A Mathematical Investigation of Spot it!™

Let's play Spot it!™

1. Play the game a bit at your table. What do you notice about the game? Is it fun? What ages is it appropriate for?

2. How many mathematical questions about the game can you come up with?

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How does Spot it!™ work?

1. How many symbols are on each card?

2. Are there the same number of symbols on each card? Why?

3. How many cards are in the deck? Why? Could there be more? Is there a limit?

4. How was the game made?

5. How many times does each symbol appear? Is it the same number for all symbols?

6. How many total symbols are there? Could there be more?

7. Can these questions be answered without putting down some assumptions about the game? What are those assumptions? What are the implicit rules about the game that are in place from the game designers?

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Formal Assumptions and Exploration

Assumption 1: Each card has the same number of symbols on it.

Assumption 2: Each pair of cards has exactly one matching symbol.

Primary Goal: Understand how to construct Spot it!™ with a given number of symbols per card.

1. Let's try to achieve the primary goal for a few simple cases, and answer some of the questions we had on the previous page as well. Build a game of Spot it!™ with S symbols per card. For each case, note the number of cards in the deck and total symbols used. Is your deck as big as it possibly could be? Do you have a system/algorithm? How do you represent it? Can you justify your conclusions?

   (a) $S = 1$.

   (b) $S = 2$.

   (c) $S = 3$.

   (d) $S = 4$.

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Deeper Mathematical Questions

1. Given a game with exactly S symbols per card, find a formula for the maximum number of cards that can comprise a deck.

2. Can a deck be constructed for every choice of S?

Answers from Algorithms and Geometry

1. How is this game like geometry?

Classroom Connections

1. Are there any connections between the math we've done tonight and what you teach in your classroom?

2. Is there something we did tonight you would incorporate into one of your lessons?

3. How would you have improved the activity we did tonight?

4. What standards from the CCSS connect to what we did tonight?