

Secret Shape Pictures

Strand: Measurement and Geometry

Topic: Describing the location of one object relative to another regardless of their positions and orientations in space

Primary SOL: K.10 The student will

- b) compare the size (smaller, larger) and shape of plane figures (circle, triangle, square, and rectangle); and
- c) describe the location of one object relative to another (above, below, next to) and identify representations of plane figures (circle, triangle, square, and rectangle) regardless of their positions and orientations in space.

Related SOL: K.10a, K.12

Materials:

- Attribute blocks that differ by size, shape, and color (if your set also includes thickness use only the thick or thin shapes); one set per pair of students plus an additional set for teacher use
- Plain paper for each student to use as a mat for creating their picture
- File folders to use as a barrier between students

Vocabulary

above, alike, below, circle, compare, describe, different, larger, next to, rectangle, shape, size, smaller, square, triangle

Student/Teacher Actions: What should students be doing? What should teachers be doing?

Note: This lesson should be completed after the Shape Detectives lesson.

1. Review shapes and their characteristics using the attribute blocks. Show several triangles, all the same color, from the attribute block set and ask students to name the shape and describe what is the same about all of the triangles. In addition to naming the shape, encourage students to use the terms *sides* and *vertices* as they talk about the similarities. Refer to the anchor charts that were made in the Shape Detective lesson as necessary. Ask students to tell you what is different about these triangles (their size). Explain that when we *compare* things we tell what is the same and different about them. Repeat with each of the other shapes (circles, rectangles, and squares).
2. Explain that today students will be using words that describe the location of things. Explain that location means where something is. Write “above” on the board. Ask students to put their hands *above* their heads. Discuss what it means for one thing to be *above* another thing. Have students practice putting their hands *above* their shoulders, *above* their laps, *above* their feet, etc.

3. Write “below” on the board. Ask students to put their hands *below* their chin. Discuss what the word *below* means. Have students practice putting their hands *below* their knees, *below* their elbows, etc.
4. Write the phrase “next to” on the board. Ask one student to stand *next to* another student. Discuss what the phrase *next to* means. Have students practice putting their hands *next to* their heads, *next to* their feet, *next to* their shoulders, etc.
5. To provide further practice with *above*, *below*, and *next to*, play a quick game of Simon Says. Use the words *above*, *below*, and *next to* as you give the commands. (*Simon says put one shoe above the other shoe. Simon says put your feet next to each other. Simon says put your finger above your nose. Simon says put your finger below your nose, etc.*)
6. Pair students and pass out the attribute blocks and a paper “mat” to each pair. Tell students that you are going to choose some attribute blocks to make a secret picture. They will work with their partner to try to make the same picture on their paper mat with their shapes by listening to your directions. You will not show your picture until you have finished it. Then you will show your shape and they can see whether the picture they made looked the same.
7. If a document camera is available, make your picture on a paper mat so that it can be displayed on the document camera after you have given all of the directions. If a document camera is not available, you may want to place a roll of tape under each piece so that you can then hang it on the board for everyone to see. Use no more than four attribute blocks for your first secret picture. Give the directions, repeating each one as necessary.
 - a. Place the large blue square in the middle of your paper.
 - b. Place the small yellow circle *above* the square.
 - c. Place a medium-sized green triangle *next to* the large blue square. (If your students are ready to use the terms *right* and *left*, you can modify this to say – *next to* the large blue square on the right.)
 - d. Place a small red rectangle *below* the green triangle.
8. Show your picture and ask students to compare their picture to yours. Note that *next to* might mean the triangle could be on the right or on the left. Reread the directions, discuss what each direction means, and let students change their pictures to match yours. Ask the following questions: *What kind of words did I need to use so that you would know which shape to find from your pile of shapes? If I had said place the blue square in the middle of your paper, would you have known which blue square to pick up? What kind of words did I use to let you know where to put the shape?*
9. Repeat the activity several times, with the teacher giving directions and the students trying to create the same picture. As students become more familiar with the activity, try increasing the level of challenge by using more shapes and/or incorporating the words *side* and *vertex* (vertices). *Place the small blue shape with three sides next to the circle. Place a small red rectangle next to the square so that one of the rectangle’s vertices touches the side of the square.*
10. On the same day, if time permits, or the next day, let students work with a partner to make secret pictures. Each student will secretly draw a simple shape. One student will

give the directions for a secret picture and the other student will try to make the same secret picture. Students should sit side by side with a file folder or other barrier between them. Encourage the listeners to ask questions if their partner does not give them enough information. Students should take turns being the direction giver and the direction follower. As students work, take note of the following: *Who is describing the shapes using the necessary adjectives to let the partner know what shapes to use? Who has trouble with this? Who is using positional words correctly? Who finds this difficult? Who interprets the descriptions correctly? Who does not? Who interprets the positional words correctly? Who does not?*

11. At the end of the activity, discuss the following questions: *Why is it important to describe the shapes? Why is it important to use the words above, below, and next to? Are there other words that you used to help your partner make your secret shape?*

Assessment

- **Questions**
 - How do words like *above*, *below*, and *next to* help us?
 - Where is something in the room that is *above* another object? Where is something in the room that is *below* another object? Where is something in the room that is *next to* another object?
 - What are some words we might use if we are comparing the size of two things?
 - What is missing in this direction? “Place the small blue square next to.”
- **Journal/writing prompts**
 - Draw a circle above a triangle. Write the word *above* next to the shape that is above the other shape. Repeat with other shapes and positional words.
 - Draw a shape that is not a circle. Tell why your shape is not a circle. Repeat with other shapes.
 - Draw three triangles and one shape that is not a triangle. Put an X on the shape that is not a triangle.
- **Other Assessments**
 - Have students describe something that is *above* the chalkboard. Repeat with other positional words.
 - Provide a set of attribute blocks. Have students sort them by size. Then have students sort them by shape.

Extensions and Connections (for all students)

- Have students work in pairs to create two shapes on a Geoboard. Have student pairs describe their shapes and tell about the location of the shapes relative to each other.
- Have students create drawings according to directions you give for positioning geometric figures in their drawings (e.g., “Draw a square *in the middle* of the page.” “Draw a triangle *next to* the square.” “Draw a rectangle *below* the square and triangle.” “Put a circle high *above* the triangle.”). Allow students to turn their drawings into works of art by continuing to draw and color, using the four drawn geometric shapes as a basic structure on which to build. (If students need guidance, point out that the triangle might

become something like a tree or bush, the square could be a table, the rectangle a swimming pool or patio, and the circle the sun or a cloud.)

- Place the secret shape pictures activity at a station or center for students to complete while a teacher works with a small group of students.

Strategies for Differentiation

- Use fewer or more attribute blocks to create the secret pictures, depending on student abilities.
- Introduce and practice only one positional word at a time.
- Use all of the same size attribute blocks for students who are not ready to incorporate comparing sizes.

The following pages are intended for classroom use for students as a visual aid to learning.

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