

Geometry / Names and Shapes  
*Mathematics and Millennials – 6th*

---

---

---

---

---

---

---

---

**Classify & Categorize**

The **Garden Approach** allows much to be learned!

Basic Skills of **Classify and Categorize** are involved!

After Classify or Categorize, **Order** also helps learning!

Placing items in a **Logical Order** supports learning!

---

---

---

---

---

---

---

---

**Single Lines - 1**

**Horizontal Line**



Unending ( Infinite )

**Vertical Line**



Not Curved or Broken

---

---

---

---

---

---

---

---

## Single Lines - 2

Oblique (+) Line

Oblique (-) Line



Unending ( Infinite )

Not Curved or Broken

---

---

---

---

---

---

---

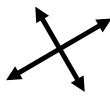
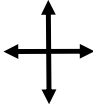
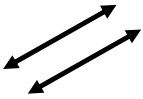
---

## Pairs of Lines

Parallel

(Perpendicular)

Intersecting



Never Intersect

Lines Intersect  $90^\circ$

Intersect Once

---

---

---

---

---

---

---

---

## Overview of Lines

Fundamental Lines of Geometry:



Horizontal, Vertical, Oblique(+), Oblique (-)

Parallel, Intersecting (Perpendicular)

Properties: Infinite and Straight

Many Line segments & Half lines (rays) exist!

---

---

---

---

---

---

---

---

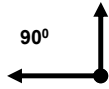
## Single Angles - 1

Acute Angle



$$90^\circ > \text{Acute} > 0^\circ$$

Right Angle



$$\text{Equal to } 90^\circ$$

---

---

---

---

---

---

---

---

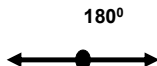
## Single Angles - 2

Obtuse Angle



$$180^\circ > \text{Obtuse} > 90^\circ$$

Straight Angle



$$\text{Equal to } 180^\circ$$

---

---

---

---

---

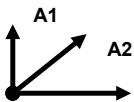
---

---

---

## Pairs of Angles

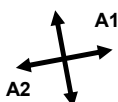
Complementary



$$A1 + A2 = 90^\circ$$

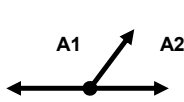
Adjacent Angles

Vertical



Two Pairs of  
Opposite & Equal

Supplementary



$$A1 + A2 = 180^\circ$$

Adjacent Angles

---

---

---

---

---

---

---

---

## Overview of Angles

Fundamental Angles of Geometry:



Acute, Right, Obtuse, Straight

Complementary, Supplementary, Vertical

Angles:  $0^\circ$  to  $180^\circ$ , Initial & Terminal Rays

Many angles are greater than  $180^\circ$ !

---

---

---

---

---

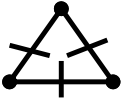
---

---

---

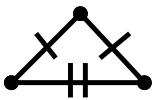
## Triangles - 1

Equilateral



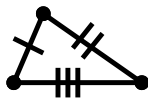
All Sides Equal

Isosceles



Two Sides Equal

Scalene



No Sides Equal

Sum of Interior Angles \*  $A_1 + A_2 + A_3 = 180^\circ$

---

---

---

---

---

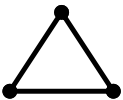
---

---

---

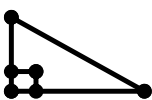
## Triangles - 2

Acute



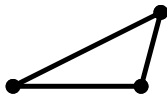
All Angles  $< 90^\circ$

Right



One Angle =  $90^\circ$

Obtuse



One Angle  $> 90^\circ$

Sum of Interior Angles \*  $A_1 + A_2 + A_3 = 180^\circ$

---

---

---

---

---

---

---

---

## Overview of Triangles

Fundamental Triangles of Geometry:



Triangles by Angles: Acute, Right, Obtuse

Triangles by Sides: Equilateral, Isosceles, Scalene

3-Sided & Closed Shapes, Sum of Angles =  $0^\circ$  to  $180^\circ$

Many 3 sided shapes exists but not all Triangles!

---

---

---

---

---

---

---

---

## Parallelograms - 1

Square

All Angles =  $90^\circ$

Rectangle



All Sides Equal

$\Leftrightarrow$

Opposite Sides Equal

Parallelogram: Opposite Sides & Angles Equal

---

---

---

---

---

---

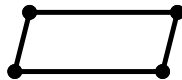
---

---

## Parallelograms - 2

Rhombus

Rhomboid



Opposite Sides Equal

$\Leftrightarrow$

Opposite Angles Equal

Parallelogram: Opposite Sides & Angles Equal

---

---

---

---

---

---

---

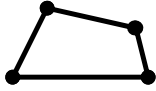
---

## Non-Parallelograms

Trapezoid



Trapezium



Top & Bottom Parallel

\*

No Sides Parallel

**Non-Parallelogram:** Sides & Angles Unequal

---

---

---

---

---

---

---

---

## Quadrilaterals

Fundamental Quadrilaterals of Geometry:



Parallelograms: **Square, Rectangle, Rhombus, Rhomboid**

Non-Parallelograms: **Trapezoid and Trapezium**

4-Sided & Closed Shapes, Sum of Angles:  $0^\circ$  to  $360^\circ$ ,

Many Quadrilaterals exist, **but**, not all Quadrilaterals !

---

---

---

---

---

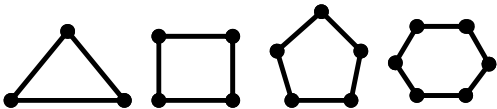
---

---

---

## Regular Polygons

**Regular Polygon:** All Sides & Angles are Equal!



Triangle \* Quadrilateral \* Pentagon \* Hexagon

Do you know of any other regular polygons?

---

---

---

---

---

---

---

---

## Irregular Polygons

**Irregular Polygon:** Sides & Angles are Unequal!



Triangle \* Quadrilateral \* Pentagon \* Hexagon

Do you know of any other irregular polygons?

---

---

---

---

---

---

---

---

## Overview of Polygons

Polygons of Geometry: **Polygons = Many Angles!**

**Regular:** Triangles, Quadrilaterals, Pentagons, Hexagons...

**Irregular:** Triangles, Quadrilaterals, Pentagons, Hexagons...

Many-sided & Closed Shapes, Sum of Angles:  $180^\circ(n-2)$ ,

Many Polygons exist, **but**, not all Polygons!

---

---

---

---

---

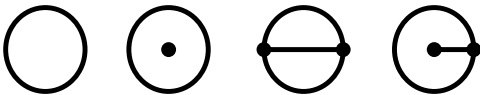
---

---

---

## Circles - 1

Special Characteristics of Circles:



Circumference \* Center \* Diameter \* Radius

Do you know of any other special features of circles?

---

---

---

---

---

---

---

---

## Overview of Circles

Circles of Geometry: Only (1) Circle many sizes!

Basic Parts: **Center, Radius, Diameter, Circumference**

Basic Relationships:  $D = 2(R)$       $Pi = 3.14159...$

Basic Relationships:  $C = Pi \times D$    or    $A = Pi \times (R)^2$

Many size Circles exist, **and**, many sizes!

---

---

---

---

---

---

---

---

## Solids - 1

Sphere



Cylinder



Cone



Images of 3D have Surface Area **and** Volume

Do you know of any special features of solids?

---

---

---

---

---

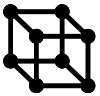
---

---

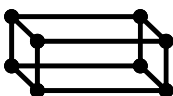
---

## Solids - 2

Cube



Prism



Pyramid



Images of 3D have Surface Area and Volume

Do you know of any special features of solids?

---

---

---

---

---

---

---

---



## Overview of Solids

Basic 3D Images: Why 3Ds in Plane Geometry?

Rounded 3D Images: Sphere, Cylinder, Cone

Lateral 3D Images: Cube, Prism Pyramid

Classify 3Ds then Order 3Ds in similar arrangement!

Many size 3Ds exist, but, only a few categories!

---

---

---

---

---

---

---

---

## Conclusion

---

---

---

---

---

---

---

---