

# Probability Boxes

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**Reporting Category** Probability and Statistics

**Topic** Exploring the concept of probability

**Primary SOL** 3.18 The student will investigate and describe the concept of probability as chance and list possible results of a given situation.

## Materials

- Eight small boxes labeled A through H (e.g., take-out food box, pencil box)
- Small manipulatives (e.g., wrapped pieces of candy, colored paper clips, colored bottle caps, linking cubes, colored tiles, crayons, markers, beads)
- Pencils or markers
- Probability Boxes Recording Sheet (attached)
- Probability Picture (attached)
- Question Cards for Probability Picture (attached)

## Vocabulary

*possible outcome, event, predict, probability, impossible, unlikely, equally likely, likely, certain, least likely, most likely, as likely as*

## Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

Note: Before undertaking this activity, prepare eight “Probability Boxes” by placing into each small box a different number of manipulatives of the same set but with at least one varied attribute (e.g., 9 paperclips—7 blue and 2 red). Close the boxes.

1. Explain to students that they will be exploring probability by using Probability Boxes. Hold a class discussion of the probability terms *certain*, *impossible*, *likely*, *equally likely*, *as likely as*, and *unlikely*, and have students give examples of sentences using each term.
2. Distribute copies of the Probability Boxes Recording Sheet. Put students into eight small groups. Model how to use one of the boxes to fill in the recording sheet. Then, distribute the eight boxes among the eight teams, and have the teams complete the recording sheets for their boxes. Encourage team members to discuss their findings and to justify their reasoning.
3. Rotate the boxes among the teams so that each team has an opportunity to discuss the probability of each of the probability boxes.
4. Ask each team to select a representative to share their probability results with the whole class, explaining why the teams decided on their answers.

## Assessment

- **Questions**
  - How did you determine whether one kind of item was *least likely* to be drawn?
  - How did you determine whether one kind of item was *most likely* to be drawn?
  - How would you make drawing a particular kind of item from Probability Box A *certain*?

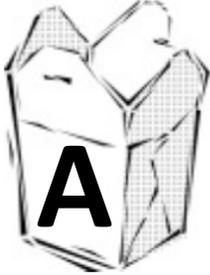
- How would you make drawing a particular kind of item from Probability Box B *impossible*?
- How would you make drawing a particular kind of item from Probability Box C *equally likely* as the other kind of item?
- **Journal/Writing Prompts**
  - Draw a bag that contains seven marbles. Using green and purple crayons, color the marbles so that the green marbles would be least likely to be drawn out and the purple marbles would be most likely to be drawn out.
  - Draw a basket with eight apples. Color the apples so that it would be impossible to draw out a yellow apple. Write a statement about the basket that proves it is impossible to draw out a yellow apple.

**Extensions and Connections (for all students)**

- Distribute copies of the attached Probability Picture and Question Cards for the Probability Picture. Have students carefully examine the picture and answer the questions. When students have finished answering, discuss the answers. Have students explain what strategies they used to make their decisions.

# Probability Boxes Recording Sheet

Name: \_\_\_\_\_ Date: \_\_\_\_\_



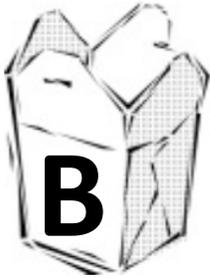
This box contains \_\_\_\_\_ and \_\_\_\_\_.

Which item is *least likely* to be chosen? \_\_\_\_\_

Which item is *most likely* to be chosen? \_\_\_\_\_

How do you know? \_\_\_\_\_

\_\_\_\_\_



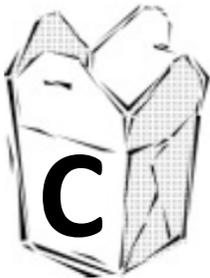
This box contains \_\_\_\_\_ and \_\_\_\_\_.

Which item is *least likely* to be chosen? \_\_\_\_\_

Which item is *most likely* to be chosen? \_\_\_\_\_

How do you know? \_\_\_\_\_

\_\_\_\_\_



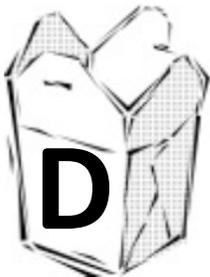
This box contains \_\_\_\_\_ and \_\_\_\_\_.

Which item is *least likely* to be chosen? \_\_\_\_\_

Which item is *most likely* to be chosen? \_\_\_\_\_

How do you know? \_\_\_\_\_

\_\_\_\_\_



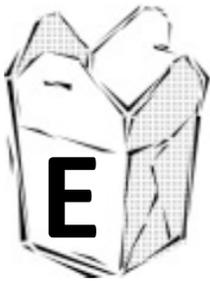
This box contains \_\_\_\_\_ and \_\_\_\_\_.

Which item is *least likely* to be chosen? \_\_\_\_\_

Which item is *most likely* to be chosen? \_\_\_\_\_

How do you know? \_\_\_\_\_

\_\_\_\_\_



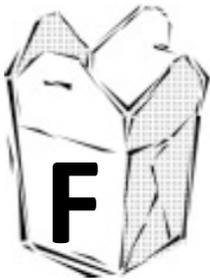
This box contains \_\_\_\_\_ and \_\_\_\_\_.

Which item is *least likely* to be chosen? \_\_\_\_\_

Which item is *most likely* to be chosen? \_\_\_\_\_

How do you know? \_\_\_\_\_

\_\_\_\_\_



This box contains \_\_\_\_\_ and \_\_\_\_\_.

Which item is *least likely* to be chosen? \_\_\_\_\_

Which item is *most likely* to be chosen? \_\_\_\_\_

How do you know? \_\_\_\_\_

\_\_\_\_\_



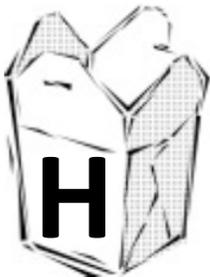
This box contains \_\_\_\_\_ and \_\_\_\_\_.

Which item is *least likely* to be chosen? \_\_\_\_\_

Which item is *most likely* to be chosen? \_\_\_\_\_

How do you know? \_\_\_\_\_

\_\_\_\_\_



This box contains \_\_\_\_\_ and \_\_\_\_\_.

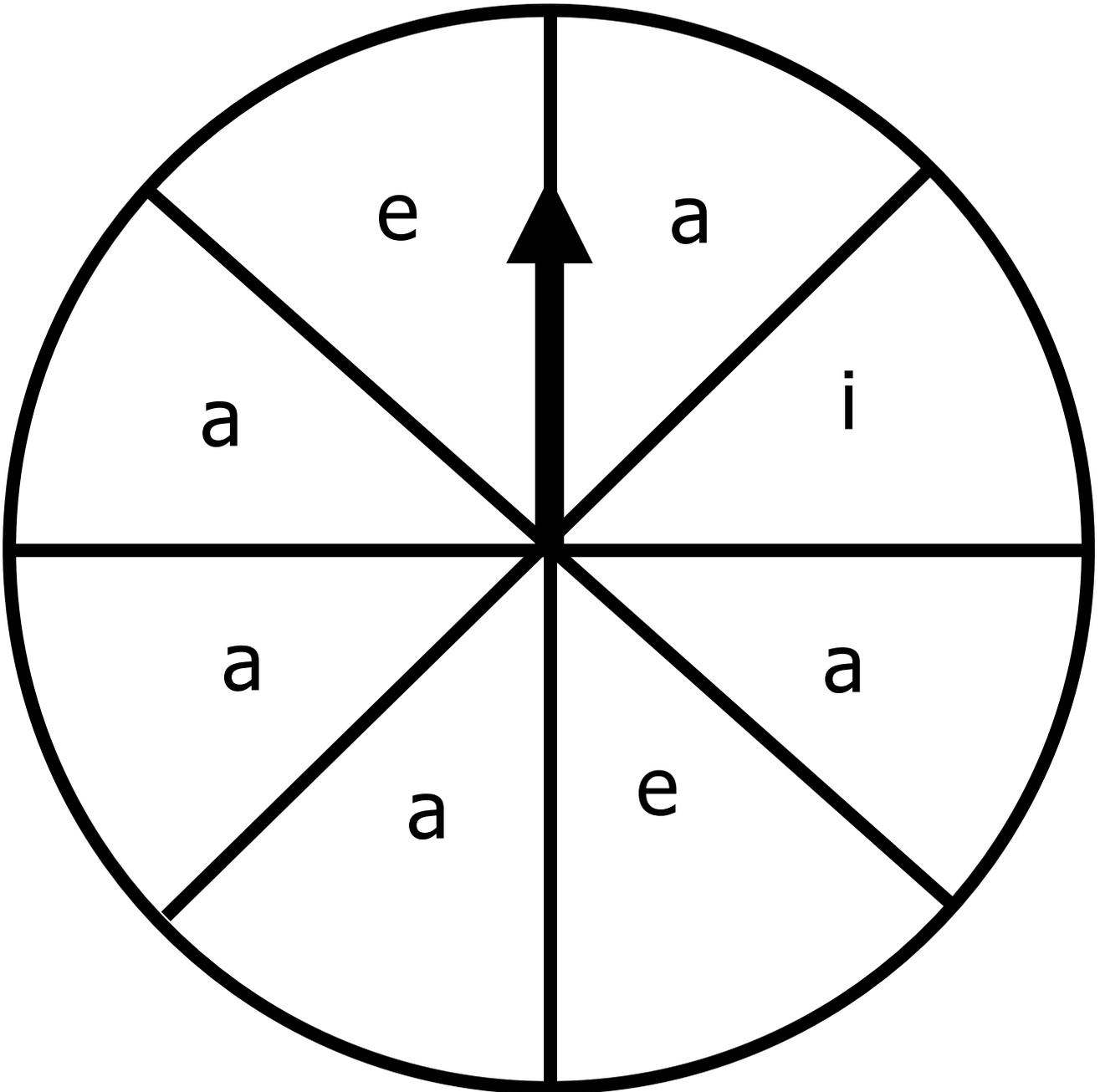
Which item is *least likely* to be chosen? \_\_\_\_\_

Which item is *most likely* to be chosen? \_\_\_\_\_

How do you know? \_\_\_\_\_

\_\_\_\_\_

# Probability Picture



# Question Cards for the Probability Picture

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Directions: Look at the Probability Picture very carefully. Use the probability terms *certain*, *impossible*, *likely*, *equally likely*, *as likely as*, and *unlikely* to answer the questions.

What is the probability of spinning once and landing on letter “a”?

\_\_\_\_\_

What is the probability of spinning once and landing on letter “i”?

\_\_\_\_\_

What is the probability of spinning once and landing on letter “e”?

\_\_\_\_\_

What is the probability of spinning once and landing on letter “o”?

\_\_\_\_\_

What is the probability of spinning once and landing on letter “u”?

\_\_\_\_\_

What is the probability of spinning once and landing on letters “a” or “e”?

\_\_\_\_\_