## Unit 4 Lesson 13: Meaning of Exponents

### 1 Notice and Wonder: Dots and Lines (Warm up)

#### Student Task Statement

What do you notice? What do you wonder?



### 2 The Genie’s Offer

#### Student Task Statement

You find a brass bottle that looks really old. When you rub some dirt off of the bottle, a genie appears! The genie offers you a reward. You must choose one:

$50,000 or a magical $1 coin.

The coin will turn into two coins on the first day. The two coins will turn into four coins on the second day. The four coins will double to 8 coins on the third day. The genie explains the doubling will continue for 28 days.

1. The number of coins on the third day will be $2⋅2⋅2$. Write an equivalent expression using exponents.
2. What do $2^{5}$ and $2^{6}$ represent in this situation? Evaluate $2^{5}$ and $2^{6}$ without a calculator. Pause for discussion.
3. How many days would it take for the number of magical coins to exceed $50,000?
4. Will the value of the magical coins exceed a million dollars within the 28 days? Explain or show your reasoning.

### 3 Make 81

#### Student Task Statement

1. Here are some expressions. All but one of them equals 16. Find the one that is *not* equal to 16 and explain how you know.
* $2^{3}⋅2$
* $4^{2}$
* $\frac{2^{5}}{2}$
* $8^{2}$
1. Write three expressions containing exponents so that each expression equals 81.



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