

Mathematics: The Language of STEM

Two Digit Addition

Mr. Wall

CONTENT AND TASK DECISIONS

Grade Level(s): 2nd

Description of the Task: Students will analyze a story problem and invent their own strategies to come up with a solution.

Indiana Mathematics Content Standards: 2.CA.2: Solve real-world problems involving addition and subtraction within 100 in situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all parts of the addition or subtraction problem (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem). Use estimation to decide whether answers are reasonable in addition problems.

Indiana Mathematics Process Standards: PS.3: Construct viable arguments and critique the reasoning of others.

Mathematics Content Goals: Students will add two digit numbers and single digit numbers using drawings, equations, or symbols to deconstruct an addition story problem.

Language Objectives: Explain the terms add to, take away, and compare when referring to numbers in a story.

Materials: chart paper, markers, sticky notes, pencils

THE LESSON

Before:

- **Activate prior knowledge**
 - Ask, “In your own words what is a story problem in math?”
 - Have students share several examples of story problems that they can think of from their day (eg. Number of students who walked vs. rode the bus, how many students are here compared to students who are missing)
 - Clarify vocabulary including the word **compare**
- **Be sure the problem is understood**
 - Introduce the problem: Mr. Wall had 36 cookies. Some were chocolate chip, some were sugar, and some were shortcake cookies. How many of each could he have had?
 - How many possibilities can you find?
- **Establish clear expectations**
 - Each set of partners will have chart paper, markers, and tiles (representing the cookies) to work on the problem.
 - Clearly show the different possibilities Mr. Wall could have of the different types of cookies.
 - Include a section explaining how you came up with your answer and the math you used to figure it out.

During:

- **Let go**
 - As students work walk around the room and observe student progress.
 - Let them invent their own strategies without intervention regardless of mistakes or incorrect math.
 - As probing questions like; how many cookies is that all together? Are there any other ways you could think about this problem?
- **Listen actively**
 - Engage with each set of partners and have them explain their thinking for the math problem. Why did they solve the problem that way? What thinking did you do to arrive at that answer?
- **Provide appropriate support**
 - How many cookies do you have all together?
 - How many ways are there to solve the problem?
- **Provide worthwhile extensions.**
 - Is there another way to solve this problem?

After:

- **Promote a mathematical community of learners**
 - Each partner group will bring their chart paper to the front of the room. They will explain how they came up with their answer and any unique challenges they encountered trying to solve the problem.
- **Listen actively without evaluation**
 - Allow time once students have finished their explanations, to elicit feedback from the audience. Did anyone else have similar or different thinking from this group?
- **Make connections**
 - How is this problem similar to other story problems we have worked on?
 - What skills have you learned from doing this story problem that you could connect to future problems in math?
 - How was this similar to other problems in math besides story problems?
 - Did you notice any similarities between this groups' thinking and any others?
- **Summarize main ideas**
 - Hang the chart papers around the room and have the students take a gallery walk to reinforce the concepts presented throughout the lesson. Encourage them to look closely at the explanations the students gave and decide if their rationale makes sense.
- **Extension**
 - Transition to two step story problems by prompting students with anecdote of going to the grocery store and picking out the cookies.
 - I started by purchasing 15 chocolate chip cookies and then ordered 8 sugar cookies. Can you complete the math that I had to do to determine how many more cookies I would need to have all 36 cookies?
 - Continue this extension of the activity as a Segway into two step story problems.

ASSESSMENT

On a notecard, at the end of the lesson, students will explain what they learned about story problems and mathematics strategies from today's lesson. Collect and assess what new strategies students have acquired and which ones still seem to be lacking.