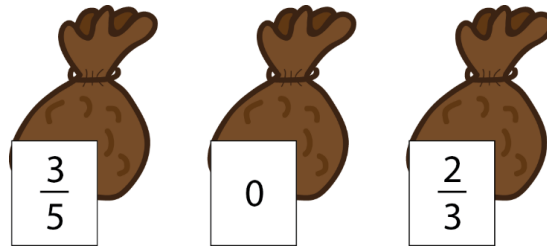


Grade 7: Prize Game

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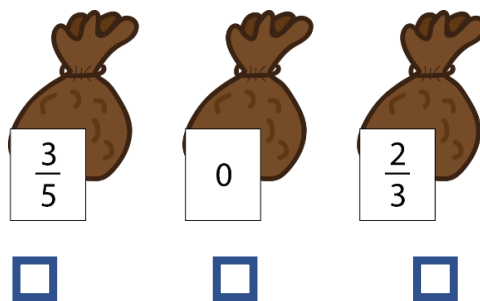
7.SP.C.5 - Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around $\frac{1}{2}$ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.

At a school party, there are three bags on a table.



The teacher says, “I have put some red marbles and white marbles into bags. Choose a bag, reach in without looking, and take out a marble. If the marble is red, you win a prize! The sign in front of each bag tells the probability of getting a red marble.”

To have the greatest chance of winning a prize, which of the three bags should you choose? Answer by selecting one of the boxes below.



Solution

Correct if student selects the third of the three bags.

The third bag gives the greatest probability of drawing a red marble. There are many ways to decide which probability is greater, $\frac{3}{5}$ or $\frac{2}{3}$:

- Rewrite the fractions as decimals to see that 0.66... is greater than 0.6.
- Rewrite the fractions with a common denominator to see that $\frac{10}{15} > \frac{9}{15}$
- Subtract $\frac{2}{3} - \frac{3}{5} = \frac{1}{15}$ to see that $\frac{2}{3}$ is greater than $\frac{3}{5}$ by that amount.
- Divide $\frac{2}{3}$ by $\frac{3}{5}$ and see how the answer compares to 1:

$$\begin{aligned}\frac{2}{3} \div \frac{3}{5} \\ &= \frac{2}{3} \times \frac{5}{3} \\ &= \frac{10}{9}\end{aligned}$$

This is greater than 1, so $\frac{2}{3} > \frac{3}{5}$.

If students get the right answer, you might ask how they thought about the problem. If students are having trouble with the problem, you might ask a warmup question: for example, ask what they think about the second bag. They should be able to interpret “0” as meaning that there is no chance of winning a prize with the second bag. Evidently there are no red marbles in that bag!

A follow-up question could be to ask the student what the probabilities are of not winning a prize, for each of the three bags. (Answers: $\frac{2}{5}$, 1, $\frac{1}{3}$) You could also ask: for any of these bags, are you more likely to win a prize or more likely not to win a prize?

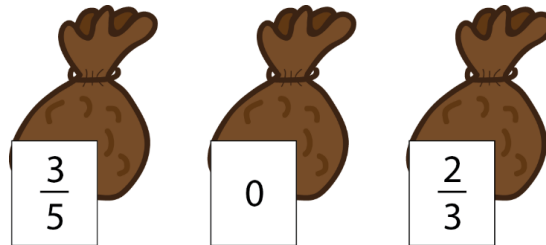
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Name: _____

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