

Magic Bag Lesson Plan

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The Task

You're cleaning out your closet and find a velvet bag in the corner. When you pick up the bag it feels heavy, and you find 24 pennies inside it. Before you go to sleep, you pull out the pennies and count them up again. Now there are 27 pennies in the bag! When you check the bag at the end of the second day, you count 30 pennies. At the end of Day 3, you count 33 pennies. How many pennies will be in the bag after 10 days? 25 days? 100 days? Can you come up with a rule to find the number of pennies in the bag on any day?

Materials

- The task
- Bag (to model task)
- Coins/counters (available for students)
- cm grid paper (available for students)
- Newsprint (for groups to record rule)
- Poster paper (for recording class data table)
- Poster inch grid paper (for graphing class data)

Facilitating Task

- Read task and clarify as needed
- Give individual think time before sharing with a partner
- Small groups (3-5 students)
 - Compare and come to consensus on days 10, 25, 100
 - Record you rule on poster
- Whole group
 - Record class data in 3 column table for days 0-10, 25, 100
 - Record class data on graph for days 0-10
 - Share out rules and connect words to symbolic notation
 - Discuss connections between representations - story context, table, graphs, verbal rule, symbolic rule

Misconceptions

- Day 0, the start, has 0 pennies or 27 pennies (Day 0 has 24 pennies)
- Students might have difficulty identifying the pattern that relates the day to the total

Suggested Prompts or Questions

- What patterns do you notice?
- What's the relationship between the day and the number of pennies?
- How did you find the total number

number of pennies. While it will likely be easy for students to notice the pattern from one day to the next, this iterative pattern requires you to know the previous day, in order to determine the day you are on. This makes finding the total pennies for any day challenging.

of pennies for day 3? What expression could you write to show this? ($24+3+3+3$ or $24+3\times 3$)

- Is there a quicker way to figure it out?
- Can you figure out the total number of pennies on day 25 without doing every day?
- How would you figure out the total number of pennies for day 100?