Objective: Students will be able to identify and calculate the odds of drawing a particular colored brick from a container.

*Vocabulary:
DIVIDE
PROBABILITY
RATIO
TRIAL
TOOL
SCIENTIFIC METHOD

Materials: LEGO® materials, Paper, Ruler, Containers

Preparation: Be familiar with LEGO® materials. Gather 50 2x2 bricks, be sure 25 are one color and 25 are another color, such as red and blue. Put them into a container that does not lend itself to peeking inside.

Discussion: The instructor will lead a group discussion regarding the concept of **probability**. Probability is the odds that something will happen, or that an event will occur. Usually, probability is expressed as a **ratio** of the number of favorable results **divided** by the total number of **trials**. For example, a coin has two sides. Flipping the coin in the air and catching it will result in a 1:2 odds that the coin will result in one side over the other. Probability is an important mathematical **tool** used by many people, from safety experts to weather anchors. Observing, making a hypothesis, predicting, and experimenting are what the **scientific method** is all about!

Activity 1: Students will randomly draw out a brick and record their results. After 10 trials (returning the drawn brick each time), ask students to guesstimate the probability of drawing one color over the other based on their experiments. Require students to calculate the odds of drawing a black brick using a ratio.

Activity 2: Repeat the experiment, but this time do not return the drawn bricks. At the end of 10 trials, require students to calculate the probability of drawing a particular color of brick on the 11th trial.

Activity 3: Challenge students to subtly influence the probability. Have them concentrate on a particular color, stand on one foot or utter a formula (such as: "Come out 2x2 red brick"). Compare the ratio with previous trials. Did the actions alter the probability?

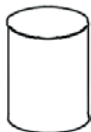**Activity 4:** Students will write a short essay defining and explaining the importance of calculating probability.
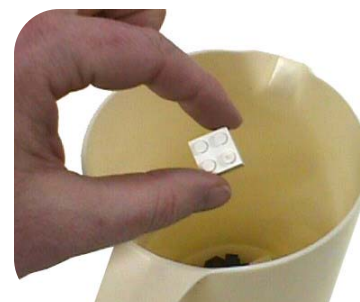
*Use the PCS Edventures™ Term Browser, http://www.edventures.com, or a dictionary to find vocabulary definitions.

Required Materials:

50 - 2x2
bricks

1 - solid
container

3. Place all fifty bricks into the container.

Check off when complete ☐
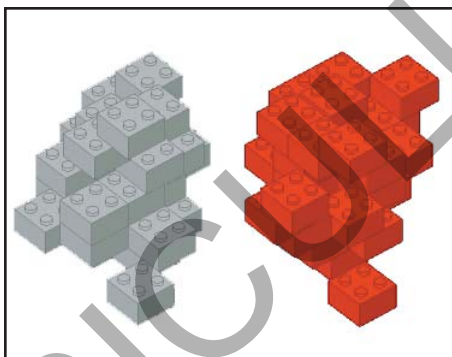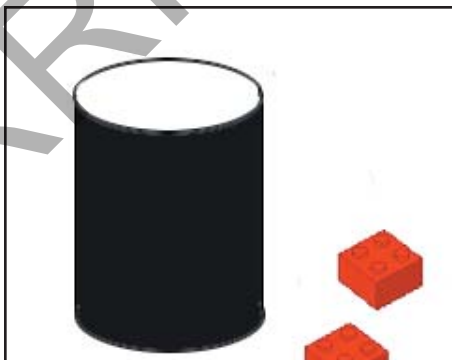
1. Count a total of fifty 2x2 bricks. Make 25 of the bricks one color and the other 25 another color. You should have two piles of like colored bricks.
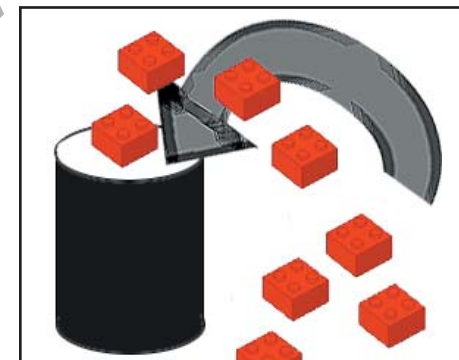
Check off when complete ☐

4. Select a brick without looking and record your answer on paper. Put the brick back into the container. Repeat this ten times.

Check off when complete ☐

2. Collect the solid colored container your instructor has provided for you.

Check off when complete ☐

5. Compare your data and create a ratio for your experiment!

2:1
7:10

Check off when complete ☐

Assessment
PROBABILITY

Name:

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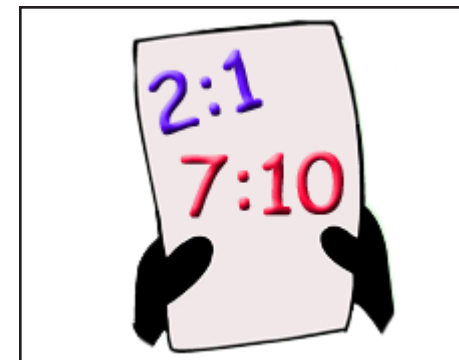
Vocabulary Review:

DIVIDE   PROBABILITY   RATIO

TRIAL   SCIENTIFIC METHOD   TOOL

Multiple Choice:

1. The odds something will happen is that event's...

- ○ Ratio
- ○ Trial
- ○ Length
- ○ Probability

2. A series of controlled experiments are referred to as...

- ○ Probability
- ○ Ratios
- ○ Trials
- ○ Tools

3. Probability is calculated as the...

- ○ Total number of trials
- ○ Number of favorable results divided by the total number of trials.
- ○ Total number of favorable results
- ○ All of the above

Questions to Ponder:

(Use these questions as a starting point for your journal entry.)

1. How do you calculate probability?

2. What are some uses for calculating probability?

3. Can you describe one step of the scientific method?

Journal Entry:

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Grade _____

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