What Could Happen?

Grade Level: 7th

Subject(s):

Primary: Math

Integrated Activity: Science

Reporting Category:

Probability, Statistics, Patterns, Functions, and Algebra

Lesson Summary and Connections:

Students will compare the relative probability of two different objects being selected for an event.

Lesson Components Links

VESOL(s) Complexity Continuum	Functional Skills	Assistive Technology	Materials
Vocabulary	Common Misconceptions	Student-Friendly Outcome(s)	Introductory Activity
Plan for Instruction	Differentiation:	Reflection	Formative Assessment
Word Wall Cards	Supplemental Materials	Practice Items	Integrated Activity

VESOL(s):

M-PS.7.1: The student will determine the likelihood of an outcome of a simple event.

Complexity Continuum:

Concepts could range from determining the probability of an outcome given a group of:

- 2 to 10 objects
- 11 to 20 objects
- 21 to 40 objects

Functional Skill(s):

- Making choices for dressing for correct weather
- Being flexible and making back-up plans if something does not work out
- Understanding the possibility of different outcomes to events
- Creating flexible solutions

Assistive Technology/AAC (Augmentative and Alternative Communication):

- Adapted Pencil, if needed
- Pencil grip, if needed

- Hands on materials for students to physically manipulate the materials/problem
- PowerPoint slide or Google slide of activity or problem for students to manipulate the problem or visually represent the problem
- High contrast visuals

Materials:

- Computer/Projector/Speakers
- Pencils
- Highlighters, colored pencils, crayons, etc.
- Word Wall
- Probability Introduction Cards.
- Probability! Mini Math Movie (video)
- Mystery Bags hand out and bags, pencils, crayons, blocks, candy etc.
- Probability Worksheet
- Notes page
- Integrated Lesson Materials:
  - How do You Know it Will Rain video
  - Weather Probability Worksheet

Vocabulary:

Prior Knowledge What words will students need to know prior to starting the lesson?

- chance
- might
- could
- always
- never
- probably

Current Vocabulary What words will students learn during the lesson?

- probability
- certain
- likely
- unlikely
- impossible
- equally Likely
- probability number line
- event

Common Misconceptions:

- Students may struggle to understand that it could happen but is not guaranteed to happen.
- Student may struggle to understand that there are various outcomes that could happen.
- Students may struggle to determine probability if the likely outcome of events are very similar.

Student-Friendly Outcome(s):

- I can use the words certain, likely, and impossible to describe events.
- I can use the words likely, equally likely, and unlikely to describe events.

Prior to the start of the lesson, hang the Word Wall cards associated with this unit on a bulletin board or central location. These cards should be used throughout the lesson to enhance student understanding.

Introductory Activity:

- Hand each student a set of Probability Introduction Cards.
  - Have a class discussion on the words on the cards and what each word means. Use the Word Wall cards to help aide your discussion.
  - Keep a running log of students who remember and those who struggle with the words and their meaning.

- Ask the following questions and have students respond using their cards. Students can hold up their card, point to the card or use eye gaze. Encourage students to explain why they chose the card they did.
    - *How likely are you to get out of bed tomorrow morning?*
    - *What is the likelihood the sun will rise in the morning?*
    - *How likely are you to drive a car today?*
    - *What is the likelihood of the pencil on your desk being yellow?*
        - This question may have different responses. Encourage your students to talk about these differences.
        - If a student has more than one pencil on their desk, encourage them to share their thoughts about the chance of randomly picking one from their group of pencils.
    - *What chance do you have of riding the bus home today?*
    - Continue to ask questions that are relevant to students pausing to give students a chance to explain their response and/or ask questions.

Plan for Instruction:

- Complete the introductory activity. Emphasize that probability is used every day in our lives even though we might not think about it as using probability. It can be used for what we are having for dinner, the activities we complete at school or at home, picking out clothes, etc. For this lesson, the focus will be determining the probability by using the terms certain, likely, equally likely, unlikely, and impossible.

Part 1

- Create an anchor chart with your students reflecting on what they know about probability from their past experience and/or the introductory lesson. An anchor chart is a tool that is used to support instruction throughout a unit. It is an "anchor" for the learning that is taking place. It should be created with your students (not prior to instruction), capture important content, and be displayed throughout the unit where students have access to it.
- Watch the video Probability to further develop understanding of the vocabulary and have students continue to think about how they use probability daily.
    - Pause the video each time the main character juggles the balls. Have students recap/summarize what they heard and add anything new to the anchor chart.

Part 2

- Create Mystery Bags using items from the classroom such as pencils, crayons, blocks, candy, etc. Use bags that students cannot see inside. Students will use these to experiment and practice the vocabulary from the introduction lesson.
- Example bag setups- use these examples to help you create the different bags for your students. Create different bags with different variety of objects to match the ability levels in your room. These are just examples. You may set the bags up any way you wish just make sure to stay within the parameters of the standard.
    - Bag one: two objects of different color (i.e., 1 yellow block and 1 green block)
    - Bag two: two objects of the same color (i.e., 2 pieces of purple candy)
    - Bag three: four objects with two different colors (i.e., 2 red pencils and 2 blue pencils)
    - Bag four: twelve objects eight objects of color one, three object of color two, and one object of color three. (i.e., 8 orange crayons, 3 black crayons, and 1 white crayon)
    - Bag five: 20 objects 4 of one color and 16 of another color (i.e., 4 green colored counters and 16 red colored counters)
- Give each student, pair of students, or small group a bag.
    - Have students guess what they think is inside the bag, then check to see if their prediction was correct.
    - Next have students talk about what is in the bag (number of objects, colors, etc.) Encourage those who can read to read the information card.

- Each card will have four questions for the contents inside the bag. Have students answer the questions either orally to a teacher or their partner or print a copy of the completed Mystery Bags table for them to record their answers.
- Students can experiment with the objects in the bags by randomly taking an object from the bag and replacing it back in the bag. They can do this several times to see if their answers to the questions were correct. If students aren't physically able, they can be partnered up or have the teacher or aide assist them. This is a good time to explain that we use probability to make predictions but sometimes those predictions don't actually happen.
- Rotate the bags around so students get an opportunity to work with several different bags.
- Conduct a whole class discussion encouraging students to talk about their experiences with the bags. Ask questions like: "What surprised you the most about this experiment?" Which bag did you think had the easiest probability to figure out and why?" "Which had the hardest and why?" "What strategy did you use to guess the probability/answer the questions for each bag?"

Part 3

- Hand each student a copy of the Probability Worksheet (Use manipulatives for students who are struggling to picture what is happening in each of the scenarios.)
  - Individually or in a small group setting, have students complete each question.
  - Once students have completed all five questions, have a whole group/small group discussion about their understanding of probability.
  - The worksheet and this discussion will act as formative assessments for this unit.
- Give each student a Notes page
  - The notes page has the definition and a visual for each word.
  - The student must come up with their own version of the definition and may use pictures, words and/or numbers in this version. (This can be stated orally or written down on the notes page.)
  - The notes will act as a way for students to reflect on their learning.

Differentiation:

- Thorough out the lesson, ways to differentiation have been given.
- Create mystery bags that have many objects of differing colors.
- Have students create their own mystery bags and questions. These can then be used by other students.
- Some students might be overwhelmed with the amount of reading, consider presenting only the pictures and the question.

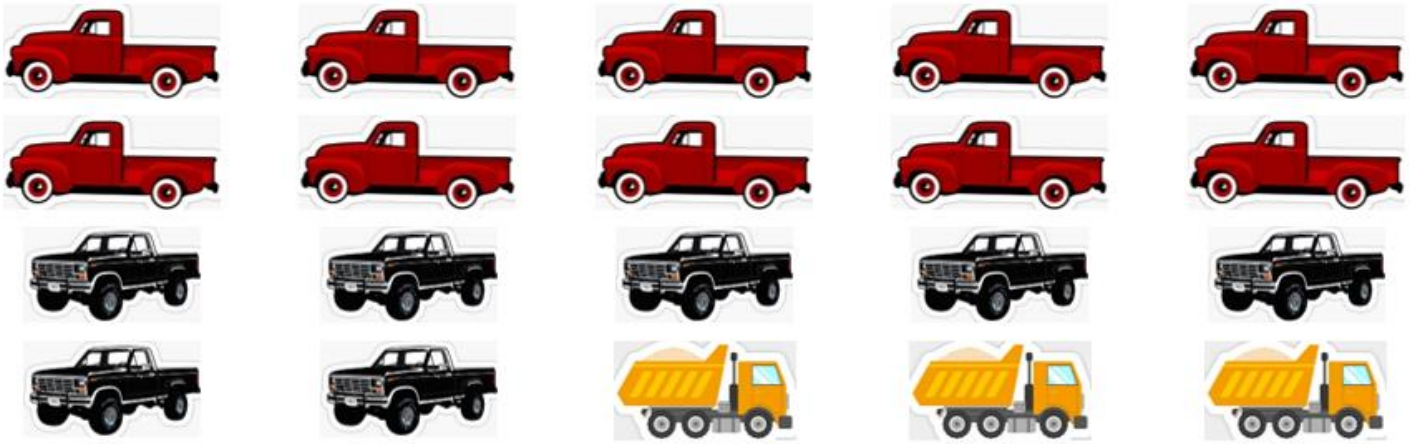
Reflection:

- Completing the Notes page.
- Students could reflect on how they use probability daily. Pose this question to students and ask them how they might find out the probability.
  - Kathryn's favorite Starburst color is orange. What is the probability of her picking an orange out of a bag of Starbursts?

Formative Assessment:

Directions: Use the situations to answer the questions that follow each.

Antony has a collection of truck stickers. He had 10 red, 7 black, and 3 yellow truck stickers. Antony put all his truck stickers in a bag.



1. If Antony reached in the bag of stickers, what is the probability he would take a red truck sticker?

   certain impossible likely

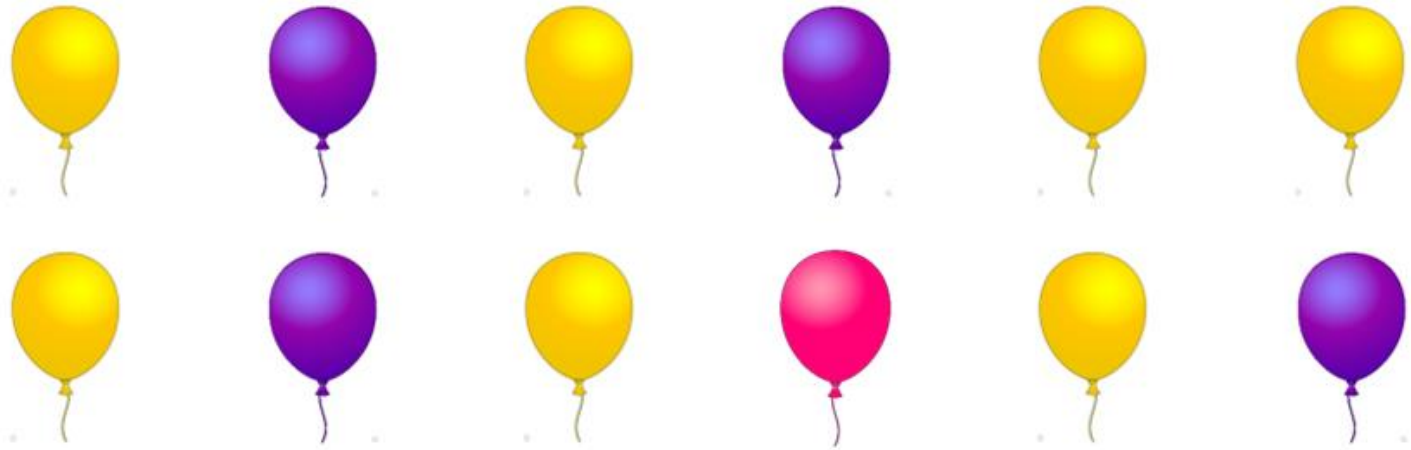
2. If Antony reached in the bag of stickers, what is the probability he would take a yellow truck sticker?

   unlikely certain impossible

3. If Antony reached in the bag of stickers, which color truck sticker is he most likely to take out of the bag?

   red black yellow

Lilah got 12 ballons on her birthday. She had 7 yellow balloons, 1 pink balloon, and 4 purple balloons.



4. If Lilah closed her eyes and grabbed a balloon, what color balloon would she probably grab?

purple yellow pink

5. If Lilah closed her eyes and grabbed a balloon, what is the likelihood Lilah would grab a white balloon?

certain likely impossible

6. If Lilah closed her eyes and grabbed a balloon, what is the likelihood she would grab a yellow balloon?

certain impossible unlikely

Notes:

- Students could create a list of ways they use probability in their daily lives. They can use these examples with their peers to determine the probability of other students choosing the same outcomes. This could then be graphed to further reinforce graphing.
- Teachers could increase student engagement by using things that are of personal interest to their students. This could include TV shows, stickers, characters, food, candy, etc.
- For the candy, teacher could get a small bag of M&Ms or skittles, or even a variety of small chocolates, or food preferences to complete a probability activity.

Integrated Activity

S-8.6 The student will recognize different types of weather conditions and their characteristics.

- Show this image of the weekly forecast or the weekly forecast for your local area.

- Have student compare and contrast this forecast with the activities they completed in the math lesson.
  - Ask questions like: “What do you notice? What do you wonder?”, “What do you think the numbers mean?” “What about the pictures?”, “Which day is most likely to have rain?” “Which day is most likely to be sunny all day?” “Which day has an equally likely chance of rain and sun?”, “Can we use the words impossible or certain when looking at the weather?”
  - Discuss with students that Meteorologist use probability and science to predict the weather.
- Show How do You Know it Will Rain video. Pause the video often to have students recap what they heard.
- After the video, have a discussion on how using the weather forecast helps us make decisions about what to wear and what activities we can do. Encourage students to explain how they would dress and/or what activity they might do on each day.
- To close the lesson hand students the Weather Probability Worksheet
  - Students will use the 7-day forecast to determine the different chances of weather types. Students will also determine if accessories, such as a jacket, rain boots, umbrella, snow suit, etc. will be needed based on the weather forecast for a day.

Weather Probability Worksheet

Name: _____ Date: _____

Part I: Weather Predictions

Directions: Look at the 7-day weather report and answer the questions.

1.) What is the chance that there will be rain on Monday?

likely unlikely impossible

2.) What is the chance that there will be only sun on Wednesday?

likely unlikely certain

3.) What kind of weather is probable for Saturday?

sunny rainy cloudy

Part II: Dressing and Being Prepared for Weather

Directions: Using the weather forecast determine to answer the questions.

4.) Based on the forecast for Thursday, will you need to bring an umbrella with you in case it rains?

Yes No

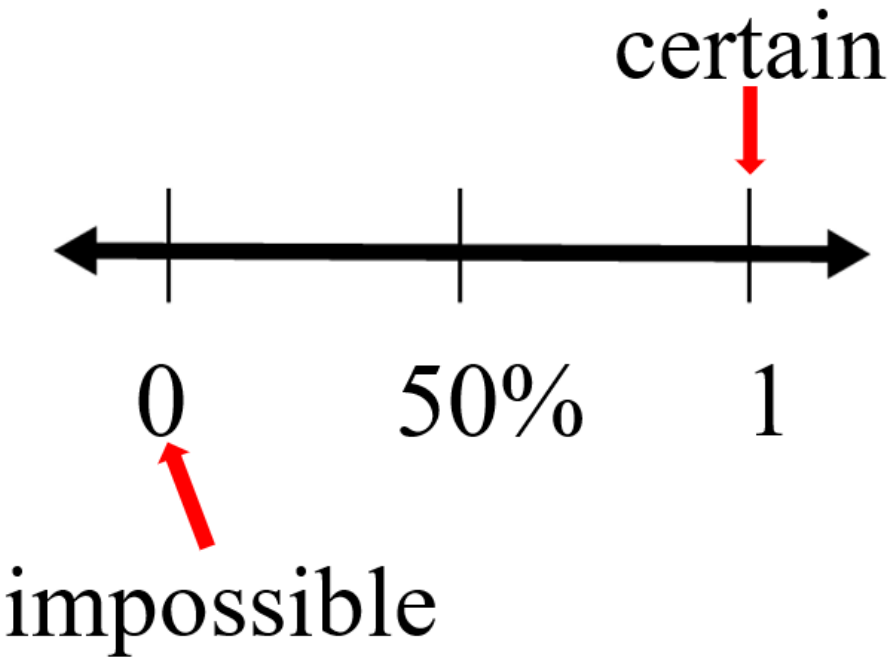
5.) Which student is prepared for the weather on Monday?

6.) You want to go play outside this week. Which days would NOT be good days to play outside?

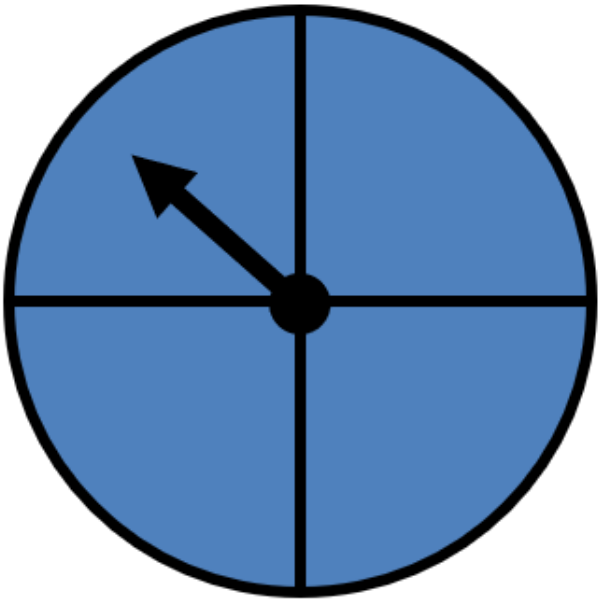
Monday/Tuesday Saturday/Sunday Thursday/Friday

Word Wall Cards:

Probability Number Line



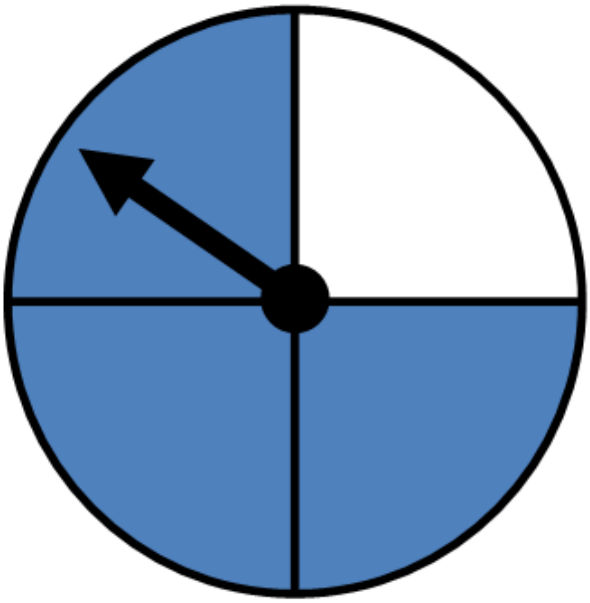
Certain



is certain

100% probability

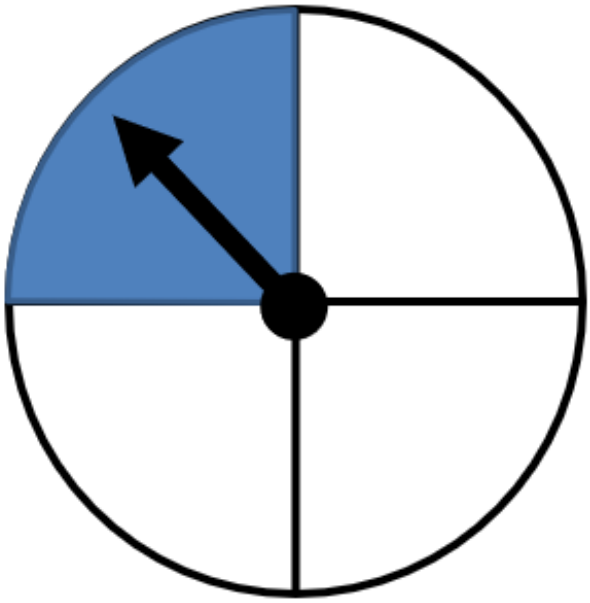
Likely



is likely

75% probability

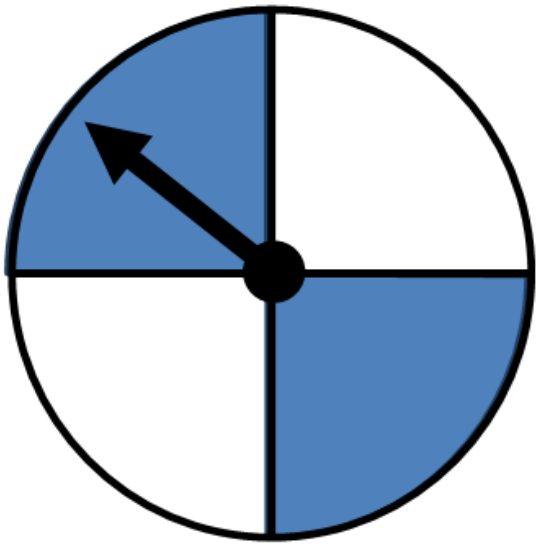
Unlikely



is unlikely

25% probability

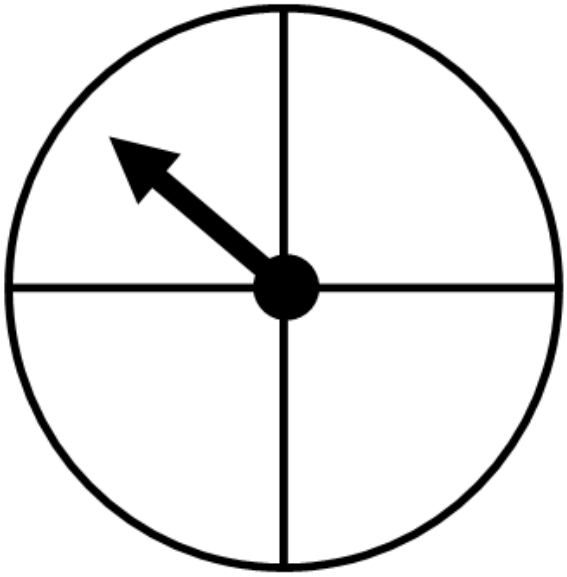
Equally likely



■ and □ are equally likely

50% probability

Impossible



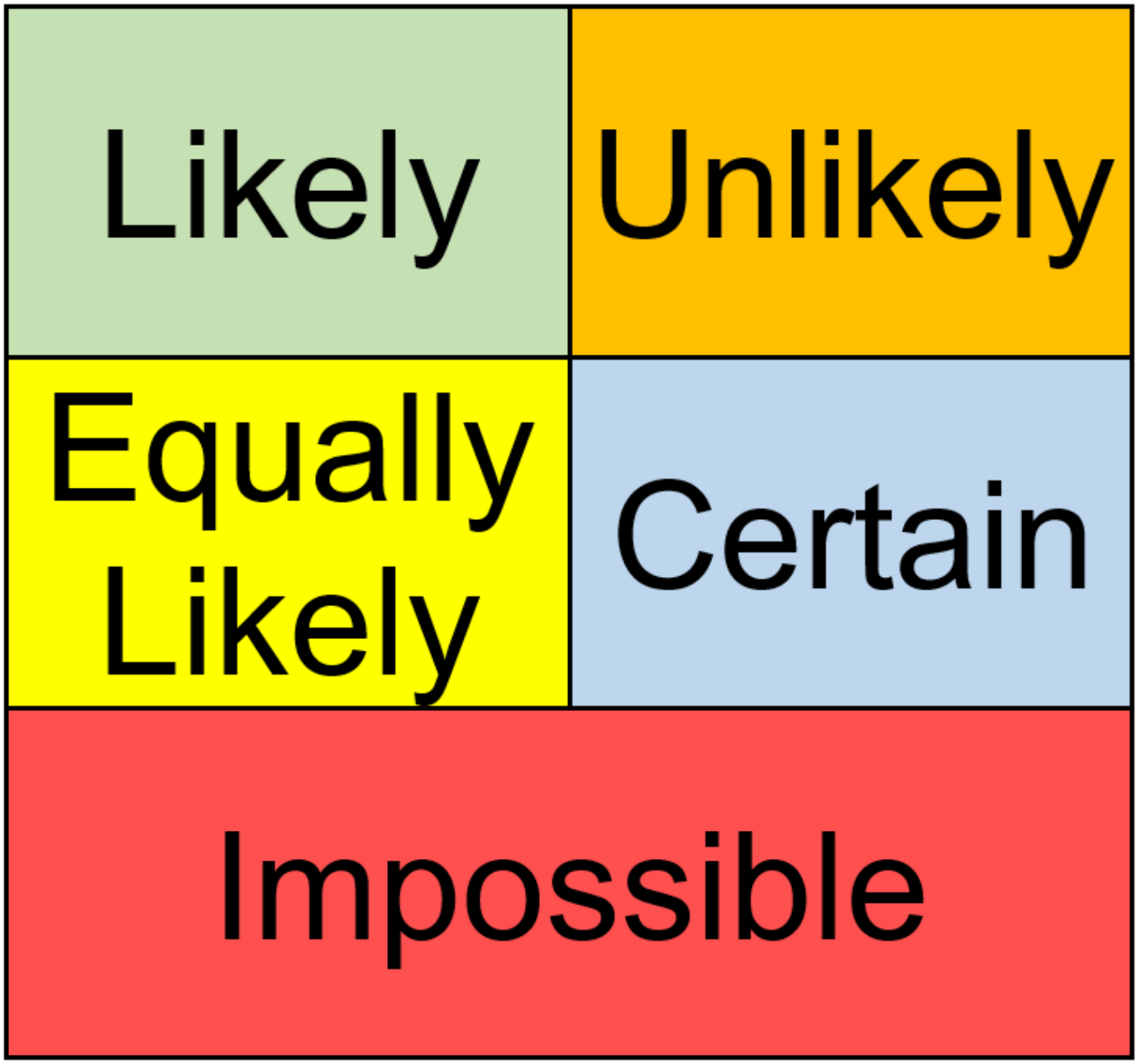
■ is impossible

0% probability

Supplemental Materials:

Probability Introduction Word Cards

Directions: Use these cards with the introduction activity. Give each student a set of 5 cards. If you can't print in color, use a marker and color or circle the word on each card to help student who struggle to read identify the cards. When you ask a question, have the student hold up the card they think matches the likelihood of the event happening.



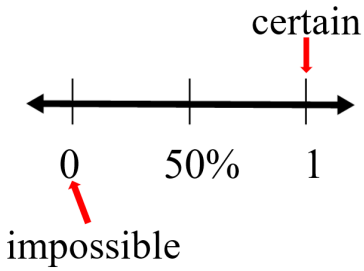
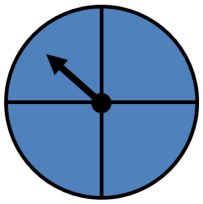
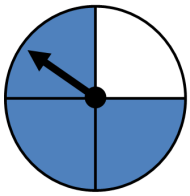
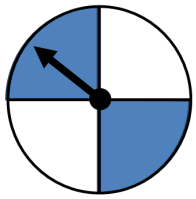
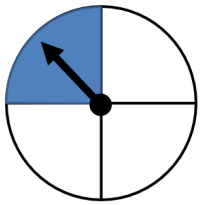
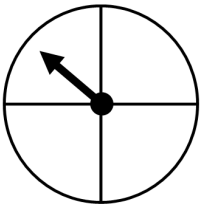
Myster Bag Activity

Directions: Create an information card for each mystery bag you make. Use the example bag as a guide for each card. Adjust the cards as needed by adding more than two different objects or limiting it to just one object. Make sure to stay within the parameters of the standard. Add four questions similar to the example for each of the bags created. Once you are finished creating the cards, cut them out and place them inside their respective bags. If you would like students to record their answers, print a copy of the filled in table below. Students can circle their answers.

Example Bag	**Bag 1**
Number of objects in the bag: 2 Object 1: 1 red pencils Object 2: 1 yellow pencils Answer the following questions: 1. What is the likelihood of taking a red pencil out of the bag without looking? Certain, likely, equally likely, unlikely, or impossible 2. What is the likelihood of taking a yellow pencil out of the bag without looking? Certain, likely, equally likely, unlikely, or impossible 3. What is the likelihood of taking a blue pencil out of the bag without looking? Certain, likely, equally likely, unlikely, or impossible 4. If you take a pencil out of the bag without looking, what are you likely to take? Red pencil, yellow pencil, the same chance for both	Number of objects in the bag: Object 1: Answer the following questions: 1. What is the likelihood 2. What is the likelihood 3. What is the likelihood 4. If you take a _____ out of the bag without looking, what are you likely to take?
Bag 2	**Bag 3**
Number of objects in the bag: Object 1: Object 2: Answer the following questions: 1. What is the likelihood 2. What is the likelihood 3. What is the likelihood 4. If you take a _____ out of the bag without looking, what are you likely to take?	Number of objects in the bag: Object 1: Object 2: Object 3: Answer the following questions: 1. What is the likelihood 2. What is the likelihood 3. What is the likelihood 4. If you take a _____ out of the bag without looking, what are you likely to take?
Bag 4	**Bag 5**
Number of objects in the bag: Object 1: Object 2: Object 3 Object 4 Answer the following questions: 1. What is the likelihood 2. What is the likelihood 3. What is the likelihood 4. If you take a _____ out of the bag without looking, what are you likely to take?	Number of objects in the bag: Object 1: Object 2: Object 3 Object 4 Answer the following questions: 1. What is the likelihood 2. What is the likelihood 3. What is the likelihood 4. If you take a _____ out of the bag without looking, what are you likely to take?

Probability Notes

Directions: Use the definitions and visuals to write your own definition. You may use words, numbers or pictures for your definition.

Vocabulary Word And Definition	Definition in Your Own Words	Visual:
Probability Number Line: A number line showing the probability of an event happening from impossible (0) to certain (1).		
Certain: The event will definitely happen.		
Likely: The event will happen more than half of the time.		
Equally Likely: Each event has the same chance of happening.		
Unlikely: The event will happen less than half of the time.		
Impossible: The event will never happen.		

Probability Worksheet

Directions: Answer each question.

1) Teagan was at the ballpark. He was hungry. Teagan went to the food stand to get something to eat. The food stand only had hot dogs and nachos. What is the likelihood that Teagan would buy a hot dog?

certain unlikely equally likely

2) Teagan was also thirsty. When he went to the food stand, he saw they sold water and soda. Teagan really wanted a sports drink. What is the probability that Teagan can get a sports drink at the food stand?

unlikely certain impossible

3) Bobbie likes to take stuffed animals with her on vacation. Bobbie's parents said she could only take one. Bobbie has 7 stuffed bears and 3 stuffed frogs. If she reaches in the toy chest and grabs one, which type of stuffed animal will she most likely grab?

stuffed bear stuffed unicorn stuffed frog

4) Tanya had a jar of candy. She only had 10 red, 4 purple, and 6 blue candies in the jar. What is the probability that Tanya will randomly pick a red candy?

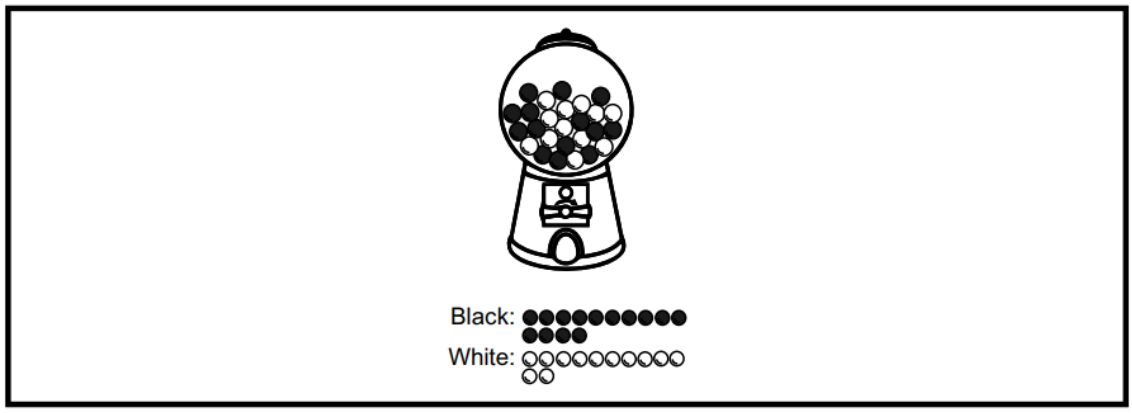
impossible likely certain

5) Jamie had 12 pencils in her pencil case. She had 8 blue, 3 green and 1 white pencil. If Jamie reaches in her pencil case, what is the color pencil she is unlikely to take?

blue pencil green pencil white pencil

Practice Items:

Item 9



If the machine has 14 black gumballs and 12 white gumballs, what would you probably get?

A	B	C
black	white	same