

Investigating Chance Processes of Probability

Lesson Overview

In this lesson, students learn that the probability of a chance event is likely, unlikely or neither. Students will also learn to predict the probability of a chance event and compare that prediction to actual observations by collecting data.

Standards Addressed

- CCSS 7.SP.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 around $\frac{1}{2}$ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
- CCSS 7.SP.6 Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency and predict the approximate relative frequency given the probability.

Disciplinary Literacy Best Practices

- Agree and Disagree Statements
- Brainstorm (for Likely/Unlikely Activity)
- Partner Talk (during “Does It Match?” Activity)
- Exit Slip

Lesson Plan

Time Required – one 60–minute class period

Disciplinary Vocabulary: Chance event, probability, likely, unlikely, prediction

Materials needed:

- One Die for each pair of students (Shake ‘em Dice is a free App for iPad)
- Likely/Unlikely Activity: 3 chart papers, 3 sticky notes per student
- “Does It Match?” Activity

Engage

- Students complete the first column of the Agree and Disagree Statements about events and whether each is likely. Students should select “agree”, “disagree”, “it depends on”, or “not sure” and write their thoughts that led to their selection.
- Teacher will tell that students that they will be learning about the mathematics behind deciding if something is likely or unlikely. Events are determined to be likely or unlikely based on data. For example, we determine whether it is likely to rain today (the first statement) by the data we have from the weather forecast. What percentage chance of rain would make it “likely”? What percentages would mean rain is “unlikely”?
- With your elbow partner, consider each of the events. What data might you collect to determine if each event is likely?
- Class discussion: What evidence do we have for each of the events? Which ones are likely? Which ones are unlikely?

Explore Part One

- Brainstorm: Students will think of events that are LIKELY, UNLIKELY and NEITHER. Students will write each event on a post it note and place them on charts labeled Likely, Unlikely or Neither (three separate charts.)

Explain Part One

- Teacher will lead discussion about the events posted on each chart. Students will come to consensus and share reasoning why they identified the events as likely, unlikely, or neither.

Explore Part Two

- Students will work with partners to complete the tasks on the “Does it match?” activity sheet. Students will predict the probability of rolling a 4 if they roll one die, then compare their prediction with the experimental probability found from rolling a die 48 times.
- Students will record their results on a class probability chart.

Explain Part Two

- For the “Does It Match?” activity, the students will share their findings with the class.
 - *Did we all get the same results? Why or why not?*
 - *Let’s see what happens if we add all of our experiments together.*
 - *What do you think would happen if we did this experiment 1000 times? 10,000 times? A million times?*
- The Theoretical Probability ($1/6$) is based on an unlimited number of rolls of the die. The more times we do the experiment, the closer our experimental results (experimental probability) will get to the calculated theoretical probability.

Assessment: Exit Slips: *Explain what makes an event LIKELY to happen.*

Teacher Biographical Information

Lesson Author: Audra Hill is an education specialist with S²TEM Centers SC. She has 20 years experience teaching math, five of which were in a middle school math class in Horry County Schools.

Likely and Unlikely Agree and Disagree Statements

Name: _____

Date: _____

Statement	How can you find out?	Evidence
1. It is likely to rain today. ___ agree ___ disagree ___ it depends on ___ not sure My thoughts:		
2. It is likely that you will have homework tonight from this class. ___ agree ___ disagree ___ it depends on ___ not sure My thoughts:		
3. It is likely that we will have chicken tomorrow for lunch in the cafeteria. ___ agree ___ disagree ___ it depends on ___ not sure My thoughts:		
4. It is likely that the teacher will be absent tomorrow. ___ agree ___ disagree ___ it depends on ___ not sure My thoughts:		

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Name: _____ Date: _____

“Does It Match?”

IF you were to roll a die, how likely would it be that you’d roll a 4? Circle one

UNLIKELY

NEITHER

LIKELY

Explain: _____

Predict the probability that you will roll a 4. _____

Explain: _____

EXPERIMENT

Roll a die 48 times and record the results in this chart. Use tally marks, then totals.

Roll	Tally	Total
1		
2		
3		
4		
5		
6		

How many times did you actually roll a 4 out of the 48 rolls? _____

Write the fraction in simplest form. _____

Does your prediction match what actually happened? _____

Why or why not? _____

EXTENSION: Predict the probability of rolling an even number. _____

Explain: _____

