**Content Area:** Geometry **Grade Level: 4**

**Content Standard:** 2.9.4.A Identify, describe, and define 1-, 2-, and 3- dimensional shapes and their related parts; compare 2-d imensional shapes; compare 3- dimensional shapes.

**PASA Anchor:** **M3&4.CA.1** Analyze characteristics and properties of two- and three- dimensional geometric shapes and demonstrate understanding of geometric relationships

**PASA linked to PSSA Anchor(s):** M4.C.1 Analyze characteristics and properties of two- and three- dimensional geometric shapes and demonstrate understanding of geometric relationships. M4.C.1.2 Represent and/or use properties or relationships of points, lines, line segments, rays and angles.

**Grade Level PSSA Anchor/Eligible Content:** M4.C.1.2.1 Identify points, lines, line segments or rays. M4.C.1.2.2 Identify parallel and perpendicular lines.

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| **Webb’s Depth of Knowledge (Cognitive Demand)** |
| **[ ]  1 – Recall** **[ ]  2 – Application of Skill/Concept** | **[x]  3 – Strategic Thinking****[ ]  4 – Extended Thinking** |

**Big Idea:** Two- and three-dimensional objects can be described, classified, and analyzed by their attributes, and their location can be described quantitatively.

**Essential Questions:** How can we use area as a tool to make sense of the world, and when is the use of an estimate more appropriate than the actual measurement?

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| **Prioritization**  |
| [x]  Skill is assessed in the general assessment [x]  Skill is assessed in the alternate assessment[x]  Skill is required for future learning in the content area [x]  Needed in next age/appropriate environment[x]  Required for instructional activities in a variety of practice communities[x]  Lesson plan available in SAS Voluntary Model Curriculum |

**Example of General Education Instructional Activity:**

Students will:

* identify, describe, and compare line segments, lines, rays, and angles.
* use appropriate vocabulary and symbols.

**Description:**

This lesson describes a hands-on way for students to learn about lines, rays, segments, and points. Students use yarn to create a "web" of parallel and perpendicular lines.

**Materials:**

* yarn
* wipe boards/dry erase makers for students
* letters of the alphabet cut out of construction paper; attach black dots to the letters to represent points (laminating works well)

**Vocabulary:**

1. Ray - A line starting at a single point and going on forever in one direction.
2. Point - A fixed spot on a plane.
3. Line - A straight line going on forever in both directions.
4. Segment - A line with two endpoints.
5. Parallel - Two lines, line segments, or rays that are constantly equidistant apart from one another so that they never intersect.
6. Perpendicular - A line, line segment, or ray that touches or intersects another line, line segment, or ray at a 90 degree angle.
7. Intersecting - Two lines, line segments, or rays that touch or pass through one another at any angle.

**Discussion:**

* 1. Review how to name lines, rays, segments, points, parallel lines, perpendicular lines, and intersecting lines. Clear out the center of the room and have students stand in a circle. Teacher will stand in the center of the group to help guide the yarn and ensure that there are some parallel and perpendicular lines. Pass yarn around the circle. Students hold onto a small piece of the yarn and then pass it either across the circle or next to them to form a web design. The web is then carefully laid down on the floor so that every student has a clear view of it. The laminated alphabet points are placed at intersecting points on the web. These points will allow the children to name rays, line segments, lines, etc. using mathematical terminology.
	2. Each student sits near the web and works in pairs with a wipe board. Ask each pair to find (one at a time) rays, points, lines, segments, intersecting lines, parallel lines, and perpendicular lines. Students must re-draw each figure on their wipe board, label it correctly, and write the symbolic form. Students use the alphabet points that were placed at intersecting points on the web to label the lines, rays, etc. that they find. Then students write out the figures that they find using the correct form of mathematical labeling. [I also had my students write how they would say it out loud when naming it. Example: "Line AB or line segment AB is perpendicular to line segment CD."] Below is information on how students should label rays, lines, etc.
1. Ray - The endpoint letter first, then a second point with a line ending in an arrow over the two letters, pointing to the right.
2. Point - A dot and then the point's letter.
3. Line - Two points on the line with a line with arrows in both directions above the letters.
4. Segment - The two endpoint letters of the segment with a line, no arrows, above the two letters
5. Intersecting - (AB x BC) The AB and BC would have a line or a line with arrows above them to show what figures they were. The x stands for intersects.
6. Parallel - (AB // BC) The AB and BC would have a line or a line with arrows above them to show what figures they were. The // stands for parallel.
7. Perpendicular - (AB \_|\_ BC) The AB and BC would have a line or a line with arrows above them to show what figures they were. The \_|\_ means perpendicular.
8. After each item, students hold up their wipe boards for the teacher to check. After student’s work is check, wipe boards are erased. When students are finished identifying all 7 items (ray, point, line, etc) conclude by discussing how these figures are found in everyday life. Have students respond orally to the following questions:  *“Today* we have made a web of lines in our classroom. There are examples of lines, rays, line segments, and points everywhere in our everyday life. Brainstorm two or three examples of these figures around you. Did you notice them as being a point, line, segment, or ray before learning about them in geometry? Why or why not?" Teacher may provide example of items in the classroom then have the students generate their own examples in the room as well as outside of the room.

**Assessment:**

Observe students’ participation in the activity along with their responses on the wipe boards. Teachers can create a checklist to more formally assess students' abilities to draw, name, and symbolize the figures correctly.

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| **General Instructional Format** | **Formative Assessment Options**  |
| **[x]  Cooperative learning****[ ]  Project based****[x]  Performance event/task****[ ]  Note-taking****[x]  Presentation****[x]  Direct Instruction (I do, We do, You do)****[ ] Indirect Instruction****[x] Other: graphic organizers** | **[ ]  Observation with Data Collection****[ ]  Random Reporter** **[x]  Ticket out the door** **[x]  Think Pair Share** **[x]  Student work sample** **[ ]  Video tape****[ ]  Multiple choice Item** **[ ]  Open response Item** **[x]  Item Other:** |

**Access to the Instructional Activity for Students at Different Communication Levels**

**Symbolic**

Students will:

* identify, describe, and compare line segments, lines, rays, and angles.
* use appropriate vocabulary and symbols.

**Description:**

This lesson describes a hands-on way for students to learn about lines, rays, segments, and points. Students use yarn to create a "web" of parallel and perpendicular lines.

**Materials:**

* yarn
* wipe boards/dry erase makers for students
* letters of the alphabet cut out of construction paper; attach black dots to the letters to represent points (laminating works well)
* Visuals that represent the mathematical figures
* Pictures of common items that represent the figures
* Communication device (as appropriate) with the necessary vocabulary/figures

**Vocabulary:**

1. Ray - A line starting at a single point and going on forever in one direction.
2. Point - A fixed spot on a plane.
3. Line - A straight line going on forever in both directions.
4. Segment - A line with two endpoints.
5. Parallel - Two lines, line segments, or rays that are constantly equidistant apart from one another so that they never intersect.
6. Perpendicular - A line, line segment, or ray that touches or intersects another line, line segment, or ray at a 90 degree angle.
7. Intersecting - Two lines, line segments, or rays that touch or pass through one another at any angle.

**Discussion:**

* 1. Review how to name lines, rays, segments, points, parallel lines, perpendicular lines, and intersecting lines. Clear out the center of the room and have students stand in a circle. Teacher will stand in the center of the group to help guide the yarn and ensure that there are some parallel and perpendicular lines. Pass yarn around the circle. Students hold onto a small piece of the yarn and then pass it either across the circle or next to them to form a web design. The web is then carefully laid down on the floor so that every student has a clear view of it. The laminated alphabet points are placed at intersecting points on the web. These points will allow the children to name rays, line segments, lines, etc. using mathematical terminology. Visually represent the targeted vocabulary (lines, rays, etc) with the label and a drawing and provide to the learner.
	2. Each student sits near the web and works in pairs with a wipe board. Ask each pair to find (one at a time) rays, points, lines, segments, intersecting lines, parallel lines, and perpendicular lines. Students must re-draw each figure on their wipe board, label it correctly, and write the symbolic form. Students use the alphabet points that were placed at intersecting points on the web to label the lines, rays, etc. that they find. Then students write out the figures that they find using the correct form of mathematical labeling. [I also had my students write how they would say it out loud when naming it. Example: "Line AB or line segment AB is perpendicular to line segment CD."] Below is information on how students should label rays, lines, etc. When drawing each form, provide a model for the learner to copy. Provide visuals to be used when identifying the label and the symbolic form.
1. Ray - The endpoint letter first, then a second point with a line ending in an arrow over the two letters, pointing to the right.
2. Point - A dot and then the point's letter.
3. Line - Two points on the line with a line with arrows in both directions above the letters.
4. Segment - The two endpoint letters of the segment with a line, no arrows, above the two letters
5. Intersecting - (AB x BC) The AB and BC would have a line or a line with arrows above them to show what figures they were. The x stands for intersects.
6. Parallel - (AB // BC) The AB and BC would have a line or a line with arrows above them to show what figures they were. The // stands for parallel.
7. Perpendicular - (AB \_|\_ BC) The AB and BC would have a line or a line with arrows above them to show what figures they were. The \_|\_ means perpendicular.
8. After each item, students hold up their wipe boards for the teacher to check. After student’s work is check, wipe boards are erased. When students are finished identifying all 7 items (ray, point, line, etc) conclude by discussing how these figures are found in everyday life. Have students respond orally to the following questions:  *“Today* we have made a web of lines in our classroom. There are examples of lines, rays, line segments, and points everywhere in our everyday life. Brainstorm two or three examples of these figures around you. Did you notice them as being a point, line, segment, or ray before learning about them in geometry? Why or why not?" Teacher may provide example of items in the classroom then have the students generate their own examples in the room as well as outside of the room. Provide pictures of common items that would illustrate the targeted figures and have them match these items to the mathematical figure.

**Assessment:**

Observe students’ participation in the activity along with their responses on the wipe boards. Teachers can create a checklist to more formally assess students' abilities to draw, name, and symbolize the figures correctly.

**Emerging Symbolic**

Students will:

* identify, describe, and compare line segments, lines, rays, and angles.
* use appropriate vocabulary and symbols.

**Description:**

This lesson describes a hands-on way for students to learn about lines, rays, segments, and points. Students use yarn to create a "web" of parallel and perpendicular lines.

**Materials:**

* yarn
* wipe boards/dry erase makers for students
* letters of the alphabet cut out of construction paper; attach black dots to the letters to represent points (laminating works well)
* Visuals that represent the mathematical figures
* Objects of common items that represent the figures
* Communication device (as appropriate) with the necessary vocabulary/figures

**Vocabulary:**

1. Ray - A line starting at a single point and going on forever in one direction.
2. Point - A fixed spot on a plane.
3. Line - A straight line going on forever in both directions.
4. Segment - A line with two endpoints.
5. Parallel - Two lines, line segments, or rays that are constantly equidistant apart from one another so that they never intersect.
6. Perpendicular - A line, line segment, or ray that touches or intersects another line, line segment, or ray at a 90 degree angle.
7. Intersecting - Two lines, line segments, or rays that touch or pass through one another at any angle.

**Discussion:**

* 1. Review how to name lines, rays, segments, points, parallel lines, perpendicular lines, and intersecting lines. Clear out the center of the room and have students stand in a circle. Teacher will stand in the center of the group to help guide the yarn and ensure that there are some parallel and perpendicular lines. Pass yarn around the circle. Students hold onto a small piece of the yarn and then pass it either across the circle or next to them to form a web design. The web is then carefully laid down on the floor so that every student has a clear view of it. The laminated alphabet points are placed at intersecting points on the web. These points will allow the children to name rays, line segments, lines, etc. using mathematical terminology. Visually represent the targeted vocabulary (lines, rays, etc) with the label and a drawing and provide to the learner. Provide visuals identified above.
	2. Each student sits near the web and works in pairs with a wipe board. Ask each pair to find (one at a time) rays, points, lines, segments, intersecting lines, parallel lines, and perpendicular lines. Students must re-draw each figure on their wipe board, label it correctly, and write the symbolic form. Students use the alphabet points that were placed at intersecting points on the web to label the lines, rays, etc. that they find. Then students write out the figures that they find using the correct form of mathematical labeling. [I also had my students write how they would say it out loud when naming it. Example: "Line AB or line segment AB is perpendicular to line segment CD."] Below is information on how students should label rays, lines, etc. Augmentative systems with necessary vocabulary could be used to label. Choice boards could be used to identify the symbolic form.
1. Ray - The endpoint letter first, then a second point with a line ending in an arrow over the two letters, pointing to the right.
2. Point - A dot and then the point's letter.
3. Line - Two points on the line with a line with arrows in both directions above the letters.
4. Segment - The two endpoint letters of the segment with a line, no arrows, above the two letters
5. Intersecting - (AB x BC) The AB and BC would have a line or a line with arrows above them to show what figures they were. The x stands for intersects.
6. Parallel - (AB // BC) The AB and BC would have a line or a line with arrows above them to show what figures they were. The // stands for parallel.
7. Perpendicular - (AB \_|\_ BC) The AB and BC would have a line or a line with arrows above them to show what figures they were. The \_|\_ means perpendicular.
8. After each item, students hold up their wipe boards for the teacher to check. After student’s work is check, wipe boards are erased. When students are finished identifying all 7 items (ray, point, line, etc) conclude by discussing how these figures are found in everyday life. Have students respond orally to the following questions:  *“Today* we have made a web of lines in our classroom. There are examples of lines, rays, line segments, and points everywhere in our everyday life. Brainstorm two or three examples of these figures around you. Did you notice them as being a point, line, segment, or ray before learning about them in geometry? Why or why not?" Teacher may provide example of items in the classroom then have the students generate their own examples in the room as well as outside of the room. Provide objects that would illustrate the targeted concepts and match them to a visual of the mathematical figure. Provide written explanation choices paired with picture symbols to explain why an item is an example of a figure.

**Assessment:**

Observe students’ participation in the activity along with their responses on the wipe boards. Teachers can create a checklist to more formally assess students' abilities to draw, name, and symbolize the figures correctly.

**Pre-Symbolic**

Students will:

* identify, describe, and compare line segments, lines, rays, and angles.
* use appropriate vocabulary and symbols.

**Description:**

This lesson describes a hands-on way for students to learn about lines, rays, segments, and points. Students use yarn to create a "web" of parallel and perpendicular lines.

**Materials:**

* yarn
* wipe boards/dry erase makers for students
* letters of the alphabet cut out of construction paper; attach black dots to the letters to represent points (laminating works well)
* Visuals that represent the mathematical figures
* Objects of common items that represent the figures
* Communication device (as appropriate) with the necessary vocabulary/figures

**Vocabulary:**

1. Ray - A line starting at a single point and going on forever in one direction.
2. Point - A fixed spot on a plane.
3. Line - A straight line going on forever in both directions.
4. Segment - A line with two endpoints.
5. Parallel - Two lines, line segments, or rays that are constantly equidistant apart from one another so that they never intersect.
6. Perpendicular - A line, line segment, or ray that touches or intersects another line, line segment, or ray at a 90 degree angle.
7. Intersecting - Two lines, line segments, or rays that touch or pass through one another at any angle.

**Discussion:**

* 1. Review how to name lines, rays, segments, points, parallel lines, perpendicular lines, and intersecting lines. Clear out the center of the room and have students stand in a circle. Teacher will stand in the center of the group to help guide the yarn and ensure that there are some parallel and perpendicular lines. Pass yarn around the circle. Students hold onto a small piece of the yarn and then pass it either across the circle or next to them to form a web design. The web is then carefully laid down on the floor so that every student has a clear view of it. The laminated alphabet points are placed at intersecting points on the web. These points will allow the children to name rays, line segments, lines, etc. using mathematical terminology. Provide tactile or object representation of a limited number of figures (point, line & parallel)
	2. Each student sits near the web and works in pairs with a wipe board. Ask each pair to find (one at a time) rays, points, lines, segments, intersecting lines, parallel lines, and perpendicular lines. Students must re-draw each figure on their wipe board, label it correctly, and write the symbolic form. Students use the alphabet points that were placed at intersecting points on the web to label the lines, rays, etc. that they find. Then students write out the figures that they find using the correct form of mathematical labeling. [I also had my students write how they would say it out loud when naming it. Example: "Line AB or line segment AB is perpendicular to line segment CD."] Below is information on how students should label rays, lines, etc. Provide a simplified copy of the web on the floor (using WIKI sticks, etc) with a reduced number of intersections, include each of the targeted figures, label intersection with alphabet. Use the tactile or object representations to identify each figure.
1. Ray - The endpoint letter first, then a second point with a line ending in an arrow over the two letters, pointing to the right.
2. Point - A dot and then the point's letter.
3. Line - Two points on the line with a line with arrows in both directions above the letters.
4. Segment - The two endpoint letters of the segment with a line, no arrows, above the two letters
5. Intersecting - (AB x BC) The AB and BC would have a line or a line with arrows above them to show what figures they were. The x stands for intersects.
6. Parallel - (AB // BC) The AB and BC would have a line or a line with arrows above them to show what figures they were. The // stands for parallel.
7. Perpendicular - (AB \_|\_ BC) The AB and BC would have a line or a line with arrows above them to show what figures they were. The \_|\_ means perpendicular.
8. After each item, students hold up their wipe boards for the teacher to check. After student’s work is check, wipe boards are erased. When students are finished identifying all 7 items (ray, point, line, etc) conclude by discussing how these figures are found in everyday life. Have students respond orally to the following questions:  *“Today* we have made a web of lines in our classroom. There are examples of lines, rays, line segments, and points everywhere in our everyday life. Brainstorm two or three examples of these figures around you. Did you notice them as being a point, line, segment, or ray before learning about them in geometry? Why or why not?" Teacher may provide example of items in the classroom then have the students generate their own examples in the room as well as outside of the room. Sort items that represent the limited figures that will be targeted (point, line & parallel). Examples of real world items may be: Point (a bingo chip, a coin, dots used for labeling the web on the floor), Line (pencils, crayon, pipe cleaner), Parallel (2 of following items: straws, wiki sticks, pencils)

**Assessment:**

Observe students’ participation in the activity along with their responses on the wipe boards. Teachers can create a checklist to more formally assess students' abilities to draw, name, and symbolize the figures correctly.