Unit 8, Lesson 2

Chance Experiments

Let's investigate chance.

2.1 Which Is More Likely?

Which is more likely to happen? Explain your reasoning.

- When reaching into a dark closet and pulling out one shoe from a pile of 20 pairs of shoes, a left shoe is pulled out.
- When listening to a 5-song playlist in shuffle mode, the first song on the playlist plays first.

2.2 How Likely Is It?

1. For each **chance experiment**, label the **event** with one of these options: impossible, unlikely, equally likely as not, likely, certain.

   a. A raffle prize is given to the person holding 1 ticket drawn from the 100 given out.
   Event: One of the 2 tickets you have is chosen.

   b. You time how long you wait before someone takes your order at a fast-food restaurant.
   Event: It takes less than 10 minutes.

   c. You roll a standard number cube.
   Event: You get an even number on top.

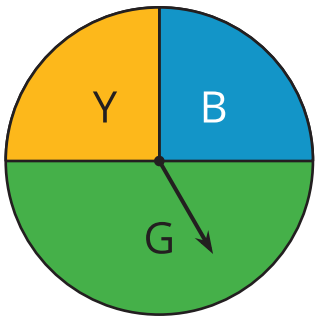
d. A random 4-year-old child is selected and their height is measured.
Event: The chosen child is over 6 feet tall.

e. You write down the weather on July 1.
Event: It snowed on that day.

f. You toss a ball into water.
Event: The ball gets wet.

g. You spin the spinner here and find out which part the arrow points to.
Event: It points to green.

h. You spin the spinner here and find out which part the arrow points to.
Event: It points to red.



2. Discuss your answers to the previous question with your partner. If you disagree, work to reach an agreement.
3. For each of the 5 labels, write a combination of chance experiment and event that fits the likelihood.

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2.3 Take a Chance

Your teacher will have 2 students play a short game.

1. During the first round, player 1 won if it was even, and player 2 won if it was odd. What do you notice about the results of the games this round?

2. During the second round, player 1 won if it was 1, 2, 3, or 4, and player 2 won if it was 5 or 6. What do you notice about the results of the games this round?

3. Did you expect those results? Explain your reasoning.

Are you ready for more?

On a game show, there are 3 closed doors. One door has a prize behind it. The contestant chooses one of the doors. The host of the game show, who knows where the prize is located, opens one of the *other* doors which does not have the prize. The contestant can choose to stay with their first choice or switch to the remaining closed door.

1. Do you think it matters if the contestant switches doors or stays?
2. Practice playing the game with your partner and record your results. Whoever is the host starts each round by secretly deciding which door has the prize.
   a. Play 20 rounds where the contestant always stays with their first choice.
   b. Play 20 more rounds where the contestant always switches doors.
3. Did the results from playing the game change your answer to the first question? Explain.

2.4 Card Sort: Likelihood

Your teacher will give you a set of cards. Each card contains a situation describing a chance experiment and event.

Sort the situations so that they are in order from least likely to most likely.

Lesson 2 Summary

A **chance experiment** is something that can be done over and over again, and what ends up happening is unknown before doing the experiment. For example, flipping a coin is a chance experiment because we don't know if the result will be a head or a tail. An **outcome** of a chance experiment is one of the things that can happen when the experiment is done. For example, when a coin is flipped, one possible outcome is that it will be a head. An **event** is a set of one or more outcomes.

We can describe events using these words and phrases:

- Impossible
- Unlikely
- Equally likely as not
- Likely
- Certain

For example, if we flip a coin:

- It is *impossible* that the coin will turn into a bottle of ketchup.
- It is *unlikely* that the coin will land on its edge.
- It is *equally likely as not* that we will get a tail.
- It is *likely* that you will get a head or a tail.
- It is *certain* that the coin will land somewhere.

The *probability* of an event is a measure of the likelihood that an event will occur. We will learn more about probabilities in the lessons to come.

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