Sorting takes on a new challenge for students in this activity which engages their critical thinking skills. As students determine defining attributes, they’ll figure out what makes a shape a shape!

Learning Objectives
Students will be to distinguish between defining attributes and non-defining attributes of shapes.

Materials and Preparation
- Paper
- Lined paper
- Pencils, markers, or crayons

Key Terms:
- defining attributes
- non-defining attributes

Lesson

Introduction *(5 minutes)*

- Call students together.
- Ask students to think of a triangle in their mind. Have students draw this triangle on a sheet of paper.
- Hold up several of the students’ drawings. Ask students if all of the triangles look the same, what all of the triangles have in common, and what some differences are between the triangles?
- Inform students that they have just identified some of the defining and non-defining attributes of triangles. All shapes have defining attributes and today they will be on a mission to figure out what these attributes are.
Explicit Instruction/Teacher Modeling (5 minutes)

- Tell students that **defining attributes** are those that are necessary for a shape or object to fall into a certain group **non-defining attributes** are those that neither make nor break a shape’s inclusion in a certain group. For example, having three sides is a defining attribute of a triangle. Every single drawing of a triangle included a shape with three sides. Being the color blue is not a defining attribute of a triangle, since some people drew triangles that were blue and some people drew triangles that were other colors. Thus, color must be a non-defining attribute.
- Have students take a few seconds to discuss again the differences and similarities they noted before, this time focusing on what these mean for defining attributes and non-defining attributes.
- Explain to students that one way to determine whether or not something is a defining attribute is to think about whether or not that fact would be included in the definition for the shape or object. For example, the definition of a triangle would certainly include that it involves three sides that close together. The definition would not include that it is a certain size or color. Therefore, these two things must be non-defining attributes.
- Work with students to write a definition for a triangle, such as *a triangle is a shape that has three sides with no openings*. Demonstrate to students how this can be useful in determining defining attributes and non-defining attributes.

Guided Practice/Interactive Modeling (5 minutes)

- Next, have students try to list some defining attributes and non-defining attributes of circles. To help in this process, ask several students to draw a circle. Remind students that the things which are consistent in all of the drawings are defining attributes and the things which vary between the drawings are non-defining attributes.
- Once students have observed the drawings and listed a few of each type of attribute, have them come up with a definition for a circle. Students should mention that it is round, has one line, and is closed.
- After coming up with a definition, see if there are any other defining attributes or non-defining attributes students wish to add to their lists.
- Tell students that they are now going to work alone, or in partners, to define and determine the defining and non-defining attributes of rectangles, squares, diamonds, ovals, and stars. They should feel free to draw pictures if that would help them in this process.
- Ask if there are any final questions. Tell students that they will all be reporting back to the group on their findings, so they need to keep a list of the defining and non-defining attributes for each shape as well as the definitions they came up with.
Independent Working Time *(10 minutes)*

- While students are working independently, any adults should be circulating, answering questions, and correcting misconceptions. Soft background music can help to set an appropriate atmosphere and keep student conversations to a minimum.

---

**Extend**

**Differentiation**

- **Enrichment:** For those students needing a greater challenge, asking them to write definitions and determine the defining attributes for three-dimensional shapes like cubes or cylinders can add to difficulty.
- **Support:** For students needing additional assistance, leaving the lists of defining attributes and non-defining attributes for triangles and circles posted in a prominent location can help. Having students work with a partner can also scaffold this activity. For students who have a hard time writing down their thoughts, pair them with a student scribe.
Review

Assessment (5 minutes)

- Whether or not students have met the learning object can be determined by their definitions and lists of defining and non-defining attributes as well as contributions to the class discussion.
- For homework, students can be assigned additional shapes to define. These definitions can then be used to determine whether or not students are able to identify the defining attributes.

Review and Closing (5 minutes)

- Call students back together.
- Review the lists of defining attributes and non-defining attributes for triangles and circles that the class came up with. Ask if students found any similar defining attributes and non-attributes for the other shapes.
- Ask students to share some of their definitions for rectangles, squares, diamonds, ovals, and stars.
- Discuss the defining attributes they mention.
- Remind students that a defining attribute is one that is necessary for a shape to fall into a shape group. A non-defining attribute is one that neither makes nor prevents a shape from falling into a shape group.