Spinning Color

Reporting Category Probability and Statistics

Topic Predicting the likelihood of outcomes

Primary SOL 4.13 The student will
a) predict the likelihood of an outcome of a simple event; and
b) represent probability as a number between 0 and 1, inclusive.

Related SOL 4.14

Materials

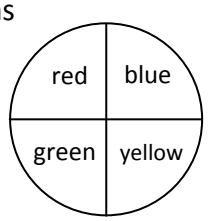
- Four-section spinners
- Large paper clips
- Pencils
- Spinning Colors handout (attached)
- Poster board for constructing bar graphs
- Markers

Vocabulary

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

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

1. Explain to the class that they are going to use a data-generating manipulative—a spinner—to create data that will be converted into a graph. Divide students into teams of two members each. Give each team a copy of the Spinning Colors handout, a large paper clip and a spinner with four equal sections containing the color words *red, blue, green,* and *yellow*. Instruct each team to spin the spinner, using a paper clip and pencil, and record the spins with tally marks on the handout. Do not say how many times to spin the spinner, but instead, let teams continue for two minutes. Make sure each team carefully records each spin with a tally mark and that each color is tallied separately.



2. Next, direct the teams to use the data from their tally marks to create bar graphs showing the four colors and the number of spins.
3. When teams have completed their bar graphs, have them exchange graphs with neighboring teams and answer the following questions based on the data displayed in the graphs:
   - How many times did the team spin the spinner?
   - Did the team spin one color approximately twice as many times as another color? If so, which one?
   - What color do you think the team would spin next? Why?
4. Model for students how to represent probability as a number between 0 and 1, inclusive. Then, lead students in representing the probability of spinning each color as a number between 0 and 1, inclusive. Discuss their ideas, and guide them to understand this process.

5. Give each team another copy of the Spinning Colors handout. Have them repeat the experiment, but this time, have each team spin the spinner 30 times. Once again, have the teams record the spins with tally marks and create another bar graph. Have them represent the probability of spinning each color as a number between 0 and 1, inclusive. Finally, have them compare their results with those of the first experiment.
6. Instruct students to write about this activity in their math journals, summarizing the results.

Assessment

- **Questions**
  - How was the first trial different from the second trial? Why was it different or the same?
  - Did you have a fair spinner? How do you know?
  - Why is representing probability as a number between 0 and 1, inclusive, useful? How might this be applied to a real-life situation?
- **Journal/Writing Prompts**
  - Look at different types of spinners, and determine the probability of landing on each space. What characteristic must a spinner have to be "fair"? (equal-size spaces) Why?
  - Create your own spinner with each section being *equally likely* to be landed on as the other sections. What does your spinner look like, how is it different and/or the same as spinners with sections that are not equally likely?
- **Other**
  - Observe the groups as they respond to the questions. Watch for cooperation, discussion, and sharing of information. Note whether all students are involved in answering the questions. Note whether students compare ease of reading data from tally marks to ease of reading bar graphs. Ask which they think is more useful.

Extensions and Connections (for all students)

- Have the students conduct additional experiments, using different numbers of spins and compare results to previous experiments. As the number of spins increases, ask students to explain what will happen to the bar graph.
- Look at different types of spinners and determine the probability of landing on each space. Is the spinner a fair spinner? How do you know?

Strategies for Differentiation

- Have students use a mnemonic device to remember the parts of a bar graph—TAILS: **T**itle, **A**xes, **I**ncrements, **L**abels, **S**paces (between bars).
- Have students use a software program to practice reading bar graphs.
- Have students use a word processing program, talking word processing program, and/or template for the math journal entry.
- Use collections of blocks in four different colors placed in a bag instead of spinners. Have students select one block at a time from the bag and record it on the "Spinning Colors" handout.

- Provide ESL students with cards on which the colors are written in their language, as needed.
- Have students use linking cubes to build the bar graphs.
- Have students use large sheets of construction paper to create a large bar graph on a shower curtain grid.
- Ask students to bring in newspapers or magazines and use them to locate and cut out various graphs. Have them group the graphs according to types and then glue them on chart paper to create posters of types of graphs.

Spinning Colors

Name _____ **Date** _____

Direction: Use tally marks to record each spin.

Color	Tally Mark Count	Represent probability as a number between 0 and 1
Red		
Yellow		
Green		
Blue		

On the back of this paper, use the tally marks to create a bar graph showing the number of spins and the four colors.