

# 6.1 Lesson

## Key Vocabulary

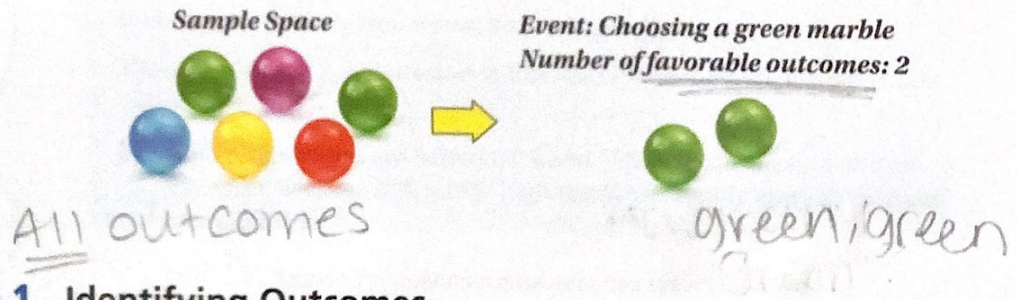
experiment, p. 461  
 sample space, p. 461  
 outcomes, p. 461  
 event, p. 461  
 favorable outcomes, p. 461  
 probability, p. 462  
 relative frequency, p. 464

## Key Idea

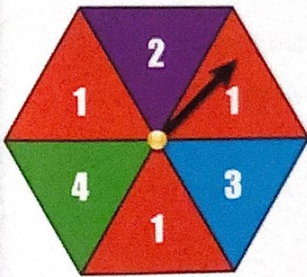
### Outcomes and Events

An **experiment** is an investigation or a procedure that has varying results. The **sample space** of an experiment is the set of all possible results, or **outcomes**, of the experiment. A collection of one or more outcomes is an **event**. The outcomes of a specific event are called **favorable outcomes**.

For example, randomly choosing a marble from a group of marbles is an experiment. Each marble in the group is an outcome. Selecting a green marble from the group is an event.



### Example 1 Identifying Outcomes



You spin the spinner.

- a. Find the sample space. How many possible outcomes are there?

The sample space is the set of all possible outcomes of spinning the spinner, {1, 2, 1, 3, 1, 4}. So, there are six possible outcomes.

- b. What are the favorable outcomes of spinning an even number?

even	not even
2, 4	1, 1, 3, 1

The favorable outcomes of spinning an even number are 2 and 4.

- c. In how many ways can spinning a number less than 2 occur?

less than 2	not less than 2
1, 1, 1	2, 3, 4

The possible outcomes of spinning a number less than 2 are 1, 1, and 1. So, spinning a number less than 2 can occur in 3 ways.

sample space

1, 2, 1, 3, 1, 4

Favorable outcomes of even #

2, 4

How many ways spinning < 2?

1, 1, 1  
 so 3 ways



**Try It**



1. You randomly choose one of the tiles shown from a hat.
  - a. Find the sample space. How many possible outcomes are there?

A, B, B, D, E, C, B, A

8 possible outcomes

- b. What are the favorable outcomes of choosing a vowel? A E I O U

A, E, A

- c. In how many ways can choosing a consonant occur?

any letter not a vowel

B, D, B, C, B

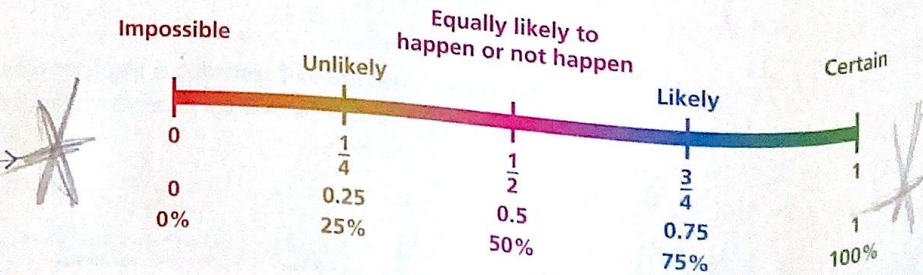
5 ways

**Key Idea**

**Probability**

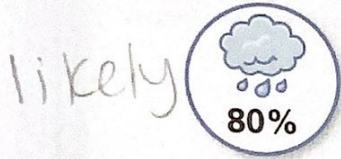
The **probability** of an event is a number that represents the likelihood that the event will occur. Probabilities are between 0 and 1, including 0 and 1. The diagram relates likelihoods (above the diagram) and probabilities (below the diagram).

Probabilities can be written as fractions, decimals, or percents.



## Example 2 Describing Likelihood

There is an 80% chance of rain, a 50% chance of thunderstorms, a 15% chance of hail, and a 20% chance of high winds tomorrow.



- a. Describe the likelihood that there is rain tomorrow.

The probability of rain tomorrow is 80%.

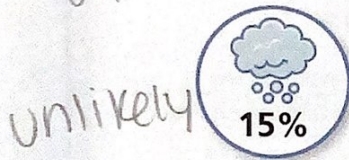
- ▶ Because 80% is close to 75%, it is *likely* that there will be rain tomorrow.



- b. Describe the likelihood that there are thunderstorms tomorrow.

The probability of thunderstorms tomorrow is 50%.

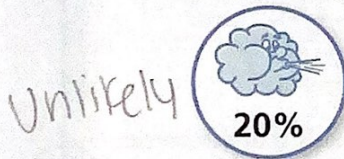
- ▶ Because the probability is 50%, thunderstorms are *equally likely to happen or not happen*.



- c. Which is more likely tomorrow, hail or high winds?

The probability of hail tomorrow is 15%, and the probability of high winds tomorrow is 20%.

- ▶ Both probabilities are between 0% and 25%, so each event is *unlikely*. However, because  $20\% > 15\%$ , high winds are slightly more likely than hail tomorrow.



\* for it to be impossible, HAS to be exactly 0  
 certain → HAS to be exactly 100

**Try It** Describe the likelihood of the event given its probability.

2. The probability that you land a jump on a snowboard is  $\frac{1}{10}$ .

$$1 \div 10 = 0.1$$

10% unlikely

3. There is a 100% chance that the temperature will be less than 120°F tomorrow.

certain

