Unit 1: Shapes and Design
Two-Dimensional Geometry

- What a polygon is
  - Closed figure made up of at least three straight sides and angles. The sides do not cross over themselves and there are no curves.
- How to sort polygons
- How to estimate and measure angles
- How to draw and label angles and polygons with given conditions
  - Draw $\angle RAT = 55^\circ$

- Draw $\triangle XYZ$ with $\angle XYZ = 90^\circ, \angle YZX = 45^\circ$, and side $YZ = 1$ in

- Know what complementary angles are, and how to find them
  - Complementary angles are two angles whose measures sum to 90°
- Know what supplementary angles are, and how to find them
  - Supplementary angles are two angles whose measures sum to 180°
- Know what a regular polygon is
  - A regular polygon is a polygon where all the sides are the same length and all angles have the same measure
- Know what an irregular polygon is
  - In an irregular polygon, not all sides are the same length and not all of the angles have the same measure
- How to use variables to represent quantities
- Know what convex polygons are
Convex polygons are familiar figures like triangles, parallelograms, and trapezoids.

- Know what **concave polygons** are
  - Concave polygons figures like a star and an arrowhead

- Know what **interior angles** and **exterior angles** are
  - Interior angles are angles inside the polygon
  - Exterior angles are found by extending out a side of a convex polygon and lies outside of the polygon

- Realizing that exterior and interior angles are supplementary
- How to use complementary and supplementary angles to solve for missing angles

- Know the formula $180(n-2)$ to solve for the sum of the interior angles
- Find a missing angle in a regular polygon
- Be able to explain if a triangle can have certain angle measures
- Be able to draw a geometric shape given conditions
  - Triangles
    - The sum of any two sides must be greater than the third
    - SSS, SAS, AAA, ASA, AAS
  - Quadrilaterals
    - The sum of the smallest three sides must be greater than the fourth
    - Properties of:
      - Squares
      - Rectangles
      - Rhombuses
      - Parallelograms
      - Trapezoids
• Be able to use facts about complementary, supplementary, adjacent, consecutive, and vertical angles to solve for missing angles

• Know what \textbf{parallel lines} are
  o Parallel lines are lines in a plane that never meet

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• Know what a \textbf{transversal} is
  o A transversal is a line that intersect two other lines

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• Know what \textbf{vertical angles} are
  o Vertical angles are the opposite pairs of angles that are formed when two lines are intersected
  \[
  \angle a \text{ and } \angle c \text{ are vertical angles} \\
  \angle b \text{ and } \angle d \text{ are vertical angles}
  \]

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• Know what interior angle and exterior angle sums are
• Know how to solve for one exterior angle in a regular polygon