## KEY CONCEPT OVERVIEW

In Lessons 1 through 6, students use number lines to explore and develop the concept of a coordinate plane, focusing only on the first quadrant.

You can expect to see homework that asks your child to do the following:

- Plot and label shapes and points on number lines.
- Identify the locations of shapes and plot shapes on coordinate planes.
- Construct $x$ - and y-axes and label numbers along both axes to create coordinate planes.
- Plot and label coordinate pairs and points on coordinate planes.
- Construct and identify perpendicular lines and parallel lines to both axes of a coordinate plane.

SAMPLE PROBLEM
(From Lesson 2)
Use the coordinate plane to answer the following.
a. Name the shape at each location.

| $x$-coordinate | $y$-coordinate | Shape |
| :---: | :---: | :--- |
| 1 | 2 | sun |
| 4 | $2 \frac{1}{2}$ | square |
| $4 \frac{1}{2}$ | 2 | heart |
| $1 \frac{1}{2}$ | $\frac{1}{2}$ | arrow |

b. Which two shapes have the same $y$-coordinate?


## sun and heart

c. What shape is $2 \frac{1}{2}$ units from the $x$-axis? square

## HOW YOU CAN HELP AT HOME

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- Play a paper-and-pencil version of the game Battleship with your child. The directions, rules, and template are in the Lesson 4 Problem Set.
- Practice plotting coordinate pairs with your child. You say the coordinate pairs, and your child plots them on a coordinate plane. You may use the coordinate plane template from either Lesson 2 or Lesson 6.


## TERMS

Axis: A fixed reference line for the measurement of coordinates.
Coordinate pair: Two numbers that identify a point on a plane. Coordinate pairs are written $(x, y)$, where $x$ represents a distance from 0 on the horizontal $x$-axis and $y$ represents a distance from 0 on the vertical $y$-axis. For example, $(3,10)$ is a coordinate pair.
Parallel lines: Two lines in a plane that do not intersect. Parallel lines can be denoted as $\overleftrightarrow{A B} \| \overleftrightarrow{C D}$.
Perpendicular lines: Formed by two lines, line segments, or rays intersecting to form a 90 degree angle and denoted by the symbol $\perp$. For example, $\overrightarrow{A B} \perp \overrightarrow{C D}$ represents the perpendicular lines $A B$ and $C D$.
$\boldsymbol{x}$-coordinate: The horizontal value in a coordinate pair. The $x$-coordinate is always written first in an ordered pair of coordinates $(x, y)$. For example, in (9,2), the value 9 is the $x$-coordinate.
$\boldsymbol{y}$-coordinate: The vertical value in a coordinate pair. The $y$-coordinate is always written second in an ordered pair of coordinates $(x, y)$. For example, in $(9,2)$, the value 2 is the $y$-coordinate.

## MODELS

## First Quadrant of the Coordinate Plane



## TIPS FOR FAMILIES

## KEY CONCEPT OVERVIEW

In Lessons 7 through 13, students continue to learn about the coordinate plane by investigating patterns.
You can expect to see homework that asks your child to do the following:

- Use given rules to generate coordinate pairs, plot points, and investigate relationships.
- Construct lines and analyze the relationships between them.
- Generate number patterns from given rules, plot the points, and analyze the relationships within the sequences of the ordered pairs.
- Create rules to generate number patterns and plot the points.

SAMPLE PROBLEM (FromLesson9)

Complete the table for the given rule. Then, construct lines $a$ and $b$ on the coordinate plane.
a. Construct each line on the coordinate plane.

Line a
Rule: $y$ is 2 less than $x$

| $\boldsymbol{x}$ | $\boldsymbol{y}$ | $(\boldsymbol{x}, \boldsymbol{y})$ |
| :---: | :---: | :---: |
| 2 | 0 | $(2,0)$ |
| 5 | 3 | $(5,3)$ |
| 11 | 9 | $(11,9)$ |
| 17 | 15 | $(17,15)$ |

Line $b$
Rule: $y$ is 4 less than $x$

| $x$ | $y$ | $(x, y)$ |
| :---: | :---: | :---: |
| 5 | 1 | $(5,1)$ |
| 8 | 4 | $(8,4)$ |
| 14 | 10 | $(14,10)$ |
| 20 | 16 | $(20,16)$ |

b. Compare and contrast these lines.


The lines are parallel. Neither line passes through the origin. Line bhas y-values 2 units less than in line $a$.
c. Based on the patterns you see, predict what line $c$, whose rule is $y$ is 6 less than $x$, would look like.
Since the rule for line c is also a subtraction rule, I think line c will also be parallel to lines $a$ and b. Line $c$ will have $y$-values 2 units less than in line band 4 units less than in line $a$.

## HOW YOU CAN HELP AT HOME

- Practice naming coordinate pairs with your child. Plot a set of points on the coordinate plane and have your child name the coordinate pair for each point. To make it more interesting and fun, try to plot a set of points so that when all points are connected they form either a shape or an animal. You may use the coordinate grid template from Lesson 8.
- Ask your child to explain how she determines where to plot an ordered pair on the coordinate plane. What does the first number in the ordered pair mean? What does the second number in the ordered pair mean? (Answers: The first number in the ordered pair is the $x$-coordinate. This number represents the distance from 0 on the $x$-axis. The second number in the ordered pair is the $y$-coordinate. This number represents the distance from 0 on the $y$-axis.)


## TERMS

Ordered pair: Two quantities written in a given fixed order, usually written as $(x, y)$.
Origin: A fixed point from which coordinates are measured; the point at which the $x$-axis and $y$-axis intersect, labeled $(0,0)$ on the coordinate plane.

## TIPS FOR FAMILIES

## KEY CONCEPT OVERVIEW

In Lessons 14-18, students focus on data analysis by using graphical representations. Students collect and represent data by using dot plots, stem-and-leaf plots, and scatterplots. Students discover that scatterplots, a new form of data representation, are used to represent paired data displayed as ordered pairs. Finally, students match data sets with their graphical representations and solve one- and two-step problems.

You can expect to see homework that asks your child to do the following:

- Create and analyze a dot plot representing a set of observations.
- Create and analyze a stem-and-leaf plot.
- Create scatterplots representing paired data.
- Match various data sets with their graphical representations and solve one- and two-step problems.


## SAMPLE PROBLEM

(From Lesson 18)

Match each data set or display on the left with a data set or display on the right.


## HOW YOU CAN HELP AT HOME

- Find data displays in magazines, newspapers, or on the internet and ask your child questions about the data.
- Have your child measure several similar objects and record the measurements. Then have your child display the data by using a dot plot and/or a stem-and-leaf plot. Your child can create a question that can be answered by using the data. For example, if you measure the heights of several pieces of furniture in your home, a possible question is, "What is the difference in height between the tallest and shortest pieces of furniture that were measured?"
- Have your child collect paired data, display it on a scatterplot, and look for a pattern. For example, your student might collect data on the number of hours of screen time each day and the corresponding number of hours of sleep.


## TERMS

Observation: A data value collected from the study of a person, animal, object, or event as it naturally occurs.

Ordered pair: Two quantities written in a given fixed order, usually written as $(x, y)$.

## MODELS

Dot Plot: A graphical representation showing numerical data as dots along a number line, with each dot representing an occurrence of that data point. For example, four dots above 0 indicates that there are four occurrences of 0 cm of rainfall.

Scatterplot: A graphical representation showing a set of points plotted in the coordinate plane, generally representing paired data. This allows for analysis of the relationship between two categories of data. For example, the diameter and height of tree saplings might be measured and shown in a scatterplot to analyze whether there might be a relationship between a sapling's height and its diameter.



Stem-and-Leaf Plot: A graphical
representation showing data in a T-chart.
The chart splits each value into a stem (i.e., the leading digits) and a leaf (i.e., the last digit).

| Lengths of Baby Garter <br> Snakes (cm) |  |  |
| :--- | :--- | :---: |
| Stem | Leaf |  |
| 17 | 9 |  |
| 18 | 1 |  |
| 19 | 3 |  |
| 20 | 0 |  |
| 21 | 6 |  |
| 22 | 0 |  |
| 23 | 0 |  |
| 24 | 5 |  |
| Key: $17 \mid 5$ means 17.5 |  |  |

## KEY CONCEPT OVERVIEW

In Lessons 19 through 23, students solve complex, multi-step problems requiring the application of concepts and skills they have mastered throughout the Grade 5 curriculum.

You can expect to see homework that asks your child to do the following:
Use all four operations (addition, subtraction, multiplication, and division) with both whole numbers and fractions to solve problems in various contexts.

SAMPLE PROBLEM

Meyer read 4 times as many books as Zenin. Lenox read as many books as Meyer and Zenin combined. Parks read half as many books as Zenin. In total, the students read 147 books. How many books did each child read?

21 units $=147$ books
1 units $=147$ books $\div 21=7$ books
Parks read 7 books.
$8 \times 7$ books $=56$ books
Meyer read 56 books.
$2 \times 7$ books $=14$ books
Zenin read 14 books.
56 books +14 books $=70$ books
Lenox read 70 books.

- Remind your child to use the Read, Draw, Write (RDW) process to solve problems. Have him select a few word problems from his homework and ask him to show you the steps of the RDW process as he solves each problem. First, he should carefully read through the problem. Then, he should draw a model to make sense of the problem, or he may prefer to act out what is happening in the story to help him understand the word problem. Finally, he should write an equation and a statement to put the answer back into the context of the problem.


## TIPS FOR FAMILIES

## KEY CONCEPT OVERVIEW

In Lessons 24 through 34, students solidify the year's learning by creating and playing games and by exploring patterns such as the Fibonacci sequence. They also design and construct boxes to house materials for summer use.

You can expect to see homework that asks your child to do the following:

- Draw symmetric figures on the coordinate plane.
- Analyze line graphs and explore patterns in the coordinate plane.
- Write and interpret numerical expressions.
- Create and solve multi-step word problems.
- Name and classify quadrilaterals based on their properties.
- Teach someone at home to play a game that was taught in math class.
- Find various rectangular boxes at home and then calculate their volumes.
- Write reflections on the material learned throughout the year.


## SAMPLE PROBLEM

(From Lesson 26)

Write a numerical expression for the written phrase below, and then evaluate your expression.

Three-fifths the difference of twenty-five and ten

$$
\begin{aligned}
& \frac{3}{5} \times(25-10) \\
& =\frac{3}{5} \times 15 \\
& =9
\end{aligned}
$$

## HOW YOU CAN HELP AT HOME

- Your child will soon bring home summer math boxes containing games and activities collected from Lessons 24 through 30. Each game and activity was carefully designed to help your child practice math throughout the summer. Set aside some math time each day. Play the math games and complete the math activities with your child. Challenge your child to math contests. Celebrate what she knows and what she has learned this year. Congratulate her on her hard work and perseverance.
- Continue to practice multi-digit addition, subtraction, multiplication, and division with whole numbers, fractions, and decimals to help prepare your child for the next school year.

TERMS

Expression: A mathematical phrase involving a combination of sums, differences, products, or divisions of numbers. Expressions are not complete mathematical sentences like equations, so they do not have an equal sign. For example, $600+3+0.07$ is an expression.
Fibonacci sequence: An infinite sequence of whole numbers in which the first two terms are 1 and 1 , and each term after is the sum of the two terms immediately before (i.e., $1,1,2,3,5,8,13,21, \ldots$ ).
Quadrilateral: A closed figure with four sides. For example, trapezoids, parallelograms, rectangles, rhombuses, kites, and squares are all quadrilaterals.
Volume of a solid: The amount of space inside a three-dimensional solid. For example, in rectangular prisms, Volume $=$ length $\times$ width $\times$ height.

