



GRADE 3 SUPPLEMENT

Set E2 Data Analysis: Probability

Includes

Activity 1: Spinner Game Probability	E2.1
Independent Worksheet 1: The Mystery Marker Experiment	E2.7
Independent Worksheet 2: Sports Spinners	E2.9

Skills & Concepts

- ★ describe events as likely or unlikely
- ★ discuss the degree of likelihood using such words as certain, equally likely, and impossible

Bridges in Mathematics Grade 3 Supplement

Set E2 Data Analysis: Probability

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Bridges in Mathematics is a standards-based K–5 curriculum that provides a unique blend of concept development and skills practice in the context of problem solving. It incorporates the Number Corner, a collection of daily skill-building activities for students.

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Set E2 ★ Activity 1



ACTIVITY

Spinner Game Probability

Overview

Students color in spinners and test them to explore the terms *more likely than*, *less likely than*, and *equally likely as*.

Skills & Concepts

- ★ describe events as likely or unlikely
- ★ discuss the degree of likelihood using such words as certain, equally likely, and impossible

You'll need

- ★ Spinner Game Record Sheet (page E2.4, run a transparency)
- ★ Spinner (page E2.5, run 1 and a half class sets, and cut the sheets in half)
- ★ overhead pens in red, blue, and black
- ★ single transparent spinner overlay
- ★ a piece of paper to mask parts of the overhead
- ★ red and blue crayons
- ★ pencil and paperclip for use as a spinner (1 set for every 2 students)
- ★ Student Math Journals

Instructions for Spinner Game Probability

1. Place the top part of the Spinner Game Record Sheet overhead on display, keeping the rest covered for now. As students watch, quickly shade the circle red. Set the spinner overlay on top of the red circle and tell students you're going to spin the arrow. How likely is the arrow to land on red? How likely is it to land on blue? After some discussion, record the likelihood of each event using the terms *certain* and *impossible*.

Set E2 Data Analysis: Probability Blackline Run 1 copy on a transparency

Spinner Game Record Sheet

How likely are you to land on red or blue if the spinner is...

	Red Won	Red & Blue Tied	Blue Won
1 All red? The arrow is certain to land on red. It would be impossible for the arrow to land on blue.			

2. Ask students to pair up with their nearest neighbors and assign one student in each pair to play for the red team and the other to play for the blue team. Then give each pair one blank Spinner and ask them to work together to color it in so it's fair to both of them; so that the arrow will be equally likely

Activity 1 Spinner Game Probability (cont.)

to land on red as on blue. After they've had a minute or two to work, ask volunteers to share the way they've colored their spinners. Chances are, most will have colored their spinner half red and half blue. Press them to explain why.

Students *We colored our spinner half and half because it seemed the most fair. If there was more red than blue, it wouldn't be fair for Jon. The spinner has half a chance of landing on red and half a chance of landing on blue. It's like sharing something. You have to split it in half to be fair.*

3. Draw students' attention back to the overhead. As they watch, re-shade the circle so it's half red and half blue. Reveal the next section of the overhead and discuss the likelihood of getting red or blue with this spinner. Record the response using the term *equally likely*.

4. Explain that in a minute, each pair is going to use a paperclip and pencil to spin their spinner 24 times. One of them will spin. The other will record in his or her math journal how many times the paperclip arrow lands on red and how many times it lands on blue. Ask students to pair-share conjectures about the results, and invite volunteers to share their thinking with the class.

5. Give students a few minutes to play the game, and then ask them to report their results. Use tally marks at the overhead to show how many ties, red wins, and blue wins there were.

Set E2 Data Analysis: Probability Blackline Run 1 copy on a transparency

Spinner Game Record Sheet

How likely are you to land on red or blue if the spinner is...

	Red Won	Red & Blue Tied	Blue Won
1 All red? The arrow is certain to land on red. It would be impossible for the arrow to land on blue.			
2 Half red and half blue? You're equally likely to get red as to get blue.			

6. Ask students to discuss the outcome. Do the class results support the idea that red and blue are equally likely as one another to win on a half-and-half spinner?

Students *Not really. Blue won more times. I think it's pretty close. We had 2 ties, and blue only won once more than red. Yeah, it hardly ever comes out perfect where you get 12 and 12. But red and blue won about the same number of times.*

Activity 1 Spinner Game Probability (cont.)

7. Now re-shade the circle on the overhead so it's three-fourths red and one-fourth blue. Reveal the next section of the overhead and discuss the likelihood of getting red or blue with this spinner. Record the response using the term *more likely than* and *less likely than*. What if the situation was reversed, and the circle was only one-fourth red and three-fourths blue? Record the response at the bottom of the overhead.
8. Give each student a blank Spinner. Ask them to color $\frac{3}{4}$ of the spinner in their own color and $\frac{1}{4}$ in their partner's color. Have them make conjectures about the results of spinning each spinner 24 times.
9. Give the children time to play the game with both of their spinners. Remind them to have one partner keep track of how many times the paperclip lands on red and how many times it lands on blue while the other spins. Suggest that they trade jobs when they play the game with the second spinner.
10. Record the class results at the overhead and discuss them with your students. Does the data support their conjectures? Is the paperclip arrow really more likely to land on red than blue if the spinner is $\frac{3}{4}$ red and $\frac{1}{4}$ blue? Is it less likely to land on red than blue if the spinner is $\frac{3}{4}$ blue and only $\frac{1}{4}$ red?

	Red Won	Red & Blue Tied	Blue Won
1 All red? The arrow is certain to land on red. It would be impossible for the arrow to land on blue.			
2 Half red and half blue? You're equally likely to get red as to get blue.			
3 $\frac{3}{4}$ red and $\frac{1}{4}$ blue? More likely to get red than blue, and less likely to get blue than red.			
4 $\frac{3}{4}$ blue and $\frac{1}{4}$ red? More likely to get blue than red, and less likely to get red than blue.			

Students *Red won for almost everyone when we used the spinner with $\frac{3}{4}$ red.*

I don't get how blue could win on that spinner. Are you guys sure you spun it right?

Yes! We just kept getting blue, even though it was only $\frac{1}{4}$ of the circle.

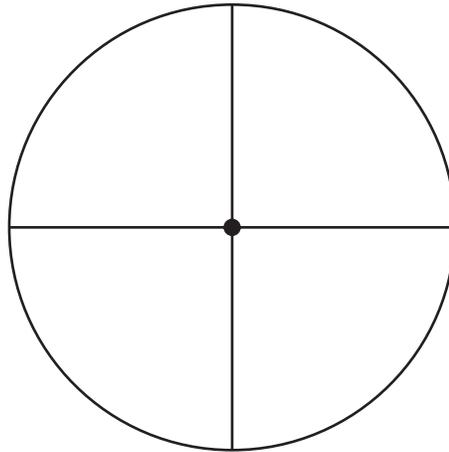
Yeah, and we were really surprised when we got a tie. It seemed like red would win for sure.

Well it did most of the time, and blue won most of the time when we used the spinner with more blue, so I think we were right.

**INDEPENDENT WORKSHEET**

See Set E2 Independent Worksheets 1 and 2 for more practice with the language of probability.

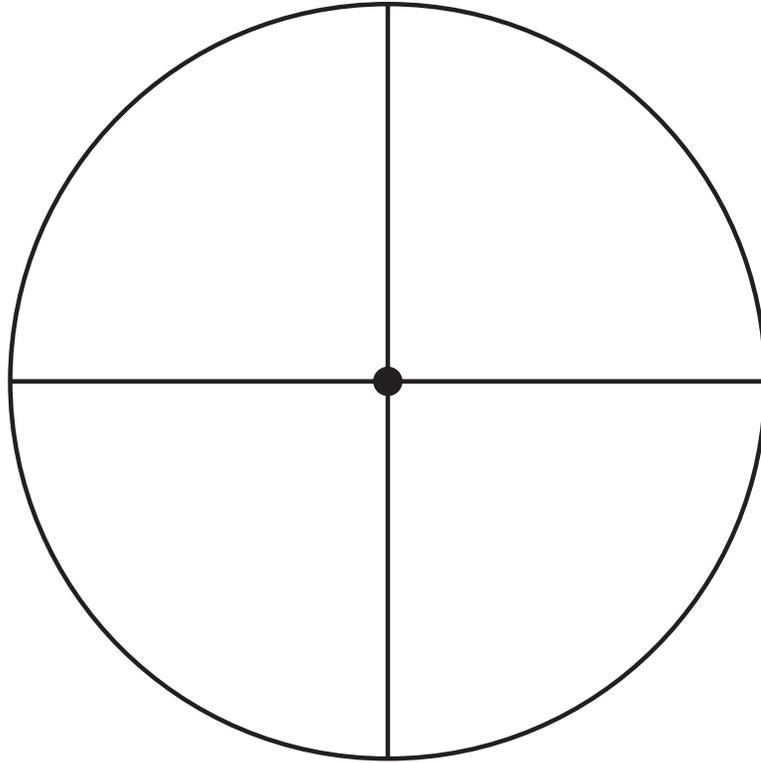
Spinner Game Record Sheet



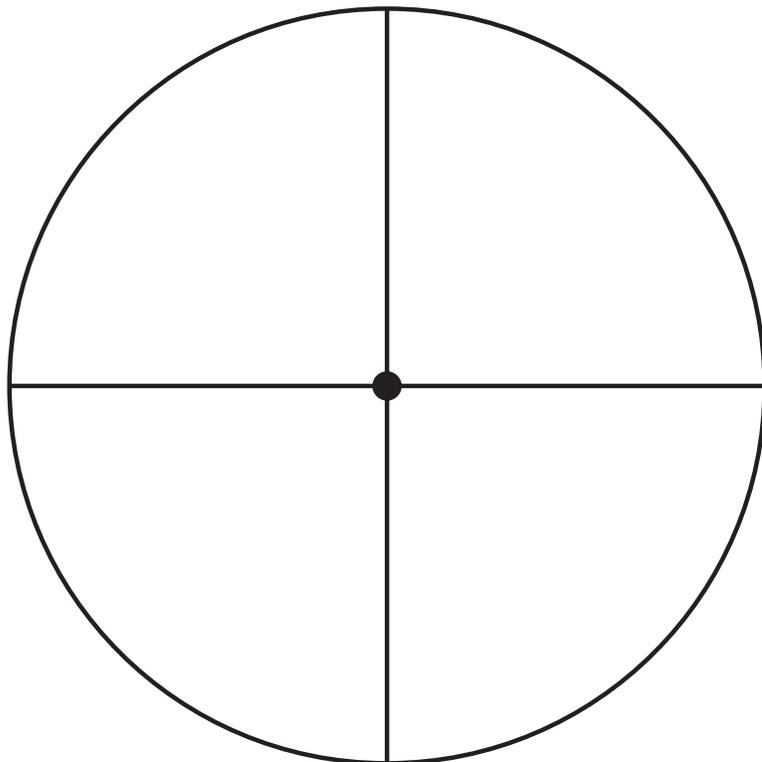
How likely are you to land on red or blue if the spinner is...

	Red Won	Red & Blue Tied	Blue Won
1 All red?			
2 Half red and half blue?			
3 $\frac{3}{4}$ red and $\frac{1}{4}$ blue?			
4 $\frac{3}{4}$ blue and $\frac{1}{4}$ red?			

Spinner



Spinner



NAME _____

DATE _____

Set E2 ★ Independent Worksheet 1



INDEPENDENT WORKSHEET

The Mystery Marker Experiment

Mrs. Jones put 12 red, 6 blue, and 2 yellow game markers in a lunch bag. Her students shook the bag and pulled out a marker. Then they put the marker back in the bag, shook it to mix up the markers, and pulled out another one 3 more times. They did this experiment twice a week for a month. Here are their results.

Results of Our Mystery Marker Experiment			
Red	Blue	Green	Yellow
## ## ## ## -	## III		IIII

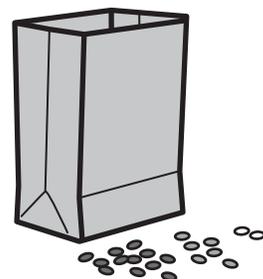
Use the data on this chart to answer the following questions:

1a Are you more likely to pull out a red marker than a blue marker? Yes No

b Why?

2a Are you less likely to pull out a yellow marker than a red marker? Yes No

b Why?



(Continued on back.)

Independent Worksheet 1 The Mystery Marker Experiment (cont.)

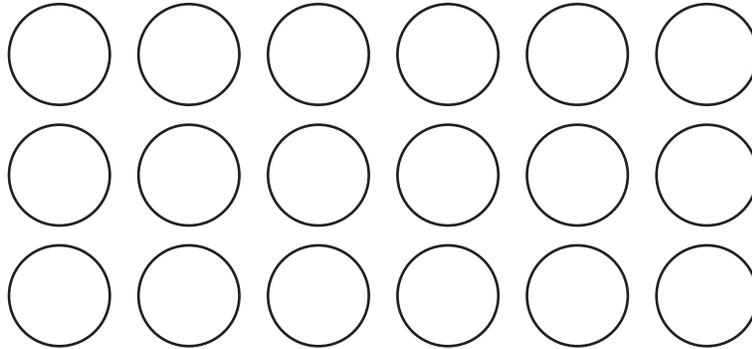
3 Circle the word below that shows how likely you are to pull a purple marker out of the bag.

Certain

Equally likely

Impossible

4 Color in the game markers below so if you put them in a lunch bag, shook it to mix them up, and pulled out just one marker, you'd be *equally likely* to get red, blue, or yellow.



NAME _____

DATE _____

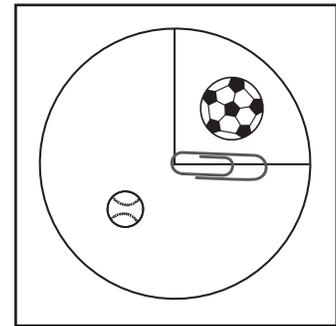
Set E2 ★ Independent Worksheet 2



INDEPENDENT WORKSHEET

Sports Spinners

Mr. Lee gave this spinner to his third graders. He said, “I want you to play a game where you spin the spinner 24 times. Every time it lands on the soccer ball, Partner A gets a point. Every time it lands on the baseball, Partner B gets a point.” Kris raised his hand and said, “But Mr. Lee, that’s not a fair game!”



1a Do you agree with Kris?

b Why?

2a Are you more likely to spin a soccer ball than a baseball? Yes No

b Why?

3a Are you less likely to spin a soccer ball than a baseball? Yes No

b Why?

4 Circle the word or phrase that shows how likely you are to spin a ball on this spinner.

Certain

Equally likely

Impossible

5 Circle the word or phrase that shows how likely you are to spin a football on this spinner.

Impossible

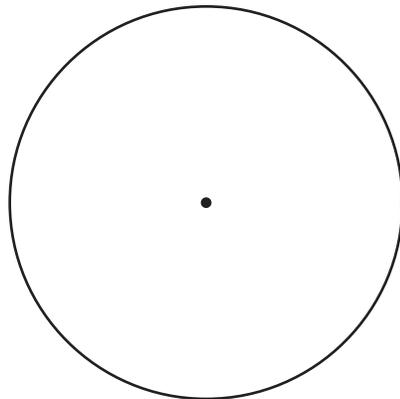
Certain

More likely than a soccer ball

(Continued on back.)

Independent Worksheet 2 Sports Spinners (cont.)

6 Use your pencil and ruler (and crayons or colored pencils if you want) to turn this circle into a fair sports spinner. You can choose any 2 sports you want.



7 You are going to test your spinner in a minute. But first, tell what you think will happen if you spin it 24 times, and explain why.

8 Use a paperclip and a pencil for an arrow, and spin your spinner 24 times. Make up your own chart below and record the results.