

## TRIANGLES ARE INCLINED PLANES

Common Core Math: Geometry: HSG-CO.C.10, HSG-CO.D.12

Common Core Math: Trigonometry: HSG-SRT.B.5, HSG-SRT.C.6

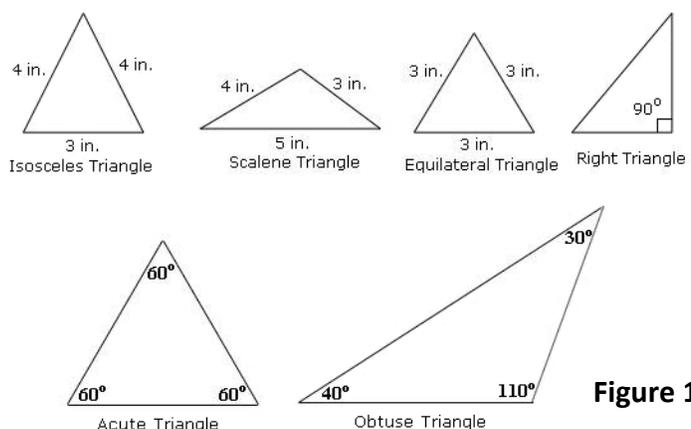
### Triangle Overview

- A **triangle** is a **polygon** (shape) with three arms (sides) and three vertices (corners). **ALL Triangles have three sides and three angles.**
- A **triangle** is the result of three angles converging where the arms become the sides and the vertices become the corners. **The three angles ALWAYS add up to 180°.**

Supplies: pencil, scissors and attached paper tools: protractor, ruler and triangles

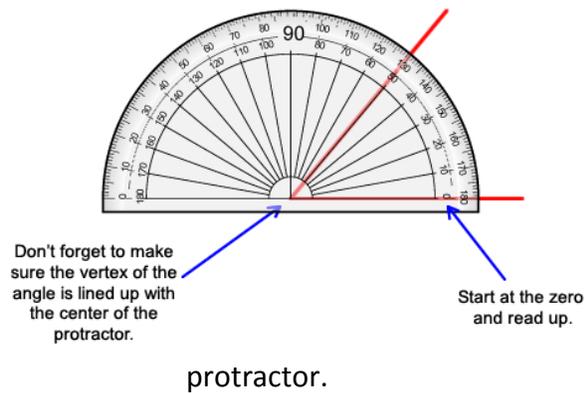
### Directions:

1. Using scissors, cut out the protractor, ruler and each triangle on pages 3 and 4.
2. Using the letter labels on each triangle, arrange them in alphabetical order (A-N).
3. Use the paper ruler to measure each side of the triangles in centimeters and inches.
4. Using the pencil, write these measurements on all the triangle sides. [See Figure 1 as reference.]
5. Angles are measured by a tool called a **protractor**. The unit of measure is in **degrees (°)**. The degrees of measurement on a protractor are **0° to 180°** Use the paper protractor to measure the angles in degrees. Using the pencil write each degree measurement on all of the corners of the triangles. [See the image on the right as a triangle label reference.]



**Figure 1**

Line up the bottom of the protractor with bottom line of the angle.



### How to Use a Protractor

- Place the protractor's center point on the angle's vertex (corner).
- Place the starting  $0^\circ$  mark on the base angle's arm.
- Read and record the measurement (in degrees) where the other arm crosses the

6. For reference, cut out the triangle names below and use them to group the triangles.

**Scalene   Isosceles   Equilateral   Right   Acute**  
**Obtuse**

7. Arrange the triangles into three groups by side measurements: **scalene**, **isosceles** and **equilateral**

A **SCALENE** triangle has **NO EQUAL SIDES** and **NO EQUAL ANGLES**.

An **ISOSCELES** triangle has **TWO EQUAL SIDES** and **TWO EQUAL ANGLES**.

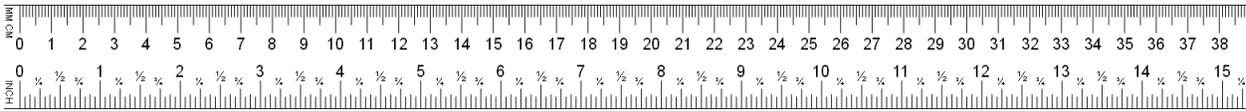
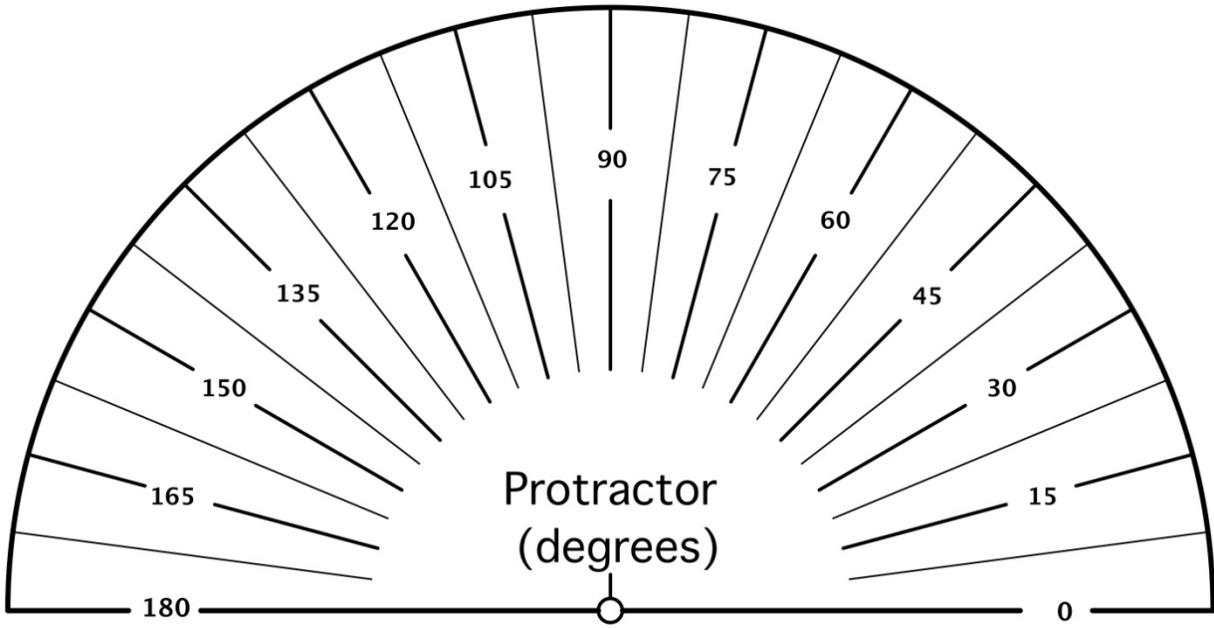
An **EQUILATERAL** triangle has **THREE EQUAL SIDES** and **THREE EQUAL ANGLES (all  $60^\circ$ )**.

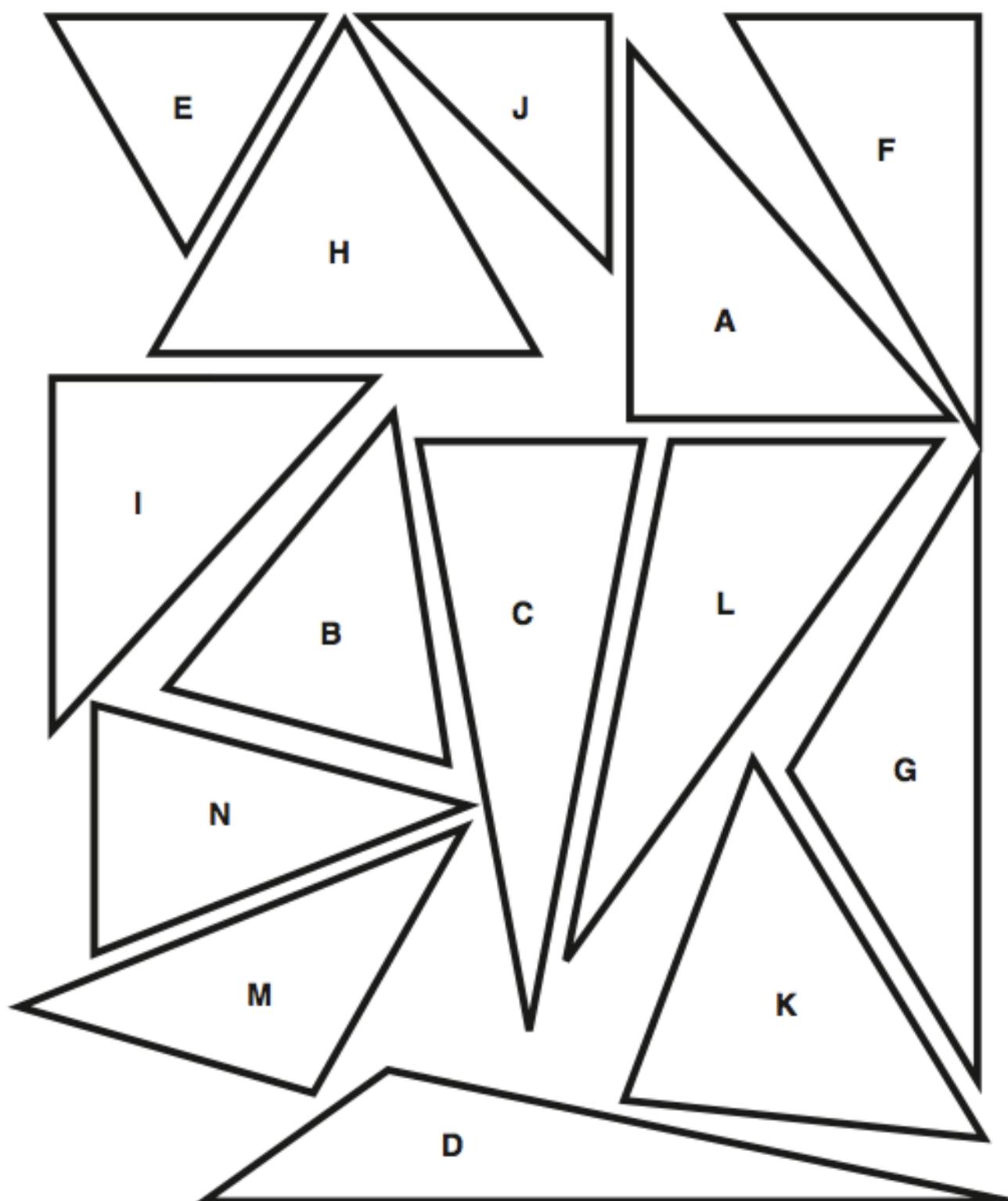
8. Arrange the triangles into three groups by angle degrees: **right**, **acute** and **obtuse**.

An **ACUTE** angle is **between  $0^\circ$  and  $90^\circ$**

A **RIGHT** angle is **exactly  $90^\circ$**

An **OBTUSE** angle is **between  $90^\circ$  and  $180^\circ$**





Key

<b>Triangle</b>	<b>Sides</b>	<b>Angle</b>
A	Scalene	Right
B	Isosceles	Acute
C	Isosceles	Acute
D	Scalene	Obtuse
E	Equilateral	Acute
F	Scalene	Right
G	Isosceles	Obtuse
H	equilateral	Acute
I	Scalene	Right
J	Isosceles	Right
K	Isosceles	Acute
L	Scalene	Obtuse
M	Isosceles	Obtuse
N	Scalene (NOT Isosceles)	Acute

*This lesson was designed by the U.S Space and Rocket Center*

