Inspect

CCR Performance Task

Math Grade 4: Classify Two-Dimensional Shapes

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- includes authentic, permissioned texts of appropriate complexity
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Content that addresses your scope and sequence so that your assessments do not waste valuable instruction time

Help for teachers addressing the instructional shifts with content that elicits evidence of learning from each response

NATIVE CCR & NGSS

SCOPE & SEQUENCE

STUDENT LEARNING

EMBEDDED PD

INSTRUCTIONAL SHIFTS

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CCR Performance Tasks

Math Grade 4: Classify Two-Dimensional Shapes

Student Test Booklet

Name:

Student Rubric

This problem tests if you can:
• Identify properties (attributes) of two-dimensional shapes;
• Use a rule to classify shapes based on their properties;
• Create and use your own rule to classify shapes.

Your teacher will give your response a 4, 3, 2, 1, or 0.

This is how you get a 4:
Your answers are correct and complete.
• You identify the names and all the properties of all the shapes;
• You use Venn diagrams to organize the shapes by specific properties;
• You make up a rule and use it to organize the shapes in a new way.

This is how you get a 3:
Your answers are mostly correct, but you make some mistakes or your answers are not complete.
• You identify the names and properties of all the shapes but you may forget some properties;
• You use Venn diagrams to organize the shapes;
• You need help from a friend or your teacher to make up a rule, but then you can use it to organize the shapes by yourself.

This is how you get a 2:
You do not answer one part, or you make some mistakes on several parts.
• You identify the names and properties of some but not all of the shapes;
• You can use only one of the Venn diagrams correctly or you make some mistakes with both diagrams;
• You leave the last part blank or make a lot of mistakes.

This is how you get a 1:
You do not answer two parts or you make mistakes in all the parts.
• You identify the names and properties of some of the shapes;
• You leave the other parts blank or make a lot of mistakes.

This is how you get a 0:
You do not answer the question or your teacher cannot understand your answer.

Name:_____

Math Grade 4: Classify Two-Dimensional Shapes

Complete all the tasks in the test booklet.

1 | **The list below shows words that describe attributes of two-dimensional shapes.**

acute angle	rhombus
right angle	trapezoid
obtuse angle	octagon
parallel sides	rectangle
perpendicular sides	square
line of symmetry	pentagon
triangle	polygon
hexagon	quadrilateral

A. The shapes of traffic signs are shown below. For each shape, write all of the words from the list that describe the shape of the sign.

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SCHOOL

345 National Forest

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SCHOOL SPEED LIMIT 15 WHEN FLASHING
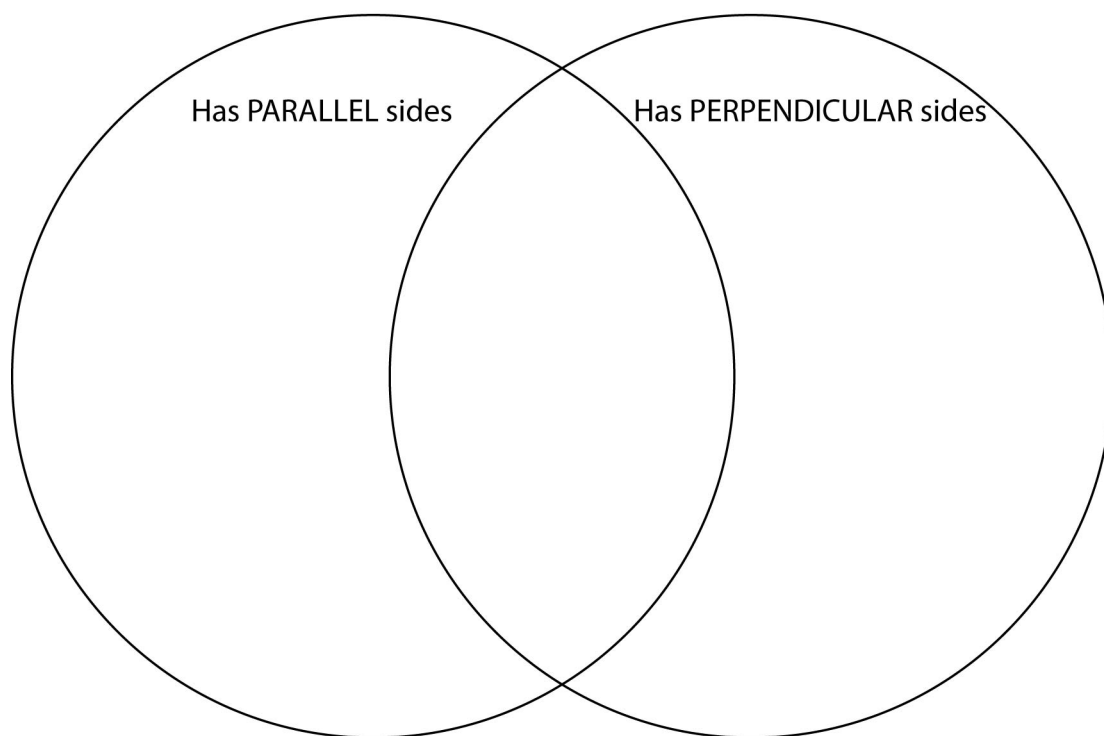
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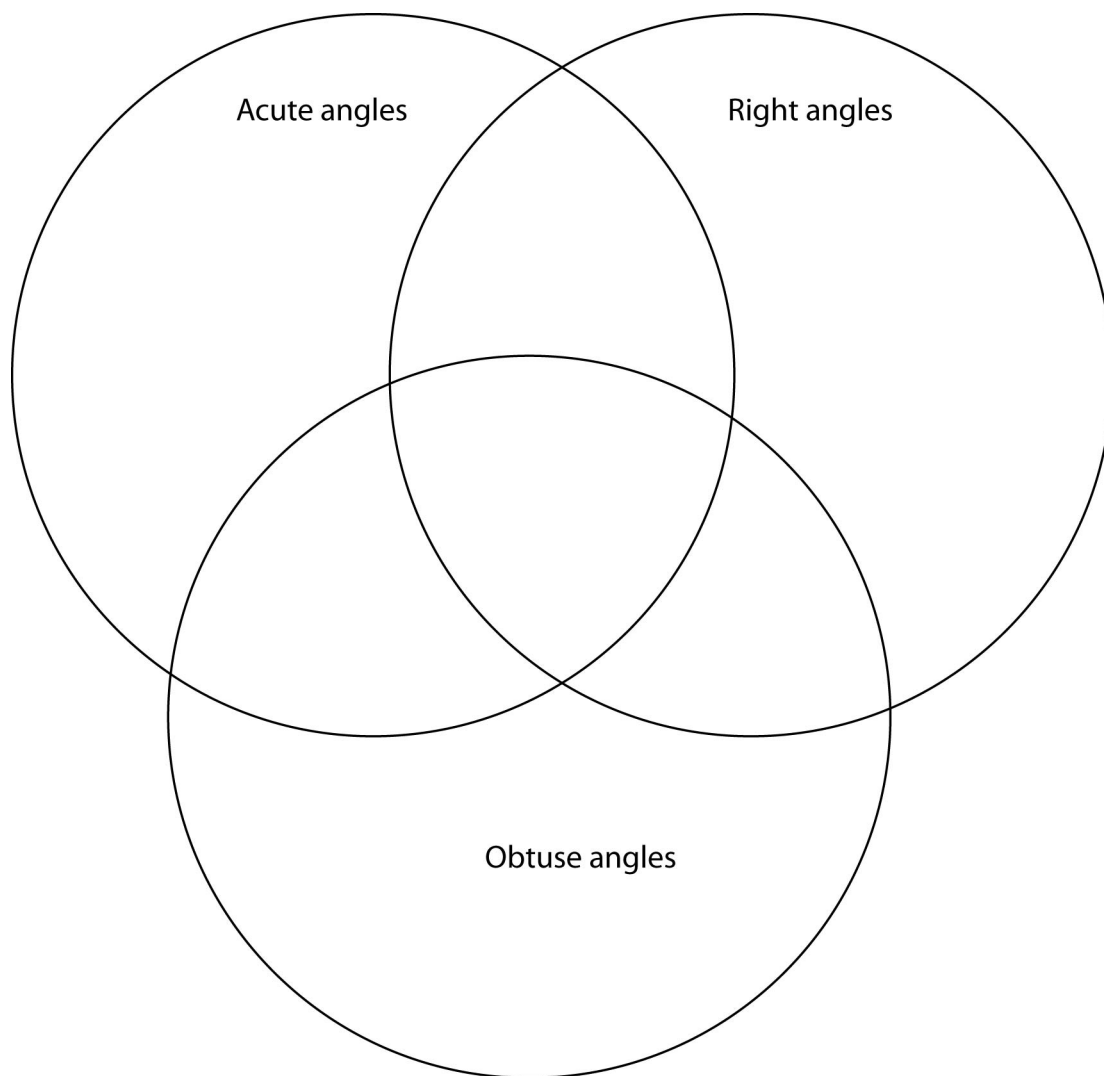
Math Grade 4: Classify Two-Dimensional Shapes

B. Classify the signs based on parallel and perpendicular sides. Use the Venn diagram below to show which shapes have one or more pairs of parallel sides and which shapes have one or more pairs of perpendicular sides. Draw the shapes of the signs in the correct parts of the Venn diagram.

Has PARALLEL sides   Has PERPENDICULAR sides

— 3 —

Math Grade 4: Classify Two-Dimensional Shapes

C. Classify the shapes of the signs based on the types of angles they contain. Use the Venn diagram below to show which shapes have acute angles, right angles, or obtuse angles. Draw the shapes of the signs in the correct parts of the Venn diagram.

Acute angles

Right angles

Obtuse angles

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Math Grade 4: Classify Two-Dimensional Shapes

D. Make up a rule to classify the shapes. Write your rule in the lined space provided below. Draw a diagram to show how the shapes of the signs are organized by your rule.

CCR Performance Tasks

Math Grade 4: Classify Two-Dimensional Shapes

Teacher Guide

About the Teacher Guide

This document contains the support materials for "Math Grade 4: Classify Two-Dimensional Shapes." This includes:

(a) The task
(b) The standards and depth of knowledge level of the task
(c) The scoring rubric
(d) Discussion questions
(e) Extension activities

These specifications have been included to help you connect the task to the Common Core content standards and the standards for mathematical practice. The rubric is designed to help you look for the development of mathematical practices in student work. It is also here to help you look for consistencies in student content errors that can help guide intervention and re-teach strategies.

Test Definition File

Item #	Correct Answer	Practice Standard	Content Standards
1	See Scoring Rubric	Mathematical Practice 7	4.G.1, 4.G.2, 4.G.3

SBAC Claims	PARCC Sub-Claims
1 and 3	B and D

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Performance Task

The list below shows words that describe attributes of two-dimensional shapes.

acute angle	rhombus
right angle	trapezoid
obtuse angle	octagon
parallel sides	rectangle
perpendicular sides	square
line of symmetry	pentagon
triangle	polygon
hexagon	quadrilateral

A. The shapes of traffic signs are shown below. For each shape, write all of the words from the list that describe the shape of the sign.

ONE WAY

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SCHOOL

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345 National Forest

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SCHOOL SPEED LIMIT 15 WHEN FLASHING
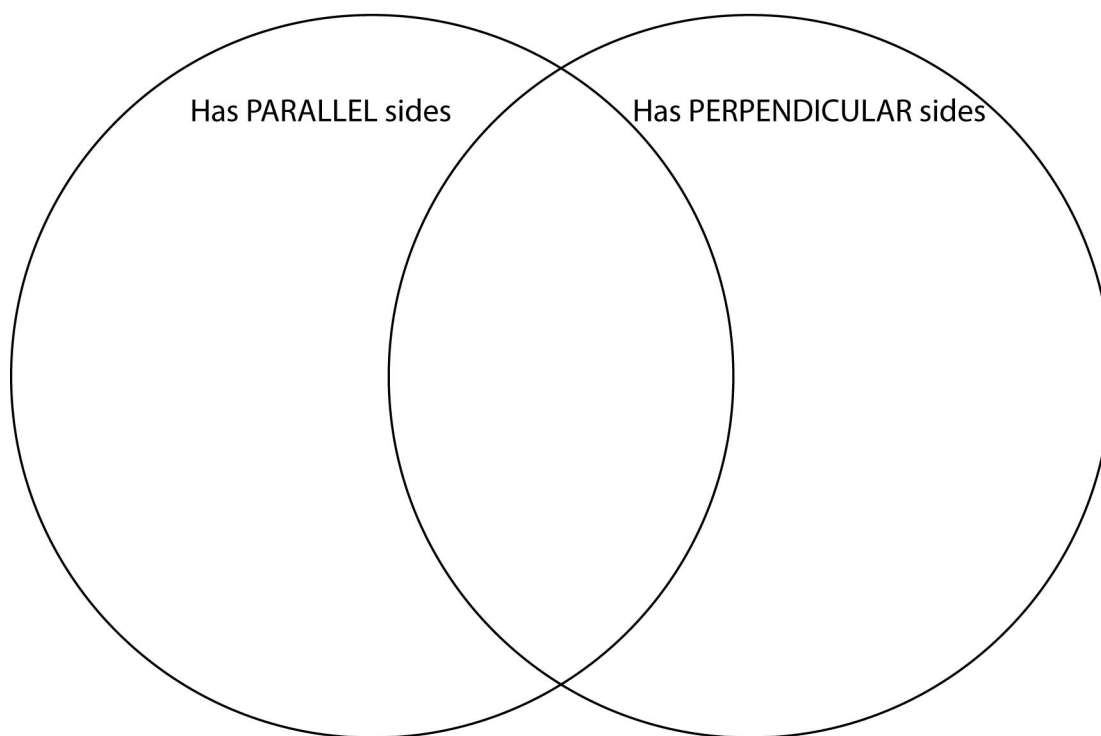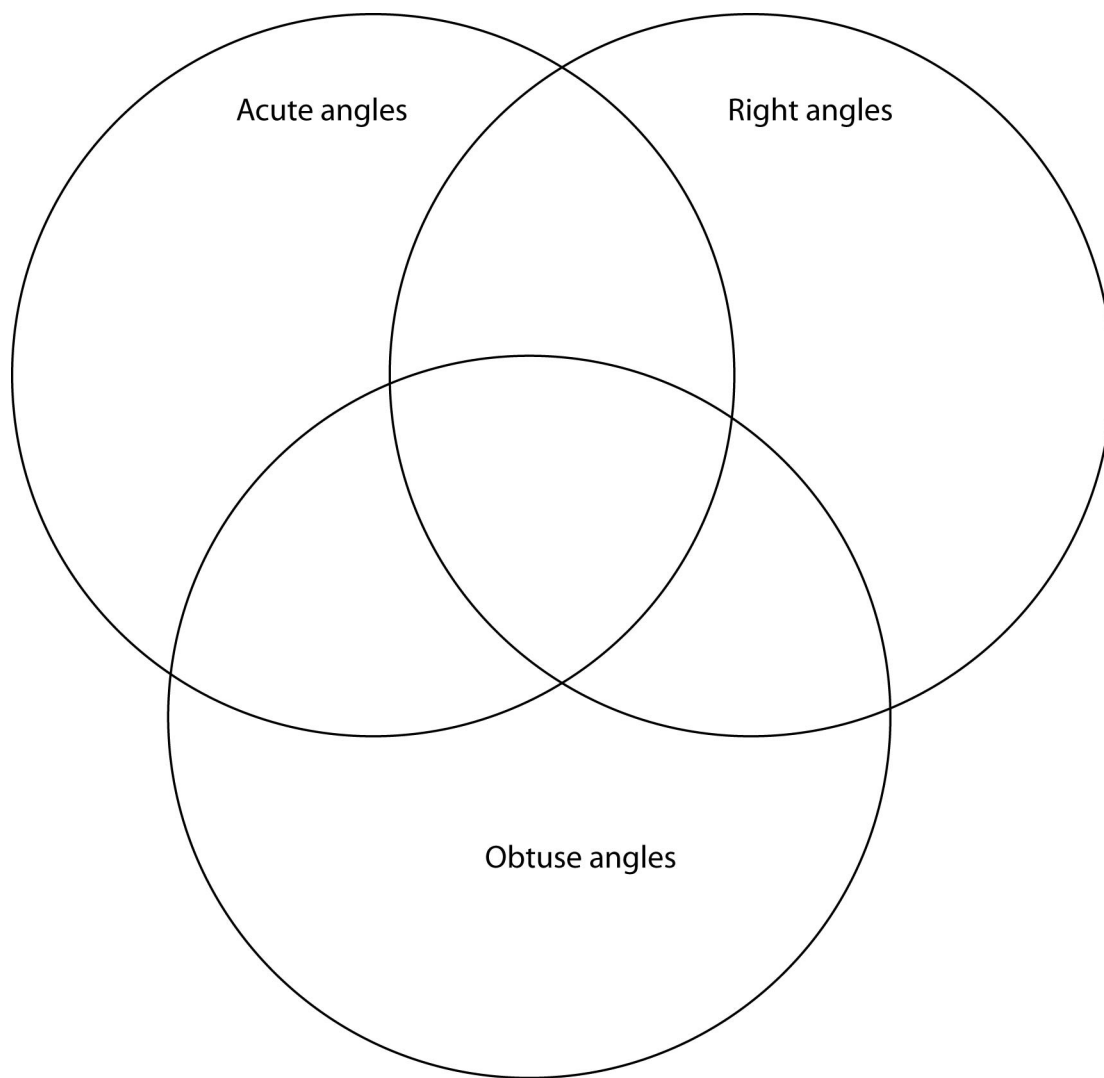
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B. Classify the signs based on parallel and perpendicular sides. Use the Venn diagram below to show which shapes have one or more pairs of parallel sides and which shapes have one or more pairs of perpendicular sides. Draw the shapes of the signs in the correct parts of the Venn diagram.

Has PARALLEL sides   Has PERPENDICULAR sides

C. Classify the shapes of the signs based on the types of angles they contain. Use the Venn diagram below to show which shapes have acute angles, right angles, or obtuse angles. Draw the shapes of the signs in the correct parts of the Venn diagram.

Acute angles

Right angles

Obtuse angles

D. Make up a rule to classify the shapes. Write your rule in the lined space provided below. Draw a diagram to show how the shapes of the signs are organized by your rule.

Math Grade 4: Classify Two-Dimensional Shapes

Standards Alignment

Practice Standards

MP7 > DOK 3

Look for and make use of structure. -- Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7×8 equals the well remembered $7 \times 5 + 7 \times 3$, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the 14 as 2×7 and the 9 as $2 + 7$. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 - 3(x - y)^2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y.

Content Standards

4.G.1

Draw points, lines, line segments, rays, angles (right, acute, and obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

4.G.2

Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.

4.G.3

Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

SBAC Claims

Mathematics Claim #1:

Concepts and Procedures. Students can explain and apply mathematical concepts and interpret and carry out mathematical procedures with precision and fluency.

Mathematics Claim #3:

Communicating Reasoning. Students can clearly and precisely construct viable arguments to support their own reasoning and to critique the reasoning of others.

PARCC Sub-Claims

Sub-Claim B:

Additional and Supporting Content with Connections to Practices. The student solves problems involving the additional and supporting content for the grade/course with connections to the Standards for Mathematical Practice.

Sub-Claim D:

Highlighted Practice MP.4 with Connections to Content: Modeling/Application. The student solves real-world problems with a degree of difficulty appropriate to the grade/course by applying knowledge and skills articulated in the standards for the current grade/course (or, for more complex problems, knowledge and skills articulated in the standards for previous grades/courses), engaging particularly in the modeling practice, and, where helpful, making sense of problems and persevering to solve them (MP.1), reasoning abstractly and quantitatively (MP.2), using appropriate tools strategically (MP.5), looking for and making use of structure (MP.7), and/or looking for and expressing regularity in repeated reasoning (MP.8).

Scoring Rubric

4 Point Response:

The response demonstrates a high level of understanding. A level 4 response is characterized by:

- A strong understanding of the attributes of two-dimensional shapes;
- A strong ability to classify shapes based on attributes;
- A strong ability to identify a rule related to the attributes of shapes and use the rule to classify shapes.

A level 4 response should include:

- In part A, correct and complete lists of attributes for each shape;
- In part B, a correct and complete Venn diagram;
- In part C, a correct and complete Venn diagram;
- In part D, a clearly defined rule for classifying shapes and a correct Venn diagram or other display showing the classification of the shapes of the signs.

A sample level 4 response follows.

Sample response for part A:

STOP

Octagon
Polygon
Obtuse angles
Parallel sides
Lines of symmetry

YIELD

Triangle
Polygon
Acute angles
Line of symmetry

SCHOOL
SPEED
LIMIT
15
WHEN
FLASHING

Rectangle
Polygon
Quadrilateral
Right angles
Perpendicular sides
Parallel sides
Line of symmetry

ONE
WAY

Rectangle
Polygon
Quadrilateral
Right angles
Perpendicular sides
Parallel sides
Lines of symmetry

Rhombus
Rectangle
Square
Polygon
Quadrilateral
Right angles
Perpendicular sides
Parallel sides
Line of symmetry

Polygon
Pentagon
Right angles
Obtuse angles
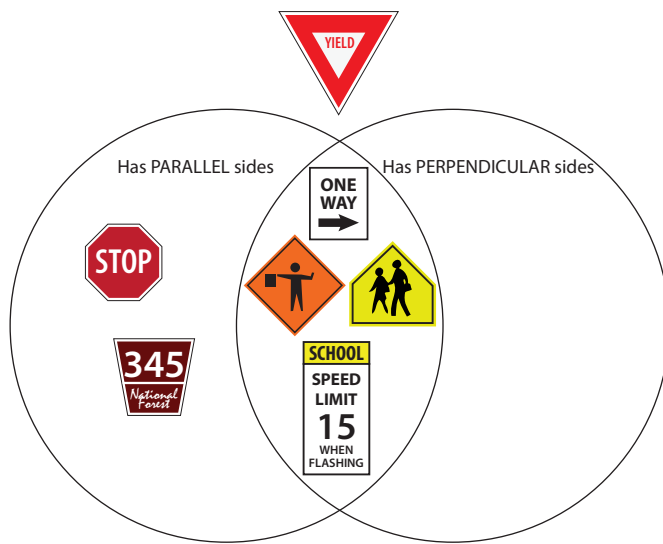Perpendicular sides
Parallel sides
Line of symmetry

345
National
Forest

Polygon
Quadrilateral
Trapezoid
Obtuse angles
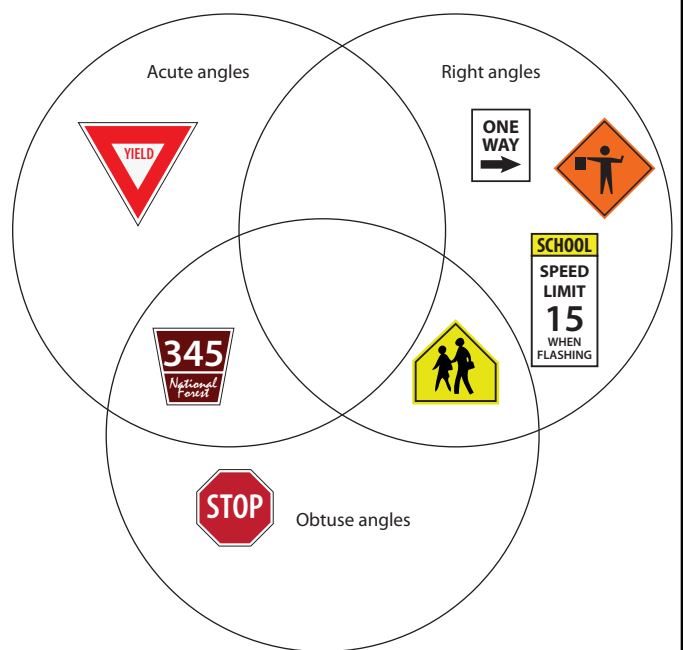Acute angles
Parallel sides
Line of symmetry

Notes:

1. The stop sign has sides that, when extended into lines, are perpendicular, but these are not considered perpendicular sides because they are not adjacent.
2. The top angle on the crossing sign looks like it might be acute, but is actually a right angle.
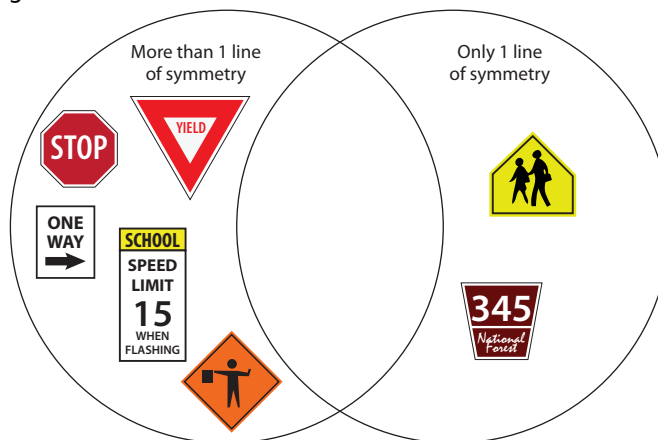
Sample response for part B:

Sample response for part C:

For part D, many classification rules are possible. Here is one example based on symmetry:

"I organized the shapes into two groups: group 1 contains shapes with more than one line of symmetry, and group 2 contains shapes with only one line of symmetry. Only the shapes have symmetry, not the words or pictures on the signs."

3 Point Response:

The response demonstrates a strong understanding, but the work contains minor errors. A level 3 response is characterized by:

- A strong understanding of the attributes of two-dimensional shapes, but the attribute list in part A may be incomplete for some shapes;

- A strong ability to classify shapes based on attributes;

- A strong ability to identify a rule related to the attributes of shapes and use the rule to classify shapes, although the statement of the rule may be incomplete or vague. The student may struggle to identify a rule but successfully applies the rule once identified.

2 Point Response:

The response demonstrates a basic but incomplete understanding. A level 2 response is characterized by:

- A basic understanding of the attributes of two-dimensional shapes. Part A may contain some errors and omissions;
- A basic ability to classify shapes based on attributes. Part B likely contains some errors;
- A weak ability to identify a rule related to the attributes of shapes and use the rule to classify shapes. The student may not be able to identify a rule or use the rule once identified.

1 Point Response:

The response demonstrates minimal understanding. A level 1 response is characterized by:

- An insufficient understanding of the attributes of two-dimensional shapes;
- A lack of ability to classify shapes based on attributes;
- A lack of ability to identify a rule related to the attributes of shapes and to use the rule to classify shapes.

0 Point Response:

There is no response, or the response is off topic.

Discussion Questions

Use the following questions to help students struggling to access the problem:

1. What is a Venn diagram?

Possible response: *It is some overlapping circles that you can use to show how things are organized in groups that may overlap.*

2. How can we use a Venn diagram to organize these objects? (Draw some shapes on the board that vary by size and color.)

Help students see how to organize the shapes using a Venn diagram. For example, if one circle is labeled "red" and the other is labeled "large," put the shapes that are large and red in the overlapping area, put the shapes that are red and not large into the red-only area, and the shapes that are large but not red into the large-only area.

3. How can you use the corner of an index card to determine if an angle is right, acute, or obtuse?

Possible response: *Place the corner of the index card on one ray of the angle. If the both rays match the edges of the card, the angle is a right angle; if one of the rays is covered by the card, the angle is acute; if one ray sticks out from the card, so there is space between the end of the ray and the edge of the card, the angle is obtuse.*

4. How do you know when a shape shows a line of symmetry?

Possible response: *The parts match when the figure is folded in half.*

Extension Activities

1. Give students toothpicks, paste, and paper. Tell them to make some two-dimensional shapes. Then have them name the figures they have made and list the properties of their figures.

2. Provide students with magazines or newspapers. Have them look for two-dimensional shapes. Tell them to cut out the pictures and paste them on poster board in groups that show their common properties. This is another opportunity to use Venn diagrams to see relationships among shapes.
   This activity can be DOK 4 if students are encouraged to add shapes to the board over several months.

3. Have students work in small groups or pairs to make a matching game. Provide 20 index cards. Tell groups to write the properties of shapes on 5 of the cards (shapes with right angles, shapes with sides, shapes with more than 4 angles, shapes with no right angles, and so on). Then have the students draw a variety of shapes in various sizes on the remaining cards. Instruct them to place the property cards in a row and exchange shape cards with another group or pair of students. Then have them sort the shape cards under the correct property description.
   This activity is DOK 4.

4. Play a riddle game, What am I? Have students make up riddles about different shapes.
   For example, "I have two sets of parallel lines and four square corners. What am I?"