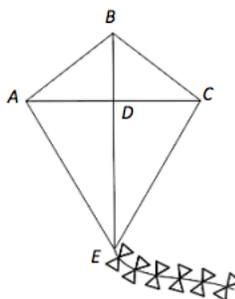## Angle Measure and Plane Figures

This 20-day module introduces points, lines, line segments, rays, and angles, as well as the relationships between them. Students will construct, recognize, and define these geometric objects before using their new knowledge and understanding to classify figures and solve problems. Students will construct and measure angles, as well as create equations to find an unknown angle.

Students will be asked to identify points, line segments, lines, rays, and angles.

Given a geometrical drawing like the one below, students will learn to use what they know to solve for an unknown angle measure.
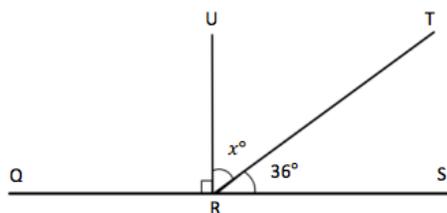
Solve for ∠TRU.
∠QRS is a straight angle.

What Came Before this Module:
We applied multiplication and division to contexts such as area and perimeter, and worked up to multiplication and division of multi-digit whole numbers.

What Comes After this Module:
Students will explore fraction equivalence, working for the first time with mixed numbers. They will solve to find equivalent fractions, compare and order fractions, and add and subtract fractions using familiar models to support their conceptual understanding.

Key Words to Know

Angle - union of two different rays sharing a common vertex

Acute Angle – angle with a measure of less than 90 degrees

Line of symmetry - line through a figure such that when the figure is folded along the line two halves are created that match up exactly

Obtuse angle - angle with a measure greater than 90 degrees but less than 180 degrees

Parallel - two lines in a plane that do not intersect

Perpendicular - Two lines are perpendicular if they intersect, and any of the angles formed between the lines is a 90° angle

Right angle - angle formed by perpendicular lines, measuring 90 degrees

Straight angle - angle that measures 180 degrees

Triangle - A triangle consists of three non-collinear points and the three line segments between them.

Vertex - a point, often used to refer to the point where two lines meet, such as in an angle or the corner of a triangle

+ How you can help at home:

- Review vocabulary! This module introduces many new terms and ideas. Use your student's homework to find key terms to review.
- Practice adding to make 90, 180, 270 and 360, as well as subtracting from those numbers. This will be useful when students are solving problems like the missing angle one above.

Key Common Core Standards:

- *Geometric measurement: understand concepts of angle and measure angles.*
  - o Recognize angles as geometric shapes that are formed whenever two rays share a common endpoint, and understand concepts of angle measurement.
  - o Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
  - o Recognize angle measure as additive.
- *Draw and identify lines and angles, and classify shapes by properties of their lines and angles.*
  - o Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
  - o 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.
  - o Recognize a line of symmetry for a two-dimensional figure.

Prepared by Erin Schweng, Math Coach

Eureka Math, *A Story of Units*

Some sample Total Physical Response questions from this module:

What teacher says:	What students do:
Model a point	Clench one hand in a fist.
Model a ray	Extend arms straight so that they are parallel with the floor. Clench one hand in a fist and point the fingers of the other hand towards the wall.
Model a right angle	Stretch one arm up, directly at the ceiling. Stretch another arm directly towards a wall, parallel to the floor.
Make an angle that measures approximately 60°	Open arms apart to approximately 60°.

Spotlight on Math Strategies:

Total Physical Response

Borrowed from language instruction, this is a powerful tool for learning new math vocabulary.

A Story of Units has several key mathematical strategies that will be used throughout a student's elementary years.

In the world of language learning, "total physical response" refers to the coordination of language and physical movement. In this module, there are many new geometry terms and ideas that students must remember. Using their bodies in connection with new vocabulary helps students to cement these new words and their meanings in lasting ways. Throughout the module, students engage in fluency activities called "Physiometry" (a single-word combination of "physical" and "geometry") in which they use body movements and positioning to indicate terms such as point, line segment, ray, acute, obtuse, and right angles, as well as many others.
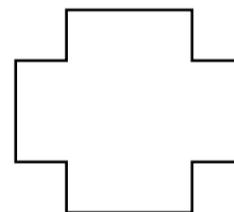
Other Key Skills in Module 4 Include:

Classifying 2-D figures:
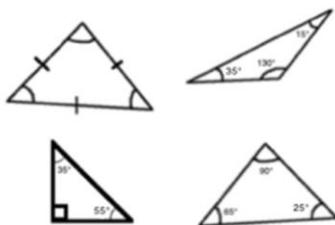
Students will be able to classify these triangles by their sides and their angles.

Understanding line relationships:

Students will be able to identify the parallel and perpendicular lines in the figure.

EUREKA MATH