

THE LESSON

Before:

- Student Actions: Turn and talk with a partner to answer the questions the teacher asks.
- Teacher Actions: As students enter the classroom the teacher will give each student a “piece of party” (1/2 cupcake, part of a streamer, party hat, napkin,...)

Questions: How many of you have had a birthday party or attended one? What do you know about a party? What is wrong with the party we are having now? After turn and talk: Do you think *you* can plan a better party?

During:

- Student Actions: Students will use the expense sheet to make choices about their party. They will find total cost for each category. In other words they will know what they want and what it will cost by the end of the class period.
- Teacher Actions: Teacher hands out expense sheet and instructs students to begin making choices about their party. They should find the total cost for each choice they make in each category. Teacher is listening actively.

Follow up question: This can happen with the whole group. Which is most important to you, the people, the food, the place, or the activity? Did any of you want everything? What did you realize? Is this possible? If so, what made it work out? If not, what can you change? (even if you don't want to, what can you change in order to fulfill this task?)

After:

- Student Actions: Students share with groups. Round table discussions.
- Teacher Actions: Teacher asks: What did you find? Who was over/under budget? Explain the reasons for being over/under budget. What changes might be necessary to meet the budget goal?

ASSESSMENT: Students will respond to the (teacher actions) questions in their math journals. Discussions using their answers will begin the class the next day.

Observe:

- Are students using correct vocabulary?
- Are students stating important concepts and formulas to their partners?
- What strategies are students using to plan their parties?
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Ask:

- What is most important to you? People? Activities? Did you have to compromise?

Mathematics: The Language of STEM

Lesson Title: Birthday Bash (Day 2)

CONTENT AND TASK DECISIONS

Grade Level(s): Pre=Algebra

Description of the Task: Students will plan a birthday party using a budget incorporating venue, menu, number of guests, and other expenses. (see attached)

Indiana Mathematics Content Standards: 6. AF4, 6.AF5, 6.AF7, 6AF8, 8AF2 (Same as in day 1)

Indiana Mathematics Process Standards: PS1, PS2, PS4, PS5,PS 6,PS7 (Same as in day 1)

Mathematics Content Goals: Students will be able to write, solve, and graph equations.

Language Objectives:

Students will be able to verbally explain why the results of the QR questions will change if the variable changes.

Students will be able to write an equation and explain how this equation can be graphed

Materials: party supplies, graph paper, the activities planning page

THE LESSON

Before:

- Student Actions: Recall/review yesterday's work. Discuss answers to question with their group.
- Teacher Actions: Ask: What if I told you how many people to invite to your party? What would that do to your costs? Would this cause a problem somewhere else in your planning?

During:

- Student Actions: Students will answer questions on the QR scans.



- Teacher Actions: Give directions how to use QR codes. Teacher circulates room and support students through scaffolding of questions.

After:

- Student Actions: Students will complete exit ticket.
- Teacher Actions: Is it possible to write one equation for all of the options to find the total cost for x amount of people? Write out your equation and explain your thinking. (exit ticket)

ASSESSMENT: Students will complete the exit ticket

Observe:

- Are students using correct vocabulary?
- Are students stating important concepts and formulas to their partners?
- Are students beginning to form an equation?

Ask:

- What do you notice about your equation?
- Can you graph this?

Mathematics: The Language of STEM

Lesson Title: Birthday Bash (Day 3)

CONTENT AND TASK DECISIONS

Grade Level(s): Pre-Algebra

Description of the Task: Students will plan a birthday party using a budget incorporating venue, menu, number of guests, and other expenses. (see attached)

Indiana Mathematics Content Standards: 6. AF4, 6.AF5, 6.AF7, 6AF8, 8AF2

Indiana Mathematics Process Standards: PS1, PS2, PS4, PS5, PS 6, PS7

Mathematics Content Goals: Students will be able to write, solve, and graph equations.

Language Objectives:

Students will share results and support their choices with verbal and written data.

Students will be able to write an equation and explain how this equation can be graphed.

Materials: graph paper, the activities planning page

THE LESSON

Before:

- Student Actions: Discuss answers to exit ticket with their group. Share out their findings to the whole group
- Teacher Actions: Ask: Lead students in discussion of previous day's exit ticket. This would be whole group with opportunities to turn and talk. Ask: What did you conclude about yesterday's exit ticket? Is the task possible? Can anyone show the class what the graph might look like?

During:

- Student Actions: Students will create a function table using their choices from Day 1. They must do calculations for 5, 15, 25, and 50 people. Students will graph their data to determine the maximum amount of people they can invite to their party.
- Teacher Actions: Does your equation from yesterday's exit ticket match your function table and graph? If not, go back and look at your data and equation to determine why it does not match.

After:

- Student Actions: Present graphs and their party plans to their team members. (roundtable presentation)
- Teacher Actions: Teacher circulate the room listening. After presentations, teacher collects function tables, graphs, and data

ASSESSMENT: Students will have a final exit ticket and will write and solve a similar real world problem involving a linear equation.

The Birthday Bash

Your family has surprised you by giving you permission for a big 13th birthday party. The catch is you are responsible to plan the entire event yourself without going over a budget of \$500. Your goal is to select a location, the food, the drinks, the entertainment, the cake, the ice cream, and other supplies. The expense of the party will change depending on how many people you invite to your party.

The Location (one location)		The Food & Drinks (one food & one drink)		
Place	Cost	Place	Cost	
Tokens & Tickets	\$5.50 per person	Sandwiches	\$3.50 per person	
North Pointe	\$11.50 per person	Pizza	\$2.50 per person	
Laser X	\$5.00 per person per game	Hot Dogs	\$1.50 per person	
Eastlake	\$4.50 per person	Pop	\$1.25 per person	
Your Church	\$75.00	Bottled Water	\$0.25 per person	
Outside Park	Free	Gatorade	\$1.75 per person	

Cake & Ice Cream (one cake & one ice cream)		Other Expenses		
Place	Cost	Expenses	Cost	
Betty's Cake	\$40 feeds 25 people	DJ for Music	\$75 optional	
Marsh Cake	\$28 feeds 25 people	Big TV	\$75 optional	
Wal-Mart Cake	\$22 feeds 25 people	Outdoor Equip	\$30 optional	
Ben & Jerry IC	\$6.50 feeds 8	Invitations	\$0.25 per person	
Edy's Ice Cream	\$5.75 feeds 8	Supplies	\$1.25 per person	
Store Brand	\$4.25 feeds 8			

- 1) Write an equation to determine the total cost to hold the party at North Pointe Cinema for x amount of people? What is the total cost if x equals 25 people?
- 2) Assume 25 people are attending our party. How much money would you save if you chose to eat hot dogs instead of pizza?
- 3) For each type of cake and ice cream, what is the cost per person?
- 4) Assume you are holding your party at an outside park with sandwiches and pop. Write an equation to find the total cost for x amount of people to attend. Find the total cost for when x is 5, 15, 25, and 50 people.

Now it's time for you to create your own party. You must choose a location, food, drink, cake, ice cream, and other expenses. Remember, you have \$500 for your party.

5a) Make your choices. For each choice, write an equation to determine the cost of each item for x amount of people.

5b) For each choice, create a function table to find the cost of 5, 15, 25, and 50 people.

5c) How can you determine the total cost of the party? What is the total cost of the party for 5, 15, 25, and 50 people?

5d) Is it possible to write one equation for all of the options to find the total cost for x amount of people? Give it a shot and simplify it. Does this equation match the total cost for 5, 15, 25, and 50 people you found above?

5e) Use this new equation to graph a line to determine the maximum number of people that can attend your party.

5f) Write and solve an equation to find the maximum number of people that can attend your party. Does it match your graph?