InsightMath

Organizing Two-Dimensional Space

Family Guide | Grade 5 | Unit 10

Your student is exploring how creating geometric structures and categories helps to analyze and organize space.

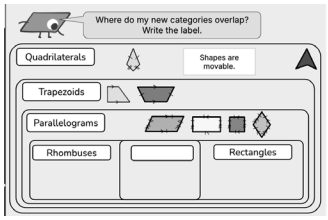
Key Math Ideas

In previous grades, your student compared and classified two-dimensional shapes based on one or more attributes, such as number of sides or parallel lines. In this unit, students explore shared attributes or shapes and how shapes can belong to multiple categories, such as a square being grouped with a rhombus because both have four equal sides and also grouped with a rectangle because it has four right angles.

Your student is also introduced to a coordinate system in this unit, exploring it as a way to organize, analyze, and communicate about two-dimensional space. They plot and identify points on a coordinate grid and use the coordinate grid to represent real world situations. Lastly, your your student will explore how tables and graphs help students to understand relationships between numerical patterns. Students explore how numerical patterns can be represented visually and extend their previous work with patterns to identifying and using relationships between two patterns.

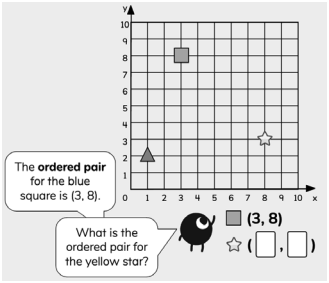
→ In the beginning of the unit, your student will learn to

- name types of triangles and classify them by attributes, such as by angles and side lengths;
- name types of quadrilaterals and classify them by attributes, such as angles, side lengths, and parallel or perpendicular sides;
- explain that shapes can belong to more than one classification category or subcategory, as shown in the examples to the right.



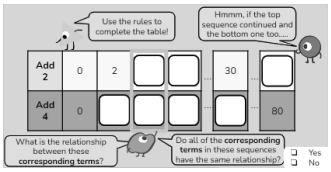
→ In the middle of the unit, your student will learn to

- plot and read points on a coordinate grid using ordered pairs, as shown in the example to the right;
- describe the location of a point on a coordinate grid
- in relation to the origin, the point at (0,0);
- represent and analyze real-world situations by plotting points on a coordinate grid.



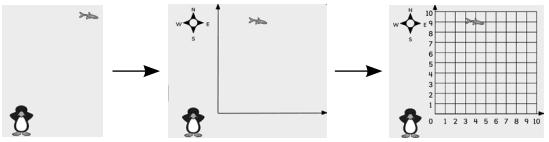
→ By the end of the unit, your student will learn to

- create and extend numerical sequences given a starting value and a rule, such as starting with 4 and adding 6 repeatedly;
- describe relationships between two numerical sequences using graphs, tables, and multiplication thinking;
- describe the relationship between a numerical sequence and its corresponding pattern on the coordinate grid.



Helpful Hint

Coordinate grids not only help us understand and organize 2-D space, but they also help us be precise when communicating location. Think about how much harder it would be to tell JiJi where the fish is the example on the left, and how the middle and right slides each add more precision to how we can communicate. Consider discussing with your student situations in your daily life where this is true as well.



Tips for Supporting Your Student at Home

Questions to Ask Your Student

→ In the beginning of the unit:

- How can you organize triangles into categories? *(try the same question for quadrilaterals)*
- Is a square a rectangle? Is a rectangle a square? How do you know?

→ In the middle of the unit:

- How do coordinate grids and ordered pairs help you tell about location?
- How do you use a coordinate grid to make shapes?
- How can you use coordinates to better understand a situation?

→ By the end of the unit:

- What is the rule of the pattern(s)? How do you know?
- What numbers will both patterns include? How do you now?
- How can you use multiplication to describe the relationship between two numerical patterns?

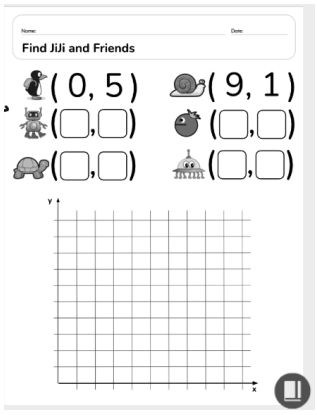
If...	Try...
your student is focusing on only one attribute when classifying or describing shapes instead of using multiple attributes . . .	encouraging your student to name the attributes they can use to make connections between shapes to help identify shared attributes. Ask, "What do you know about the side lengths of the shape(s)?" or "What do you know about the angles of the shape(s)?"

Student Strengths Spotlight

I do not give up, even when a problem is challenging.	Students persevere to solve difficult problems or interpret and use corresponding numerical patterns, which helps them build skills and confidence.
I justify my thinking.	Students explain their reasoning behind their choices, decisions, or problem-solving process, providing evidence or logic to support their perspective.
I am precise with the words I use to explain thinking.	Students need to use precise language throughout the unit, such as identifying specific shared attributes of shapes and telling location on a coordinate grid.
I use math to represent real-life situations, and I create contexts to match the given math.	In this unit, students explore how to represent real-world situations with coordinate grids.

Try This Together!

- **Coordinate Grid Games.** Play board games that involve using the concept of a coordinate grid, such as the example below. Create or print your own grid and label the x-axis and y-axis with numbers 0–10. Have your student mark their "locations" at specific coordinates. You can then try to "hit" their locations by calling out the coordinates.



- **Numerical Pattern Hopscotch.** Have your student make a line of connecting boxes with two rows (like a table) on the sidewalk using chalk (see below for example). Have them fill in the first box with 0, then choose a number for the second box to set the rule for their pattern. Switch places, and then you do the same for the boxes on the second row. Before continuing the pattern, have your students make predictions about what numbers will be in both rows. Then have your student continuing the pattern, filling in the boxes, and explain the relationships they see between the patterns using multiplication.

0	3				
0	6				