

Core Content

Cluster Title: Geometric Measurement: understand concepts of angle and measure angles.

Standard 7: Recognize angle measures 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.

MASTERY Patterns of Reasoning:

Conceptual:

Students will understand the total angle measurement is the sum of its parts.

Students will understand two non-overlapping angles can be added together to find the sum of both angles.

Procedural:

Students can identify and justify the operation required to find unknown angles from a diagram, real-life problem or a mathematical equation.

Students can accurately measure angles with a protractor.

Representational:

Students can use models, manipulatives, diagrams and equations to demonstrate an understanding of additive angle measurement.

Students can using models, manipulatives, and diagrams formulate equations with an unknown value to determine the total measure of the angle.

Supports for Teachers

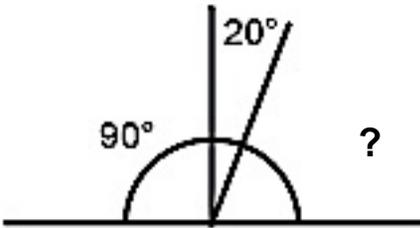
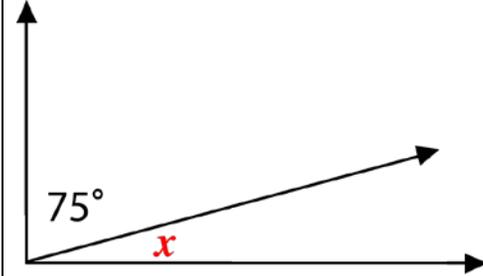
Critical Background Knowledge

Conceptual:

Students will understand benchmark angles: right angle = 90° , straight angle = 180° , $0^\circ < \text{acute} < 90^\circ$, $90^\circ < \text{obtuse} < 180^\circ$.

Students will understand part-to-whole relationships and how this relates to addition and subtraction (e.g., missing addend).

<p>Procedural: Students can identify benchmark angles. Students can compare benchmark angles to angle sums for reference purposes. Students can solve equations with an unknown value.</p> <p>Representational: Students can represent angles pictorially and express their measure in whole number degrees.</p> <p>Academic Vocabulary and Notation angle, protractor, sum, degree (and symbol °) acute angle, obtuse angle, straight angle, right angle, angle measure, perpendicular</p>

Instructional Strategies Used	Resources
<p>Using previous knowledge of angle measure, students will be able to view the diagrams at the right, and determine the missing angles.</p> <p>Using protractors, students will draw angles with missing measure and trade drawings with a partner. The partner will then solve for the missing angle.</p>  <p> $180 - (90 + 20) = ?$ $180 - 110 = 70^\circ$ </p>	<p>http://www.mathsisfun.com/geometry/complementary-angles.html</p> <p>http://www.mathsisfun.com/geometry/supplementary-angles.html</p> <p>http://www.khanacademy.org/video/complementary-and-supplementary-angles?playlist=Geometry</p> <p>Book: <i>Sir Cumference and the Great Knight of Angleland</i>, by Cindy Neuschwander</p> 

Assessment Tasks Used	
<p>Skill-Based Task: Ruby is standing on first base. Jasmine is standing on second base. What is the angle of measure from home plate between the two girls? What is the angle between third base and second base?</p> <p>Answer: 45°</p>	<p>Problem Task: Bella and Edward's teacher told them that the two outside rays in this drawing are perpendicular. She asked them to find the missing measure. What is it?</p> <p>Answer: 45° (again!)</p> 