

Data and Line Plots

Unit 12 Overview: 9 lessons

Students read and make picture graphs where each picture stands for 2, 5 or 10, then read and make bar graphs with a scale, and answer how many more, how many fewer and two-step questions from both. They measure to the nearest half and quarter inch and show the lengths on line plots marked in halves and quarters. In some states the unit ends with surveys and frequency tables, and listing the possible outcomes of an event.

THE UNIT, DAY BY DAY

Day 1	Pre-Check	What students already know, before the first lesson.
Day 2	12.1 Read picture graphs	I can read a picture graph with a key.
Day 3	12.2 Make picture graphs	I can draw a picture graph with a key.
Day 4	12.3 Read scaled bar graphs	I can read a bar graph with a scale.
Day 5	12.4 Make scaled bar graphs	I can draw a bar graph with a scale.
Day 6	12.5 How many more, how many fewer	I can answer how many more and how many fewer.
Day 7	12.6 Half and quarter inches	I can measure to the nearest half and quarter inch.
Day 8	12.7 Line plots with halves and quarters	I can make and read a line plot.
Day 9	12.8 Surveys and frequency tables ★	I can tally survey answers in a frequency table.
Day 10	12.9 Possible outcomes ★	I can list the possible outcomes of an event.
Day 11	Unit Review	The review, to go over together.
Day 12	Unit Test	Form A; Form B (other numbers) is for a retest.

★ Taught in 3rd grade in some states. Skip these lessons if yours teaches them in another grade; animalmath.com/standards shows your state's list.

GET READY FOR THE UNIT

- Picture graphs and bar graphs on chart paper, with keys and scales of 2, 5 and 10
- Graph paper, rulers and colored pencils
- Inch rulers marked in quarters, one for each student, and a bin of things to measure
- Sticky notes or X cards for class line plots
- For the state lessons: survey answer cards, a coin, a number cube, a spinner and a bag of colored cubes

HOW EACH LESSON GOES

- 1. Warm up** (5 min)
 - 2. Teach** (10 min)
 - 3. Try it together** (10 min)
 - 4. Practice** (15 min)
 - 5. Exit ticket** (5 min): a quick check on the lesson.
- Each lesson page ends with the Animal Math sheets, makers, tools and quizzes for it. "Sheet 3" is the third worksheet of a pack; a color pack prints each sheet again in black and white.

CHECKING AS YOU GO

PRINTABLE	Pre-Check: Day 1, with a key	EXIT TICKET	Exit Tickets: one a lesson, four to a page
PRINTABLE	Unit Review: the day before the test	PRINTABLE	Unit Test: Forms A and B, with keys



Data and Line Plots

Lesson 12.1: Read picture graphs

GOAL Students read picture graphs where each picture stands for 2, 5 or 10: they read the key first, skip count the whole pictures, and add half of the key for a half picture.

About 45 minutes

I can read a picture graph with a key.

THE LESSON

- 1 **Warm up** (5 min) Skip count by 2s, 5s and 10s together. Then ask how much 4 groups of 5 and 6 groups of 2 are.
- 2 **Teach** (10 min) Show Lunch Choices, where each apple stands for 2 students. Pizza has 4 apples: count by 2s, 2, 4, 6, 8: 8 students. Tacos has 5 apples and a half apple: 10, and half of 2 is 1 more: 11 students. Then a graph with a key of 10: 2 pictures and a half picture is 10, 20, and 5 more: 25.
Say: "I read the key first. I skip count the whole pictures, then add half of the key for a half picture."
- 3 **Try it together** (10 min) Partners read a picture graph with a key of 5, Birds at the Feeder: robins 4 pictures, jays 2, finches 6. They write how many for each row and say which bird came most.
- 4 **Practice** (15 min) Students read the recess games graph on sheet 1 and the sticker and pizza graphs on sheet 3 of Pictographs with a Key, and answer the questions. Early finishers write two questions about one of the graphs.
- 5 **Exit ticket** (5 min) Students do **Exit Ticket 12.1** and circle a face beside the "I can" line. On question 1, look for 7, 10 and 5; 4, 5 and 3 means they counted the pictures instead of using the key. On question 2, look for 15 goals; 11 or 20 means the half ball was counted as 1 or as a whole ball.

Need help? Write the key's number under each picture, then add them.

Ready for more? How many pictures would 20 need with a key of 2? With a key of 5?

GET READY

- A picture graph on chart paper with a key of 2
- Picture graph cards with keys of 5 and 10
- Whiteboards and markers

WORDS TO USE

key: tells how many each picture stands for

half picture: stands for half of the key: 1 when the key is 2

picture graph: a graph that shows data with pictures

ASK

- What does the key tell you?
- How much is a half picture worth when the key is 10?
- How did you count this row?

WATCH FOR

Counts the pictures and forgets the key. Point to the key first and say what one picture stands for.

Counts a half picture as 1 or as a whole. A half picture is half of the key: half of 2 is 1, half of 10 is 5.

Loses count skip counting a long row. Touch each picture and say the number out loud.

ON ANIMAL MATH

PRINTABLE

Pictographs with a Key: sheets 1 and 3

QUIZ

Graphs and Data Quiz: the Scaled Graphs level

EXIT TICKET

3rd Grade Data and Line Plots Exit Tickets: Exit Ticket 12.1

Data and Line Plots

Lesson 12.2: Make picture graphs

GOAL Students draw a picture graph from a table with a key of 2, 5 or 10: they find how many pictures each number needs, draw a half picture for an odd number when the key is 2, and give the graph a title and a key.

About 45 minutes

I can draw a picture graph with a key.

THE LESSON

- 1 Warm up** (5 min) Ask how many 5s make 20, how many 2s make 12, and how many 10s make 40.
- 2 Teach** (10 min) Copy a table, Fruit Snacks: apples 12, grapes 7, pears 4. The key: each circle stands for 2. Apples: 12 is six 2s, so draw 6 circles. Grapes: 7 is three 2s and 1 more, so draw 3 circles and a half circle. Pears: 2 circles. Write the title and the key under the graph.
Say: "How many of the key make the number? That is how many pictures I draw. One left over is a half picture."
- 3 Try it together** (10 min) Partners make a picture graph with a key of 5 from a table, Kites Flown: Monday 20, Tuesday 35, Wednesday 40. Then they check each other's rows by skip counting.
- 4 Practice** (15 min) Students draw the cookie graph on sheet 2 and make the book graph, with its title, label and key, on sheet 4 of Pictographs with a Key, then finish the graph and choose the best key on sheet 5. Early finishers graph the class's favorite colors with a key of 2.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 12.2** and circle a face beside the "I can" line. On question 1, look for 3, 6 and 2 shells; 15 pictures in the first row means each was drawn as 1. On question 2, look for 6 faces and a half face; 13 faces means the key was not used.

Need help? Give a table with the number of pictures already worked out beside each row.

Ready for more? Make the same graph with a key of 2 and a key of 5, and say which one is easier to read.

GET READY

- A frequency table on the board
- Picture graph frames on paper
- Pencils and crayons

WORDS TO USE

key: what one picture stands for

title: tells what the graph is about

row: one line of pictures for one choice

ASK

- How many pictures does 12 need when each one stands for 2?
- When do you draw a half picture?
- Why is a key of 10 better than a key of 2 for big numbers?

WATCH FOR

Draws one picture for each one counted.

Divide by the key: how many 5s make 20?

Draws a half picture with a key of 5. Half of 5 is not a whole number, so with a key of 5 every row is whole pictures.

Leaves off the title or the key. Check the parts: title, labels and key.

ON ANIMAL MATH

PRINTABLE

Pictographs with a Key: sheets 2, 4 and 5

EXIT TICKET

3rd Grade Data and Line Plots Exit Tickets: Exit Ticket 12.2

Data and Line Plots

Lesson 12.3: Read scaled bar graphs

GOAL Students read bar graphs whose scale counts by 2, 5, 10 or 100: they find what each grid line is worth, read where a bar ends, and know that a bar ending halfway between two lines shows the number in between.

About 45 minutes

I can read a bar graph with a scale.

THE LESSON

- 1 Warm up** (5 min) Count by 5s to 50 and by 10s to 100. Ask what number is halfway between 60 and 70, and between 4 and 6.
- 2 Teach** (10 min) Show Books Donated, with a scale of 10. Ask what each grid line is worth: 0, 10, 20, so each is 10. Mr. Lee's class bar ends on the line at 70: 70 books. Ms. Park's class bar ends halfway between 50 and 60: 55 books. Lay a ruler from the end of a bar across to the scale to read it.
Say: "I find what each line is worth. If the bar stops between two lines, it is the number halfway."
- 3 Try it together** (10 min) Partners read a bar graph with a scale of 2, Leaves We Found: oak 6, maple 11, pine 14. They write how many each bar shows, then say which leaf they found most and fewest.
- 4 Practice** (15 min) Students read the graph scaled by 2 on sheet 1 and the graph scaled by 5 on sheet 2 of Scaled Bar Graphs, and answer the questions. Early finishers make a graph with the Bar Graphs maker and trade it with a partner.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 12.3** and circle a face beside the "I can" line. On question 1, look for 35, 60 and 45; 30 or 40 means they read the nearest line instead of halfway. On question 2, look for 13; 12 or 14 means the same mistake.

Need help? Write the number beside every grid line before reading the bars.

Ready for more? Read a graph scaled by 100, and find how many in all.

GET READY

- A large bar graph with a scale of 10 on chart paper
- A ruler or a strip of paper to line up a bar's end with the scale
- Whiteboards and markers

WORDS TO USE

scale: the numbers along the side of a bar graph

grid line: a line across the graph at each number of the scale

halfway: in the middle between two lines

ASK

- What is each grid line worth on this graph?
- Where does this bar end?
- What number is halfway between 50 and 60?

WATCH FOR

Counts each grid line as 1. Read the scale numbers first: 0, 10, 20 means each line is 10.

Reads a bar that ends halfway as the line below it. Find the two lines it is between and say the number in the middle.

Reads the end of a bar against the wrong line. Lay a ruler or a strip of paper from the end of the bar to the scale.

ON ANIMAL MATH

PRINTABLE

Scaled Bar Graphs: sheets 1-2

MAKER

Bar Graphs: Activity Read the Graph, Scale Count by 2s, Max Value on Axis 20

QUIZ

Graphs and Data Quiz: the Scaled Graphs level

EXIT TICKET

3rd Grade Data and Line Plots Exit Tickets: Exit Ticket 12.3

Data and Line Plots

Lesson 12.4: Make scaled bar graphs

GOAL Students draw a bar graph with a scale: they choose a scale that reaches the biggest number, write the scale numbers, and draw each bar to its number, stopping halfway between two lines when the number is in between.

About 45 minutes

I can draw a bar graph with a scale.

THE LESSON

- 1 Warm up** (5 min) Write 6, 13 and 20 on the board. Ask which scale, counting by 1s, 2s or 5s, reaches 20 with the fewest lines.
- 2 Teach** (10 min) Copy a table, Seeds Planted: Sam 30, Lily 45, Omar 20. The biggest number is 45, so count by 10s to 50. Write 0, 10, 20, 30, 40, 50 on the scale. Draw Sam's bar to the line at 30, Omar's to 20, and Lily's halfway between 40 and 50. Give the graph a title and label both sides.
Say: "My scale has to reach the biggest number. I draw each bar to its number, halfway when it is between two lines."
- 3 Try it together** (10 min) Partners make a graph scaled by 2 from a table, Rocks Found: Monday 16, Tuesday 9, Wednesday 20. They check each bar's end against the table.
- 4 Practice** (15 min) Students draw the bars of a graph scaled by 10 on sheet 3 of Scaled Bar Graphs, then pick the scale, write its numbers and draw the bars on sheet 5. Early finishers graph a class survey with a scale of their choice.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 12.4** and circle a face beside the "I can" line. On question 1, look for bars ending at 7 (halfway between 6 and 8), 12 and 4; a bar at 14 for 7 means each box was counted as 1. On question 2, look for the scale 10, 20, 30, 40; 5, 10, 15, 20 means they did not check that 40 fits.

Need help? Give a graph with the scale written in and the first bar drawn.

Ready for more? Make the same table into a graph with two different scales and say which is easier to read.

GET READY

- A frequency table and an empty graph on the board
- Graph paper and rulers
- Colored pencils

WORDS TO USE

scale: the numbers counting up along the graph

axis: the line where the scale is written

bar: a long box that shows one number

ASK

- What is the biggest number in the table? Does your scale reach it?
- Where does a bar for 25 stop on a scale of 10?
- Why not count by 1s for these numbers?

WATCH FOR

Picks a scale that stops before the biggest number. Find the biggest number first and check that the last line reaches it.

Counts boxes instead of reading the scale. Read the number on the line where the bar stops.

Spaces the scale numbers unevenly. Every line counts by the same amount: write them all before drawing.

ON ANIMAL MATH

PRINTABLE

Scaled Bar Graphs: sheets 3 and 5

MAKER

Bar Graphs: Activity Make the Graph, Scale Count by 5s, Max Value on Axis 50

EXIT TICKET

3rd Grade Data and Line Plots Exit Tickets: Exit Ticket 12.4

Data and Line Plots

Lesson 12.5: How many more, how many fewer

GOAL Students answer one-step and two-step questions from picture graphs and scaled bar graphs: how many more, how many fewer and how many in all, reading both numbers before they add or subtract.

About 45 minutes

I can answer how many more and how many fewer.

THE LESSON

- 1 Warm up** (5 min) Subtract: $60 - 15$, $45 - 20$, $70 - 35$. Ask which ones are easy to count up by 5s.
- 2 Teach** (10 min) Show Points Scored, scaled by 10: Lions 70, Bears 45, Hawks 20. How many more did the Lions score than the Bears? Read both bars, then subtract: $70 - 45 = 25$. Then a two-step question: how many fewer did the Hawks score than the Lions and the Bears together? First add: $70 + 45 = 115$. Then subtract: $115 - 20 = 95$.
Say: "I read both numbers first. More or fewer means subtract; in all means add. Two steps: I use the first answer in the second step."
- 3 Try it together** (10 min) Partners use a picture graph with a key of 5, Apples Picked: Jo 30, Mae 15, Tim 25. How many fewer did Mae pick than Tim? How many did all three pick in all?
- 4 Practice** (15 min) Students answer the questions about the graph scaled by 100 on sheet 4 of Scaled Bar Graphs, then make a graph with the Bar Graphs maker and answer its questions. Early finishers write a two-step question for a partner.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 12.5** and circle a face beside the "I can" line. On question 1, look for 15; 65 means they added. On question 2, look for 50; 65 means they stopped after adding, and 25 or 10 means they compared with only one bar.

Need help? Line up two bars with a strip of paper and count the extra part by the scale.

Ready for more? Write and answer a question that uses three bars and two steps.

GET READY

- A scaled bar graph on chart paper
- Question cards
- Whiteboards and markers

WORDS TO USE

how many more: the bigger number minus the smaller

how many fewer: the same subtraction, asked the other way

in all: add the numbers together

ASK

- Which two bars does the question compare?
- Do you add or subtract? How do you know?
- What is the first step of this question?

WATCH FOR

Adds when the question asks how many more.

Ask: is it putting together or comparing?
Comparing means subtract.

Answers a two-step question after one step.

Underline each part of the question and check off each step.

Reads a bar wrong before subtracting. Write each bar's number at its end first.

ON ANIMAL MATH

PRINTABLE

Scaled Bar Graphs: sheet 4

MAKER

Bar Graphs: Activity Read the Graph, Scale Count by 10s, Max Value on Axis 100, Questions per Graph 5

QUIZ

Graphs and Data Quiz: the Scaled Graphs level

EXIT TICKET

3rd Grade Data and Line Plots Exit Tickets: Exit Ticket 12.5

Data and Line Plots

Lesson 12.6: Half and quarter inches

GOAL Students measure to the nearest half inch and quarter inch: they line the thing up at 0, find the half and quarter marks between whole inches, and write the length as a whole number and a fraction.

About 45 minutes

I can measure to the nearest half and quarter inch.

THE LESSON

- 1 Warm up** (5 min) Draw one inch on the board, split it in 2, then in 4. Students name the marks: $\frac{1}{4}$, $\frac{1}{2}$ (or $\frac{2}{4}$), $\frac{3}{4}$.
- 2 Teach** (10 min) Line a straw up at 0 on a big ruler: it ends at the half mark after 3, so it is $3\frac{1}{2}$ inches. Then a marker ends on the third quarter mark after 4: $4\frac{3}{4}$ inches. Show that $2\frac{2}{4}$ is the same mark as $2\frac{1}{2}$. Last, when an end falls between two marks, read the mark it is closest to.
Say: "I start at 0. I count the whole inches, then the halves or quarters after the last whole inch."
- 3 Try it together** (10 min) Partners measure four things from the bin, one to the nearest half inch and three to the nearest quarter inch, and compare. If they disagree, they line both rulers up again.
- 4 Practice** (15 min) Students read the tape measures on sheets 1 and 2 and measure things on sheet 3 of Measuring to the Half and Quarter Inch, then measure on sheets 1 and 2 of Line Plots for 3rd Grade. Early finishers draw lines and arrows on sheet 4.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 12.6** and circle a face beside the "I can" line. On question 1, look for $1\frac{1}{2}$; 1 or 2 means they measured to the nearest whole inch. On question 2, look for $1\frac{1}{4}$; $1\frac{1}{2}$ means they read the half inch mark instead of the quarter inch mark.

Need help? Measure with a ruler marked only in halves first, then one marked in quarters.

Ready for more? Measure three things to the nearest quarter inch and order them from shortest to longest.

GET READY

- Inch rulers marked in quarters, one for each student
- Pencils, crayons, straws and ribbons to measure
- A large drawn inch with its halves and quarters marked

WORDS TO USE

half inch: one of 2 equal parts of an inch

quarter inch: one of 4 equal parts of an inch

nearest: the mark closest to the end

ASK

- Where do you put the end of the thing?
- How many quarter inches make a half inch?
- Which mark is the end closest to?

WATCH FOR

Starts at the edge of the ruler, not at 0. Put the end of the thing on the 0 line.

Counts the marks instead of the spaces. Count the jumps from the last whole inch.

Reads the whole number after the end. Read the last whole inch the thing passed, then the part after it.

ON ANIMAL MATH

PRINTABLE

Measuring to the Half and Quarter Inch: sheets 1-4

PRINTABLE

Line Plots for 3rd Grade: sheets 1-2

TOOL

Measuring Tool: Measure With Inch Ruler, Ruler Marks Every Mark: for showing the marks only

EXIT TICKET

3rd Grade Data and Line Plots Exit Tickets: Exit Ticket 12.6

Data and Line Plots

Lesson 12.7: Line plots with halves and quarters

GOAL Students make a line plot from measurements in halves and quarters: they mark a number line in quarters, put one X above each length, and read the plot to answer how many, and how many are longer or shorter than a length.

About 45 minutes

I can make and read a line plot.

THE LESSON

- 1 Warm up** (5 min) Count by quarters from 1 to 3 together: 1, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2, and on.
- 2 Teach** (10 min) Write eight pinecone lengths: 3, $3\frac{1}{4}$, $2\frac{3}{4}$, 3, $3\frac{1}{2}$, $3\frac{1}{4}$, 3, $2\frac{3}{4}$. Draw a line from $2\frac{1}{2}$ to 4 marked in quarters. Read each length, put an X above its mark, and cross it off the list. Count: 8 X's for 8 pinecones. Then ask how many are 3 inches long (3) and how many are shorter than 3 inches (2).
Say: "One X for each length. I cross it off the list so I never plot one twice."
- 3 Try it together** (10 min) Partners measure six paper strips to the nearest quarter inch, make a line plot of them, and write one question it answers.
- 4 Practice** (15 min) Students read line plots on sheet 3 and make them from tables on sheet 4 of Line Plots for 3rd Grade, then measure and plot the worms on sheet 5. Early finishers measure and plot the crayons on sheet 5 of Measuring to the Half and Quarter Inch, or try the eighths on sheets 1 and 2 of Line Plots with Fractions.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 12.7** and circle a face beside the "I can" line. On question 1, look for two X's at 2, two at $2\frac{1}{4}$, one at $1\frac{3}{4}$ and one at $2\frac{1}{2}$. On question 2, look for 3; 5 means they counted the 2s as longer than 2.

Need help? Give a line with every quarter mark labeled and the first two X's drawn.

Ready for more? Find the difference between the longest and the shortest length on the plot.

GET READY

- A number line marked in quarters on chart paper, and sticky notes for X's
- Inch rulers marked in quarters
- Paper strips cut to lengths in halves and quarters of an inch

WORDS TO USE

line plot: a number line with an X for each measurement

data: the numbers we collected

X: one mark for one thing measured

ASK

- How many X's should the plot have?
- Where does $2\frac{3}{4}$ go on the line?
- How many are longer than 3 inches? How do you know?

WATCH FOR

Puts an X on the wrong quarter mark. Label every mark on the line before plotting.

Plots a length twice or skips one. Cross each length off the list as you plot it, then count the X's.

Counts the lengths that are equal as longer. Longer than 3 starts at the next mark after 3.

ON ANIMAL MATH

PRINTABLE

Line Plots for 3rd Grade: sheets 3-5

PRINTABLE

Measuring to the Half and Quarter Inch: sheet 5

PRINTABLE

Line Plots with Fractions: sheets 1-2, a stretch

EXIT TICKET

3rd Grade Data and Line Plots Exit Tickets: Exit Ticket 12.7

Data and Line Plots

Lesson 12.8: Surveys and frequency tables

GOAL Students ask a survey question that has many answers, record the answers with tally marks, and write how many times each answer was given in a frequency table.

I can tally survey answers in a frequency table.

About 45 minutes
★ Taught in 3rd grade in some states

THE LESSON

- 1 Warm up** (5 min) Show tally marks for 7 and 12. Students write each number, then draw tallies for 8.
- 2 Teach** (10 min) Ask: Which pet would you like, a hamster, a fish or a rabbit? Read 15 answer cards one at a time and make a tally in the right row, crossing each card off. Bundle the tallies in fives. Count each row and write the frequency: hamster 6, fish 5, rabbit 4. Check: $6 + 5 + 4 = 15$ cards. Last, "What color is the sky?" has one answer, so it is not a survey question.
Say: "One tally for each answer. I bundle them in fives, count each row, and check the total."
- 3 Try it together** (10 min) The class answers a survey question of its own. Partners record the answers in a frequency table and check that the frequencies add up to the number of students.
- 4 Practice** (15 min) Students sort questions on sheet 1, tally the class survey on sheet 3 and build the library table on sheet 4 of Survey Questions and Data Collection. Early finishers write their own survey on sheet 5 and ask 10 classmates.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 12.8** and circle a face beside the "I can" line. On question 1, look for lions 5, giraffes 3 and elephants 4, adding to 12. On question 2, look for the favorite season question; "What month comes after May?" has only one answer.

Need help? Tally with real cards: move each card to its pile, then count the piles.

Ready for more? Write two questions the finished table can answer, and answer them.

GET READY

- A survey question and answer cards on the board
- Blank frequency tables (choice, tally, frequency)
- Clipboards for collecting answers

WORDS TO USE

survey: asking many people the same question

tally mark: one line for each answer; the fifth crosses the four

frequency: how many times an answer was given

ASK

- Does this question have one answer or many?
- How many tally marks make a bundle?
- How can you check that you counted every answer?

WATCH FOR

Counts a card twice or skips one. Cross each card off as you tally it, then check the total.

Draws the fifth tally as a fifth line. The fifth tally crosses the four, so you can count by 5s.

Picks a question with one answer for a survey.
Ask: would everyone give the same answer?

ON ANIMAL MATH

PRINTABLE

Survey Questions and Data Collection: sheets 1 and 3-5

EXIT TICKET

3rd Grade Data and Line Plots Exit Tickets: Exit Ticket 12.8

Data and Line Plots

Lesson 12.9: Possible outcomes

GOAL Students list all the possible outcomes of an event, such as flipping a coin, rolling a number cube or spinning a spinner, list each different outcome once, and tell possible events from impossible ones.

About 45 minutes

★ Taught in 3rd grade in some states

I can list the possible outcomes of an event.

THE LESSON

- 1 Warm up** (5 min) Flip a coin three times. Ask what else could have happened: heads or tails, and nothing else.
- 2 Teach** (10 min) Show a spinner with 6 parts: red, blue, red, green, blue, red. List the outcomes: red, blue, green. Each color is one outcome, even when it shows up more than once: 3 outcomes. Then a number cube: 1, 2, 3, 4, 5, 6, so 6 outcomes. Rolling a 0 is impossible.
Say: "I list each different outcome one time. If it is not on the coin, the cube or the spinner, it is impossible."
- 3 Try it together** (10 min) Partners take a bag of cubes (2 yellow, 1 orange, 3 purple) and list the outcomes of picking one: yellow, orange, purple. Then they sort event cards into possible and impossible.
- 4 Practice** (15 min) Students list the outcomes of the events on sheet 1, circle possible or impossible on sheet 2 and list each different outcome once on sheet 3 of Possible Outcomes. Early finishers do the number cube experiment on sheet 5 with a partner.
- 5 Exit ticket** (5 min) Students do **Exit Ticket 12.9** and circle a face beside the "I can" line. On question 1, look for 1, 4 and 6; 1, 4, 1, 6, 4 means they listed every part instead of each outcome once. On question 2, look for 8: a number cube has only 1 to 6.

Need help? Use a real spinner and cube, and write each outcome as it comes up.

Ready for more? Design a spinner with 6 parts and exactly 3 outcomes.

GET READY

- A coin, a number cube and a spinner with repeated colors
- A bag with a few colored cubes
- Event cards to sort into possible and impossible

WORDS TO USE

outcome: one thing that could happen

possible: could happen

impossible: can never happen

ASK

- What could happen when you spin this spinner?
- Is red one outcome or three?
- Is it possible to roll a 9? Why not?

WATCH FOR

Lists a color each time it shows up. Cross out a color on the spinner once it is on the list.

Thinks an unlikely outcome is impossible.

Impossible means it can never happen: a small part of a spinner can still win.

Leaves an outcome off the list. Touch each part of the spinner or each face of the cube to check the list.

ON ANIMAL MATH

PRINTABLE

Possible Outcomes: sheets 1-3 and 5

EXIT TICKET

3rd Grade Data and Line Plots Exit Tickets: Exit Ticket 12.9