

Mathematics: The Language of STEM

Family Adventure Day Part 2

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Content and task decisions

Grade Level(s): 2

Description of the Task:

Students will be asked to plan a Family Adventure Day for a family of four using an adventure fund of random coins collected throughout a year of saving.

- First, students will be presented with the challenge of counting the coins within the fund using a student-selected method (included in the lesson plan for part one of this activity).
- Second, students will be asked to plan out a Family Adventure Day using the money within the jar and flyers that indicate event/activity pricing (included in this lesson plan).
- Throughout, students will then present their findings to their peers and evaluate the work of other students.

Indiana Mathematics Content Standards:

- 2.M.7: Find the value of a collection of pennies, nickels, dimes, quarters and dollars.
- 2.DA.1: Draw a picture graph (with single unit scale) and a bar graph (with single unit scale) to represent a data set with up to four choices (What is your favorite color? red, blue, yellow, green). Solve simple put together, take- apart, and compare problems using information presented in the graphs.

Indiana Mathematics Process Standards:

- PS.1: Make sense of problems and persevere in solving them.
- PS.3: Construct viable arguments and critique the reasoning of others.
- PS.6: Attend to precision

Mathematics Content Goals:

- Students will be able to count and represent money combinations of pennies, nickels, dimes, quarters, and dollars within one hundred dollars.
- Students will be able to use multiple ways/strategies to solve mathematical conjectures and communicate their thinking/process through writing, technical means, or discussion.

Materials: (Used throughout all lessons)

- Plastic or Glass Jars (Enough for each group of four students)
- Paper of various sizes (for student work)

- Various Plastic Coins (Varying denominations excluding half dollars)
- Various Paper Bills (Varying denominations excluding bills over \$20)
- Sets of Flyers Attached (Enough for each group of four students)
- Assignment/Task Explanation Sheets (Time Table, Money Task Explanation Sheet, Recording Sheets, and Reflection Questions, Time Task Explanation Sheets Explanation Sheet, Recording Sheets, and Reflection Questions)

Procedure: Family Adventure Day (Part Two)

Before: (Prepare coin jars with same amount of money using same coin combination within each jar. This amount should be the same amount as previous work. I suggest picking a larger amount than \$120. This amount will need to be large to have the ability to pay for multiple activities throughout the adventure day.)

- Review work from previous activity (Discuss how we solved problem of how much money each jar contained and what strategies we used. You might even read some of student reflections from previous activity or have students read their own reflections to celebrate learning)
- Review narrative problem presented to students (included within lesson plan documents)- Students will use coins to pay for various activities during a family adventure day. Students will use coins/bills as manipulates, various activity advertisements, and recording sheets to represent and demonstrate their thinking
- Review expectations for small math squads (take risks, respectful treatment of others and opinions, persevere through challenge, mistakes are learning, take care of math tools)
- Distribute materials (jars full of coin values, various paper, pencils, advertisements, recordings sheets) to small groups of students; students will also receive a student friendly task sheet (included within materials)
- Remind students of how many members within my family and how many adults and children that will participate in activities (You may want to discuss activities with other rentals such as bowling shoes or mini-golf clubs)

During: Prepare Class Data Chart using document camera or large chart paper (graphing what activities were chosen)

- Monitor student progress throughout this time period. If a group is struggling, prompt students to try various methods that have been explored by other groups. You may also have a student leader visit another squad to observe how the other group is tackling the problem.
- Discuss with students what to do when disagree about an activity choice (stop students to discuss this procedure only if needed)

- Students will manipulate the coins and bills and use various resources to aid their thinking and process if needed (Remember they know the amount of coins from previous work)
- Students will record their thinking and conjectures on paper (size is chosen by groups of students) or using technology (student presentation app such as popplet- each popple is an activity with picture and pricing)
- Students will record their group's activity choices within class bar graph (If students finish early, they may discuss how to present their thinking to others, or come up with another schedule/way to spend their money within squads)

After:

- Review class data using Class Bar Graph to discuss trends (Example- activity selected the most, activity selected the least, how many different activities chosen)
- Have different groups present their thinking using their popplet. Students can see how others spent their day and answer whole group discussion questions such as:
 - Which group spent the most money?
 - Which group spent the least amount of money?
 - Which group's schedule was the most similar to and most different than your group's schedule?
 - Did this group miss any hidden costs such as shoe rentals?
 - Which group planned out the most activities in their day? Which group planned the least amount of activities in their day?
- Optional: Students can express their learning through a narrative book/story. Students will complete a page for each activity. Each page should include:
 - A picture of family completing the activity
 - A narrative about experience (created by students)
 - A chart containing total of amount/cost of activity for family and running total
 - A final page that summarizes the day (narrative and mathematical)
- Optional: If time, students will then return to their groups to complete second way to use their money (or you can do this step independently or cut it out altogether)
- Students will then complete an independent reflection sheet about their thinking and process (attached within plans)

Assessment:

- Students will be assessed on participation within math group and both group and individual reflections.
- Students will be asked to communicate their thinking/process through a narrative book and written reflection. Students will answer the following questions on their written reflection using individual means:

- What strategy or process did you use to solve the problem?
- What part of your strategy made this work easier?
- What part of your strategy proved to be difficult?
- What did you learn about working with groups?
- What did you do differently and the same next time?
- What answer did you get both times? What is the difference between these totals?
- How well did your group work together?

Our Family Adventure Day

My family collects change in a jar all year long. Once a year, we use all of the change that we have collected to have a family adventure day. This year, I get to pick what our family does during our family adventure day. My mom told me that I could pick from these activities:

- going bowling
- going to the zoo
- going walking on a trail
- going for ice cream
- going to the mall
- going to the movies
- going for dinner/lunch
- going fishing
- going mini-golfing
- going to a trampoline park
- going to a park for a picnic
- going to an arcade
- going go-cart racing



My mom told me that I am only allowed to use the money in our jar. I may not use more than that amount of money, but I can use less.

My mom also told me that that I needed to:

- Plan out activities for 2 adults and 2 children
- Use the flyers to help me plan out how much everything will cost for each activity
- Make sure that I add in rental prices for different activities that you have to rent (or borrow) something
- Write down my plans for the day with cost on the recording sheet for her to double check my work.

Name: _____ Date: _____

Our Family Adventure Day Reflection

Answer the following questions using your learning from part two of our family adventure day activity. Make sure to use complete sentences and your best spelling.

5. What did you do differently and the same next time?

6. How well did your group work together?

7. Draw a picture of your favorite activity from your day below.

Name: _____ Date: _____

Our Family Adventure Day Recording Sheet

Activity	Amount Used
Total Amount Used	
Total Amount Left	
Number of Activities	