

TAKING YOUR CHANCES

An Introduction to Probability

Target Grade: Sixth Grade

Estimated Time: 45-55 minutes

Materials: 10 fair coins; 10 fair dice; 10 spinners; pencils; paper

Lesson Topic: Probability Events

Michigan Benchmark #: D.PR.06.01 and D.PR.06.02

Objectives: Students will be able to...

1. Express probabilities as fractions, decimals, or percentages between 0 and 1.
2. Explain that events with 0 probability will not occur; and events with probability 1 will occur.
3. Compute probabilities of events from simple experiments with equally likely outcomes.
4. Devise probability experiments such as tossing dice, flipping coins and spinning spinners.
5. List all possible outcomes of a probability experiment.
6. Find the fraction that meets the given conditions.

Procedure:

1. Define probability and introduce the topic with brief background information.

A probability is, at its simplest, a ratio that indicates how likely or unlikely something is.

It all got started when two friends tried to figure out who was most likely to win a game.

2. Present some common examples of probability in everyday life.

What are the chances of winning a game of tic-tac-toe?

How likely is it that it will be sunny during the week and rain on the weekend?

3. Define key probability terms. (experiment, outcome, sample space, event etc.)

*A probability **experiment** is an activity with results that can be observed and recorded.*

*The **outcome** is each possible result of a probability experiment.*

*A **sample space** is the set of all possible outcomes for a probability experiment.*

*A probability **event** is any subset of a sample space, e.g. heads, tails, odds, evens, blue.*

4. Demonstrate a simple experiment to illustrate the key probability terms.

Roll a die ten times recording each outcome. Use volunteers. Apply terms to results.

5. Explain how probabilities are to be expressed as values between 0 and 1; explain 0 and 1 too.

Identify roles of numerator/denominator in probability fractions; decimals/percentages.

6. Demonstrate a couple more simple experiments to illustrate such numerical representation.

Calculate probability of outcomes beginning with letter T for the following experiments:

Toss a coin ten times recording outcomes. Use volunteers. Express findings numerically.

Have volunteers roll a die a random number of times. Express findings numerically.

7. Assign simple probability experiments for the students to complete in small groups.

Spin the spinner twenty (20) times and record outcomes, sample space and events. Pose

various events; groups must record probabilities in fractions, decimals and percentages.

Evaluation:

1. Students will be evaluated for effort and general grasp based on their level of participation.
2. Students will be rated on discussion of group results, observations, conclusions, suggestions.
3. Students will be assessed by their responses to verbal and visual class review questions.
4. Students will be graded on their overall grasp of the material using the lesson worksheet.
5. Students will be expected to demonstrate lesson mastery by devising a probability game.



Taking Your Chances

Probability Worksheet



Fill in the Blank

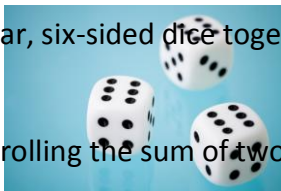
1. The _____ is each possible result of a probability _____.
2. A _____ is a ratio that indicates how _____ or unlikely something is.
3. A _____ space is the set of all possible outcomes for a probability _____.
4. A probability _____ is an activity with results that can be _____ and recorded.
5. A probability _____ is any subset of a _____ space.

Write your answer in the space provided.

6. What is the probability of rolling a three-letter number using a regular, six-sided die?

7. What is the probability of a coin landing on either heads or tails if dropped on the floor?

8. List the sample space of rolling three regular, six-sided dice together.

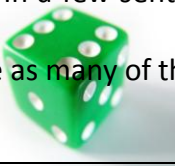


9. Use decimals to express the probability of rolling the sum of two (2) in the example above.



10. In a few sentences, describe your own simple probability experiment using a coin or a die.

Use as many of the key probability terms as you can. _____





Challenge: Your friend places a regular deck of 52 playing cards facedown on the table and asks you to pick a card. What is the probability that you will not draw a face card?

Taking Your Chances

Probability Worksheet Answer Key

1. outcome / experiment
2. probability / likely
3. sample / experiment
4. experiment / observed
5. event / sample
6. $\frac{1}{2}$
7. 1
8. {3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18}
9. 0.0
10. Answers will vary.

Challenge: 10/13