

# ELG 4.MD.C Understand concepts of angle and measure angles

### Vertical Progression:

<b>2<sup>nd</sup> Grade</b>	<p><b>2.G.A Reason with shapes and their attributes.</b></p> <ul style="list-style-type: none"> <li>○ <b>2.G.A.1</b> Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.</li> </ul>
<b>3<sup>rd</sup> Grade</b>	<p><b>3.G.A Reason with shapes and their attributes.</b></p> <ul style="list-style-type: none"> <li>○ <b>3.G.A.1</b> Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.</li> </ul>
<b>4<sup>th</sup> Grade</b>	<p><b>4.MD.C Geometric measurement: understand concepts of angle and measure angles.</b></p> <ul style="list-style-type: none"> <li>○ <b>4.MD.C.5</b> Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.</li> <li>○ <b>4.MD.C.5.a</b> An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through <math>\frac{1}{360}</math> of a circle is called a “one-degree angle,” and can be used to measure angles.</li> <li>○ <b>4.MD.C.5.b</b> An angle that turns through <math>n</math> one-degree angles is said to have an angle measure of <math>n</math> degrees.</li> <li>○ <b>4.MD.C.6</b> Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.</li> <li>○ <b>4.MD.C.7</b> Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.</li> </ul>
<b>7<sup>th</sup> Grade</b>	<p><b>7.G.B Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.</b></p> <ul style="list-style-type: none"> <li>○ <b>7.G.B.5</b> Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.</li> </ul>

### Students will demonstrate command of the ELG by:

- Identifying an angle.
- Measuring an angle in degrees with reference to a circle.
- Using a protractor to measure angles to the nearest degree.
- Using a protractor to draw angles to a given number of degrees.
- Decomposing an angle into non-overlapping parts.
- Finding the angle measure of the whole by adding together the degrees in each decomposed part.
- Writing an equation with a symbol for an unknown angle measure.
- Using an equation and adding or subtracting to find the amount of an unknown angle.

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#### Vocabulary:

- acute
- angle
- degree
- endpoint
- intersect
- obtuse
- one-degree angle
- perpendicular
- protractor
- ray
- right angle

#### Sample Instructional/Assessment Tasks:

##### 1) Standard: 4.MD.C.5

**Source:** <https://grade4commoncoremath.wikispaces.hcpss.org/Assessing+4.MD.5>

**Item Prompt:**

A circle measures 360°. If the circle were divided into 4 equal parts, what would be the angle measurement of each part? Explain how you know.

**Correct Answer:**

If a circle is divided equally into four parts, then each angle would measure to 90 degrees because  $360 \div 4 = 90$ .

##### 2) Standard: 4.MD.C.6

**Source:** <https://grade4commoncoremath.wikispaces.hcpss.org/Assessing+4.MD.6>

**Item Prompt:** Use a protractor to draw an angle for the measurement given:

- A. 65 degrees
- B. 120 degrees
- C. 105 degrees
- D. 35 degrees

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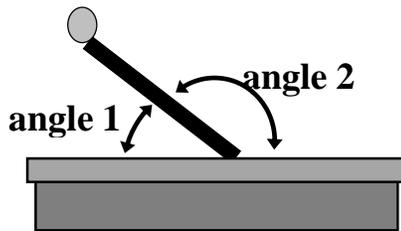
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**3) Standard: 4.MD.C.7**

**Source:** <https://grade4commoncoremath.wikispaces.hcpss.org/Assessing+4.MD.7>

**Item Prompt:**

Cameron has an electric train. The train's switch has a lever that can be pushed forward to make the train go faster or pulled back to make the train go slower. Cameron noticed that the base of the switch and the lever form two angles: angle 1 and angle 2. The angles changed when he moved the lever. Cameron moved the lever forward and used a chart to record the angles formed by the lever. Describe how angle 1 and angle 2 changed as Cameron pushed the level forward.



angle 1	angle 2
5°	175°
20°	160°
30°	150°
75°	105°

**Correct Answer:**

Each time Cameron moves the lever the sum of angle 1 and angle 2 always equals 180 degrees which is a straight line.