



Lesson Time: 10–15 minutes

What's the Chance?

Objectives & Outcomes

Lesson Objectives: Students will investigate the concept of probability through data collection.

Lesson Outcomes: *Students will be able to...*

- Work collaboratively with a partner to collect and record data.
- Make predictions and draw conclusions based on their data.

Subject Area Connection: Math, Science

Background

Students are always interested in making sure that a game is fair. What is a fair way to decide who goes first in a game? In this lesson, students will investigate the probability of throwing “heads” and “tails” in a simple coin toss. Students will collect data with a partner, represent the data as a fraction, and draw a conclusion from the data as to whether or not a coin toss is a fair method to use to start a game. They will confirm the idea that the probability or chance of tossing “heads” is equal to the chance of tossing “tails.”

“What is a **fair way** to decide who goes first in a game?”

Getting Ready

Teacher Preparation: To prepare for this lesson, review the data collection sheet. Gather coins for students to use in their data collection.

Materials Required:

- one coin for each pair of students
- pencil
- data collection sheet

Introduction and Modeling

Begin by talking to students about how they might decide who takes the first turn in a game. Ask them if they have ever seen a coin toss at a sporting event. Discuss with students the idea behind a coin toss. What are the possible outcomes? Is a coin toss a fair way to decide who goes first? Why or why not? Tell students that they are going to flip a coin 10 times. Ask each student to predict how many “heads” and how many “tails” they will get out of the total 10 tosses. Students will record their prediction on the data collection worksheet.

Key Vocabulary

fair: the outcome of the coin toss is objective and equal for all.

prediction: a guess about what may happen.

probability: the chance that something will happen.

Procedure

1. Put students in pairs. Give each student a data collection sheet and a coin.
2. One student will toss the coin 5 times. Both students will record the results (heads or tails) on their data sheet.
3. Then, the other student will toss the coin 5 times. Both students will record the results on their data collection sheet.
4. Students will add up the number of "heads" and "tails" thrown out of 10 total tosses.
5. Students will write their results as fractions as shown on the data sheet.
6. Students will compare their results with their predictions.

Discussion Questions

- What were the results of your experiment? How did your prediction compare to what actually happened?
- Was the outcome the same for each group in the class?
- Is a coin toss a fair way to choose who goes first in a game?
- Can you think of any problems that can happen that make a coin toss unfair?
- Can you think of a time when a coin toss would not work?

Evaluation

- Ask students to decide what the chances are of picking an apple from a bowl that contains 2 bananas and 2 apples.
- Ask students to decide what the chances are of picking a strawberry from a bowl that contains 2 strawberries, 2 bananas, and 2 apples.

Tips for Tailoring this Lesson

For Higher Grade Levels

- Students can repeat the experiment using a six-sided die.
- Students can create a spinner with several sections shaded various colors. They can predict the chance of the spinner landing on a particular color and then test their prediction.

For Lower Grade Levels

- If coin tossing is difficult, students can conduct the experiment by reaching in a bag to choose one of two different colored candies.
- Students can predict the chance of drawing a paper of a certain shade from a group of four different pieces of paper.

Alignment to Standards and Frameworks

Common Core State Standards:

College & Career Readiness

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Anchor Standards for Writing

CCRA.W.1 Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

CCRA.W.1 Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

COIN TOSS STUDENT DATA COLLECTION

I predict that when my partner and I toss the coin 10 times we will get _____ heads and _____ tails.

DIRECTIONS: Put an X in the box for the outcome of each coin toss.

COIN TOSS DATA

TOSS #	HEADS	TAILS
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

When my partner and I tossed the coin 10 times we got _____ heads and _____ tails.

Write your results as a fraction. We tossed "heads"

10

Write your results as a fraction. We tossed "tails"

10

Is the outcome the same or different from your prediction? _____