# Winning Ticket

Last night on my way home from school I stopped at the store to buy a lottery ticket. Although I usually do not do this sort of thing, it had been a great day so I thought I would try my luck. Well, lucky I was! I won! The only problem was, I had to pick between 2 prizes: A) \$1,000 all at once or B) \$2 on the 1st day, \$4 on the 2nd day, \$8 on the 3rd day, \$16 on the 4th day and so on for 10 days in a row.

Which prize do you think I should choose? How did you make your decision? Can you prove to me that your choice is the best choice?

P.S. If your solution is clear enough, maybe I will share my good fortune with you!

Grade Levels 3 - 5

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## Context

A student had mentioned during our morning class meeting that his father's friend had won \$1,000 on a scratch off lottery ticket. This statement led us into a brief discussion about gambling, instant scratch games and lottery tickets.

### What This Task Accomplishes

This task requires children to solve several parts of a problem, discover and continue patterns, add large numbers and make reasoned decisions.

### What the Student Will Do

Most students started off trying to discover the pattern in choice B. While most students discovered and continued the pattern, many of them did not solve the problem. Many students just looked at the amount received on the 10th day and figured it was not worth it to wait 10 days. They did not take into account that the total amount of money received was the sum of the amounts received on each of the 10 days.

### **Time Required for Task**

One to two, 45-minute periods

### **Interdisciplinary Links**

Games of chance, language arts: play on words (many tickets have clever names that have more then one meaning). Students could figure out the double meanings of current games or create their own game names and submit them to the lottery commission for consideration!



## **Teaching Tips**

In order to adapt this task to make it easier or more complicated, the pattern or money amounts that are used can be made simpler or more complex. This problem provides a good opportunity to make sure students know how to make accurate tables or charts.

### **Suggested Materials**

- Graph paper
- Calculators
- Money manipulatives
- Markers

## **Possible Solutions**

The amount of money received in choice B is \$2,046. This amount is the sum of the amount received each day. Each day for 10 days, the recipient receives twice as much as s/he did the day before.

### **Benchmark Descriptors**

#### Novice

This student shows no understanding of the task. There is no evidence of conceptual understanding, no evidence of mathematical reasoning, no relevant explanation and no math language or representation.

#### Apprentice

This student clearly understands part of the problem. S/he recognizes the pattern and accurately applies a strategy of doubling the amount of money received the previous day. This is solid evidence of mathematical reasoning. However, this student does not seem to understand that the amount of money received on day 10 is not the same as the total amount of money received after the 10 days. There is some appropriate use of math language and representation.

#### Practitioner

This solution shows a broad understanding of the problem. The student uses an effective strategy that leads to a correct solution. The student has a brief yet clear explanation, some correct notation and uses a key to link his/her computation to representation.

#### Expert

This student shows a deep understanding of the task and clearly identifies the concepts and information needed for the solution. S/he applies procedures correctly, uses a clear and effective explanation and uses math representation correctly.

### Novice

There is no evidence of a strategy used or reasoning.

I think that you should take a thousand dollars at \$ made my decision once. How I was I thought of wha I would pick, and 3 CHA and I g would pick a thousand dollars a once I don't think I can pour to you may the think thats a better choice just think that thats a better choico

The student shows no understanding of the task other than one choice was \$1000.00 at once.

## Apprentice



Apprentice



The way I went about solving the problem is first of all I made a graph and started with plan B (Using the chart) I put dayone day two and so on the I followed the patern by dobbeling each number (exaple). four and four is eight eight and eight is sixteen and so on Until I got up to day ten by then the number was one thousandtwenty four and so you should try plan B, for one thousand twenty four is more than one thousanded also observed that if you wanted to get more money try plan(B).

## Practitioner

The Winning Ticket 1) I would pick B because you get more money in a longer period of time. My oberservaison is that each time you dobble the 3) The reason I did solved the prowler. This way is because it is the most afishent way. Student uses a key to use comp. as a representation. O = day \$2.00+\$4.00+\$8.00+ \$16.00 + \$32.00+ \$CH.00 + \$128.00+\$256.00+\$512.0oC + \$ 1,024 = \$2,046.00 291\$ 512.00 00 \$1600 Þ32.00 B 00 00 00 The student uses correct notation, and some math \$128 language. Math procedures are used appropriately with effective reasoning and strategies.

### Expert



Expert

