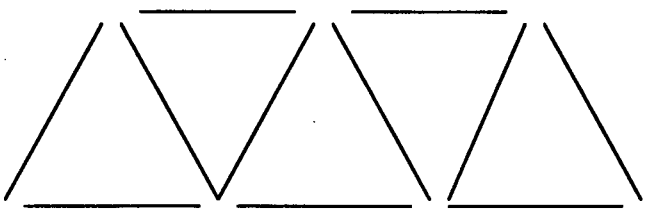
1 Truss:	5 meters long
2 Trusses:	10 meters long
3 Trusses:	15 meters long

A new bridge is being built across the Lake Champlain Islands.

The bridge will be 1 kilometer long.

PART 1: If the engineers build the bridge using Warren Trusses, how many trusses will need to be built?

PART 2: How many beams (_____) will this new bridge require?



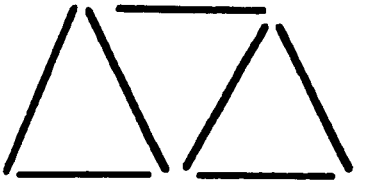
Grade Level 3-5

Bridge Building on Lake Champlain

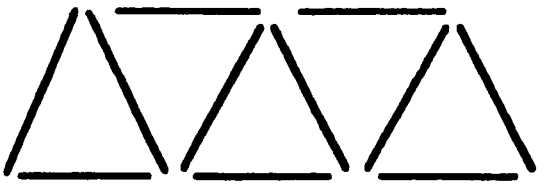
Bridges are made of trusses. Examples of Warren Trusses are shown below:

1 Truss: 5 meters long

2 Trusses: 10 meters long



3 Trusses: 15 meters long



A new bridge is being built across the Lake Champlain Islands.

The bridge will be 1 kilometer long.

Task Part 1: If the engineers build the bridge using Warren Trusses, how many trusses will need to be built?

Task Part 2: How many beams (_____) will this new bridge require?

Context

This task can be used during a unit on measurement, but is most appropriately given during a unit on patterns, functions, and algebra.

What this Task Accomplishes

To successfully complete this task, students need to be able to create and extend patterns, and then to generalize patterns. The teacher can assess which students are able to apply this higher level thinking skill. This task also assesses students' ability to convert kilometers to meters.

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Possible Solutions

# of Trusses	# of Beams	length in meters
1	3	5
2	7	10
3	11	15
N	4N - 1	5N
200	799	1000

200 trusses are needed (200 trusses x 5 meters = 1000 meters = 1 kilometer)

Benchmark Descriptors

Novice

The novice solution will be mostly incorrect. The student will not be able to find a correct pattern, nor will the novice know what to do with the measurement aspect of the task. Little or no math language will be used, and representations will be limited to rudimentary drawings that do not mimic the mathematical situation presented in the task.

Apprentice

The apprentice will achieve a partially correct solution. The apprentice will either not be able to find a pattern, or will not know how to determine the number of trusses needed. The apprentice will use accurate math language, but it will be sparse. A diagram or table will be used, but it will lack labels and accuracy in terms of consistency.

Practitioner

The practitioner will achieve a correct solution. The practitioner will find a pattern, and will be able to generalize it to the number of trusses needed. The practitioner will correctly determine the number of trusses needed, and then the number of beams needed to cross the lake. The practitioner will use accurate and appropriate math language throughout. Tables and diagrams used will be accurate, labeled, and will clearly communicate.

Expert

The expert will achieve a correct solution for all parts of the problem. The expert's solution will be clearly communicated, and all work will be documented. The expert will use algebraic notation to describe the generalized pattern. The expert will also make mathematically relevant comments and observations about her/his solution.

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NAME _____ **DATE**_____

LEVEL - 4

P.I. – 1A, 1B, 3C,

In the cafeteria there are 6 square tables. There are 4 students at each table. Each student has a sandwich, drink, and a snack.

PART 1: Draw a diagram or model to represent this information.

PART 2: Find the total number of food and drink items.

NAME _____ **DATE**_____

LEVEL - 4

P.I. – 2A, 2B, 2D,

Dependable Parent Volunteers

Mrs. Smith and Mrs. Jones both volunteer in their children's classrooms. Mrs. Smith volunteers every third school day for 1/3 of a day. Mrs. Jones volunteers every fifth day of school for 1/2 of a day. In a given month, which parent is spending more time volunteering?

M	A	R	C	H		
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Make a diagram, graph or table to show how you arrived at your answer.

Grade Level 3-5

Dependable Parent Volunteers

Mrs. Smith and Mrs. Jones both volunteer in their children's classrooms. Mrs. Smith volunteers every third school day for 1/3 of a day. Mrs. Jones volunteers every fifth day of school for 1/2 of a day. In a given month, which parent is spending more time volunteering?

Context

This fourth grade class had been working on fractions about 2 weeks prior to the administration of this particular task. The students had worked with naming fractions, identifying fractions, drawing fractions, and also had been briefly working with finding equivalent fractions. The teacher had noticed that the students seemed well versed in finding the fractional part of a number. With the information that the teacher had gained, the problem was created to truly measure who had a handle on this concept, and who still needed additional direct instruction.

What this Task Accomplishes

This task allows the teacher to see what students know in terms of finding fractional values of a particular number. It also allows the students to apply their earlier learned math knowledge of calendars and time.

What The Student Will Do

Students approach this task in many different ways. Some students rely on their knowledge of fractions and multiples, while others need to create a calendar and use a more visual approach.

Time Required for the Task

45- 60 minutes

Interdisciplinary Links

This task links well to community service. A children's book that would link well to this task is entitled *You Read to Me, I'll Read to You* by John Ciardi. This book explores fractional parts.

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Math representations will be labeled, clear, and accurate. The expert will extend her/his solution or make mathematically relevant comments or observations.

Author

Shawn Parkhurst worked last year as a grade 4 teacher at the Canadian Academy school in Kobe, Japan. He previously taught at the Williston Central School in Williston, Vermont where he also served as their assessment coordinator, in addition to serving in the role as a math portfolio network leader. This year Shawn is teaching grade 6 language arts in Japan where he and his wife reside. He can be reached via email at: shawnp@canacad.ac.jp

NAME _____ **DATE** _____

LEVEL - 4

P.I. – 3A, 3B, 4B, 5E, 6C,

Bob is training for a bicycle race. He needs to ride 75 miles every 5 days to prepare. He rode 12 miles on Monday, 14 miles on Tuesday, 17 miles on Wednesday, and 15 miles on Thursday. How many miles must he ride on Friday to reach his goal?

NAME _____ **DATE**_____

LEVEL - 4

P.I. – 3C, 4B, 6C,

Hoop it Up!

Lori, Debi, and Mike were shooting basketball hoops to raise money for a camp trip to a Knick game. The table below shows how many hoops were made by each student and how much each student earned per hoop.

1. Complete the table.

2. How much money did all three students raise all together? _____

Show all work.

Student	Number of Hoops Made	Amount Earned	Amount Raised
Lori	5		$2.50
Debi	10	$.75	
Mike	15		$7.50
Total Raised by All Students			

NAME _____ **DATE**_____

LEVEL - 4

P.I. – 3C

The list below shows how much of each item is needed to make a pizza for one.

PERSONAL PAN PIZZA RECIPE

4 oz. shredded mozzarella
6 oz. spaghetti sauce
2 crescent roles
3 oz. ground beef

You want to make 5 personal pan pizzas. Complete the list below to show how much of each item will be needed.

_____ oz. shredded mozzarella cheese

_____ oz. spaghetti sauce

_____ crescent roles

_____ oz. ground beef

Explain the steps you took to arrive at your answer.

NAME _____ **DATE**_____

LEVEL - 4

P.I. – 4C

Mrs. Martinez wants to bake cookies for a class party. She needs to bake 25 cookies, but she thought she'd use four different cookie cutters to make the cookies more interesting.

She rolled the dough out into a rectangle that was 12 in. x 18 in. The different cookie cutters were :

3 in. x 3 in. star

2in. x 3 in. bell

3in. x 5 in. clover

3 in. x 4 in. heart

How could she arrange the shapes of dough to make 25 cookies using all four cookie cutters?

Adopted From: Spring Math 1999 Exemplars (3-5), Underhill, VT.

Grade 3-5

Cookie Cutters

I want to bake cookies for a class party. I need to make 25 cookies, but I thought I'd use four different cookie cutters to make the cookies more interesting.

I rolled my dough out into a rectangle that is 12 in. x 18 in. My different cookie cutters are:

3 in. star 

2 in. x 3 in. bell 

3 in. x 5 in. clover 

3 in. x 4 in. heart 

How could I arrange the shapes on my dough in order to get 25 cookies using all four cookie cutters?

ontext

The students in this fourth grade classroom were just finishing a unit on Geometry and have spent time working on spatial sense. They were being introduced to division but were also given manipulatives with which to solve this problem.

What This Task Accomplishes

This task allows students to develop their spatial sense and reasoning. It allows them to practice division and actually see the remainder. This task also assesses students' understanding of factors of numbers and how they are used in real-life situations.

What the Students Will Do

I anticipated that my class would try not to answer this math problem MATHEMATICALLY and that they would spend too much time with their artwork. I did have 12 x 18 inch paper available and squares and rectangles cut to the size of the various cookies to discourage those who needed to use the manipulatives from actually drawing the cookies. Some children just took 25 precut shapes and glued them haphazardly onto a 12 x 18 inch rectangle, overlapping the edges. Other children attacked the problem by determining which shapes could fit into

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(Phone [illegible])

Apprentice

The apprentice will find some sort of approach with some clarity of how the cookies should be placed. The apprentice will attempt a strategy of placement and may even be able to manipulate the shapes to fit into the 12" x 18" shape. There will be some basic math language used and the diagrams or models will be labeled.

Practitioner

The practitioner will find a correct solution using all the various shapes of cookies. The practitioner will use mathematical reasoning. The practitioner will solve the problem and be able to use correct math language to describe the process. The diagrams or models will be correctly drawn and labeled.

Expert

The expert will find at least one solution to the problem using clear mathematical reasoning. The expert will make observations about which cookie shapes to use and why. This student will clearly solve the problem, have accurate diagrams or models that are clearly labeled. The expert will communicate with precise mathematical language. The expert may also solve the task with manipulatives and then solve the task using computation to verify the solution.

. uthor

Laurie Barrows is a fourth grade teacher in Newburyport, Massachusetts.

Note: The student work accompanying this task may seem out of proportion since the original work was done on large sheets of construction paper.

[illegible] Poker Hill Rd., [illegible], VT [illegible]
[illegible]

NAME _____ **DATE**_____

LEVEL - 4

P.I. – 4A, 4C, 7C

Who Owns the Most Land?

You and your friend are trying to agree on who owns the most land in your neighborhood. You and your parents own Lot A, Lot F, and Lot G. Your friend and his family own Lot B, Lot C, and Lot D.

PART 1: Who owns more land and how do you know?

PART 2: Whose land is more valuable? Here is the information provided by the tax office:

LOT	VALUE
Lot A	$88, 000
Lot B	$20, 000
Lot C	$50, 000
Lot D	$88, 000
Lot E	$62, 000
Lot F	$50, 000
Lot G	$62, 000

Adopted From: Spring Math 1999 Exemplars (3-5), Underhill, VT.

Grade Level 3-5

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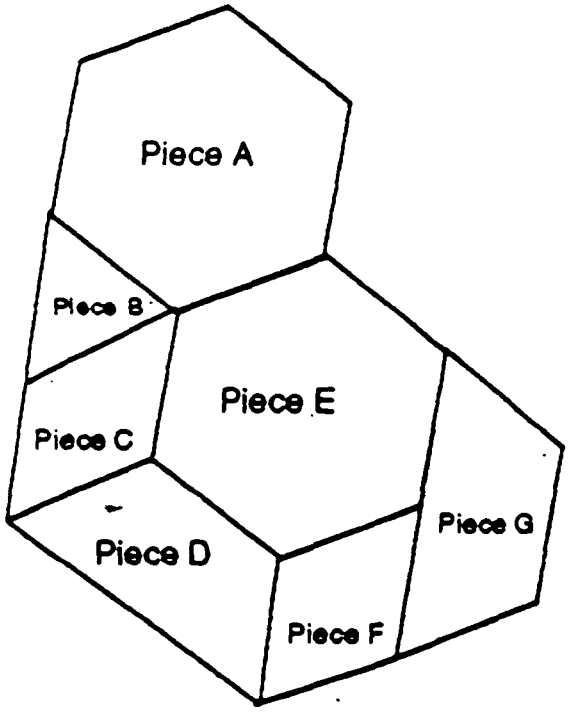

Context

This fourth grade class had worked on a unit on geometry. In addition, they began learning about fractions and how they can be applied to problem solving. The students had also learned about money.

What This Task Accomplishes

This task allows the teacher to assess the degree to which students can use spatial sense and geometric terms in problem solving situations. It assesses the degree to which students can

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accurately add large monetary values. It also assesses the degree to which students can apply fraction concepts and skills, as well as the simultaneous application of all of these concepts and skills.

What the Student Will Do

Most students began by combining the shapes of property from each family. They then created a way to compare each amount. Since the task does not require students to identify each amount, this can be done in different ways. Most students in this class chose to determine a numerical value to compare, but another approach includes only comparing shapes they do not have in common. Some students may choose to find the areas of the shapes by tracing the shapes on graph paper and counting the square units. Students could also use pattern blocks to represent each area and then stack them to find the difference. Discussing the many strategies after completing the task will help students broaden their view of approaches to problem solving. Students then compute the monetary values.

Time Required for Task

60-80 minutes

Interdisciplinary Links

This task could be linked to studies on landmasses. Students could compare the areas of different towns or countries. Students could compare the areas of land that are acquired during wartime, and how those amounts vary through the duration of the war. See also a task entitled "Lake Erie Dilemma" in the October Volume 5 issue of Exemplars for ideas on extending the topic of determining land mass area estimation.

Teaching Tips

Make sure students have been previously engaged with geometry, beginning fractions and money. A similar task, that is perhaps more complicated, is *Feverish Freddy* that can be found in the October Volume 5 issue of Exemplars. You could offer both tasks to students in your class based on which would be an appropriate challenge for each student.

Suggested Materials

Pattern blocks, graph paper

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Possible Solutions

The correct solution to part one is that you and your family has more land (2/3 more). The correct answer for part two is that you have a higher value of land ($200,000 compared to your friend whose land is worth $158,000).

Benchmark Descriptors

Novice

The novice may have some clear work, but the student will not have a general understanding of the task. No conclusions are made as the student has no approach for comparing the two areas. The novice will make no attempt to find the sum of the values. Some math language may be used, and math representations may be attempted.

Apprentice

The apprentice may have an approach that will lead to solving part of the problem. The apprentice may be able to find the sum of the land values, but not be able to compare the areas. The apprentice may also get an incorrect solution due to the inclusion of Lot E either in land value or area calculations. Some math language will be used, and math representations will be attempted.

Practitioner

The practitioner will achieve a totally correct solution. All work will be shown, and the approach and reasoning evident. The practitioner will use accurate math language throughout. Accurate and appropriate math representations will be created.

Expert

The expert will have an efficient approach to solving the task. All work will be shown, and the approach and reasoning will be clearly explained. The expert will use precise math language throughout. Accurate and appropriate math representations will be created. The expert will also extend the task and/or make mathematically relevant comments or observations.

Author

Shawn Parkhurst worked last year as a grade 4 teacher at a Canadian Academy school in Kobe, Japan. This year, Shawn is teaching grade 6 language arts in Japan where he and his wife reside. He can be reached at shawnp@canacad.ac.jp.

271 Poker Hill Rd., Underhill, VT 05489
Phone: 800-450-4050

NAME _____ DATE _____

LEVEL - 4

P.I. – 5C, 6D

A Very Tall Lady

The Statue of Liberty is about 102 yards tall. The average 10-year old girl is 42 inches tall.

PART 1: How many average 10 year old girls would it take to equal the height of the Statue of Liberty?

PART 2: How many students your height would it take?

AdoptedFrom: Spring Math Exemplars 1994 Grade 3-5, Underhill,VT.

Grade Level 3-5

A Very Tall Lady

The Statue of Liberty is about 102 yards tall. The average 10-year old girl is 42 inches tall.

Task Part 1: How many average 10 year old girls would it take to equal the height of the Statue of Liberty?

Task Part 2: How many students your height would it take?

Context

This task was given to students who were studying measurement and averaging concepts.

What This Task Accomplishes

This task allows students to apply their skills in converting between inches, feet, and yards to solve a problem involving ratios and proportions.

What the Student Will Do

Most students will begin by applying the fact that 36 inches equals 1 yard. Students will then need to find the number of inches in 102 yards. They will multiply, use repeated addition, or will divide to determine this part of the solution. Next students will divide the average girl's height into the Statue of Liberty's height. The quotient is the number of girls it would take. Students then need to determine their height and repeat the same process. Extensions for this problem would be to find the average height of students in your class, or the average height of the girls and the average height of boys to compare to the average given in the task. Students could also explore body part ratios, or compare the Statue of Liberty's height with local monuments.

Time Required For the Task

One 60-minute class period

Interdisciplinary Links

This problem could be given while studying immigration (featuring the Statue of Liberty), France (the statue was a gift from France), New York, or you could connect the task to Tall Tales.

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Practitioner

The practitioner will have a strategy for solving all parts of the task and obtaining correct answers. The practitioner will use accurate and appropriate math language. This task does not lend itself well to having students create math representations, but if the practitioner does, it will be accurate and appropriate. The practitioner will communicate the approach and reasoning used, and all work will be present.

Expert

The expert will have a strategy that leads to a correct answer to all parts of the problem. The student will use accurate and appropriate math language such as "converted", "rounded", "measured", and will demonstrate understanding of the remainder. The expert may also use algebraic or other symbolic notation to communicate an aspect of the solution. The expert will create accurate and appropriate mathematical representations. The expert will make mathematically relevant observations that are above and beyond the requirements of the task.

Author

Carol Amico McNair, who teaches grade 6 at the Camels Hump Middle School in Richmond, Vermont, wrote this task. The task was piloted in Carol Amos' grade 4 classroom located in Sutton, Vermont.

21 Poker Hill Rd., Underhill, VT 05489
Phone: 800-450-4050

NAME _____ DATE _____

LEVEL - 4

P.I. – 5E

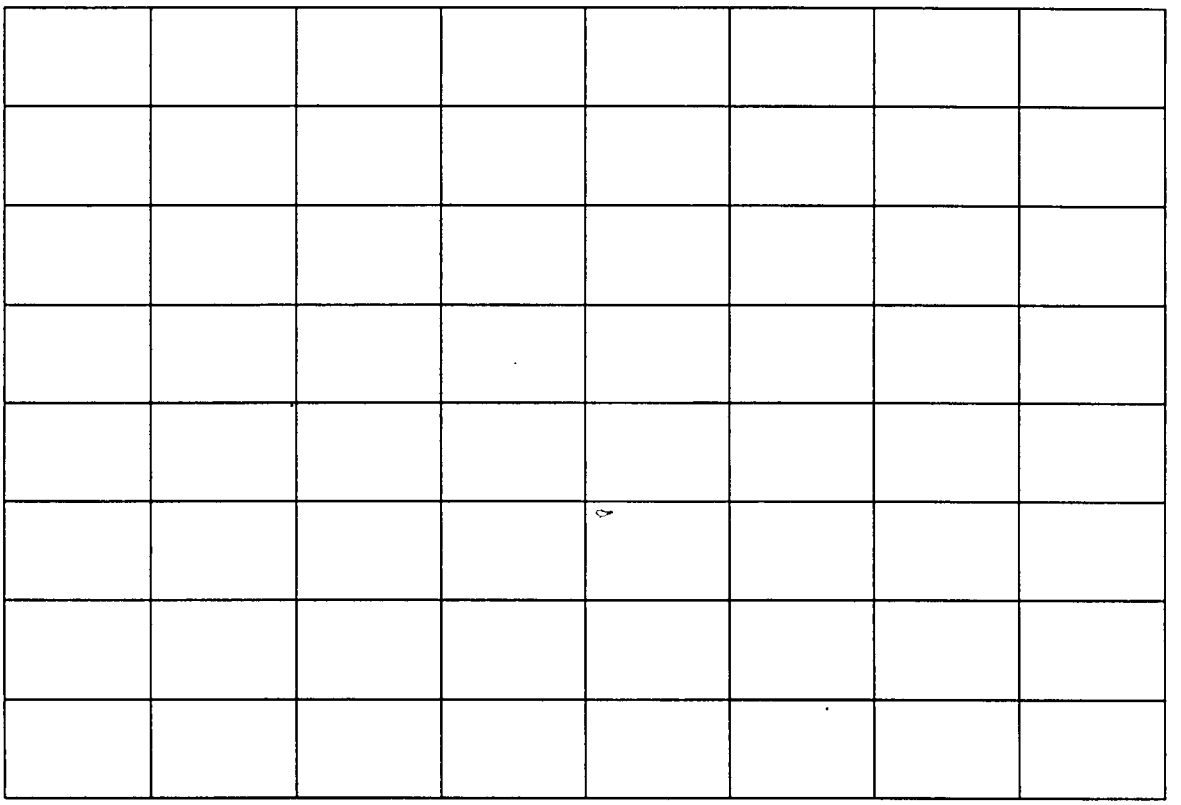
Favorite Girl Scout Cookies

Mrs. Bowden asked her fourth grade students to choose their favorite Girl Scout cookies. The results are shown in the table below.

Students	Flavor of Cookies
Minnie	Lemon Drop
Matthew	Thin Mints
Naqueeta	Do-Si-Dos
Anthony	Tagalongs
Christen	Chocolate Chips
Chane	Trefoils
RoseMary	Samoas
Andrea	Apple Cinnamon
Brandon	Thin Mints
Travis	Trefoils
Suydan	Lemon Drops
Jarred	Thin Mints
Jonathan	Trefoils
Daisy	Thin Mints
Chet	Samoas

On the grid below, make a bar graph showing the number of students who prefer each flavor of Girl Scout cookies. Use the information from the table to help you.

Be sure to: *Title the graph * Label the axes * Graph all the data



NAME _____ **DATE**_____

LEVEL - 4

P.I. – 6E, 6G, 6H,

Michael reached in the money bag and grabbed one of the bills.

$HUNDRED $FIVE

$TEN $TWENTY

$ONE

Which one of the bills did Michael grab? Use the clues to find the bill he pulled out of the bag.

CLUES

It has more than three letters.
It's not next to the five dollar bill.
It is not the first one.

Answer: _____

Explain the steps used to find your answer.

_____
_____
_____
_____
_____
_____

NAME _____ **DATE**_____

LEVEL - 4

P.I. – 7C

Monica's mother gave her 3 quarters, 2 dimes, and 3 nickels to share with her brother. Monica kept 80 cents and gave the rest to him. What is the least amount of coins Monica could have given to her brother?

Show your work.

Answer_____

On the lines below, explain how you figured out which coins Monica gave away.

_____
_____
_____
_____
_____
_____
_____
_____
_____

Classroom Ideas

Grade 4

Courtesy of

The University of the State of New York
The State Education Department

Mathematics Core Curriculum

Grade: 3–4

ASSESSMENT EXAMPLES

EXAMPLES FOR

GRADES 3 - 4

1A.

Alice started with 8 marbles. She lost 2 marbles. Then she bought 6 new marbles. Which of these statements is true about the number of marbles Alice has now?

A. Alice has fewer marbles than when she started.
B. Alice has 4 more marbles than when she started.
C. Alice has 6 more marbles than when she started.
D. Alice has the same number of marbles as when she started.

1B.

In these number sentences, the same shape always stands for the same number.

○ + ○ = 8
Δ + ❑ = ○
Δ + ○ = 5

Part A

Use the number sentences to find which numbers the Δ, ❑, and ○ stand for. Write the correct number in each shape above.

B

On the lines below, explain the steps you used to find the answer.

_____

_____

1C.

Tony and Mara saw 13 clowns at the circus. Each clown was wearing either red, yellow, or green shoes.

- Twice as many clowns were wearing red shoes as yellow shoes.
- There were 4 clowns wearing green shoes.

When they got home from the circus, Mara said there were 6 clowns wearing yellow shoes. Explain whether or not Mara is correct. Include the number of clowns wearing each shoe color.

_____

_____

1D.

You may use counters to help you solve this problem.

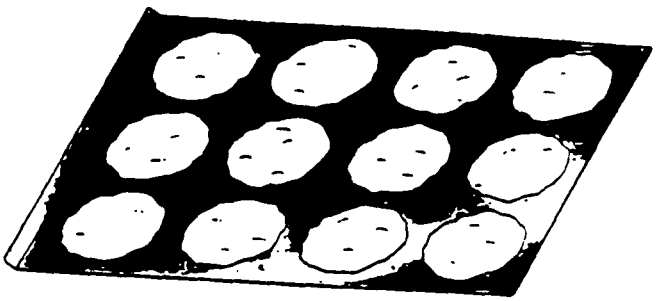
Tina has 3 craft sticks. Tina and Dan together have 5 craft sticks. Dan and Sally together have 7 craft sticks. How many craft sticks does Sally have?

A. 5
B. 2
C. 3
D. 4

5c

2A.

Label the cookies in the pan to show that
1/3 of them are Oatmeal (O)
1/2 of them are Butter (B), and
the rest are Sugar (S).
What fraction of the cookies on the pan are Sugar?

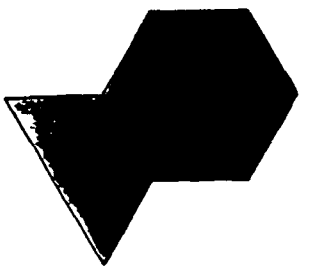


Answer_____

2B.

Use your pattern blocks to help you solve this problem.

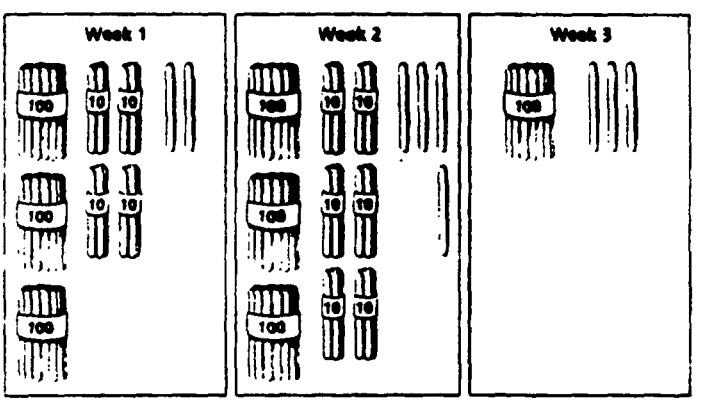
How many of the green triangles would be needed to cover exactly 2/3 of this shape?



A. 1
B. 3
C. 6
D. 9

2C.

The students are collecting craft sticks. The pictures below show the number of sticks they collected each week.



How many sticks do the students have after collecting them for 3 weeks?

A. 809
B. 890
C. 806
D. 980

2D.

Which number would be served next?

F

G

H

J

2E.

One hundred students were asked to name their favorite sport. The table below shows the results of the survey.

FAVORITE SPORT

ort	Number of Students
eball	20
Basketball	15
Soccer	35
Football	30
TOTAL	100

What percent of students chose soccer as their favorite sport? **Answer**_____%

What percent of the total group of students did *not* choose soccer as their favorite sport? **Answer**_____

Show your work.

ASSESSMENT EXAMPLES

EXAMPLES FOR

GRADES 3 - 4

Grades: 3–4

3A.

You may use counters to help you solve this problem.

The list shows how much of each item is needed to make one batch of Chocolate Chip Cookies.

2 c. flour
1 c. sugar
3 eggs
1 t. baking soda
6 oz. chocolate chips
4 T. butter

You want to make **2 *batches*** of Chocolate Chip Cookies.

Complete the list below to show how much of each item will be needed.

_____ c. flour
_____ c. sugar
_____ eggs
_____ t. baking soda
_____ oz. chocolate chips
_____ T. butter

Pat, Chris, and Jessica are skating to raise money for the school band. The table below shows how many laps each student skated and how much each student earned per lap.

SKATING FOR THE BAND

Student	Number of Laps Skated	Amount Earned Per Lap	Amount Raised
Pat	10	$0.75	
Chris	16	$0.50	
Jessica	13	$0.50	
Total raised by all 3 students			

Complete the table to show the amount of money each student raised and the amount of money the 3 students raised altogether.

3D.

Shelly, Mike, and Jason looked at the stars through a telescope every night for a week. Shelly saw 6 shooting stars, Mike saw 9, and Jason saw 11. They wondered in what order they should add up the numbers to get the highest total. Does it matter? On the lines below, explain why or why not.

_____

_____

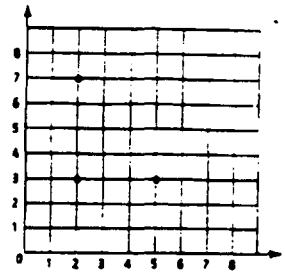
_____

4B.

Alissa plotted the first 3 corners of a rectangle on the grid.

What are the coordinates of the 4th corner?

F. (5, 7)
G. (5, 6)
H. (6, 5
J. (7, 5)



4C.

In the library, there are 2 round tables. There are 3 students sitting at each table. Each student has 4 books.

In the space below, draw a diagram or model to represent this information.

4E.

Use your pattern blocks to help you solve this problem.

In the space, trace aound two pattern blocks that show quadrilateral shapes.

On the lines below, explain what makes these shapes ***quadrilaterals.***

5C.

Use your pattern blocks to help you solve this problem.

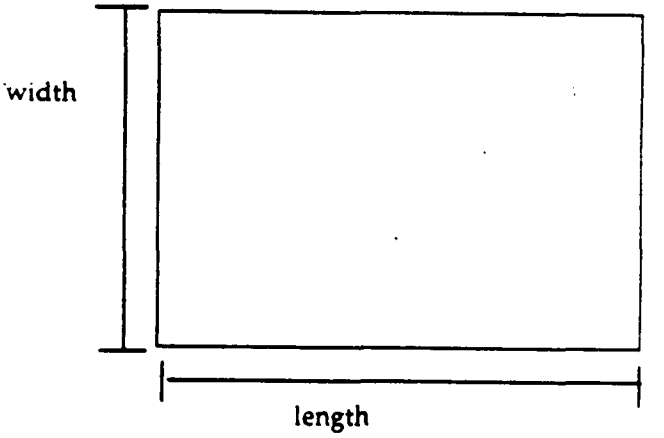
In the space below, trace one shape that has only **right** angles.

In the space below, trace all shapes that have any angle **larger** than right angles. Place an X on all of the angles larger **than** right angles.

5D.

Use your centimeter ruler to solve this problem.

Tim cut rectangles out of construction paper to make a picture. The first rectangle he cut is shown here.



Part A
What is the perimeter in centimeters of Tim's first rectangle?

Show your work.

First Perimeter _____ centimeters

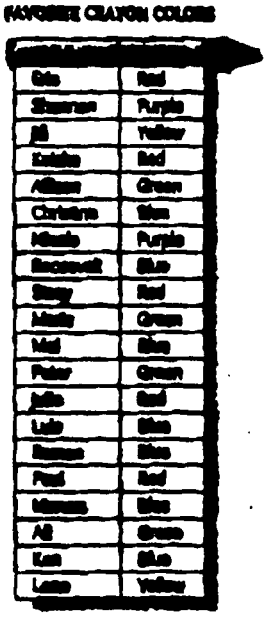
Part B
The second rectangle Tim cut has the same width as the first, but the length is 2 centimeters longer. What is the perimeter in centimeters of Tim's second rectangle?

Second Perimeter _____ centimeters

On the lines below, explain in words how you found the perimeter of Tim's second rectangle.

5E-F.

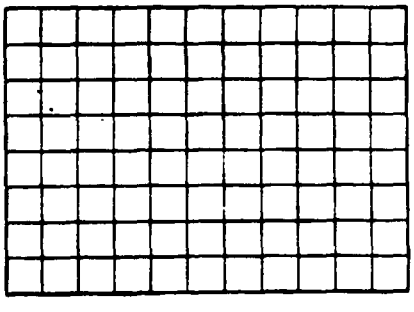
Mr. Jacobs asked his first-grade students to choose their favorite crayon colors. The results are shown in the table below.



On the grid below, make a bar graph showing the number of students who prefer each crayon color. Use the information from the table to help you.

Be sure to:

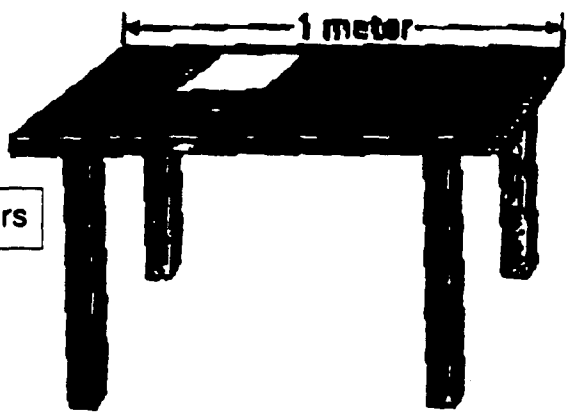
- title the graph
- label the axes
- graph all the data.



Using the information from your graph, write *one* statement comparing the crayon colors.

6A.

Look at the picture. The table is 1 meter long.
Estimate the width of the piece of paper in centimeters.



1 Meter = 100 centimeters

Estimate _____

6C.

The Lee family is standing in line for the Turtle Olympics. The family is trying to figure out the following four things:

- How much money will it cost to get in?
- How long will they have to wait in line?
- How many tickets will they need?
- What time will the Olympics start?

Which of these things will the Lee family most likely have to estimate?
Explain why you would use an estimate or why an estimate would not be used on the lines below.

_____

_____

_____

6D.

This jar has about 40 marbles in it.

Which of the jars has the amount closest to 120 marbles?

6E.

Amy says that a spaceship traveling at 7,200 miles per hour would go 15,000 miles in 8 hours. Sue disagrees and says that the spaceship would travel 56,000 miles in that amount of time.

Which student has the closer estimate to the actual distance? Explain why.

6F.

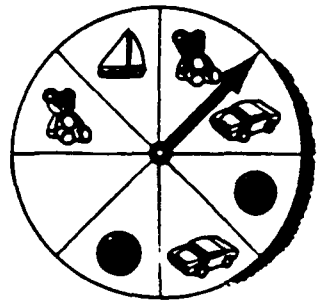
For the spinner to have an equal chance of landing on each prize, which prize should go in the blank space?

F.

G.

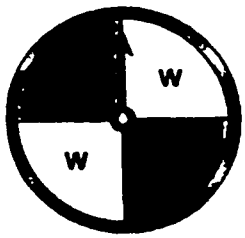
H.

J.

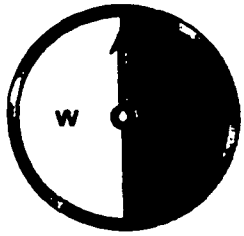


6G.

Kim and Lisa are playing a game. Each player will use a different spinner shown below. Each player will spin their own spinner 10 times and score 1 point each time the arrow on her spinner lands on R. The player with the most points wins.



Kim's Spinner



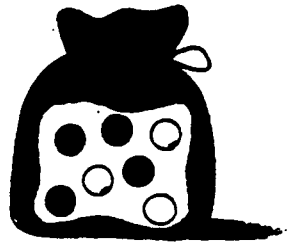
Lisa's Spinner

Use the two spinners to explain why both players do or do not have a fair chance of winning the game.

6H.

Jack will choose one marble from the bag without looking. What is the probability he will choose a black marble?

A. 1/7
B. 2/7
C. 3/7
D. 4/7



7A.

Study the pattern.  ?

What is the next shape in the pattern?

F 

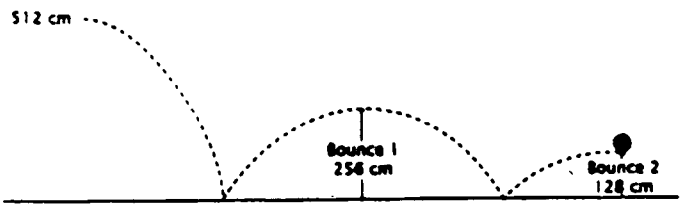
G

H 

J 

7B.

In a computer game, a ball was dropped from a height of 512 centimeters. The picture shows how high the ball bounced.



Part A

If the pattern continues, how high will Bounce 3 be?

Answer _____ cm

Part B

On the lines below, describe how the height changes from one bounce to the next.

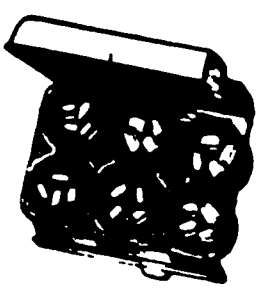
_____

_____

Part C

Predict how high Bounce 6 will be. **Answer** _____ cm

7C.



David put 4 beads in each section of the egg carton shown.

Which of these number sentences could not be used to find the total number of beads?

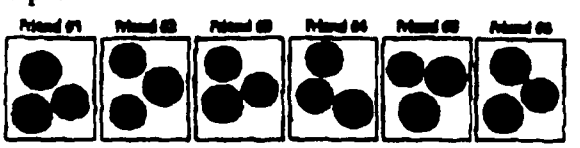
F. 4 X 6 = ❑ H. 4 + 4 + 4 + 4 + 4 + 4 = ❑

G. 6 X 4 = ❑ J. 6 + 6 + 6 + 6 + 6 + 6 = ❑

7D.

You may use your counters to help you solve this problem.

Erin has 18 cookies. She gave 3 to each of her 6 friends.



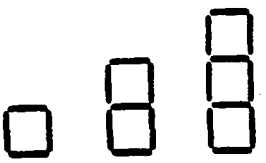
Al has 12 cookies, and wants to divide the cookies equally among each of his 3 friends. How many cookies will each of Al's friends receive?

F. 6 H. 3

G. 2 J. 4

7E.

Look at the pattern below. Each figure is made with craft sticks.



How many craft sticks are needed to make the next figure in this pattern?

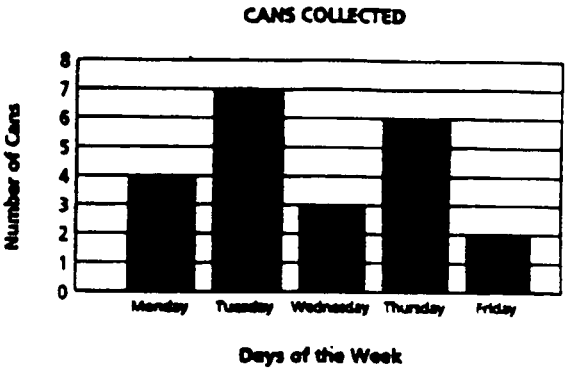
A. 3
B. 4
C. 12
D. 13

7F.

The graph shows the number of canned goods that Mr. Ruiz's class collected. Study the graph. Then answer the questions.

Part A

Mr. Ruiz promised to reward his class with animal stickers when the total number of cans reached 15. The bar graph shows the number of cans the class brought in each day.



What day did Mr. Ruiz give his class the animal stickers?

Tuesday
Wednesday
C. Thursday
D. Friday

Part B

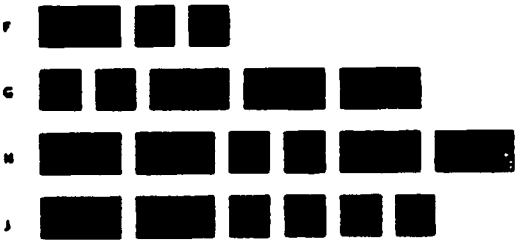
How many days did the students collect more than 5 cans?

F. 5
G. 2
H. 3
J. 4

7G.

Look at this rectangular solid (box).

Which of these groups shows all the sides of the rectangular solid (box) above?

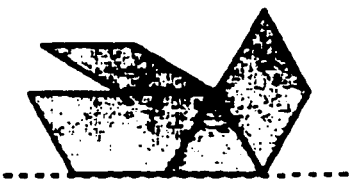


7H.

Use your pattern blocks to help you solve this problem.

Dan used pattern blocks to draw half of a design.

Complete the design below so that the dotted line is a line of symmetry. Trace around your pattern blocks to show the other half of the design.



CLASSROOM IDEAS

EXAMPLES FOR GRADES 3 - 4

Grades: 3-4

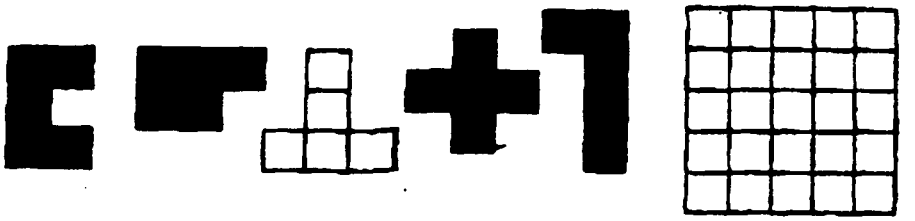
The following ideas for lessons and activities are provided to illustrate examples of each performance indicator. It is not intended that teachers use these specific ideas in their classrooms; rather, they should feel free to use them or adapt them if they so desire. Some of the ideas incorporate topics in science and technology. In those instances the appropriate standard will be identified. Some classroom ideas exemplify more than one performance indicator. Additional relevant performance indicators are given in brackets at the end of the description of the classroom idea.

3C.

Tell students, "Your classmate says that any number times zero starts with the number you are multiplying and ends with a zero (e.g., 5 x 0 would be 50)." Have students, with their partners, prepare an explanation for why this is not correct. Let students share their explanations and decide which correct explanation they feel is the clearest. [Also 1A., 1C.]

4A.

Show how these five puzzle pieces can be made to fit into the 5 x 5 grid below. Your final result will be a square. Keep trying the pieces until you can find an arrangement that works. Describe how you found the solution. [Also 1D.]



4D.

Thermometers placed outdoors on the north, south, east, and west walls of the building and also inside the building can be used to collect temperatures at different times of the day for several days. Students could be asked to choose a graph to display their recorded data. Topics for discussion include: comparisons of the warmest and coolest parts of the day, the warmest and coolest locations inside and outside, and reasons for these temperature differences. [Also 4B., 5C., 5E., 5F.]

CLASSROOM IDEAS

EXAMPLES FOR

GRADES 3 - 4

5A.

Have students work in groups to create their own measurement scale, using as units handspan, book, length of string, etc. Have them measure different objects in the classroom with their measurement scale and also with metric measurements and compare the results. They could use marbles to develop a measurement scale in a cylinder and compare it to the graduated markings in milliliters as to its accuracy in measuring by displacement. [Also 5B., 5C., 5D., 6A.]

5B.

Give students magazines or catalogs. Have them cut out various pictures of objects and glue them to poster board. Underneath the picture they should write what unit of metric measure would be used to measure the object (millimeter, centimeter, meter, kilometer, milligram, gram, kilogram, milliliter, or liter) and write a sentence underneath explaining why they feel the unit of measure chosen is the most appropriate.

6B.

Students explore various methods of rounding numbers to estimate computation. For example, in addition or multiplication, round each number to the nearer thousand and add the rounded numbers. Or, use the numbers in the thousand place and add for a lower limit and then raise all the numbers to the next thousand for the upper limit. The actual sum will be between the two values. Have students compare the two methods. For example:

Method 1		Method 2	
3569	4000	3000	4000
+2712	+3000	+2000	+3000
	7000	5000	7000

The sum is greater than 5000 but less than 7000.

THE STATE OF LEARNING

New York State Testing Program

Mathematics

Test Sampler Draft

Ever Upward . . . Ever Upwa

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THE STATE EDUCATION DEPARTMENT / THE UNIVERSITY OF THE STATE OF NEW YORK / ALBANY, N.Y. 12234

ASSISTANT COMMISSIONER FOR CURRICULUM, INSTRUCTION AND ASSESSMENT

January 1998

Dear Colleagues:

In April of last year, the State Education Department entered into a partnership with CTB/McGraw-Hill for the development of the elementary and intermediate assessments in English Language Arts and Mathematics. These tests will measure student progress toward achieving the learning standards in these areas. New York teachers, students, administrators, parents, and members of the community have assisted in the development process in a variety of ways. Committees have reviewed passages and test items; teachers and students have piloted questions for this Test Sampler Draft and will be involved in field testing this year. These Test Sampler Drafts, developed to provide information on the new assessments for you and your school community, represent the first products of this effort.

The Test Sampler Drafts for English Language Arts and Mathematics have been provided to each school. These Test Sampler Drafts provide examples of the types of questions, the formatting, and the scoring guides that we are developing for the actual tests that will be administered for the first time in 1999. Additional refinement of the tests will occur as a result of field tests that will be conducted over the next few months. These drafts may be duplicated for use in your classroom. Strategies for using the sample tests are included in the introductory materials.

Both the State Education Department and CTB/McGraw-Hill are interested in receiving your feedback on these preliminary materials. A Comment Sheet is included on the inside back cover of each Test Sampler so that you may forward your responses to us. The Comment Sheet may be faxed to (518) 486-1385 or mailed to the address listed below:

New York State Education Department
Office of Curriculum and Instruction
Room 671 EBA
Albany, New York 12234

Thank you for your assistance with this significant endeavor.

Sincerely,

Edward T. Lalor

CTB McGraw-Hill

9899-BAW-0987654321

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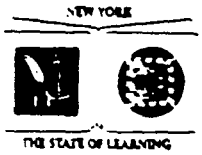


INTRODUCTION

The New York State Board of Regents has set higher learning standards for all students. To help students reach these standards, the New York State Testing Program's elementary school mathematics test will challenge students to demonstrate their ability to use mathematics.

This Test Sampler Draft for Grade 4 Mathematics provides examples of the format and types of questions that are now being field tested in preparation for the first administration of the actual test in 1999. Over the past few months, hundreds of individuals have worked with the State Education Department and CTB/McGraw-Hill staff in the development process. Committees of teachers and school administrators have reviewed the content of proposed test questions; committees of parents, business and community representatives, and members of professional organizations have also reviewed the questions. A panel of experts in mathematics is now reviewing the draft materials. You will be able to provide feedback through a comment sheet in the back of this booklet. All of this work has one goal: to ensure that the tests will be appropriate measures of student achievement of the learning standards in mathematics. Any further revisions will be based on all the information received.

The mathematics test requires students to demonstrate their ability to apply facts and definitions, solve problems, and show their understanding of mathematical procedures and problem-solving strategies. Beginning with the 1999 test administration, the assessment will provide the student, teacher, and parent/guardian with a report of individual student strengths and weaknesses.

How to Use the Sample Test

The sample test of Grade 4 mathematics may be administered in the classroom to familiarize students with the test format and the types of questions that are being planned. For the sampl students may mark answers directly in the test book. For the test beginning in 1999, students use an answer sheet for multiple choice questions but will continue to write the answers to op ended questions in the test book. The test will be administered in three timed sessions over th days. Ample time has been provided for students to answer the questions.

Teachers and students can also review the scoring guide. Answer keys are provided for the mul choice questions. The rubrics describe characteristics of responses at each point level. The rub also may be applied to other problem-solving situations the students have worked on in the classroom. A complete and correct response and a sample student response are provided for e open ended (i.e., short and extended response) question. In addition, sample responses for eac point level are provided for one short response question and one extended response question.

After administering the practice test, the teacher may discuss with the students their performar Students will be able to consider how they might have responded differently or which specific changes they might make, such as providing additional work or explanations to support their solutions, to improve their performance.

Directions for Administering the Sample Test

Please read these directions carefully before administering the test. To administer the test, read aloud to the students the boldface directions preceded by the word **SAY**.

Materials needed:

- Sample Test Books (1 for each student and 1 for the teacher)
- extra pencils and paper
- copies of the Punch-Out Tools (see Appendix B) photocopied on cardstock and cut out, or similar class manipulatives (ruler, counters, and pattern blocks; 1 set for each student)
- envelopes (for storing manipulatives; 1 for each student)

This test will be administered in three consecutive daily sessions. The Sample Test Book is divide into three parts: Session 1, Session 2, and Session 3. Administer Session 1 on the first day, Sessio on the second day, and Session 3 on the third day. Each session will take approximately one hour administer.

SESSION 1

Distribute one Sample Test Book to each student. Also distribute cut-out copies of the tools, or similar class manipulatives, and one envelope to each student. Explain to the students that they will use these tools to help them do the questions in the test. Have each student put his or her name on the envelope for collecting and redistributing the tools.

SAY **This is your Sample Test Book. Do not open your book until I tell you to do so. First, write your name on the cover of your Sample Test Book.**

Pause for the students to write their names. Then ask if anyone has questions before moving on to the next instruction.

SAY **The test is divided into three sections: Session 1, Session 2, and Session 3. Today you will complete Session 1. Tomorrow you will complete Session 2, and the next day you will complete Session 3.**

Hold up your copy of the Sample Test Book. Point to the section with tips for taking the test on the front cover.

SAY **Look at the front cover. You will see sentences about taking the test. I will read the first three sentences aloud while you read along silently.**

Read aloud the first three tips for taking the test. (Do not read the tips for the open ended questions.) Then point to the box with the icons.

SAY **Now look at the box. You will see three pictures with a sentence next to each picture. I will read each sentence aloud while you read along silently.**

Read aloud the sentences next to the icons. Hold up the tools or class manipulatives for each icon.

After the information on the front cover has been read aloud,

SAY **This first section of the test contains multiple choice questions. Read each problem in the Sample Test Book carefully and answer the questions. Circle the letter next to the answer you choose. You may use your tools to help you solve any problem on the test.**

Remember to read all directions and information in the Sample Test Book. When you see the words *GO ON* at the bottom of the page, keep going. When you come to the word STOP, you have finished the multiple choice section of the test. You may go back and check the answers you just completed, but do not go on. When you have finished, sit quietly until I call time. You will have 45 minutes to complete this section of the test.

When you are sure everyone understands the directions,

SAY **Open your test book and find question Number 1. You may begin.**

On the board, write the time the students begin the test and the finish time. When 45 minutes have elapsed (or sooner, if you are sure everyone has finished),

SAY **Please stop working. This is the end of Session 1. Close your books. Put your tools in the envelope. We will take Session 2 of the test tomorrow. Now I will collect the Sample Test Books and the envelopes.**

Collect the Sample Test Books and envelopes. Keep the materials in a safe place until the next testing session.

SESSION 2

Distribute the Sample Test Books and tools to the students. Make sure students have their own Sample Test Book and envelope before beginning the test session.

Hold up your copy of the Sample Test Book. Point to the section with tips for taking the test on the front cover.

SAY **Look at the front cover. You will see sentences about taking the test. I will read all of the sentences aloud while you read along silently.**

Read aloud all the tips for taking the test, including the tips for the open ended questions, then point to the box with the icons.

SAY **Now look at the box. You will see three pictures with a sentence next to each picture. I will read each sentence aloud while you read along silently.**

Read aloud the sentences next to the icons. Hold up the tools or class manipulatives for each icon.

After the information on the front cover has been read aloud,

SAY **Today you will complete Session 2 of the test. In this session, you will write your answers on the lines provided instead of choosing from a list of possible answers. Read the directions and questions carefully. It is important to show all your work as well as your final answers in the Sample Test Book. You may use your tools to help you solve any problem on the test. Be sure to write clearly and legibly. Are there any questions?**

Pause to answer questions. When you are sure that the students understand the directions, continue.

SAY **You will have 1 hour to complete this section of the test. When you see the words *GO ON* at the bottom of the page, keep going. When you come to the word STOP, you have finished Session 2 of the test. You may go back and check today's work, but do not go on. When you have finished, sit quietly until I call time. Are there any questions?**

Pause to answer questions.

SAY **Turn to Page T-20 and find question Number 31. You may begin.**

You may record the time left on the chalkboard as the testing session progresses. When one hour has elapsed (or sooner, if you are sure everyone has finished),

SAY **Please stop working. This is the end of Session 2. Close your books. Put your tools in the envelope. We will take Session 3 of the test tomorrow. Now I will collect the Sample Test Books and envelopes.**

Collect the Sample Test Books and envelopes. Keep the materials in a safe place until the next testing session.

SESSION 3

Distribute the Sample Test Books and tools to the students. Make sure students have their own Sample Test Book and envelope before beginning the test session.

SAY **Today you will complete Session 3 of the test. As in Session 2, you will write your answers on the lines provided in your Sample Test Book. Be sure to write clearly and legibly. It is important to show all your work as well as your final answers in the Sample Test Book. You may use your tools to help you solve any problem on the test. Are there any questions?**

Pause to answer questions.

SAY **You will have 1 hour to complete this section of the test. When you see the words *GO ON* at the bottom of the page, keep going. When you come to the word STOP, you have finished Session 3 of the test. You may go back and check today's work only. When you have finished, sit quietly until I call time.**

Turn to Page T-32 and find question Number 40. You may begin.

You may record on the chalkboard the time left as the testing session progresses. When one hour has elapsed (or sooner, if you are sure everyone has finished),

SAY **Please stop working. This is the end of the test. Close your books.**

Collect all Sample Test Books.

SAMPLE TEST BOOK

TIPS FOR TAKING THE TEST

Here are some suggestions to help you do your best:

- Be sure to carefully read all of the directions and questions in the Sample Test Book.
- Ask your teacher to explain any directions you do not understand.
- You may use your tools to help you solve any problem on the test.

Tips for answering the open ended questions:

- Read each question carefully and think about the answer before writing a response.
- Be sure to show your work when asked. You may receive partial credit if you have shown your work.

This picture means that you will use your ruler.

This picture means that you will use your pattern blocks.

This picture means that you may use your counters.

STUDENT NAME _____

Session 1

1 227
− 14

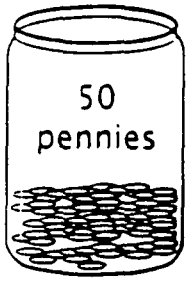
A 311
B 241
C 231
D 232
E None of these

2 $4 \times 116 =$

F 4424
G .664
H 444
J 464
K None of these

3 Which of these jars has an even number of pennies?

A



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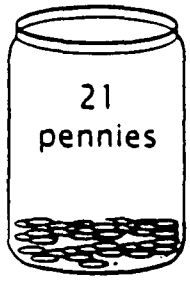

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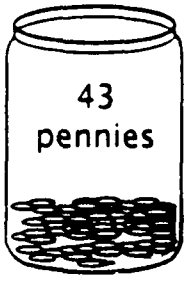

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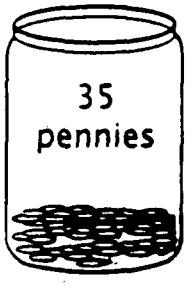
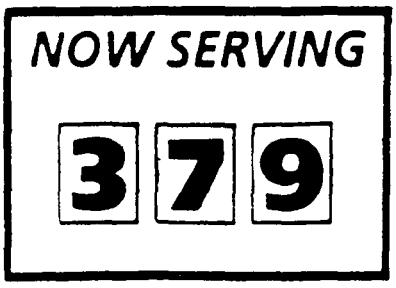


Go On

4



Which number will be served next?

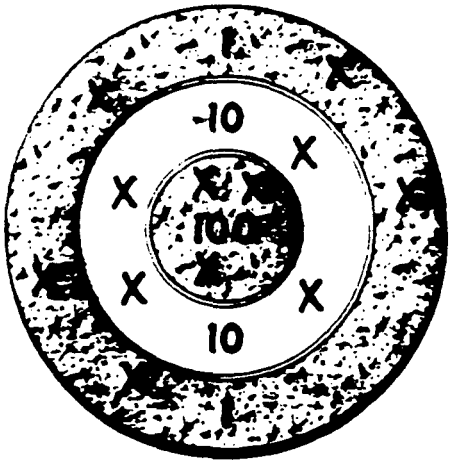
F

G

H

J

5 Harry played a game of darts. He threw 12 darts at the target. The numbers show how many points are earned for each dart that lands in that area. The X's on the target below show where the darts landed.

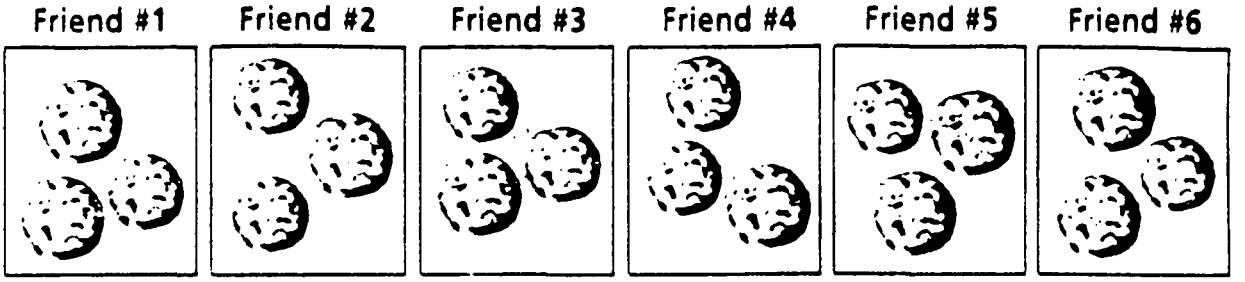


What was Harry's total score?

A 435
B 345
C 534
D 354

6 You may use your counters to help you solve this problem.

Erin has 18 cookies. She gave 3 to each of her 6 friends.

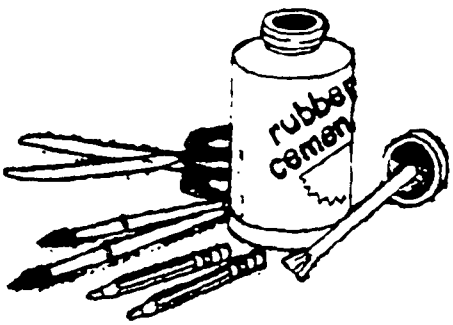


Al has 12 cookies, and wants to divide the cookies equally among each of his 3 friends. How many cookies will each of Al's friends receive?

F 6
G 2
H 3
J 4

Go On

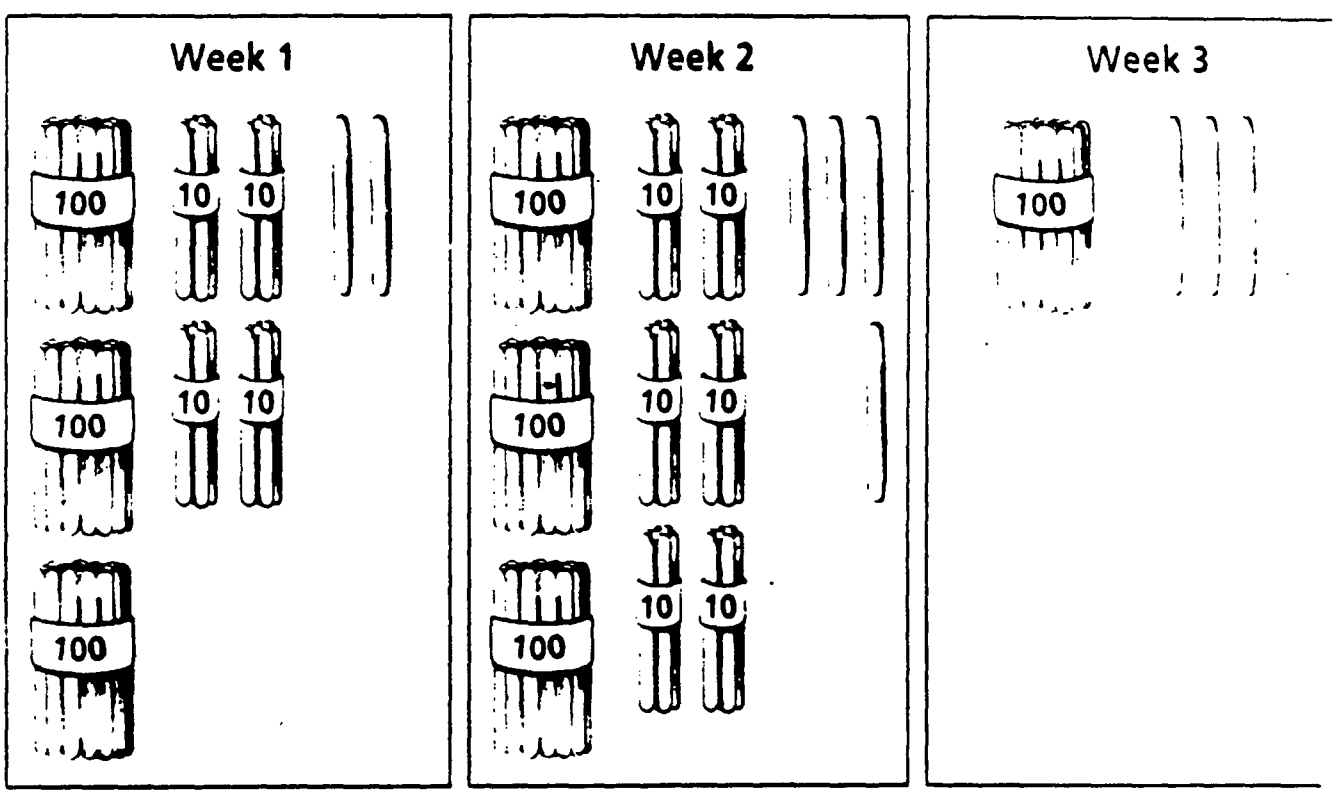
Art Project



Directions

The fourth grade is planning for an art project.
Do Numbers 7 through 12.

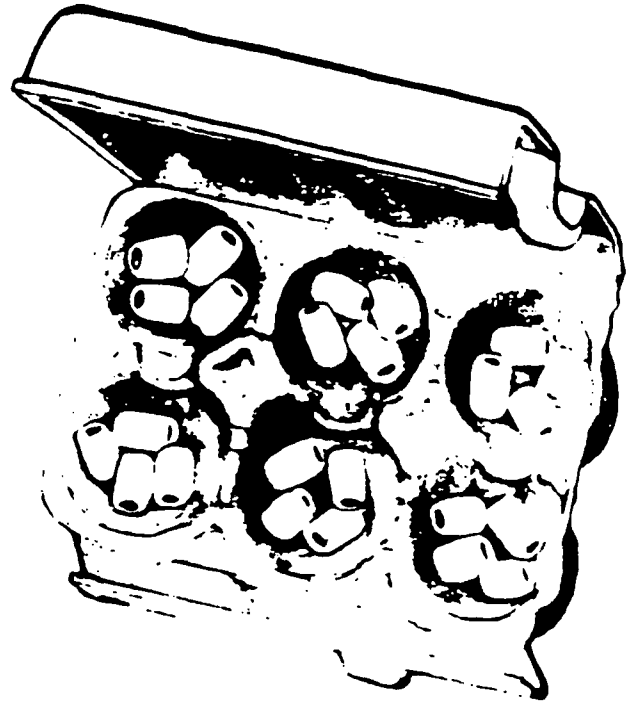
7 The students are collecting craft sticks. The pictures below show the number of sticks they collected each week.



How many sticks do the students have after collecting them for 3 weeks?

A 809
B 890
C 806
D 980

8 David put 4 beads in each section of the egg carton shown below.



Which of these number sentences could *not* be used to find the total number of beads?

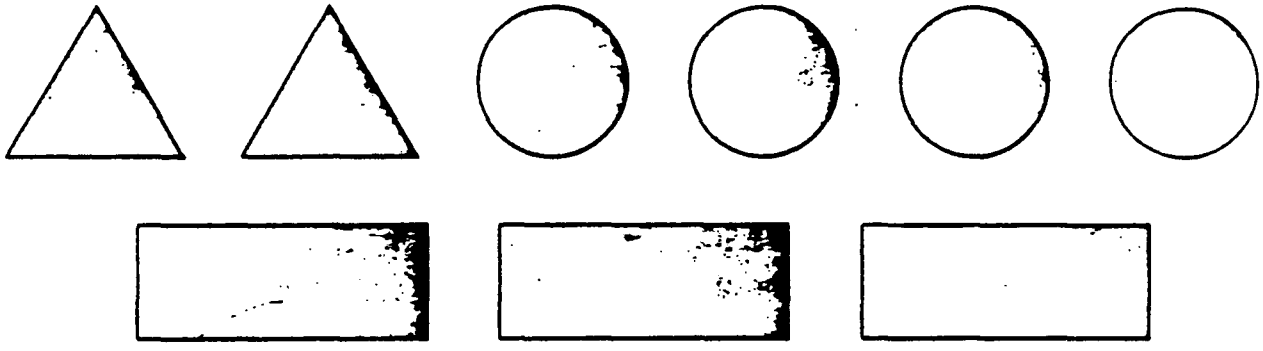
F $4 \times 6 = \square$

G $6 \times 4 = \square$

H $4 - 4 - 4 - 4 - 4 - 4 = \square$

J $6 + 6 + 6 + 6 + 6 + 6 = \square$

9 Billy cut out these shapes for his art project.



What fraction of the shapes are triangles?

A $\frac{2}{7}$

B $\frac{1}{3}$

C $\frac{7}{9}$

D $\frac{2}{9}$

10 John needs 100 buttons to complete his art project. He has 80 buttons. What percent of the 100 buttons does John have so far?

F 8%

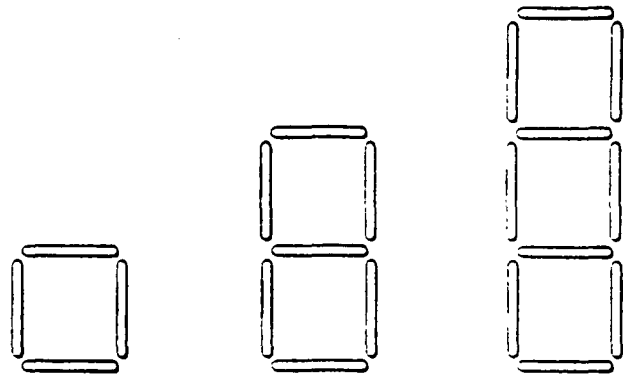
G 10%

H 20%

J 80%

Go On

11 Look at the pattern below. Each figure is made with craft sticks.



How many craft sticks are needed to make the next figure in this pattern?

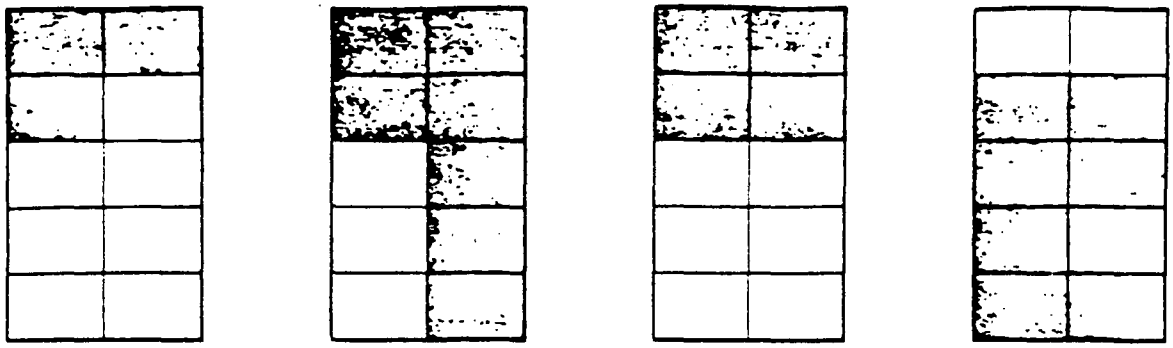
A 3
B 4
C 12
D 13

12 You may use your counters to help you solve this problem.

Tina has 3 craft sticks. Tina and Dan together have 5 craft sticks. Dan and Sally together have 7 craft sticks. How many craft sticks does Sally have?

F 5
G 2
H 3
J 4

13 Which shape below is closest to $\frac{1}{2}$ shaded?



A B C D

14 Study the pattern below.

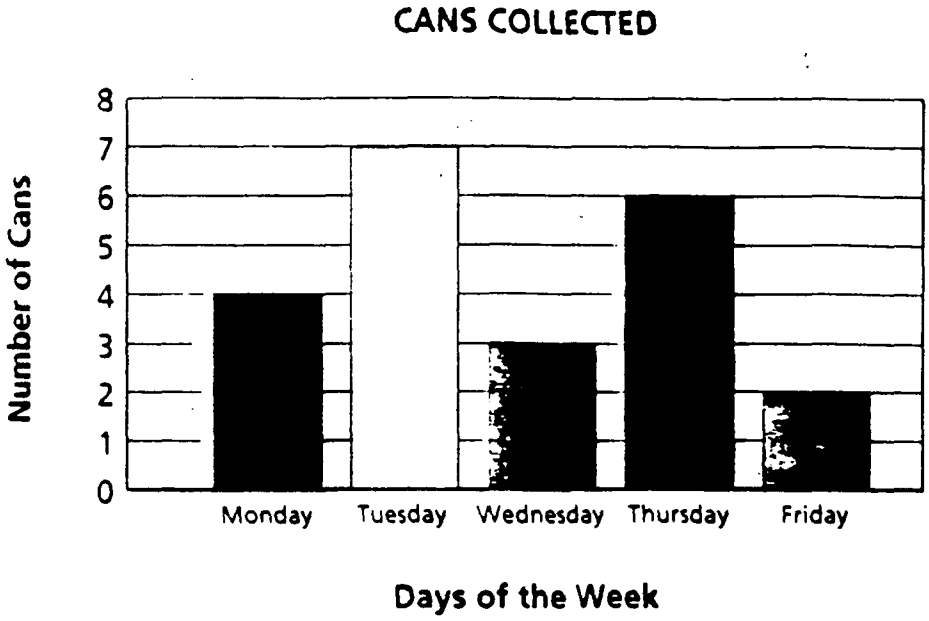
What is the next shape in the pattern?

F G H J

Go On

Directions

The graph below shows the number of canned goods that Mr. Ruiz's class collected. Study the graph. Then do Numbers 15 and 16.



15 Mr. Ruiz promised to reward his class with animal stickers when the total number of cans reached 15. The bar graph shows the number of cans the class brought in each day.

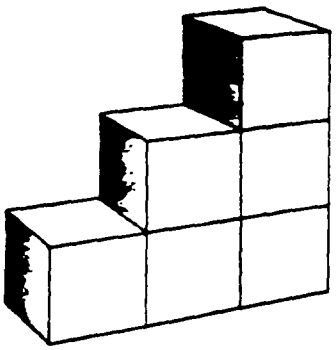
What day did Mr. Ruiz give his class the animal stickers?

A Tuesday
B Wednesday
C Thursday
D Friday

16 How many days did the students collect more than 5 cans?

F 5
G 2
H 3
J 4

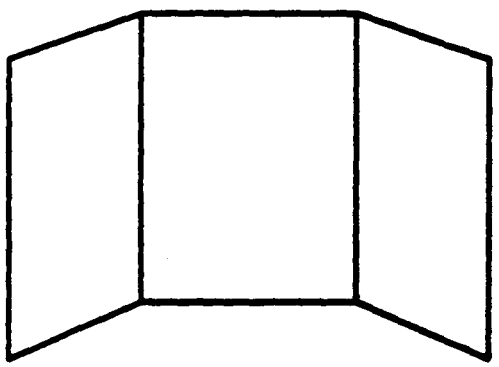
This staircase is 3 steps high.



What would be the total number of blocks in a staircase 5 steps high?

A 5
B 8
C 10
D 15

18 How many line segments are in the figure below?



F 9
G 10
H 11
J 12

Go On

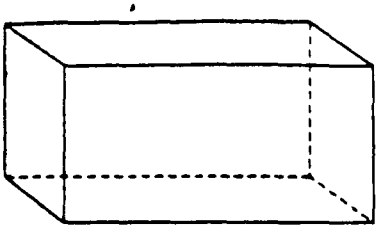
Which coins could Michael give Tara so that they both had the same amount of money?

Michael's Money

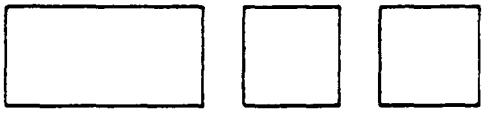
Tara's Money

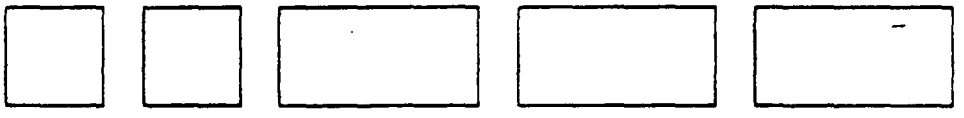
A 1 nickel and 1 penny
B 1 penny and 1 dime
C 1 nickel and 1 dime
D 1 quarter and 1 penny

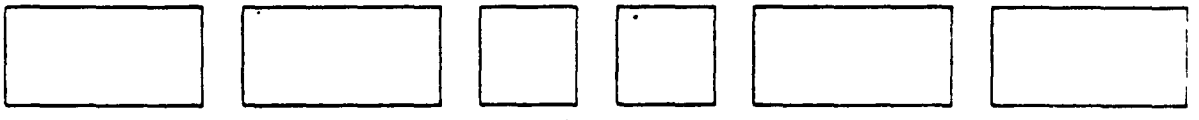
3 Look at this rectangular solid (box).

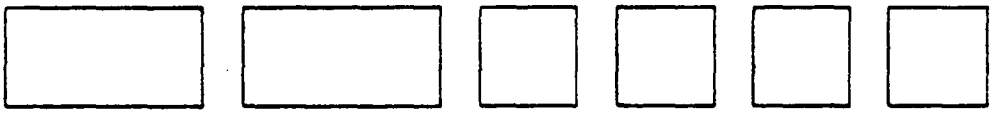


Which of these groups shows all the sides of the rectangular solid (box) above?

F 

G 

H 

J 

Directions

Do Numbers 21 through 23 about marbles.

21 Alice started with 8 marbles. She lost 2 marbles. Then she bought 6 new marbles. Which of these statements is true about the number of marbles Alice has now?

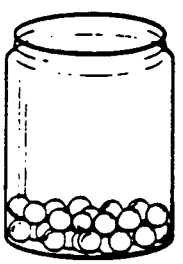
A Alice has fewer marbles than when she started.

B Alice has 4 more marbles than when she started.

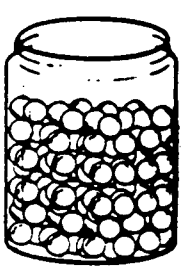
C Alice has 6 more marbles than when she started.

D Alice has the same number of marbles as when she started.

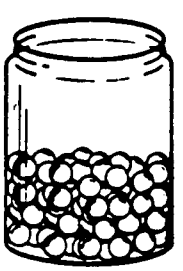
22 This jar has about 40 marbles in it.



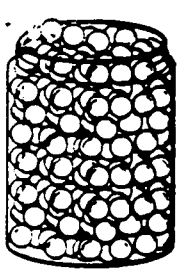
Which of these jars has the amount closest to 120 marbles?



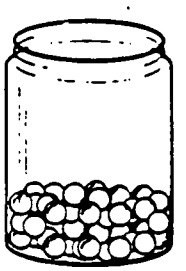
F



G

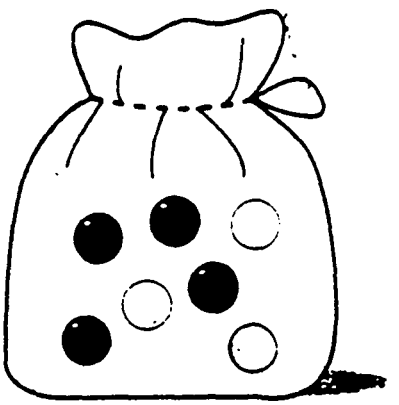


H



J

3 Jack will choose one marble from the bag without looking. What is the probability he will choose a black marble?



A $\frac{1}{7}$

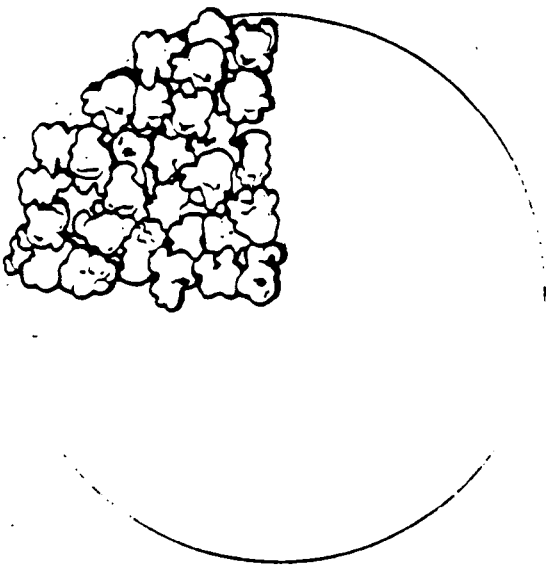
B $\frac{2}{7}$

C $\frac{3}{7}$

D $\frac{4}{7}$

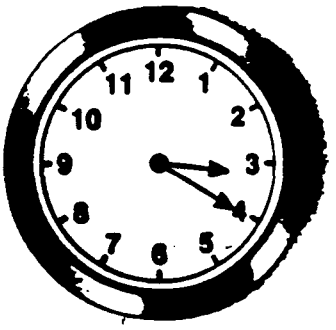
24 There are 32 pieces of popcorn on the plate below.
About how many pieces of popcorn will just cover the whole plate?

F between 115 and 124
G between 125 and 134
H between 135 and 144
J between 145 and 154

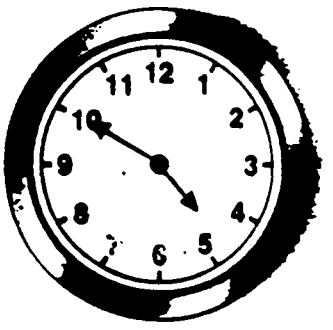


25 Sara and Jan are going to a movie that begins at 3:20 P.M. and ends at 4:50 P.M.
Look at the clocks below.

Movie Begins



Movie Ends



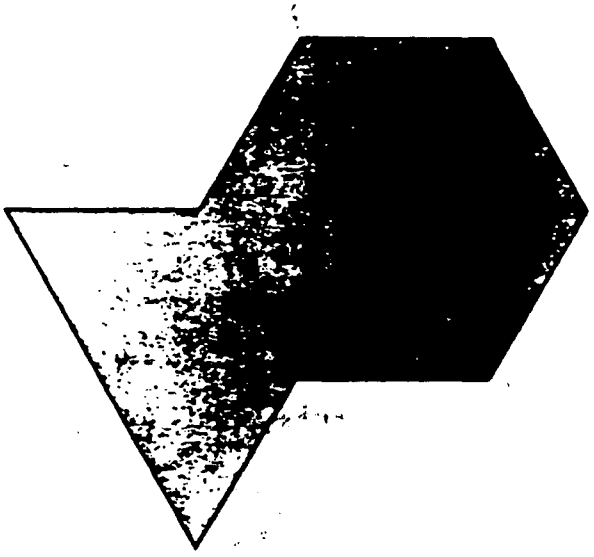
How long is the movie?

A 1 hour
B 1 hour, 20 minutes
C 1 hour, 30 minutes
D 1 hour, 35 minutes

Use your pattern blocks to help you solve this problem.

How many of the green triangles would be needed to cover exactly $\frac{2}{3}$ of the shape below?

F 1
G 3
H 6
J 9



Anita has only one of each stamp shown below.

She needs $0.52 in postage to mail a letter. How many of the stamps shown above will Anita need to make exactly $0.52 ?

A 2
B 3
C 4
D 5

Go On

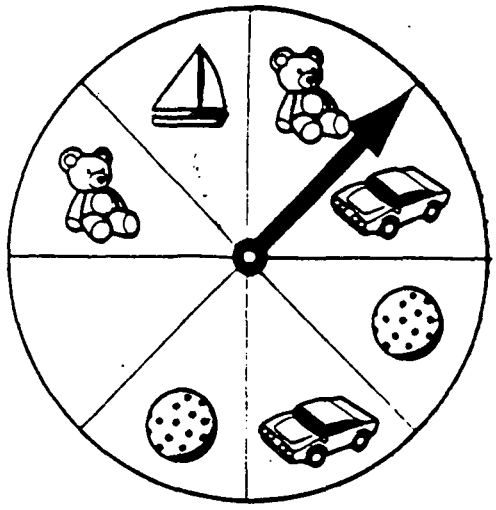
28 For the spinner to have an equal chance of landing on each prize, which prize should go in the blank space?

F 

G 

H 

J 



29 This piece of rope costs $2.00.

Which piece of rope below is ***most*** likely to cost $1.50 ?

A 

B 

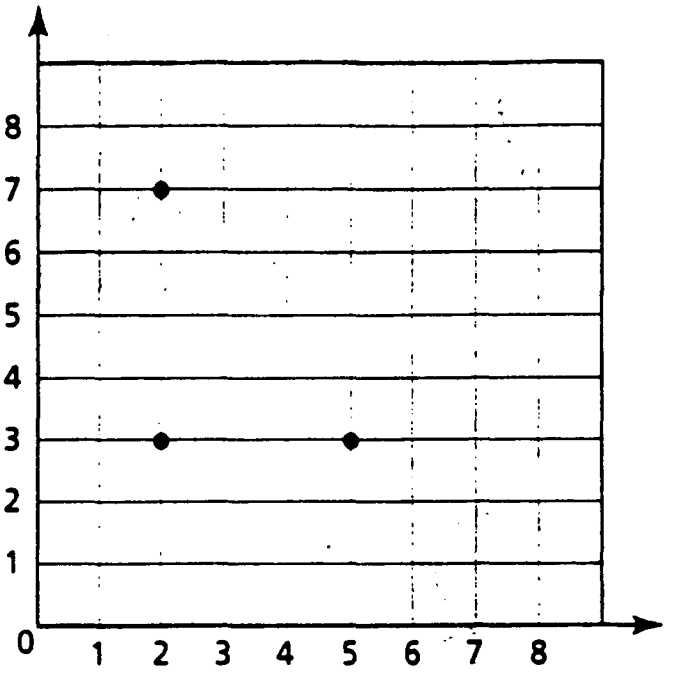
C 

D 

9. Alissa plotted the first 3 corners of a rectangle on the grid below.

What are the coordinates of the 4th corner?

F (5, 7)
G (5, 6)
H (6, 5)
J (7, 5)



STOP

31 Emma wants to practice playing her violin for a total of 90 minutes over 4 days. She practiced her violin for 30 minutes on Monday, 18 minutes on Tuesday, and 25 minutes on Wednesday. How many minutes should Emma practice on Thursday?

Show your work.

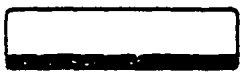
Answer _____

Use your ruler to help you solve this problem.

Part A

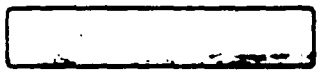
Measure each piece of chalk shown below to the nearest centimeter. Write the length in the space next to each picture.

____ centimeters



____ centimeters

____ centimeters



____ centimeters

Part B

You want to keep only the pieces of chalk that are longer than 4 centimeters. Circle each piece of chalk above that is ***longer*** than 4 centimeters.

Go On


You may use your counters to help you solve this problem.

The list below shows how much of each item is needed to make one batch of Chocolate Chip Cookies.

- 2 c. flour
- 1 c. sugar
- 3 eggs
- 1 t. baking soda
- 6 oz. chocolate chips
- 4 T. butter

You want to make ***2 batches*** of Chocolate Chip Cookies.
Complete the list below to show how much of each item will be needed.

_____ c. flour

_____ c. sugar

_____ eggs

_____ t. baking soda

_____ oz. chocolate chips

_____ T. butter

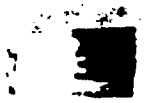
4 In the library, there are 2 round tables. There are 3 students sitting at each table. Each student has 4 books.

In the space below, draw a diagram or model to represent this information.

Find the total number of books.

Answer _____ books

Go On



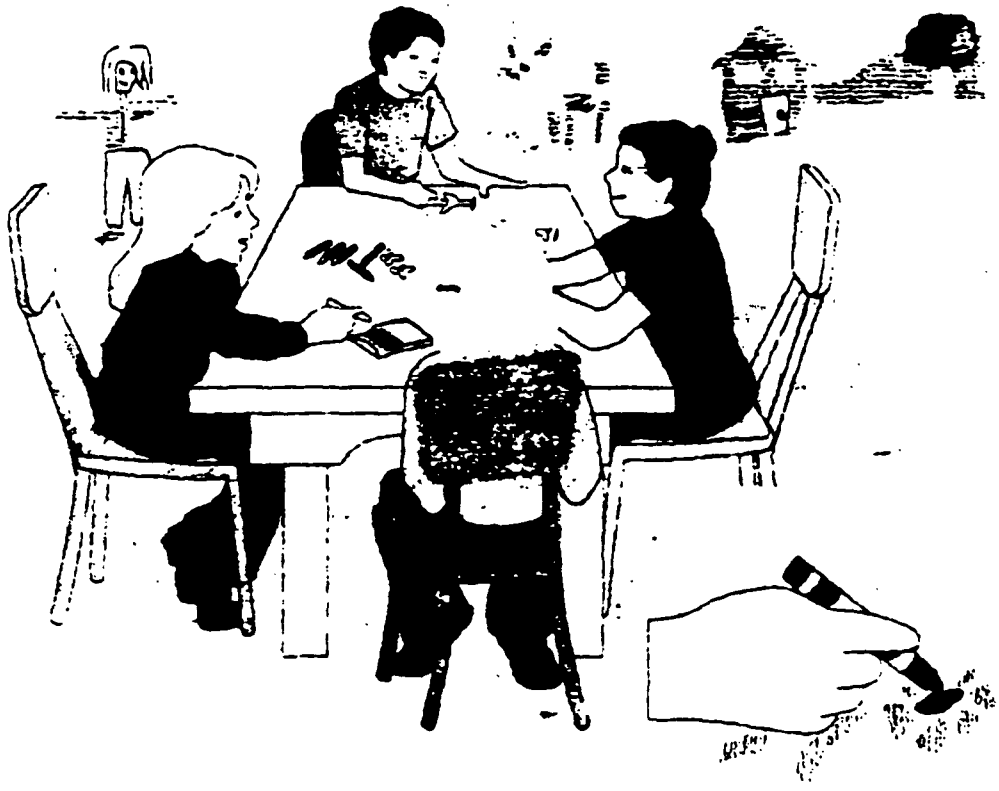
Use your pattern blocks to help you solve this problem.

In the space below, trace around two pattern blocks that show quadrilateral shapes.

On the lines below, explain in words what makes these shapes *quadrilaterals*.

Session 2

CRAYONS

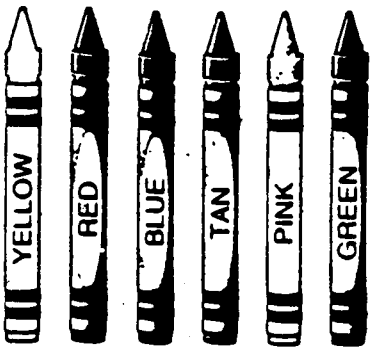


Directions

Do Numbers 36 through 38 about crayons on the following pages.

Go On

Bob reached in the supply box and grabbed these 6 crayons.



Bob used one of the crayons to color in a picture. Use the clues below to find the color of crayon Bob used.

CLUES

It has more than 3 letters, but less than 6 letters in its name.
It is ***not*** next to the red crayon.
It is ***not*** the last crayon.

What color was the crayon that Bob used?

Answer _____

Explain the steps you used to find your answer.

_____

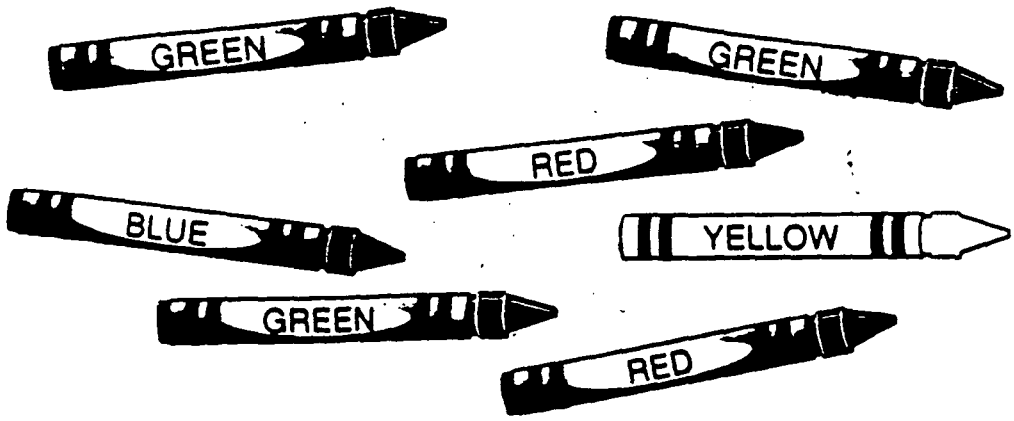
_____

_____

_____

_____

27 Amy puts these crayons in a bag and shakes the bag.



If Amy picks one crayon out of the bag without looking, which two colors have an ***equal chance*** of being chosen?

Answer _____ ***and*** _____

Explain your answer.

_____

_____

_____

_____

Go On

3 Mr. Jacobs asked his first-grade students to choose their favorite crayon colors. The results are shown in the table below.

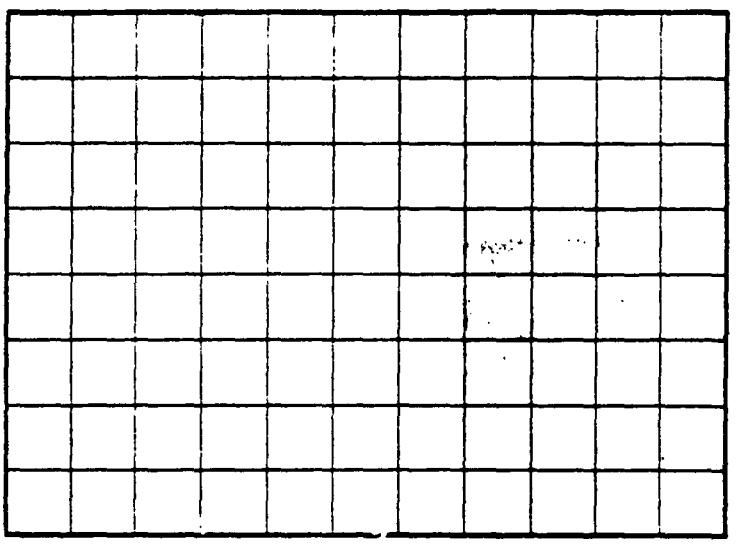
FAVORITE CRAYON COLORS

Student	Color
Eric	Red
Shannon	Purple
Jill	Yellow
Keisha	Red
Allison	Green
Christine	Blue
Nicole	Purple
Roosevelt	Blue
Stacy	Red
Marie	Green
Mel	Blue
Peter	Green
Julie	Red
Luis	Blue
Ramon	Blue
Paul	Red
Marcus	Blue
Ali	Green
Ken	Blue
Leon	Yellow

On the grid below, make a bar graph showing the number of students who prefer each crayon color. Use the information from the table on Page T-28 to help you.

Be sure to

- title the graph
- label the axes
- graph all the data



Using the information from your graph, write ***one*** statement comparing the crayon colors.

_____

_____

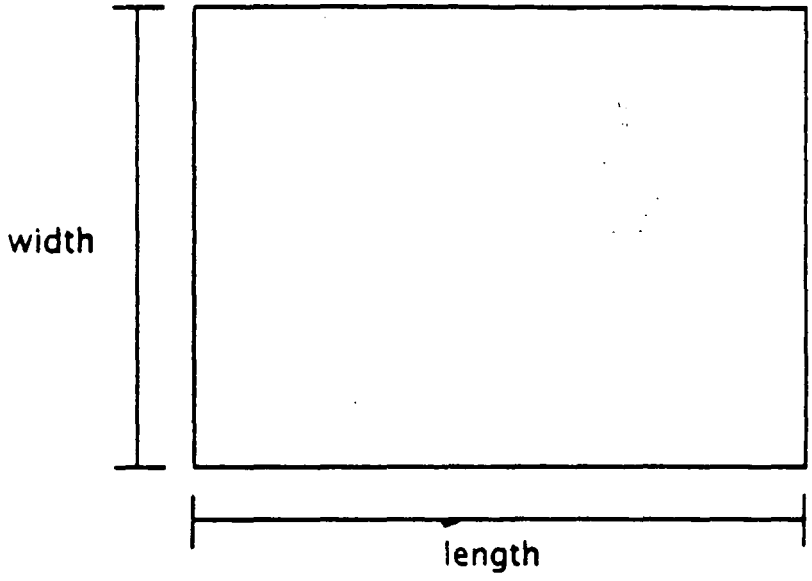
_____

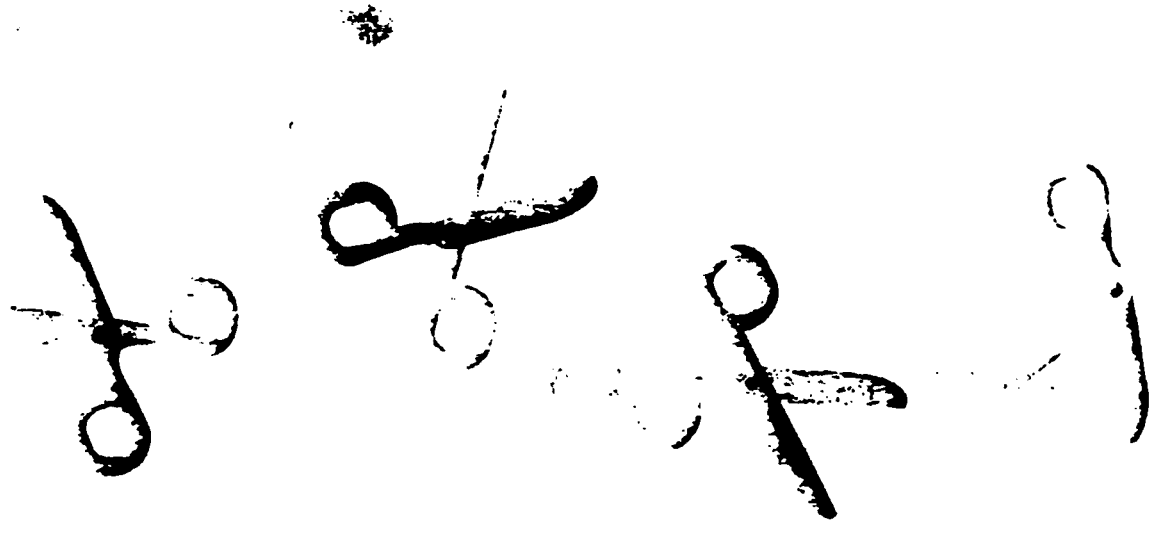
Go On

39 Use your centimeter ruler to solve this problem.

Tim cut rectangles out of construction paper to make a picture. The first rectangle he cut is shown below.

TIM'S FIRST RECTANGLE





Part A

What is the perimeter in centimeters of Tim's first rectangle?

Show your work.

First Perimeter _____ centimeters

Part B

The second rectangle Tim cut out has the same width as the first, but the length is 2 centimeters longer. What is the perimeter in centimeters of Tim's second rectangle?

Second Perimeter _____ centimeters

On the lines below, explain in words how you found the perimeter of Tim's second rectangle.

_____

_____

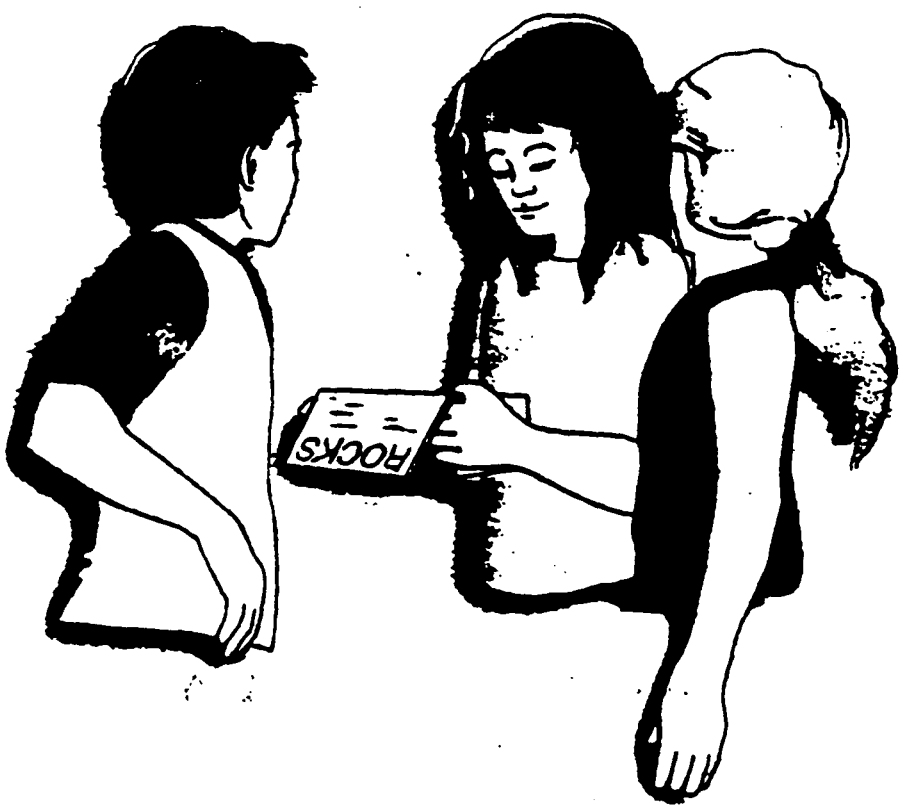
_____

STOP

40 Ann collects rocks. She had 4 boxes of rocks with 20 rocks in each box. Then she gave 6 of her rocks to a friend. How many rocks does Ann have left now?

Show your work.

Answer _____



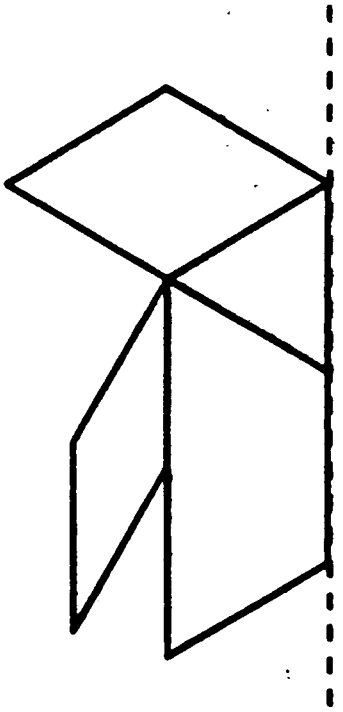
41 Shelly, Mike, and Jason looked at the stars through a telescope every night for a week. Shelly saw 6 shooting stars, Mike saw 9, and Jason saw 11. They wondered in what order they should add up the numbers to get the highest total. Does the order matter? On the lines below, explain why or why not.

Go On

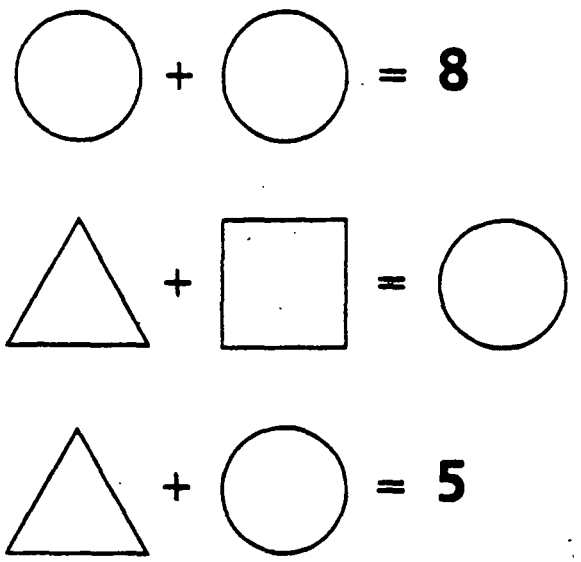
Use your pattern blocks to help you solve this problem.

Dan used pattern blocks to draw half of a design.

Complete the design below so that the dotted line is a line of symmetry. Trace around your pattern blocks to show the other half of the design.



#3 In the number sentences below, the same shape always stands for the same number.



Part A

Use the number sentences to find which numbers the △, □, and ○ stand for. Write the correct number in each shape above.

Part B

On the lines below, explain the steps you used to find the answer.

Go On

44 One hundred students were asked to name their favorite sport. The table below shows the results of the survey

FAVORITE SPORT

Sport	Number of Students
Baseball	20
Basketball	15
Soccer	35
Football	30
TOTAL	100

What percent of students chose soccer as their favorite sport?

Answer _____ %

What percent of the total group of students did ***not*** choose soccer as their favorite sport?

Show your work.

Answer _____ %

5 Sandra's mother gave her 2 quarters, 3 dimes, and 1 nickel. Sandra kept 55¢ and gave the rest of the coins to her sister. Which coins could Sandra have given to her sister?

Show your work.

Answer _____

On the lines below, explain the mathematics you used to find which coins Sandra gave away.

_____

_____

_____

Go On

Pat, Chris, and Jessica are skating to raise money for the school band. The table below shows how many laps each student skated and how much each student earned per lap.

SKATING FOR THE BAND

Student	Number of Laps Skated	Amount Earned Per Lap	Amount Raised
Pat	10	$0.75	
Chris	16	$0.50	
Jessica	13	$0.50	
		Total raised by all 3 students	

Complete the table to show the amount of money each student raised and the amount of money the 3 students raised all together.

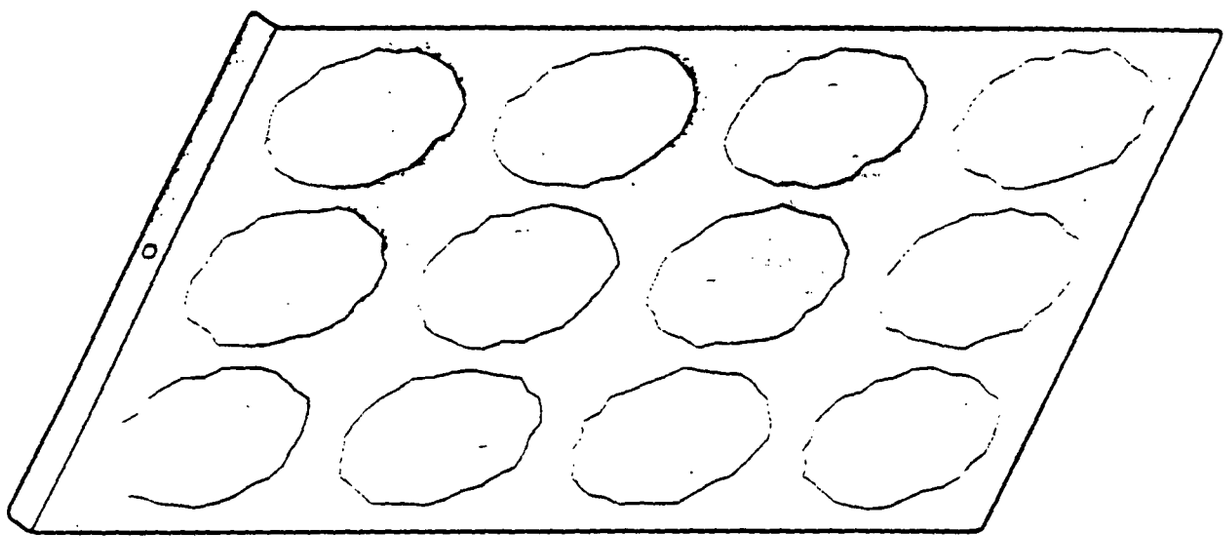
You may use your counters to help you solve this problem.

Label the cookies on the pan below to show that

$\frac{1}{3}$ of them are Oatmeal (O),

$\frac{1}{2}$ of them are Butter (B), and

the rest are Sugar (S).

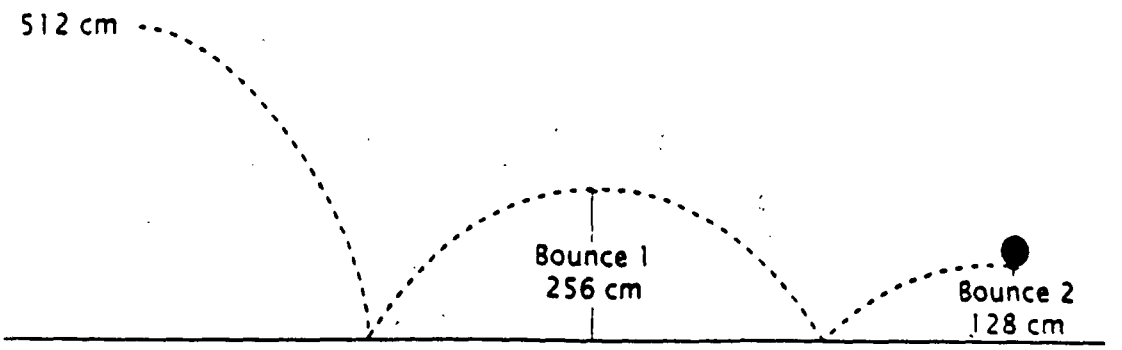


What fraction of the cookies on the pan are Sugar?

Answer _____

Go On

4 In a computer game, a ball was dropped from a height of 512 centimeters. The picture below shows how high the ball bounced.



Part A

If the pattern continues, how high will Bounce 3 be?

Answer _____ cm

Part B

On the lines below, describe how the height changes from one bounce to the next.

_____

_____

_____

Part C

Predict how high Bounce 6 will be.

Answer _____ cm

STOP

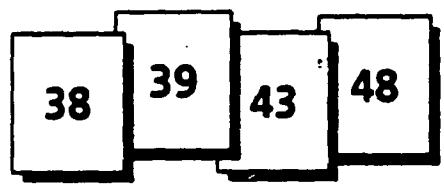
SCORING GUIDE

SCORING INFORMATION

The answer key for the multiple choice questions on the Sample Test can be found on page 8.

The 2-point holistic rubric is for scoring the short response questions and the 3-point holistic rubric is for scoring the extended response questions. These holistic rubrics can be found on pages 9 and 10.

Use the 3-point holistic rubric to score the following extended response questions:



Maximum: 3 points

All the other questions in Sessions 2 and 3 are short response and require the 2-point holistic rubric for scoring.

Holistic scoring will help you evaluate each student's achievement on the open ended questions. The score will represent an overall impression of the student's response. In addition to looking at the details of how the student solved the problem, you will look at the solution as a whole to see if the student fully understands the problem and is able to communicate that understanding.

A complete, correct response and a sample student response are provided for each open ended question. The complete and correct response shows one example of how to solve the problem. There may be other acceptable solutions. You may notice that some of the student responses include misspelled words or incorrect grammar and yet are still considered top student responses because the problem was solved correctly and communicated adequately.

For the short response question Number 36, sample student responses are given for each of the following score points: 2 points, 1 point, and 0 points. For the extended response question Number 48, sample student responses are given for each of the following score points: 3 points, 2 points, 1 point, and 0 points.

Answer Key for Multiple Choice Questions

1.	B
2.	J
3.	A
4.	J
5.	B
6.	J
7.	A
8.	J
9.	D
10.	J
11.	D
12.	F
13.	C
14.	F
15.	C
16.	G
17.	D
18.	G
19.	A
20.	H
21.	B
22.	F
23.	D
24.	G
25.	C
26.	H
27.	B
28.	J
29.	C
30.	F

2-POINT HOLISTIC RUBRIC
SHORT RESPONSE MATHEMATICS QUESTIONS

SCORE POINTS:

2 points A two-point response is complete and correct.

This response

- demonstrates a thorough understanding of the mathematical concepts and/or procedures embodied in the task
- indicates that the student has completed the task correctly, using mathematically sound procedures
- contains clear, complete explanations and/or adequate work when required

1 point A one-point response is only partially correct.

This response

- indicates that the student has demonstrated only a partial understanding of the mathematical concepts and/or procedures embodied in the task
- addresses some elements of the task correctly but may be incomplete or contain some procedural or conceptual flaws
- may contain an incorrect solution but applies a mathematically appropriate process
- may contain a correct solution with incorrect, unrelated, or no work and/or explanation when required

0 points A zero-point response is completely incorrect, irrelevant, or incoherent.

3-POINT HOLISTIC RUBRIC
EXTENDED RESPONSE MATHEMATICS QUESTIONS

SCORE POINTS:

3 points A three-point response is complete and correct.

This response

- demonstrates a thorough understanding of the mathematical concepts and/or procedures embodied in the task
- indicates that the student has completed the task correctly, using mathematically sound procedures
- contains clear, complete explanations and/or adequate work when required

2 points A two-point response is partially correct.

This response

- demonstrates partial understanding of the mathematical concepts and/or procedures embodied in the task
- addresses most aspects of the task, using mathematically sound procedures
- may contain an incorrect solution but applies a mathematically appropriate process with valid reasoning and/or explanation
- may contain a correct solution but provides faulty or incomplete procedures, reasoning, and/or explanations
- may contain a correct solution but lacks work when required
- may reflect some misunderstanding of the underlying mathematical concepts and/or procedures

1 point A one-point response is incomplete and exhibits many flaws but is not completely incorrect.

This response

- demonstrates only a limited understanding of the mathematical concepts and/or procedures embodied in the task
- may address some elements of the task correctly but reaches an inadequate solution and/or provides reasoning that is faulty or incomplete
- exhibits multiple flaws related to a misunderstanding of important aspects of the task, misuse of mathematical procedures, or faulty mathematical reasoning
- reflects a lack of essential understanding of the underlying mathematical concepts

0 points A zero-point response is completely incorrect, irrelevant, or incoherent.

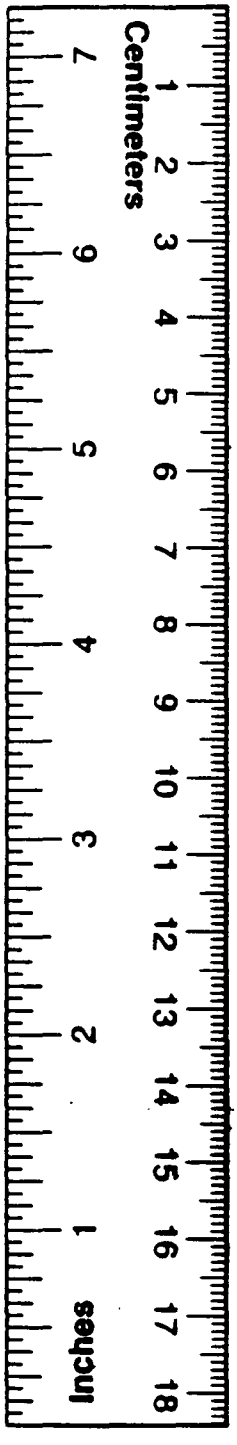
APPENDIXES

APPENDIX A: MAP TO LEARNING STANDARDS

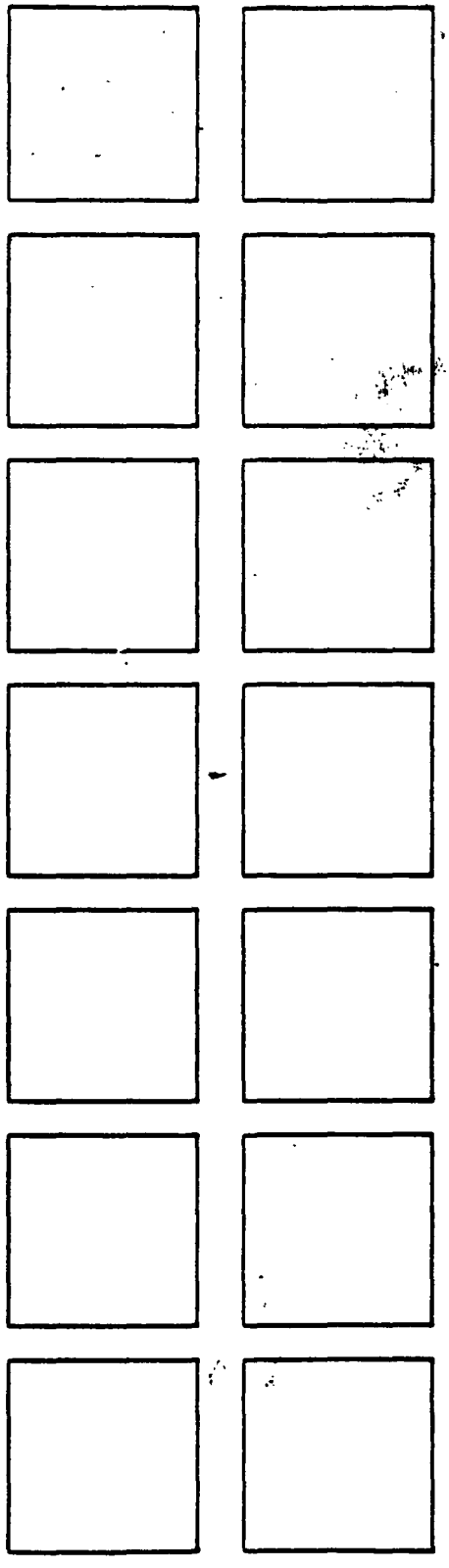
Key Idea	Multiple Choice Question Number	Short Response Question Number	Extended Response Question Number
Mathematical Reasoning	12, 19, 21	36	43
Number and Numeration	3, 4, 5, 7, 9, 10, 13, 26	44, 45, 47	
Operations	1, 2, 6, 8, 27	31, 33, 40, 41, 46	
Modeling/Multiple Representation	18, 30	34, 35	
Measurement	15, 16, 25, 29	32	38, 39
Uncertainty	22, 23, 24, 28	37	
Patterns/Functions	11, 14, 17, 20	42	48

Punch-Out Tools

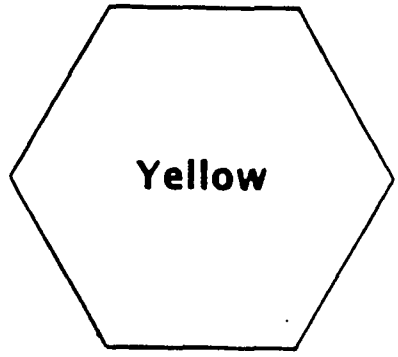
Ruler

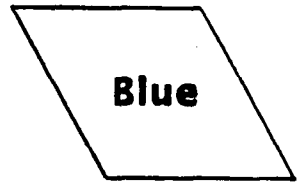


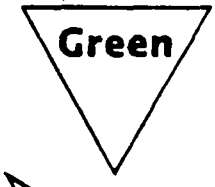
Counters

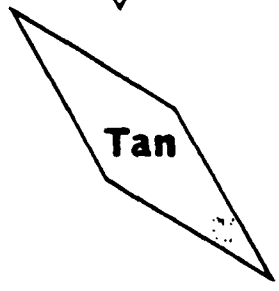


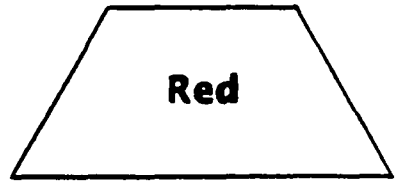
Pattern Blocks

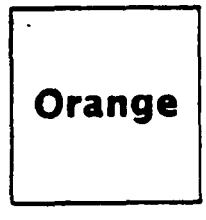












Fourth Grade

Math Assessment

Suggestions

NAME DATE

ASSESSMENT # 1 GRADE 4

PART 1

Part 1 of the test contains multiple choice questions. Read each problem carefully. Circle the correct answer to each question. If you make a mistake, erase it completely. You may use your tools to complete any problem on the test. Any scratch work may be completed on the test paper.

1. $\begin{array}{r} 78 \\ +56 \\ \hline \end{array}$

A. 124
B. 22
C. 122
D. 134

2. 8 x 6 =

A. 56
B. 48
C. 46
D. 42

3. $\begin{array}{r} 173 \\ +\ 79 \\ \hline \end{array}$

A. 152
B. 252
C. 246
D. 6

A. The refrigerator has three shelves and holds eight containers per shelf. Which of these number sentences should be used to represent how many containers the refrigerator could hold?

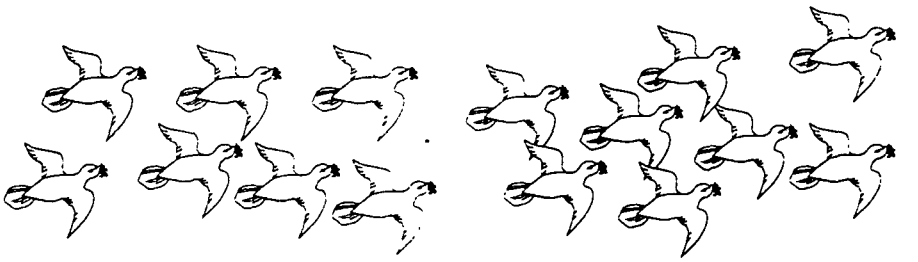
A. $8 + 3 =$
B. $8 - 3 =$
C. $8 \times 3 =$
D. $8 \div 3 =$

5. $18 \triangle 5 \square 3 = 16$

In this problem, the number spaces are hidden by shapes. What operation sign is hidden under the triangle?

A. $+$
B. $-$
C. $\times$
D. $\div$

6. A group of doves is called a flock. This picture shows a flock. About how many doves would be in 6 flocks?



A. 15 B. 30 C. 60 D. 80

Directions: The Peer Leaders at the Middle School had a coat sale to raise money for the American Red Cross. The results of the sale are shown on the graph. Study the graph. Then do Numbers 7-9.

7. How many Ski Jackets were sold?

A. 40
B. 45
C. 25
D. 30

8. How many more parkas were sold than ski jackets?

A. 5
B. 10
C. 15
D. 20

9. How many coats were sold in all?

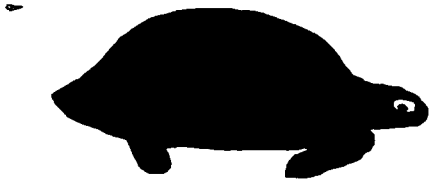
A. 45
B. 105
C. 100
D. 110

10. This hare had her first baby at age 2. Since then, she has had a baby once every 3 years. How old was she when she had her 4th baby?

A. 5
B. 7
C. 9
D. 11

11. Elissa drew the turtle below. Mark wanted to make one three times as long as Elissa's. How long would Mark's turtle be? Use the centimeter side of your ruler to help you solve this problem.

A. 10
B. 15
C. 20
D. 25



12. How much is added to each number below to create the pattern below?

75, 101, 127, ☐ 179, 205

A. 25
B. 26
C. 27
D. 28

Directions: Use the table below to answer questions 13 and 14.

SCOREBOARD

Team	Game 1	Game 2
Bluebirds	5	12
Orioles	9	3
Tigers	7	10

13. How many points were scored in game 2?

A. 12
B. 3
C. 25
D. 22

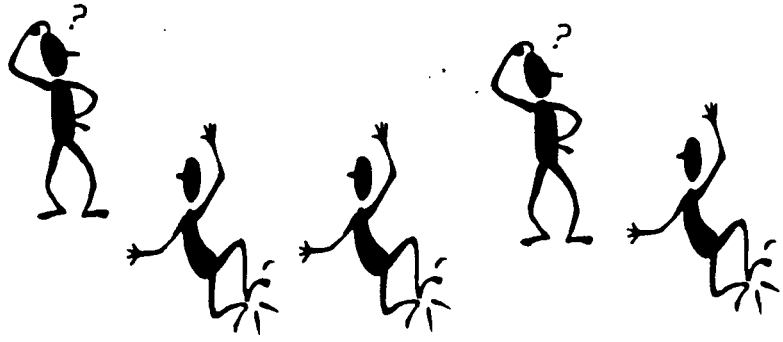
14. How many points in all did the Orioles score?

A. 9
B. 14
C. 21
D. 12

15. Kellogg's produces about 78,000 boxes of Wheaties a year. Which of these shows the number 78, 000?

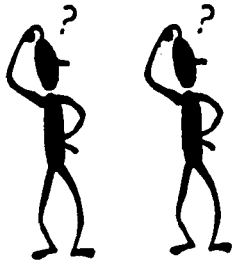
A. seventy-eight hundred thousand
B. seventy-eight thousand
C. seven thousand eight hundred
D. seven hundred eight thousand

16. The Screen Beans have made a pattern. Look at the pattern below.



What will the next two Screen Beans be in this pattern?

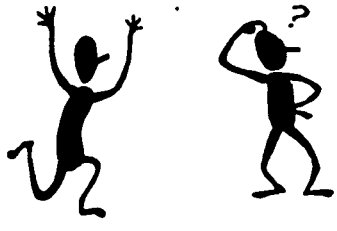
A.



B.

C.

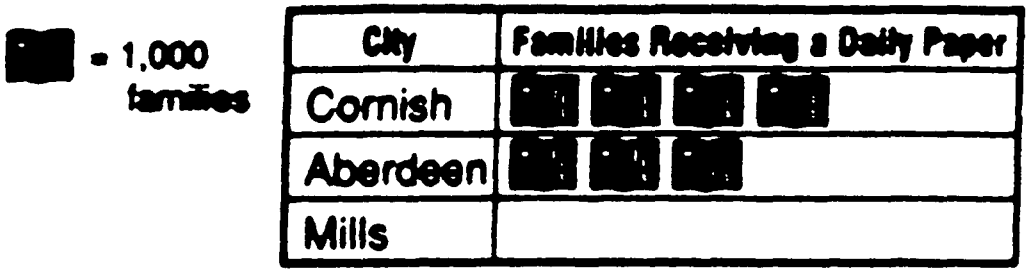
D.



17. Which of these is the smallest fraction?

A. $\frac{1}{2}$ B. $\frac{1}{8}$ C. $\frac{1}{6}$ D. $\frac{1}{4}$

18. Newsday is keeping track of how many papers it sells to each town. The graph below shows the information recorded.



Based on the graph above, which of these statements are true?

A. Mills doesn't get the paper.
B. Aberdeen gets half the amount of papers as Cornish.
C. Nobody lives in Mills.
D. Cornish gets 1, 000 more papers than Aberdeen.

19. Which of these statements are true about a rectangle?

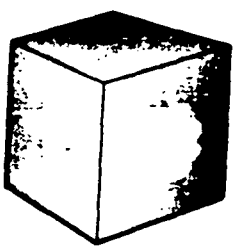
A. A rectangle has five angles and five sides.
B. A rectangle has two pairs of parallel sides.
C. A rectangle has two acute angles.
D. A rectangle has no right angles.

20. Which of these is the best estimate of 351 x 9 = ? You do not need to find the exact answer.

A. 90
B. 300
C. 900
D. 3000

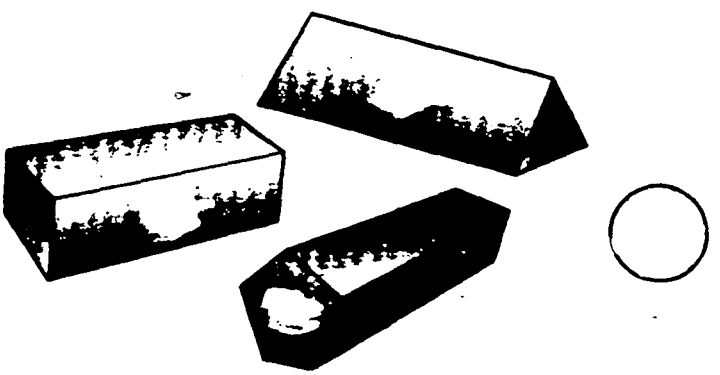
21. How many faces does the cube have?

A. 4
B. 5
C. 6
D. 7

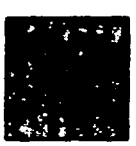


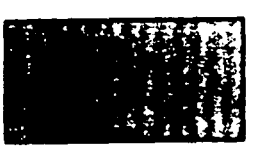
22. Which other shape has the same number of faces as the cube?

A. triangle
B. hexagon
C. rectangle
D. circle



23. Which of these shapes can be divided into exactly three triangles?

A. 

C. 

B. 

D. 

24. Which of these statements is true about the number 452, 679

A. The digit in the hundred thousands place is less than 3.
B. The digit in the ones place is even.
C. The digit in the hundreds place is odd.
D. The digit in the ten thousands place is odd.

25. Willy and his mother drove from Savannah to Atlanta. He wanted to know how far the y had traveled. What would be the best unit of measurement to use to find the distance they traveled?

A. centimeters
B. millimeters
C. kilometers
D. feet

26. On August 5, 1999, it was recorded as one of the hottest days of the summer on Long Island. The temperature reached 101.3 degrees Fahrenheit. On August 8, 2000, the temperature reached 103.2 degrees Fahrenheit. How much hotter was it almost a year later?

A. 2.1 degrees Fahrenheit
B. 1.9 degrees Fahrenheit
C. 105.2 degrees Fahrenheit
D. 104.5 degrees Fahrenheit

27. Marisa and her brother found a butterfly in their backyard. They wanted to know how wide it was. What would be the best unit of measurement to use to find the width of the butterfly?

A. kilometers
B. millimeters
C. centimeters
D. meters

28. It was the principal's birthday and some of students made her a cake. The cake was cut into 16 equal pieces. The principal shared 1/4 of the cake with her secretaries. How many slices did they eat?

A. 2 slices
B. 3 slices
C. 4 slices
D. 5 slices

29. The basketball rack in the gym has 3 shelves. If Mr. O' Hare puts an equal number of balls on each shelf, he will have 4 balls left over that don't fit on the rack. Which of these is the number of balls Mr. O' Hare has?

A. 21
B. 22
C. 23
D. 24

30. The school is having a book celebration. Group A read 106 books. Group B read 324 books and Group C read 296 books. How many books have all three groups read so far?

A. 624
B. 724
C. 726
D. 636

Num Concepts

Skills	Date	P I	Pg
Read and write numerals to one billion.	January	2A	6 7
Factoring techniques to determine common denominators.	January	2C	6 8
Explain orally and in writing the concepts of prime and composite numbers.	January	2C	6 8
Understand that zero can mean none of something or that it can represent a point on a scale and any other number can be depicted on the scale.	January	2D	6 8
Review computation skills by describing and extending number patterns and sequences.	January	7A	7 5

Grade 5

Num Concepts

Skills	Date	P I	Pg
Interpolate and / or extrapolate simple patterns of numbers.	January	7A	75
Recognize and describe simple functional relationships.	January	7A	75
Understand the basic role of place value in decimal fractions.	June	2A	67
Identify representations of a given percent and describe orally and in writing the equivalence relationship between fractions, decimals and percents.	June	2B	67
Compare size of fractions using several methods.	June	2D	68

Additio / Subtraction

Skills	Date	P I	Pg
Experience adding and subtracting integers on a number line.	January	3A	69
Add and subtract decimals to thousandths.	January	3A	69
When asked, accurately state the purpose for each step in basic calculations.	January	3D	69
Ensure quick recall of basic addition and subtraction facts.	January	3E	69
Develop strategies for mental math.	January	3E	69
Round numbers to the nearest hundredth and up to 10,000.	January	6A	74

Additio Subtraction

Skills	Date	P I	Pg
Relate rounding skills to estimation.	January	6A	74
Determine the effects of addition and subtraction on size and order of numbers.	January	6A	74

Or ize Data

Skills	Date	P I	Pg
Participate in extended record keeping projects involving data gathering.	June	1B	66

Mu ıication

Skills	Date	P I	Pg
Multiply by three digit numbers.	January	3A	69
Determine the effects of multiplication on size and order of numbers.	January	6A	74
Multiply common fractions.	June	3A	69
Multiply mixed numbers.	June	3A	69

ısion

Skills	Date	P I	Pg
Divide by three digit numbers.	January	3A	69
Divide decimals to hundredths using whole number divisors.	January	3A	69
Determine the effects of division on size and order of numbers.	January	6A	74
Divide mixed numbers.	June	3A	69

Geometry

Skills	Date	P I	Pg
Explore measurement and vocabulary of geometric figures using a concrete discovery approach with geoboards and graph paper.	January	4C	70
Graphing ordered pairs of numbers.	January	4C	70
Draw and measure plane geometric figures, using rulers, compasses and protractors.	January	4I	71
Using a protractor and a ruler, draw a perpendicular bisector of a line segment and an angle bisector.	January	4I	71
Identify acute, obtuse and right angles.	January	5C	73
Analyze the effects of combining, subdividing and changing basic shapes.	June	4A	70

Grade 5

Geometry

Skills	Date	P I	Pg
Use geometric ideas to solve problems.	June	4A	70
Understand the basic characteristics of the concept of three dimensions.	June	4A	70
Make scale drawings like floor plans, using centimeter grids to relate scale to ratio.	June	4B	70
Use concrete and artistic activities to explore the concept of symmetry.	June	4H	71
Understand that symmetry can be analyzed by performing reflections, turns or slides.	June	4H	71
Classify polygons by properties and develop definitions.	June	7F	76

Geometry

Skills	Date	P I	Pg
Understand the basic properties of and the similarity and differences between a trapezoid, rhombus and quadrilateral.	June	7F	76
Compare shapes in terms of parallel, perpendicular, similar and congruent.	June	7F	76
Understand the basic characteristics of angles.	June	7G	76
Identify line segments.	June	7G	76
Determine congruence of line segments, angles and polygons by direct comparison given their attributes.	June	7G	76

F ctions

Skills	Date	P I	Pg
Proper and improper fractions.	June	2A	67
Simplest form of a fraction.	June	2A	67
Change improper fractions to mixed numbers and vice versa.	June	2A	67
Convert common fractions to decimal form.	June	2A	67
Divide common fractions.	June	3A	69
Round fractional numbers for estimates in computation.	June	6A	74

ctions

Skills	Date	P I	Pg
Round decimal numbers for estimates in computation.	June	6A	7 4

cimals

Skills	Date	P I	Pg
Place Value concepts to thousandths.	January	2A	67
Multiply decimals to hundredths.	January	3A	69
Convert common fractions to decimal form.	June	2A	67
Understand the basic role of place value in decimal fractions.	June	2A	67

Me urement

Skills	Date	P I	Pg
Be familiar with the prefixes milli, centi, kilo, and symbols g, mg, kg, ml, L, mm, km and cm and the tools used to measure them.	January	5B	72
Introduce measurement of angles with a protractor.	January	5B	72
Make effective use of ruler, thermometer and scale for making measurements.	January	5B	72
Relate metric units to customary units via approximations.	January	5F	73
Make real world comparisons of measurements.	January	5F	73
Measure temperatures of familiar substances.	June	5A	72

Prob Solving

Skills	Date	P I	Pg
Apply basic computational skills to problems from other subject areas and real-world situations.	January	1A	66
Write and solve open sentences while working with word problems.	January	1A	66
Use a variety of problem solving strategies.	January	1A	66
State problems in own words.	January	1A	66
Construct physical representations of complex problems.	January	1A	66
Use computational skills in investigation studies in other subject areas and games.	January	1B	66

Prob.._n Solving

Skills	Date	P I	Pg
Clarify problems with piers.	January	1B	66
Develop an awareness of when an estimation is more appropriate than an exact answer.	January	6B	74
Make predictions based on sample date.	January	6C	74
Arrangements and combinations.	January	6C	74
Develop formulas for area and perimeter of rectangles an squares.	June	1B	66
Solve problems in which fractions are used in everyday life.	June	3A	69

Fifth Grade

Math Curriculum

With suggested time frames

Curriculum Arranged by Grade and Time

Grade	Area	Skills	Date	P I
5	Addition/Subtraction	Experience adding and subtracting integers on a number line.	Janua	3A
5	Addition/Subtraction	Add and subtract decimals to thousandths.	Janua	3A
5	Addition/Subtraction	When asked, accurately state the purpose for each step in basic calculations.	Janua	3D
5	Addition/Subtraction	Ensure quick recall of basic addition and subtraction facts.	Janua	3E
5	Addition/Subtraction	Develop strategies for mental math.	Janua	3E
5	Addition/Subtraction	Round numbers to the nearest hundredth and up to 10,000.	Janua	6A
5	Addition/Subtraction	Relate rounding skills to estimation.	Janua	6A
5	Addition/Subtraction	Determine the effects of addition and subtraction on size and order of numbers.	Janua	6A
5	Decimals	Place Value concepts to thousandths.	Janua	2A
5	Decimals	Multiply decimals to hundredths.	Janua	3A
5	Division	Divide by three digit numbers.	Janua	3A
5	Division	Divide decimals to hundredths using whole number divisors.	Janua	3A
5	Division	Determine the effects of division on size and order of numbers.	Janua	6A
5	Geometry	Explore measurement and vocabulary of geometric figures using a concrete discovery approach with geoboards	Janua	4C
5	Geometry	Graphing ordered pairs of numbers.	Janua	4C
5	Geometry	Draw and measure plane geometric figures, using rulers, compasses and protractors.	Janua	4I
5	Geometry	Using a protractor and a ruler, draw a perpendicular bisector of a line segment and an angle bisector.	Janua	4I
5	Geometry	Identify acute, obtuse and right angles.	Janua	5C
5	Measurement	Be familiar with the prefixes milli, centi, kilo, and symbols g, mg, kg, ml, L, mm, km and cm and the tools used	Janua	5B
5	Measurement	Introduce measurement of angles with a protractor.	Janua	5B
5	Measurement	Make effective use of ruler, thermometer and scale for making measurements.	Janua	5B
5	Measurement	Relate metric units to customary units via approximations.	Janua	5F
5	Measurement	Make real world comparisons of measurements.	Janua	5F
5	Multiplication	Multiply by three digit numbers.	Janua	3A
5	Multiplication	Determine the effects of multiplication on size and order of numbers.	Janua	6A
5	Number Concepts	Read and write numerals to one billion.	Janua	2A
5	Number Concepts	Factoring techniques to determine common denominators.	Janua	2C
5	Number Concepts	Explain orally and in writing the concepts of prime and composite numbers.	Janua	2C

Curriculum Arran oy Grade and Time

Grade	Area	Skills	Date	P I
5	Number Concepts	Understand that zero can mean none of something or that it can represent a point on a scale and any other numb	Janua	2D
5	Number Concepts	Review computation skills by describing and extending number patterns and sequences.	Janua	7A
5	Number Concepts	Interpolate and / or extrapolate simple patterns of numbers.	Janua	7A
5	Number Concepts	Recognize and describe simple functional relationships.	Janua	7A
5	Organize Data	Collect and organize simple data sets to answer questions.	Janua	5D
5	Organize Data	Use pictographs and other graphic representations to model problems.	Janua	5E
5	Problem Solving	Apply basic computational skills to problems from other subject areas and real-world situations.	Janua	1A
5	Problem Solving	Write and solve open sentences while working with word problems.	Janua	1A
5	Problem Solving	Use a variety of problem solving strategies.	Janua	1A
5	Problem Solving	State problems in own words.	Janua	1A
5	Problem Solving	Construct physical representations of complex problems.	Janua	1A
5	Problem Solving	Use computational skills in investigation studies in other subject areas and games.	Janua	1B
5	Problem Solving	Clarify problems with piers.	Janua	1B
5	Problem Solving	Develop an awareness of when antestimation is more appropriate than an exact answer.	Janua	6B
5	Problem Solving	Make predictions based on sample date.	Janua	6C
5	Problem Solving	Arrangements and combinations.	Janua	6C
5	Decimals	Convert common fractions to decimal form.	June	2A
5	Decimals	Understand the basic role of place value in decimal fractions.	June	2A
5	Division	Divide mixed numbers.	June	3A
5	Fractions	Proper and improper fractions.	June	2A
5	Fractions	Simplest form of a fraction.	June	2A
5	Fractions	Change improper fractions to mixed numbers and vice versa.	June	2A
5	Fractions	Convert common fractions to decimal form.	June	2A
5	Fractions	Divide common fractions.	June	3A
5	Fractions	Round fractional numbers for estimates in computation.	June	6A
5	Fractions	Round decimal numbers for estimates in computation.	June	6A
5	Geometry	Analyze the effects of combining, subdividing and changing basic shapes.	June	4A
5	Geometry	Use geometric ideas to solve problems.	June	4A

Curriculum Arran by Grade and Time

Grade	Area	Skills	Date	P I
5	Geometry	Understand the basic characteristics of the concept of three dimensions.	June	4A
5	Geometry	Make scale drawings like floor plans, using centimeter grids to relate scale to ratio.	June	4B
5	Geometry	Use concrete and artistic activities to explore the concept of symmetry.	June	4H
5	Geometry	Understand that symmetry can be analyzed by performing reflections, turns or slides.	June	4H
5	Geometry	Classify polygons by properties and develop definitions.	June	7F
5	Geometry	Understand the basic properties of and the similarity and differences between a trapezoid, rhombus and quadr	June	7F
5	Geometry	Compare shapes in terms of parallel, perpendicular, similar and congruent.	June	7F
5	Geometry	Understand the basic characteristics of angles.	June	7G
5	Geometry	Identify line segments.	June	7G
5	Geometry	Determine congruence of line segments, angles and polygons by direct comparison given their attributes.	June	7G
5	Measurement	Measure temperatures of familiar substances.	June	5A
5	Multiplication	Multiply common fractions.	June	3A
5	Multiplication	Multiply mixed numbers.	June	3A
5	Number Concepts	Understand the basic role of place value in decimal fractions.	June	2A
5	Number Concepts	Identify representations of a given percent and describe orally and in writing the equivalence relationship betw	June	2B
5	Number Concepts	Compare size of fractions using several methods.	June	2D
5	Organize Data	Understand that a summary of data should include where the middle is and how much spread is around it.	June	5D
5	Organizing Data	Participate in extended record keeping projects involving data gathering.	June	1B
5	Problem Solving	Develop formulas for area and perimeter of rectangles an squares.	June	1B
5	Problem Solving	Solve problems in which fractions are used in everyday life.	June	3A

Exemplars

Grade 5

Related to

Performance Indicators (PI)

Courtesy of

Spring Math 1999 Exemplars (3-5)
Underhill, VT.

NAME _____ **DATE**_____

Level - 5

P.I. – 1A, 1B, 5D, 5E, 6C

Happy New Year

Addison County is sponsoring a special New Year's celebration for its youngsters. It is anticipated that 1,000 students your age will attend the celebration. Grand Union is willing to donate 1,000 sodas for this special occasion. They need you to place order.

Conduct an investigation to determine what flavor soda you should order and the quantity of each. Do your best to ensure that all 1,000 kids gets a soda they will like.

Write letter to Grand Union thanking them for their contribution, letting them know what your order is and the process you used to ensure that all 1,000 kids will get the soda flavor of their choice

Adopted From: Spring Math 1999 Exemplars (3-5), Underhill, VT.

Grade Level 3-5) 1/98

Task

Happy New Year

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Write a letter to Grand Union thanking them for their contribution, letting them know what your order is, and the process you used to ensure that all 1,000 kids will get the soda flavor of their choice.

Context

This task was given to students before the new year. They had experience with surveys and sampling, but few had formal instruction with ratios, fractions and percents.

What this task accomplishes

This task assesses how well students understand the concept of sampling, collecting, organizing, and displaying data, as well as drawing conclusions. It also assesses to what degree students have a concept of ratio.

What the student will do

Students will take a survey of the students in their class (or a sample of their class). Most students will extrapolate the data to 100 or 1,000 to find the solution. Students with a less developed understanding of probability and ratio may focus on the majority of students selected, or not consider sample size.

Time required for task

2 Hours

Interdisciplinary links

Drug and alcohol education, commercials and advertising, measurement (what is the volume of the liquid donated), holiday celebrations and traditions. It could also lead to a discussion of how airlines and other food services determine the number of different entrees to bring on flights.

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Teaching Tips

For students who would be overly challenged by this task, you could simplify the numbers from 1,000 to 100, and/or limit the soda flavor choices. Experience in conducting surveys is essential for students before beginning this problem. I adapted the task in the following manner for a student in my class with severe special needs:

Mrs. McKegney wants to have a New Year's party for the class. She is planning to buy a special treat for each person in our class. Find out what kind of soda she needs to buy so that each person gets a soda that they like. Write a note that shows how many sodas of each flavor she needs to buy.

Concepts to be assessed and skills to be developed

Problem Solving
- Solve problems from everyday situations
- Verify and interpret results with respect to the original problem

Communication
- Relate everyday language to mathematical language and symbols

Reasoning
- Draw logical conclusions
- Justify answers and solution processes
- Use patterns and relationships to analyze mathematical ideas

Mathematical Connections
- Link concepts and procedures
- Use math in daily life

Estimation
- Explore estimation strategies
- Determine reasonableness of results

Number Sense and Numeration
- Develop number sense

Concepts of Whole Number Operations
- Recognize that a wide variety of problem structures can be represented by a single operation
- Develop operation sense

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Whole Number Computation

- Develop reasonable proficiency with basic facts and algorithms
- Use calculators in appropriate computational situations
- Select and use computational techniques appropriate to specific problems and determine whether results are reasonable

Statistics and Probability

- Collect, Organize and describe data
- Construct, read and interpret displays of data
- Solve problems that involve collecting and analyzing data
- Explore concepts of chance
- Model situations by conducting a sample space
- Devise and carry out simulations to determine probabilities

Fractions and Decimals

- Develop concepts and number sense of fractions and decimals

Suggested Materials

Calculators, graph paper, computers

Possible Solutions

Solutions will vary

Rubrics and Benchmarks

Novice

This student was only able to do an adapted version of the task, dealing only with 100 youngsters. The student bases her conclusions on popularity and then randomly assigns numbers of sodas. Since orange had the most, the student ordered half orange sodas, even though orange only totaled 30%. The student did create an accurate chart in which to organize her information, but uses little or no mathematical language.

Apprentice

This student uses an insufficient sample size on which to base his decisions (10). The student does not document his work, but does create a mathematical representation to communicate his solutions. There are some gaps in the students explanation, such as the conversion of the percentages to 1,000, but the student does make an attempt to solve the task using ratios and percentages.

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Practitioner

This student attempts to define sample size and age. In many cases she successfully converts data to percentages. She creates an mathematical representation to communicate her solution, and uses a variety of math terms, symbols and notation. She also explains her reasoning, and processes.

Expert

This student addresses sample size as a component of accuracy, creates a visual representation to communicate a solution, and uses %, decimals, and fractions to find a solution. The student successfully summarizes results of his survey, and extrapolates data to 1,000 people. The student generalizes experiences with probability, and addresses more than 3 varieties of soda (deals with open-ended student responses).

AUTHORS

Carol Amico is currently the mathematics assessment consultant at the Vermont Department of Education. Previously, she was a grade 4-5 multi-age teacher at the Robinson School in Starksboro, Vermont where she team-taught with Suzanne McKegney. Carol has a Master's degree in curriculum and instruction from the University of Vermont, and also acts as an editor for Exemplars.

Suzanne McKegney is a grade 4-5 multi-age teacher at the Robinson School in Starksboro, Vermont. She is a network leader for Vermont's Mathematics Assessment Program, and a member of her Local Standards Board, and the Vermont Mathematics Portfolio Benchmarking Committee.

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NAME _____ **DATE**_____

Level - 5

P.I. – 1A, 3E, 4A, 4B, 5F, 6C

Harvest Dinner

T is once again time for the Warren School's annual Harvest Dinner. We are expecting about 300 people. Our class will be making ratatouille for this special event. The ingredients for the recipe we'll be using are listed below. If the ingredients listed are for a serving size of six people, how much of each ingredient do we need?

Ratatouille Ingredients – serves 6
1/3 cup olive oil
3 cloves of garlic
1 1/2 large onions
2 – 3 zucchini
2 green peppers
5 ripe tomatoes
1/4 teaspoon salt
1/2 teaspoon pepper
black olives (optional)

Remember to show all of your work and make it clear how you got your answer.

Bonus: What does all this mean for us on cooking day?

Adopted From: Spring Math 1999 Exemplars (3-5), Underhill, VT.

Grade Level 3-5

Task

Harvest Dinner

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1/3 cup olive oil
3 cloves of garlic
1 1/2 large onions
2-3 zucchini
2 green peppers
5 ripe tomatoes
1/4 teaspoon salt
1/2 teaspoon pepper
black olives (optional)

Remember to show all of your work and make it clear how you got your answer.

Bonus: What does all this mean for us on cooking day?

Context

Every year my school hosts a harvest dinner for the community. This year my class was making ratatouille for the event. I do a lot of math tasks with my students that pertain to the everyday situations we encounter in our lives, that at first glance do not seem to be "math" problems. Needless to say, the students were shocked at the math involved in making the ratatouille. The numbers and ingredients in this task were very real for the students, causing them to be quite invested in the solution!

What this task accomplishes

This task forces the children early in their third and fourth grade years to construct a method for adding fractions and calculating large numbers. Because this task was very real to them and they knew they would be making the ratatouille, completing the task seemed to be purposeful.

This task allowed the children to see the often complex math needed in the seemingly simple task of cooking.

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What the student will do

The students did not have an easy time with this task. The first obstacle, and the largest, was figuring out that the recipe needed to be multiplied about 50 times to feed 300 people. Many children multiplied the 300 people by the 6 servings the recipe served, and then got stuck. Once children realized that they wanted to find out how many times they wanted to make the recipe, the next obstacle students encountered was construction a method for multiplying fractional amounts to determine the amount of each ingredient needed. Most students tended to rely on repeated addition to do so.

Time required for task

2-3 one hour periods

Interdisciplinary links

Many classes and families deal with adjusting recipes when cooking for everyday meals, holiday celebrations, special occasions, and big parties. This type of task would work well with any sort of unit that incorporated cooking or making anything which requires a "recipe".

Teaching Tips

I would definitely recommend using a smaller number than 300. For many of my kids I adapted the problem by making the total number of people 50, and in some cases 18. For the students who could handle the large numbers, this problem was a good example how simplifying the task is a great strategy to use in order to figure out what needs to be done to solve the problem.

Concepts to be assessed and skills to be developed

Concepts of Whole Number Operations
- Develop meaning of operations
- Relate math language of operations to problem situations
- Recognize a wide variety of problem structures that use a single operation
- Develop operation sense

Whole Number Computation
- Develop reasonable proficiency with basic facts and algorithms
- Use a variety of computation and estimation techniques
- Use calculators in appropriate computational situations
- Select and use computational techniques that are appropriate and determine whether results are reasonable

Measurement
- Make estimates of measurements
- Use measurements in everyday situations

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Fractions and Decimals
- Develop concepts of fractions
- Apply fractions to problem situations
- Explore operations on fractions

Problem Solving
- Use problem solving approaches to investigate and understand mathematical content
- Develop and apply strategies to solve problems
- Acquire confidence in using math meaningfully

Communication
- Reflect and clarify thinking about mathematical ideas and situations
- Relate everyday language to mathematical language and symbols

Reasoning
- Draw logical conclusions about mathematics
- Justify answers and solutions
- Believe that mathematics makes sense

Connections
- Link conceptual and procedural knowledge
- Use mathematics in everyday lives

Suggested Materials

Lined paper, graph paper, calculators, fraction manipulatives, measuring cups and spoons

Possible Solutions

When solved purely through mathematics, the recipe in this task needs to be multiplied fifty times. Although none of my students discussed this in their solutions, as a class we discussed the fact that when cooking for three hundred people that are going through a large buffet line...you don't need to make the recipe for that many people because some people won't eat it, and most will take just a little bit of everything. The original recipe assumes that the ratatouille is the main course.

For specifics on the correct amounts, see the Expert solution that follows.

Rubrics and Benchmarks

Novice

The student has applied inappropriate concepts and procedures. The strategy of adding the amount needed of each item to the total number of people attending the dinner will not solve the problem. There is no explanation of the solution. The student does use some math language to communicate his solution, but much of it is inaccurate.

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Apprentice

This student does not complete the task. She uses a strategy that is partially useful but so laborious it could not be completely carried out. This student was adding the recipe's ingredients one at a time starting with eggplants. She was going by how many eggplants would be needed to serve six people, then 12, then 18, then 24, etc. The student is unable to create an appropriate representation, but merely boxes off her solutions as some sort of organizational strategy.

Practitioner

The student has an understanding of the problem and the major concepts necessary for its solution. Mathematical procedures are used accurately, the reasoning is effective, and the strategy leads to a solution. The solution is pretty easy to follow and there is appropriate use of mathematical equations.

Expert

This student shows a deep understanding of the problem and is able to identify the appropriate mathematical concepts necessary for its solution. She uses an efficient and fairly sophisticated strategy that leads directly to a solution. This student also includes a clear and effective explanation, a variety of math language, and a mathematical representation to communicate her solution.

AUTHOR

Amy Morse teachers 3/4 grade at the Warren Elementary School in Warren, Vermont. She has a Master's degree in curriculum and instruction from the University of Vermont. Amy is a network leader for the Vermont Portfolio Program.

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Fax: (802) 899-4409
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342a.

NAME _____ **DATE**_____

Level - 5

P.I. – 1A, 3E, 4A, 4B, 5F, 6C

2 Inch Squares

I need some help. We are planning a special game in our class of 22 students. For the activity each student will need a 2-inch square of paper. How many sheets of 12 inch by 9-inch construction paper will be needed to make the squares? Will there be any paper left over?

Explain your solution with words and pictures.

Adopted From: Spring Math 1999 Exemplars (3-5), Underhill, VT.

10/17

2 Inch Squares

Grade Level 3(5)

Task

I need some help. We are planning a special game in our class of 22 students. For the activity each student will need a 2 inch square of paper. How many sheets of 12 inch by 9 inch construction paper will be needed to make the squares? Will there be any paper left over?
Explain your solution with words and pictures.

Context

This task was challenging, while at the same time, basic enough for every student to try. Since this is a problem that can easily be set up, students can explore it in several ways. Some students drew the diagram, while others actually placed 2 inch squares on a 9 x 12 inch piece of paper.

What this task accomplishes

The task encourages students to organize the information given into a concise diagram. What I liked about this task was how easy it was for student's who had difficulty at first, to draw the diagram. Once they used the manipulatives, they were successful.

What the student will do

Some students will use a diagram. Others may actually place squares on a piece of paper. A few may be able to do the problem without a diagram or using squares by dividing the length and width by 2 and determining how many squares will fit on a piece of paper. Whatever the strategy, students will most likely decide that only one piece of 9 x 12 inch paper is necessary. They may, however, multiply 9 x 12 and assume that 108 squares can fit.

Time required for task

Most students can do this problem in 20 to 30 minutes, although some children may take longer. Those who solve the problem using an algorithm will finish very quickly.

Interdisciplinary links

This problem can be used with a science unit on measurement.

Teaching Tips

I allowed students to approach this problem in whatever style was comfortable for them. Students who would otherwise become frustrated and feel unsuccessful immediately used the 2 inch squares and 9 x 12 inch paper that was available. Once they actually handled the problem, they felt more confident to draw the diagram.

Concepts to be assessed and skills to be developed

Problem solving
Reasoning
Area
Measurement
Addition

Suggested Materials

Paper, pencil, 2 inch squares, 9 x 12 inch construction paper

Possible Solutions

One sheet of paper is needed. Students will know that some paper is left over.

Rubrics and Benchmarks

Novice

Novice One and Novice Two did not appear to understand what was required to solve the problem. They did not employ strategies or procedures that could lead to a solution. Their drawings did not relate to the problem. The explanation does not show their thinking.

Apprentice

The Apprentice students knew what was being asked and drew the 9 x 12 inch paper. However, their strategies and procedures could not lead them to a successful solution. They did not place the squares in the entire area of the paper and/or did not allow for 2 inch squares. Apprentice One multiplied 12 x 9 to arrive at 108 squares. Apprentice Two added 12+12+9+9=42.

Practitioner

The Practitioner had a broad understanding of the problem. The strategy of using a diagram is appropriate. The squares in the diagram are sized appropriately, leading to the correct solution. The explanation is clear.

Expert

The Expert has a deep understanding of the problem. The diagram is accurate and shows how much paper is left over after the 22 squares are identified. The explanation is clear and effective and the mathematical terminology (rectangle) used is appropriate.

AUTHOR

Laurie Barrows is an elementary school teacher in Newburyport, Massachusetts. Laurie is on the Math Council for the Newburyport School System.

NAME _____ **DATE**_____

Level - 5

P.I. – 4A, 4H, 7F

Post Office Displays

Last week I brought the stamps my class made down to the post office to hang up. Karen the postmaster, said she had other things to display and wanted to know how much space was needed to hang up all of the stamps.

If the stamps are 8 1/2 inches by 11 inches and there are 17 of them, what would you tell her? How did you come to this conclusion?

Adopted From: Spring Math 1999 Exemplars (3-5), Underhill, VT.

Grade Level 3-5

Task

Post Office Displays

Last week I brought the stamps my class made down to the post office to hang up. Karen, the postmaster, said she had other things to display and wanted to know how much space was needed to hang up all the stamps.

If the stamps are 8 1/2 inches by 11 inches and there are 17 of them, what would you tell her? How did you come to this solution?

Context

The school I work in is in a rural area. The post office is very small and simple. The postmaster asked me if I'd have my kids participate in a stamp contest and allow her to hang the stamps they made in the post office for people to see. The children created stamps on 8 1/2 by 11 paper.

What this task accomplishes

This task was a much bigger problem for the children than I expected it to be. They had a tough time with scaling down the size of the stamps, with the concept of giving dimensions, and with the reality that when you hang things up you want them to look nice and usually have spaces between them. The fact that there were fractions involved as well as an odd number of stamps also added difficulty to the task. Although the children knew there were many ways to solve this, most only solved it one way because of the time factor.

The task allows the children to become engaged in solving a real life problem that involves many different math concepts such as measurement, fractions, geometry and more.

What the student will do

A surprising number of students actually put seventeen 8 1/2 X 11 pieces of paper down on the floor and measured , (or attempted to measure), them. I had thought more children would have drawn a diagram using some introductory concepts about scale. In my class, this was not the case.

About half of my third and fourth graders arranged the papers in a way they though would look good and the other half of the students did it the simplest way they could think of ...17 pieces of paper in one row.

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Time required for task

We spent 4-5 hours doing this task

Interdisciplinary links

A problem of this type could easily fit into many units or activities. A practical application for it would be for hanging student work in the classroom. It could also fit into units on map skills, measurement, building or art.

Teaching Tips

As I stated earlier, I expected this to be a straight forward task. It was not. I would suggest a couple of things to be aware of depending on what your objectives are:

1) Depending on the skill level of your students you may want to use "friendlier" numbers such as 18 pieces of paper that are 8 X 11. The odd number of papers and the fractions caused problems for some kids.
2) Make sure your students have a concept of scale before doing this task, OR simplify the task and use it as an instructional piece to teach about the importance of scale.
3) Children need to know measurement skills including how to measure things that are larger than their measuring tool.

Concepts to be assessed and skills to be developed

Concepts of Whole Number Operations
- Developing meaning for operations through problem situations
- Relating math language and symbols of operations to problem situations and informal language
- Developing operational sense

Whole Number Computation
- Developing reasonable proficiency with basic facts and algorithms
- Selecting and using computation techniques that are appropriate

Geometry and Spatial Sense
- Modeling and drawing shapes
- Developing spatial sense
- Relating geometric ideas to number and measurement ideas

Measurement
- Understanding attributes of length and area
- Developing the process of measuring and concepts related to units of measurement
- Making and using measurements in problem and everyday situations

POST OFFICE
February, 1996

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Phone: 1-800-450-4050
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E-Mail: EXEMPLARS@AOL.COM

Fractions and Decimals
Applying fractions to problem situations

Suggested Materials

Graph paper of various sizes, construction paper, scissors, rulers, yard/meter sticks, markers, calculators (optional)

Possible Solutions

Solutions will vary depending on how the student sets up the stamps. Things to keep in mind:
- Did the student give dimensions for the space needed or just the perimeter or area?
- Did the student include spaces between the stamps? Is this important to you?
- Is the student aware that there is more than one solution?
- Did the student measure, add and/or multiply correctly?

Rubrics and Benchmarks

Novice

It is unclear what this student has done. There is no explanation, no solution, and no evidence of a strategy.

Apprentice

This student uses a strategy that is partially useful which is marking off on graph paper where the stamps are. He then has a problem finding the dimensions for a six-sided figure. The student also seems to understand that the sides of the stamps need to be added together, but uses the dimensions of 8 X 11 instead of 8 1/2 X 11. There is some evidence of reasoning, and an attempt at using math language and representation.

Practitioner

This student shows a broad understanding of the problem and the major concepts needed to solve it. She uses effective reasoning by giving the dimensions for a rectangle with extra spaces in it. There is a clear explanation and mathematical procedures are used appropriately.

Expert

This student shows a good understanding of the task and verifies his solution. He acknowledges the fact that there is more than one solution to this task. This fourth grader gives a clear explanation of how the problem was solved, and applies mathematical procedures correctly.

RR 1 Box 7390, Underhill, VT 05489
Phone: 1-800-450-4050
Fax: (802) 899-4409
E-Mail: EXEMPLARS@AOL.COM

AUTHOR

Amy Morse teaches a multi-age 3-4 at the Warren Elementary School in Warren, Vermont. She has a Master's degree in curriculum and instruction from the University of Vermont. Amy is a network leader for the Vermont Portfolio Assessment Program.

RR 1 Box 7390, Underhill, VT 05489
Phone: 1-800-450-4050
Fax: (802) 899-4409
E-Mail: EXEMPLARS@AOL COM

NAME _____ **DATE**_____

Level - 5

P.I. – 1A, 2A, 3A, 6B

Post Office Displays

I've been looking through catalogs for new pencils to order for my class of sixteen students. Every time the ones I have get sharpened, all the lead falls out of them. So, I've decided to give mechanical pencils a try, even though they are more expensive.

Please help me!!! I need to find the best deal. On the attached catalog page is the information I have.

A) Which pencils should I order?

B) Which are the least expensive per pencil? Which are the most expensive per pencil?

C) How many sets or individual pencils do I need to order? How much will my total order cost?

D) Why do you think all the pencils aren't the same price?

Adopted From: Spring Math 1999 Exemplars (3-5), Underhill, VT.

Gr. 5
5/98

More for the Money

Grade Level 3-5

Task

I've been looking through catalogs for new pencils to order for my class of sixteen students. Every time the ones I have get sharpened, all the lead falls out of them. So, I've decided to give mechanical pencils a try, even though they are more expensive.

Please help me!!! I need to find the best deal. On the attached catalog page is the information I have.

A) Which pencils should I order?

B) Which are the lest expensive per pencil? Which are the most expensive per pencil?

C) How many sets or individual pencils do I need to order? How much will my total order cost?

D) Why do you think all the pencils aren't the same price?

Context

The pencils I have for my kids seem to be defective!! All the lead falls out when they are sharpened! This is a frustrating situation for us all. Thus, the context for this problem.

In math I have also just introduced division. This problem seemed to pull it all together, and the kids really liked it a lot!

What this task accomplishes

This task allowed the children to explore division and marketing ploys in a situation that was meaningful to them. They were invested in the solution and intrigued by their findings. This problem was a catalyst for some great discussions revolving around better buys and cost analysis.

What the student will do

Most students will use a calculator if available. It was necessary for my students as they had not learned the mechanics of long division yet. If calculators are used, children will spend some time exploring the difference between the divisor and dividend.

Some students may have a difficult time understanding that some pencils can only be bought in packs of 5, 10 or 12 even though they have a cost per pencil for those pencils.

Time required for the task

2-3 45 minute periods

Interdisciplinary links

This problem would go well with a number of different units or themes such as advertising, marketing, or money.

I often let my students look through teacher catalogs in order to help me pick out things to order for the next year. They love to do this and it gives them experience at reading catalogs and doing a lot of math.

Teaching tips

Let kids use calculators!!! If you haven't introduced your kids to them formally yet, this is a great time. If you use Explorer calculators, this is a great time to let the kids experiment with the "INT div." button and let them come to a conclusion of what an integer is and is not.

Use real catalogs and have the original colorful copy available for the students to use.

Before we did this problem we did some much easier problems together, such as "If 2 hot dogs cost $1.75, how much does each one cost?" These simple problems allowed the children to discover the powerful tool of making a simpler problem to decide what to do, (in their words...how to figure out what is divided by what).

Concepts to be assessed and skills to be developed

Fractions and Decimals
Problem Solving
Communication
Reasoning
Connections
Whole Number Computation

Suggested materials

Explorer calculators, graph paper, money manipulatives, Base 10 blocks, catalogs.

Possible solutions

Cost per pencil will/should be consistent if children are using the same catalogs although final responses will vary depending upon the decisions made. For example, some students did not choose the least expensive pencils because they did not like them. Some children included containers of lead refills, other

children wanted each child to have more than one pencil. Some children felt it was important to buy all the same pencils in order to be fair while others felt that a variety would offer choice.

Rubrics and Benchmarks

Novice

This piece contains no evidence of a strategy or procedure used. The information the student gives is incorrect, the Sports pencils are not the least expensive. The student's response contains no representation or explanation and is incomplete.

Apprentice

This solution is incomplete. It is not clear that the student understood the problem. Some evidence of mathematical reasoning is shown although it is unclear that the student understands that two packs of pencils would be needed for eleven students. S/he seemed to decide on two packs by rounding 16 to 20.

Practitioner

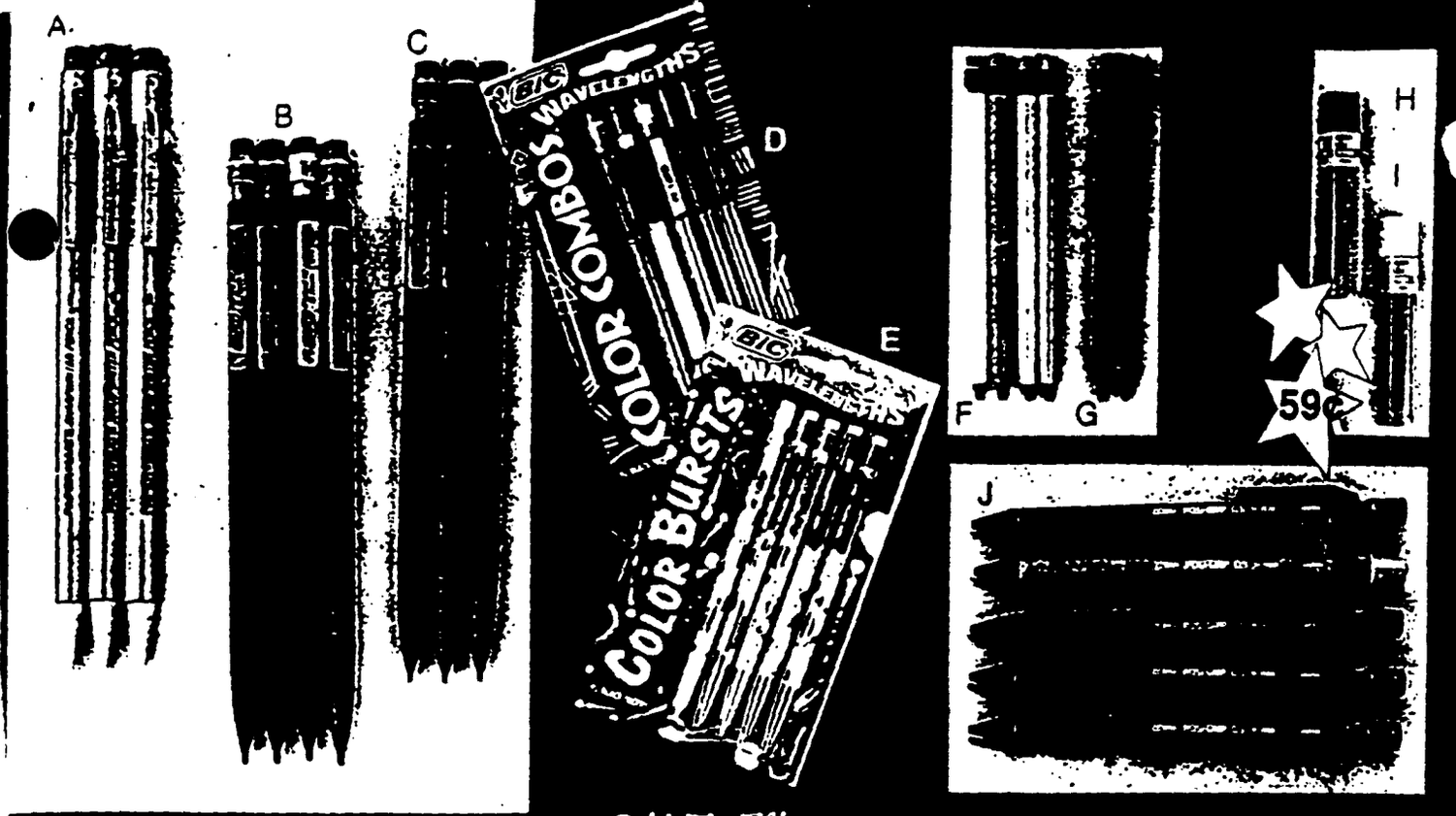
This student solves the problem and includes an explanation of how s/he solved the problem and what conclusions were drawn from the work. S/he understands that cost is an issue and combines sets of pencils to get close to 16, one for each student.

Expert

This student shows a clear understanding of the problem. S/he employs complex reasoning for a third grader and applies procedures correctly to solve the problem. A clear explanation is provided as part of the response so that the reader does not need to infer how and why decisions were made.

Author

Amy Morse teachers 3/4 grade at the Warren Elementary School in Warren, Vermont. She has a Master's degree in curriculum and instruction from the University of Vermont. Amy is a network leader for the Vermont Portfolio Program.



A. 096G	Sharpwriter 7mm	$2.65	pk/12
B. 7474B	Bic 5mm	$1.45	pk/5
C. 095B	Bic 7mm	$2.50	pk/10

SAVE 5%

Prepay with Visa, Mastercard or Discover Cards.

VISA MasterCard

Mechanical Pencils

D. 3825B	Color Combo 7mm	$1.79	/5
E. 5204B	Color Burst 7mm	$1.79	/5
F. 9349ST	Soft Touch Mechanical Pencil *Refillable!* 5mm Mechanical pencils with assorted color barrels. (48¢ each)	$5.76	/12
G. 9350ST	Mechanical Pencils *Refillable!* 5mm refillable lead pencils Assorted neons.	$5.76	/12

H. 6305K	7mm lead refill		for 12 leads
I. 6306K	5mm lead refill		for 12 leads
J.	Zebra Posi Grip 5mm		each
8807K	Blue	8821K Rose	
8822K	Lilac	8823K Teal	
8847K	Black		
8806SP	Zebra Eraser Refill,5 pack		pack

Sports Mechanical Pencils

(5mm lead)

Only [illegible]

Refillable

61U	Phoenix Suns
62U	Chicago Bulls
63U	Charlotte Hornets
64U	Orlando Magic
65U	LA Lakers
66U	Houston Rockets
67U	Atlanta Braves
68U	Colorado Rockies
69U	Florida Marlins
70U	Chicago Cubs
71U	Chicago White Sox

WOW!

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351a.

Classroom Ideas

Grade 5

Courtesy of

The University of the State of New York
The State Education Department

Mathematics Core Curriculum

CLASSROOM IDEAS

EXAMPLES FOR

GRADE 5

Grade 5

The following ideas for lessons and activities are provided to illustrate examples of each performance indicator. It is not intended that teachers use these specific ideas in their classrooms; rather, they should feel free to use them or adapt them if they so desire. Some of the ideas incorporate topics in science and technology. In those instances the appropriate standard will be identified. Some classroom ideas exemplify more than one performance indicator. Additional relevant performance indicators are given in brackets at the end of the description of the classroom idea.

1A.

Have students solve the following problem in groups and report to the class the strategy they used: A census taker asked the farmer the ages of his three daughters. The farmer told him that the product of their ages is 72 and the sum of their ages is the house number. The census taker performed some computations and then looked at the house number. At this point, he told the farmer that he still could not tell the ages of the daughters. The farmer said, "I forgot to tell you that the oldest likes chocolate pudding." This helped the census taker and he now knew the ages of the three daughters. What are the ages of the three daughters? (Hint to the teacher: If students list all the possibilities for the daughters' ages, they will notice that there are two sets of factors of 72 that have the same sum. That sum is the house number. The knowledge that there is an *oldest* daughter allows the census taker to eliminate one of the sets of factors, the one that has a set of twins as the oldest, i.e., 2, 6, 6 with sum of 14 versus 3, 3, 8, which also has a sum of 14.)

1B.

Jackie and Carolyn are going to play a spinner game. These are the rules:

- When it is a player's turn, she spins both spinners.
- Then she adds the two numbers that the arrows point to.
- If the sum is odd (1, 3, 5, 7, 9, . . .), Jackie wins, even if it was not her turn. If the sum is even (0, 2, 4, 6, 8, . . .), Carolyn wins, even if it is not her turn.

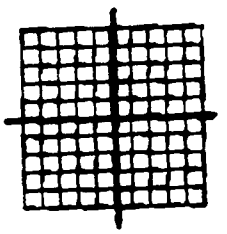
The numbers 3, 4, and 8 are equally likely on the first spinner. The numbers 0, 1, and 4 are equally likely on the second spinner.
Carolyn tries a test spin, first. She gets a 3 on the first spinner and a 0 on the second spinner. The sum of the two spinners is 3 and Jackie wins. Jackie says, "I like this game. I have a better chance to win it than you do." Carolyn says, "No, I have a better chance to win it than you do." Use mathematics to explain which girl is correct. [Also 6F., 4G.]

1C.

Students are given 16 one-inch square tiles and asked to make as many rectangles as possible and record the length, width, and perimeter of each (allowing that the area is 16 square inches). Students can count around the rectangles to find the perimeters. Have students generalize ways to calculate the area and perimeter of rectangles and squares in the form of a formula. [Also 5C.]

2A.

Students are given a grid that is 10 x 10, instructed that the grid contains 100 squares and that the entire grid is equivalent to one with each square equivalent to 1/100 or 0.01 or 1%. Students are given a series of fractions in groups of their common denominators (e.g., 1/4, 2/4, 3/4, 4/4) and are to divide the grid into those fractions and to count to find the decimal equivalent and percent. If students start with easy fractions like halves, 4ths, 10ths, and 5ths, they are then able to use the strategies they will discover to figure out more difficult fractions like 3rds, 6ths, 8ths, etc., using the grids. An example of how the grid could be divided for 4ths is shown below with a set of equivalent fractions.



1/4 = 25/100 = .25 = 25%

2/4 = 50/100 = .50 = 50%

3/4 = 75/100 = .75 = 75%

4/4 = 100/100 = 1.00 = 100%

[Also 2B.]

2B.

sing a graduated cylinder filled with a specified amount of water (e.g., 60 ml), students drop marbles into the cylinder ·o at a time and record the rise in water level. Students calculate rise in water level per marble for each trial. They ɔuld note that approximately the same relationship per marble exists for each trial. When the same multiplicative relationship exists at each trial, the relationship is proportional. Students find the mean rise in water level per marble and use that to predict the water level for a given number of marbles. Rise in Level = (Average change in water level per marble) x (Number of marbles). Students can also plot the water level changes for each trial as ordered pairs. In a proportional relationship their graph will be a straight line which passes through the origin (proportion is a linear relationship). Use the y-axis for the rise in water level and the x-axis for the number of marbles. [Also 3G., 4C.; Science: Physical Setting]

2C.

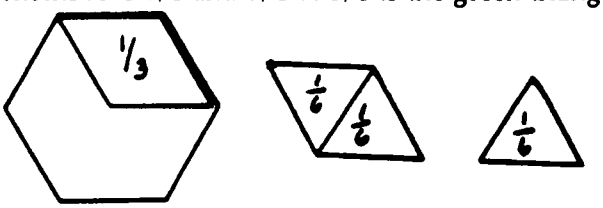
Using a calculator which operates on fractions, enter two numbers as a fraction. (Let the smaller number be the numerator.) Students use the simplify key to get the fraction in lowest terms and keep track of what number was factored out each time. Have students explain how the calculator simplified the fraction and how the factors could be used to find a greatest common factor. (The simplify function factors out prime numbers starting with 2 and continues until all common factors are factored out. If students multiply all the factors, they will have the greatest common factor.) [Also 3A.]

2D.

Encourage students to work in pairs. One student draws a line segment of any length, selects and labels the "endpoints" with the smaller number on the left, and indicates the placement of missing numbers. The other student fills in the missing number and explains how they knew what number was indicated. This activity can focus on whole numbers, fractions, decimals, or integers.

3A.

Using pattern blocks, students can discover the relationship between multiplication and division of common fractions by noting that 1/3 x 1/2 is equivalent to 1/3 ÷ 2. Using the commutative property, 1/3 x 1/2 = 1/2 x 1/3 or 1/2 of 1/3. If a yellow hexagon is 1, then the blue rhombus is 1/3 and 1/2 of 1/3 is the green triangle. The green triangle is 1/6 of the whole unit (yellow hexagon).



[Also 3C., 3E.]

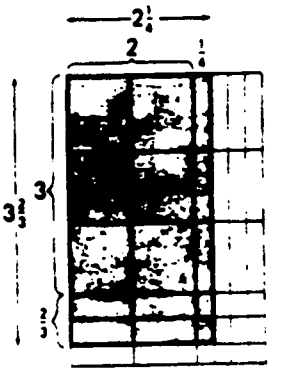
3B.

Have students express the numbers 1 through 10 by combining 4's with any mathematical operation. They must make sure they use the order of operations correctly and use parentheses when needed to show exceptions; for example, 5 = (4 x 4 + 4)/ 4.

Encourage students to find a variety of solutions. Have them explain why their order of operation works.

3C.

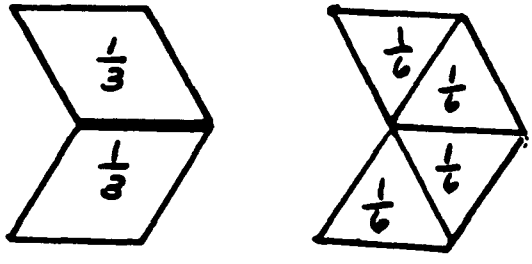
It is interesting to have students explore multiplication with fraction tiles in terms of mixed numbers. In that form each factor has two parts: a whole part and a fraction part. The result is very similar to the tile method for multiplying two two-digit numbers. In the case of 2 1/4 x 3 2/3, the student has 2 1/4 horizontally in the area model and 3 2/3 vertically. The tiles show 2 1/4 x 3 2/3 is (2 x 3) + (2 x 2/3) + (2/3 x 1/4) + (3 x 1/4). Have students relate this to the distributive property. [Also 3C., 3A.]



[redacted]

3D.

It is sometimes difficult for students to understand how it is possible to have a whole number quotient when dividing two fractions. The use of pattern blocks with a measurement approach will help them understand. For example, 2/3 ÷ 1/6 can be thought of as "How many 1/6's are in 2/3?" If the yellow hexagon is 1, then the blue rhombus is 1/3 and the green triangle is 1/6. Have the student put down two of the rhombi (2/3) and then determine how many of the triangles (1/6) it takes to cover the blue rhombi. They will find that there will be 4 triangles covering the 2 rhombi. Ask students to find a multiplication sentence that will also produce this result. [Also 3A.]



$\frac{2}{3} \div \frac{1}{6} = 4$

3E.

One student is allowed to use a calculator and the other calculates mentally. The person who gets the correct answer first gets one point. The player with the higher score at the end wins. Have students discuss each item and why the person who got the point may have an advantage. Have students write in their journals, explaining when they would use mental math instead of a calculator.

2 + 9 + 16 + 18 + 14 + 1 + 10
14 + 9 + 17 + 23 + 16 + 21 + 40
31 + 18 + 10 + 19 + 34 + 2 + 16
91 + 92 + 100 + 97 + 98 + 93 + 99
3 + 8 + 9 + 10 + 11 + 12 + 17
4 + 15 + 11 + 20 + 16 + 9 + 5
43 + 24 + 8 + 17 + 32 + 26 + 10
75 + 83 + 25 + 96 + 17 + 4 + 50

[Also 3C., 3D.]

4A.

Students use the library to research kite history and learn to identify various kinds of kites. They design a particular kind of kite (of geometric shapes), construct it, decorate it, and fly it in a contest. Students relate various geometric shapes to success of the winning kites. [Also 5B., 5A.; Information Systems: 1C.; Science: Physical Setting; Technology: 1B., 1C., 1D., 1F., 2A., 2B.; Common Themes: 2C., 6A.; Interdisciplinary Problem Solving: 1D., 2.]

4B.

Have students work in teams to make a scale drawing of the classroom, including the desks and tables, each using a different scale on centimeter grid paper. Show all the drawings and have students determine which scale they like the best and explain why.

4C.

A linear unit on a geoboard is designed as a side of a square unit. Students are given a fixed perimeter (e.g., 8) and are asked to find the dimensions and area of as many rectangles as possible. Which rectangle has the greatest area? After students try several other examples, ask them to generalize how to find the rectangle with the greatest area, given a specific perimeter. [Also 1C.]

4E.

Remind students that the formula for the circumference of a circle is $C = \pi D$. Have them use string and a ruler to find the circumferences of a number of bottle tops and canister tops. Have them use the formula to find the radius of each of the circles so they can find the area of the circles. The circle areas can be checked by tracing the tops onto grid paper and counting the squares. Ask students why the areas they determined with the formula are somewhat different than what they found with grid paper. Which method do they think was less prone to error and why? [Also 5C, 1B.]

4F.

Let students decide on a way to represent situations such as: How many different packages can be wrapped from a given number of colors of wrapping paper and different-colored ribbons? How many outfits can be arranged, using a given number of shirts and trousers or skirts and blouses? How many frosted cakes can be made from a given number of different cake mixes and a given number of different frostings? [Also 3D., 3F., 4G., 6C.]

4H.

Give students cut-out block letters and mirrors. Have them decide how they may want to identify the lines of symmetry of each letter. [Also 7E.]

4I.

Students can measure interior angles of various polygons and discover that when the number of sides of polygons are the same, so is the sum of the measures of the interior angles. [Also 3B., 7G., 1C.]

5A.

The prize for winning a radio contest will provide the winner with up to $1,000,000 in cash. The catch is that the winner is only allowed one suitcase in which to carry away as much money as it will hold. Will this amount be more or less than the $1,000,000? Students devise plans to determine an appropriate estimate for the amount of money it will take to fill a given suitcase.

5B.

Students are given three brands of paper towels and are told to test the absorbency of the towels. They must devise a test for absorbency and illustrate their data graphically. [Also 5C., 4D.; Science: Physical Setting: 3]

5C.

A leading newspaper stated that the majority of the information it contains is in the form of advertisements. To investigate this, distribute copies of the local newspaper to student groups. Have the students reach a consensus on their definition of "news" and on general headings to be used to categorize newspaper content, e.g., sports, entertainment. Using transparent grid sheets as overlays, students can estimate the total area of a newspaper page, excluding margins, and determine the area of each category of their assigned pages. Students then express the area of the article in relation to the area of the page as a fraction and decimal. The class then records all findings. The total area of each of the categories is computed. These totals are compared to the total number of pages. On the basis of this data, students decide how much of the newspaper is really news.

5D.

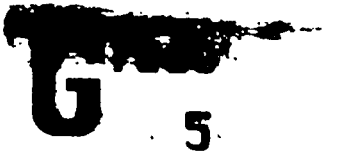
Students demonstrate understanding of measures of central tendency by writing a letter to an absent classmate, explaining how the mean, median, and mode each help describe data. What does it mean when data on all three measures are very similar? What does it tell about data if the mode is much smaller than the mean? What about situations in which the median and the mean are very different? If you are the buyer for women's clothing in a store, which measure on sizes worn by your customers would be of interest to you—mode, median, or mean? Why?

5E.

Provide students with a list of entrees with the number of calories and calories from fat. The entrees should provide a good selection of food items that might be eaten over the course of a day. Have students, in groups, develop a menu for the day in which less than 30% of calories comes from fat. Then students make graphs of the calories for the day to show that their menu met the requirement.

5F.

Ask groups of students to create a plan to solve the following problem. How much water do you drink in one year? (Enough to fill a bath tub? A swimming pool?) How much water does your family use in one year? for drinking, washing, watering, etc.? (Enough to fill a swimming pool? A lake?)



6A.

Students can compare numerators and denominators of common fractions to decide if the value is nearer to 0, 1, or 1 2 Using that information, they can estimate the sums. For example, "Would the sum of 8/9 and 9/11 be less than, more than, or exactly 2, and why?" Comparing the numerator and denominator of common fractions as a way to decide what unit fraction it is closest to can help in estimating products. For example, estimate 7/29 of 876. (7/29 is about 1/4, 1 4 of 876 is 219.) Direct students to write in their journals who might need to solve this type of problem and under what circumstances. [Also 2D., 3A., 3F.]

6B.

Have students discuss in groups the following questions.

Is an estimate enough when:

The waitress figures sales tax?
The waitress finds the total bill?
The customer figures a 15% tip?
The customer checks the bill?

[Also 1B., 2B.]

6C.

Have students use the tree diagram technique for describing various combinations of outfits (choose from two pairs of slacks, four ties, six shirts), menus (choose from two beverages, three sandwiches, two desserts), team players, committee members, etc. to estimate the probability of any one combination being picked at random. [Also 4F.]

7A.

Have students circle abundant numbers on a hundred board and describe the pattern on the hundred board. (Definition: An abundent number is a number such that the sum of its divisors is always greater than its double. For example, the sum of the divisors of 12 [1 + 2 + 3 + 4 + 6 + 12 = 28] is greater than 24 which is 12's double.) Have students write in their journal:

Why does this work?

Does it happen with all numbers? [Also 2C., 3A., 3F.]

7B.

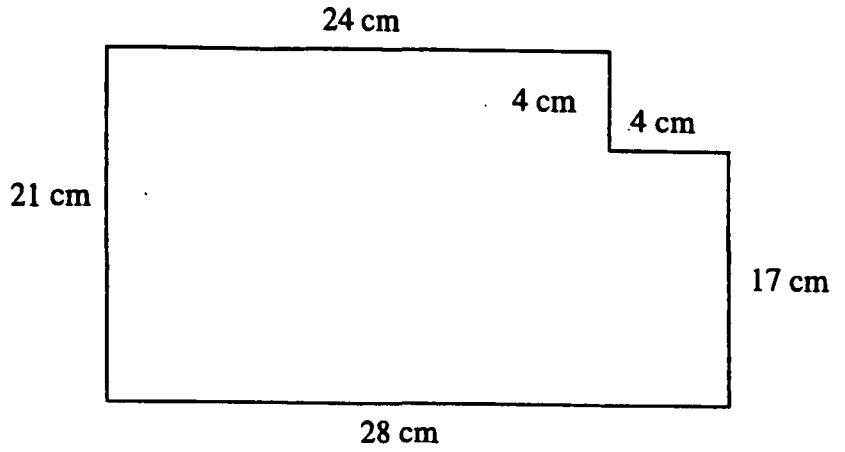
A tape measure is taped on a wall. One student releases a ball from specified distances measured from the bottom of the ball in centimeters (20 cm, 40 cm, 60 cm, 80 cm, and 100 cm.) A second student kneels to get a level view of the ball and tape measure and determines the bounce height at the bottom of the ball. The ratio of the drop heights to the bounce heights will be approximately the same for the ball. The bounce height is proportional to the drop height. Students can be asked to represent the relationship with their data table, a verbal description, a rule, and a graph. [Also 2B., 4D., 7A., 7E.]

Fifth Grade

Math Assessment

Suggestions

4. Use the following polygon to answer the questions:



a. The perimeter of the polygon is?

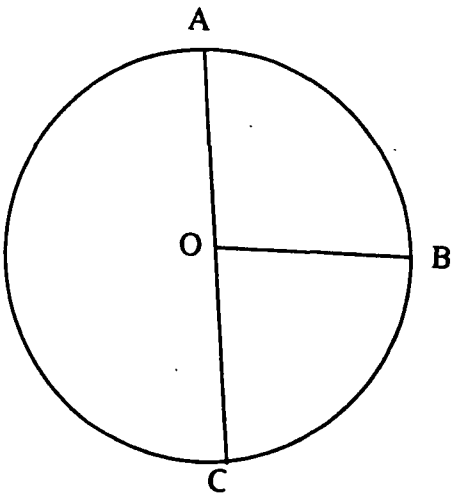
Answer _____

b. Compute the area of the polygon.

Answer _____

Work area:

5. Using the following Circle and letters label the parts listed.



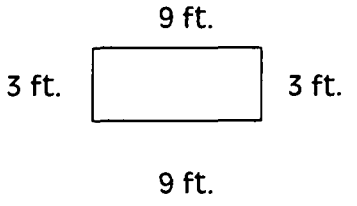
a. Diameter _____

b. Radius _____

c. Circumference _____

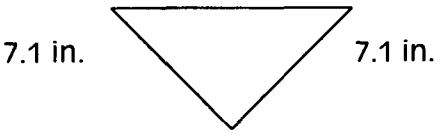
Choose the perimeter of each polygon

18.



A. 27 ft.
B. 24 ft.
C. 18 ft.
D. 15 ft.

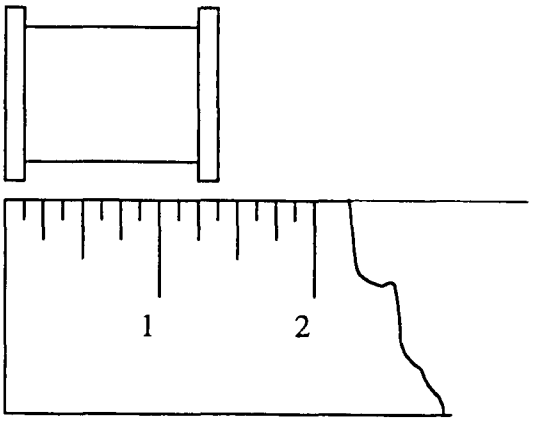
19. 12.3 in.



A. 26.5 in.
B. 26 in.
C. 19.4 in.
D. 12.2 in.

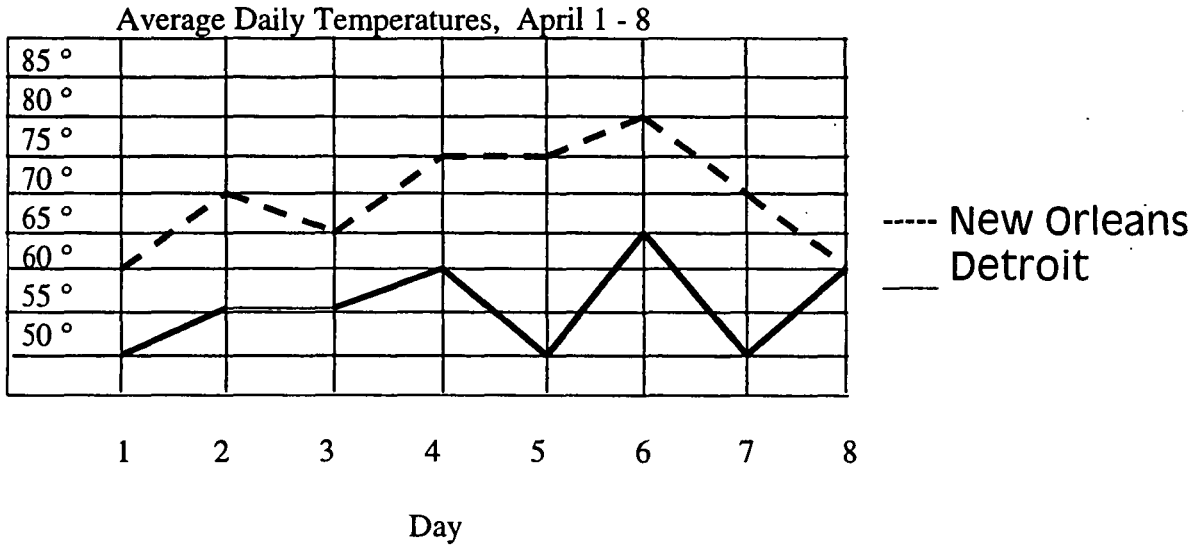
Measure the object to the nearest unit

20. Nearest 1/8 inch



A. 1 1/8 in.
B. 3/8 in.
C. 1 3/8 in.
D. 1 7/8 in

Use the line graph to answer questions 21 and 22



21. On which day was the average temperature the same in New Orleans and Detroit?

A. April 1
B. April 3
C. April 7
D. April 8

22. What was the difference in temperature between New Orleans and Detroit on April 5?

A. 30°
B. 25°
C. 20°
D. 15°

PAPER
CLIP

NAME DATE

ASSESSMENT #1 GRADE 5 out

PART 1

Part 1 of the test contains multiple choice questions. Read each problem carefully. Circle the correct answer to each question. If you make a mistake, erase it completely. You may use your tools to complete any problem on the test. Any scratch work may be completed on the test paper.

1) "eleven thousandths" would be written as...

A 11.000

B .11000

C 0.011

D 11000

E None of these

2) $145.86 – 73.55 =

A $219.41

B $72.31

C $72.41

D $27.31

E None of these

3) What is e – 7 if e is 11?

A 18

B 71

C 4

D 9

E None of these

3) The least common multiple for 3, 6, and 9 is...

A 18

B 71

C 4

D 9

E None of these

4) Books cost $2 each at the used-book store. If p stands for the number of books that Sandy will buy, which expression tells how much money Sandy will spend?

A $\$2 \times p$

B $p + \$2$

C $p - \$2$

D $\$2 / p$

E None of these

5) When $m = 9$ the value of the expression $36/m$ is…

A 6

B 45

C 4

D 27

E None of these

6) The greatest common factor for 18, 36, 54 is…

A 9

B 2

C 18

D 54

E None of these

7) Your fifth grade class has decorated 194 magnets to sell at a school craft fair. You will package them in groups of 4. How many complete packages will you have?

A 49

B 194

C 48

D 82

E None of these

8) The ages of Harry's cousins are 12, 10, 15, 11, 21, 10, 13, 9, 13, 12, and 6. What is the mean age?

A 12

B 15

C 9

D 21

E None of these

9) Using the above ages, what is the mean age?

A 20

B 9

C 12

D 15

E None of these

10) If you have a 7 in. square, what is the perimeter?

A 14 in.

B 21 in

C 96 in.

D 28 in.

E None of these

11) How many hours will pass from 9:10 A.M. to 12:10 P.M. of the same day?

A 18

B 3

C 18

D 24

E None of these

12) 1.10

X 0.8

A 88

B 1.18

C 0.88

D 880

E None of these

13) One box of raisins weighs 3.75 ounces. How many ounces do 20 boxes weigh?

A 23.75

B 16.25

C 75

D 60.75

E None of these

14) $33 \div 8 = ?$

A 4.125

B 41.25

C 264

D 4

E None of these

15) Heather spent $36 to rent cross-country skis for 5 days. About how much did it cost to rent the skis for one day?

A $ 7.20

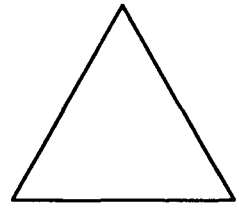
B $ 31

C $ 41

D $ 36

E None of these

16) Identify this triangle:



A Scalene

B right

C isosceles

D diamond

E None of these

17) Dora walked 20 feet and then made a 90 degree turn to the right. She did this three more times. What shape was her path?

A triangle

B square

C rectangle

D circle

E None of these

18) The simplest form for the fraction 15/35 is...

A 1/2

B 3/7

C 2 5/15

D 2 1/3

E None of these

19) 22/8 in its simplest form is...

A 2 6/8

B 11/4

C 2 3/4

D 4/11

E None of these

20) Use the sign that best completes the sentence

7/9 ☐ 4/8

A <

B >

C =

D None of these

21) Choose the answer that is in simplest form.

6 3/8 – 1 4/5 =

A 7 7/13

B 4 23/40

C 5 1/3

B 4 23/40

D None of these

22) Choose the answer that is in simplest form.

7/12 + 3/4 =

A 10/16

B 4/8

C 1 1/3

B 10 1/3

D None of these

23) Yesterday Tina spent 1 1/2 hors doing her math homework and 1 3/4 hours doing the rest of her homework. She also played soccer for 1 1/2 hours. How many hours did Tina spend doing homework yesterday?

A 3 1/4

B 4 3/4

C 1 1/2

B 3 5/8

D None of these

24) The product, in simplest form for 2/5 X 9 is..

A 18/5

B 9 2/5

C 3 3/5

D 9/5

E None of these

25) The reciprocal of 10 is...

A 10/1

B 20

C 100

D 1/10

E None of these

26) Solve 2 divided by 1/3

A 2/3

B 6

C 7/3

D 2 1/3

E None of these

27) There are 18 girls and 12 boys in Hank's class. One third of the students take gymnastics. How many students on Hank's class take gymnastics?

A 1/2

B 6

C 30

D 10

E None of these

28) What number is missing in the following sentence...

3/4 = ?/12

A 6

B 9

C 7

D 36

E None of these

29) Solve the following sentence: 75% of 28 =

A 20

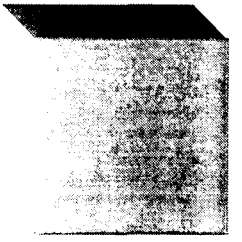
B 10

C 103

D 21

E None of these

30) How many edges does the following cube have?



A 12

B 9

C 3

D 1

E None of these

31) The area of a square having one side that measures 12 inches is...

A 144 sq. inches

B 48 sq. inches

C 24 sq. inches

D 12 sq. inches

E None of these

32) The volume of a box 7 ft. long, 5 ft. wide and 1.3 ft. high is...

A 13.3 cu. ft.

B 25 cu. ft.

C 45.5 cu. ft.

D 35 ft,

E None of these

Name _____ Date _____

Assessment # 1 Grade 5

PART 2

Part 2 of the test contains questions in which you will have to write the answer.

Be sure to carefully read all the directions.

Ask your teacher to explain any directions you do not understand.

You may use your tools to help you solve any problem on the test.

Read each question carefully and think about the answer before writing a response.

Be sure to show your work when asked. You may receive partial credit it you have shown all of your work.

Please turn the page and begin.

1) Using your calculator answer the following questions:

2) How many years, months and days old are you?

Ans._____

3) Using your answer in a), calculate how old you are in hours.

Ans._____

4) Using your answer in a), calculate how old you are in minutes.

Ans._____

5) Using your answer in a), calculate how old you are in seconds.

Ans._____

2) A train company sells souvenier pins in order to raise money for a charity. They raise $9 for each pin sold. Their goal is to raise $5000. How many pins will they Have to sell?

Ans._____

B) The company pays its workers $150 to clean each train car. If Fred cleans 15 cars, how much will he earn?

Ans._____

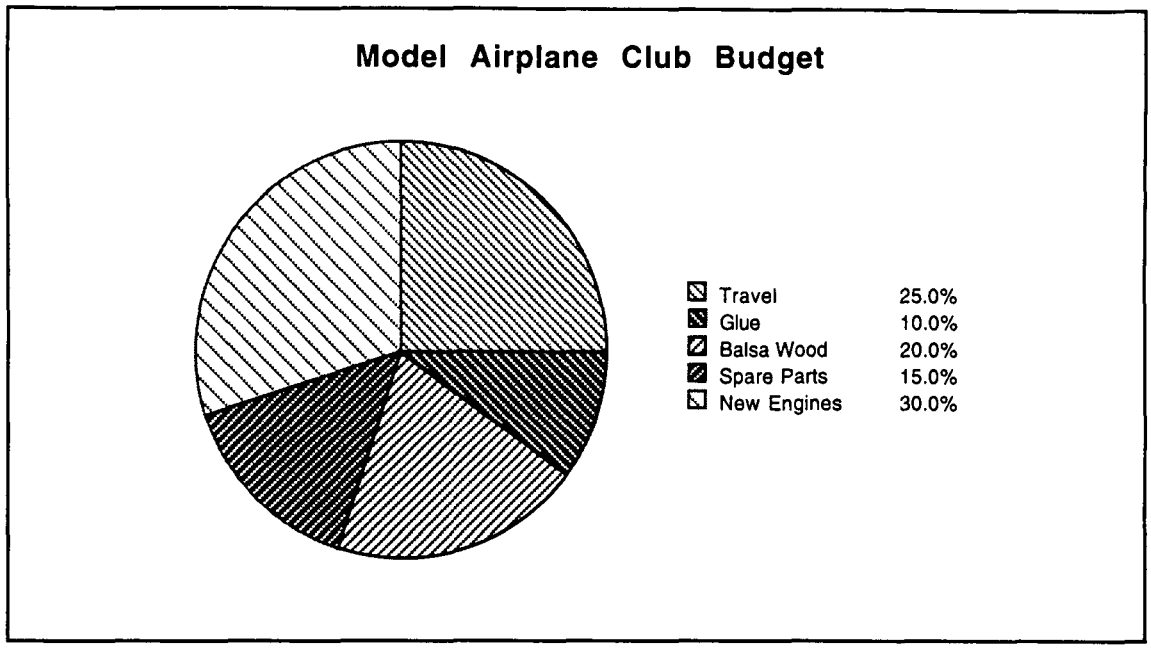
C) Tracks constantly need repairs and today 52 workers are sent to a site. They use minivans that seat 8 people each. All of the vans are filled except for the last one. What fraction of the last van is filled?

Ans._____

D) Engineers work 160 hours each month. They work both 7-hour and 9-hour shifts. How many of each type of shift do they work?

Ans._____

3) Use the graph to answer the following questions:



A) What is the total budget of the Model Airplane Club?

Ans._____

B) What fraction of the budget is spent on balsa wood?

Ans._____

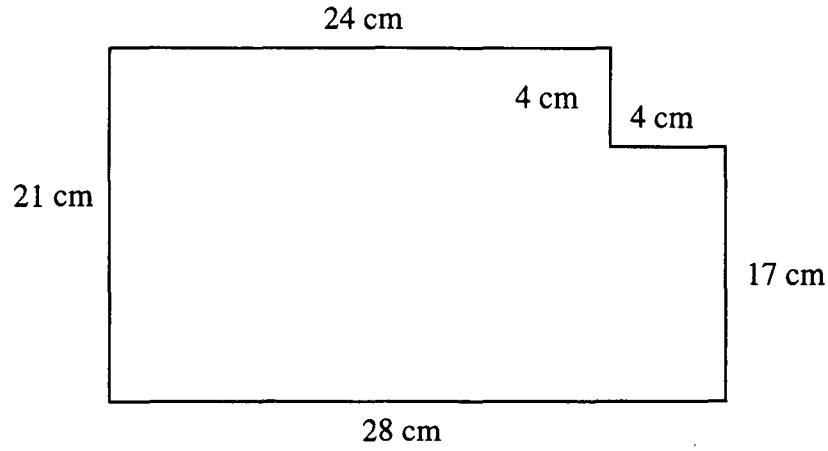
C) What is one quarter of the budget spent on?

Ans._____

Using the information in the graph above, create a bar graph on the following page. Make sure to use your ruler and label completely

D) Create Bar Graph on this page.

4) Use the following polygon to answer the questions:



A) The perimeter of the polygon is?

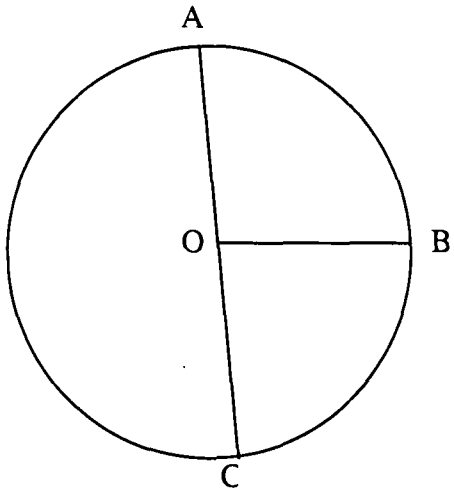
Ans._____

B) Compute the area of the polygon.

Ans._____

Work area:

5) Using the following Circle and letters label the parts listed.



A) Diameter _____

B) Radius _____

C) Circumference _____