CLASSIFYING POLYGONS

Unit 1 Lesson 6

Classifying Polygons

Students will be able to:

Identify the 2-dimensional shapes based on their properties.

Key Vocabulary

- **Polygons**
- **Triangles**
- **Quadrilaterals**
- **Pentagons and Hexagons**
- **Other Polygons**
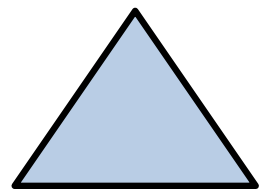
Classifying Polygons

A **polygon** is a closed plane shape formed by **three or more** line segments.

- A polygon is said to be **regular**, if all the side lengths are equal.

- A polygon is said to be **irregular**, if all the side lengths are not equal.

- **Triangle, Quadrilaterals, Pentagons etc**. are all polygons.

Classifying Polygons

A **_triangle_** is a polygon having exactly **three** sides and **three** angles inside. The angle sum of a triangle is **180°.**
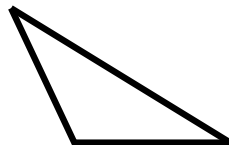
- A **_triangle_** having all the sides length equal is called an **equilateral** triangle.
- A **_triangle_** having two sides of equal length is called an **isosceles** triangle.
- A **_triangle_** having no side of equal length is called a **scalene** triangle.
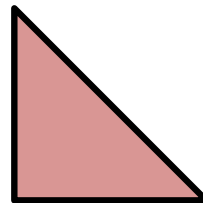- A **_triangle_** having one angle equal to 90° is called a **right** triangle

Equilateral
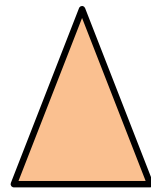
Isosceles
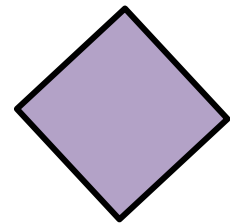
Scalene

Right triangle

Classifying Polygons

A **quadrilateral** is a polygon having exactly **four** sides and **four** angles inside. The angle sum of a quadrilateral is **360°.**

- A **quadrilateral** having all the sides length equal and all the angles equal to 90° is called a **square**.
- A **square** having the diagonals meeting at a right angle is called a **rhombus**.
- A **quadrilateral** having two opposite sides of equal length and all the angles equal to 90° is called a **rectangle.**

Square
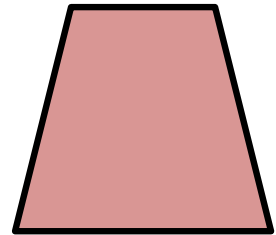
Rhombus

Rectangle

Classifying Polygons

- A **quadrilateral** having two opposite sides of equal length and none of the angles equal to 90° is called a **parallelogram.**

Parallelogram

- A **quadrilateral** having two parallel sides and two non-parallel sides is called a **trapezium.**

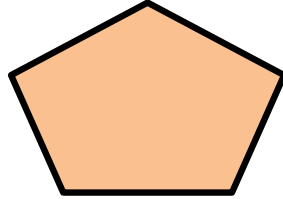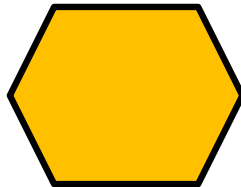**Trapezium**

Classifying Polygons

A **pentagon** is a polygon having exactly **five** sides and **five** angles inside. The angle sum of a pentagon is **540°.**

Pentagon

A **hexagon** is a polygon having exactly **six** sides and **six** angles inside. The angle sum of a pentagon is **720°.**

Hexagon

Classifying Polygons

The other polygons can be named based on the number sides they have. The table below lists the names of these polygons.

Name	Number of sides
Heptagon	7
Octagon	8
Nonagon	9
Decagon	10
Hendecagon	11
Dodecagon	12

Classifying Polygons

There is a formula relating the number of sides of a polygon to the sum of the interior angles of a polygon which is very useful. It is given as:

Sum of angles = 180° (n − 2)

where, n = number of sides of a polygon

Classifying Polygons

Problem 1:

What is the sum of the interior angles of a decagon?

A decagon has 10 sides, so put n = 10

Sum of angles = 180° (n − 2) = 180° (10 − 2)

or, **Sum of angles in a decagon = 180°× 8 = 1440°**