

# Project 40

## What Are The Chances?

**Objective:** Child will develop an understanding that a probability of an event occurring will always be a fraction or a percentage between 0 and 1 through experimentation and reasoning.

**Essential Question:** What is the probability of an event occurring?

**Special Materials:** Brown lunch bags

**Bricks Required:** Brick plates, 1x to make the borders, any size bricks to keep a tally, and a separate quantity of bricks to put in the brown bag

**Project Structure:**

**Engage/Explain:**

1. Select two different colors of bricks.
2. Ask child, "If I place these two bricks in a paper bag and ask you to select a brick, what is the likelihood that you will select \_\_\_\_\_-colored brick?"
  - a. Give child a chance to think about the question and give a response.
  - b. Encourage child to not only give the answer, but provide supporting reasoning for their answer.
3. Tell child that you will now put one brick of a 3rd color into the bag.
  - a. Repeat the question above;
  - b. Allow them time to respond with reasoning.
4. Child should write the probability in terms of a fraction:  $\frac{1}{2}$  and  $\frac{1}{3}$ .
5. Child may use a number line (0-1) to help identify fractions and their magnitude.
6. Repeat the process if desired by adding a 4th and then 5th color.

**Explore:**

1. Ask child what happens to the probability of selecting a specific color as additional colors are added.
  - a. Are the chances of selecting that color getting larger or smaller?
  - b. Will the chances of selecting a certain color ever be certain?
2. Have child brainstorm around these questions and share their conclusions and reasoning.

**Explain/Elaborate**

1. Tell child that in each case above, their odds of selecting a brick were decreasing, and at most they had a 50-50 chance of selecting a specific brick color.
2. Task child with finding a way to increase their odds of selecting a specific color from the bag.
3. Allow child time and additional bricks to develop a model of ways they may increase their odds of selecting a specific brick color.
  - a. Have child provide reasoning and examples of their model, to show that it provides an increase in the probability of a certain color being selected.
4. Child's responses should include adding more of the same brick color to generate higher probabilities for those colors.
5. Child may run into difficulty in developing fractions, as the numerators and denominators change. Facilitate sound reasoning on a case-by-case basis.

