Hello everyone,

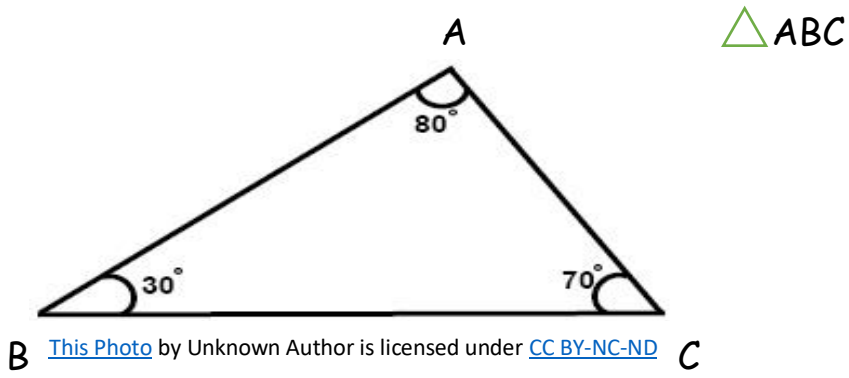
This week's lesson will concentrate on classifying triangles, the comparison and contrast of regular and irregular polygons, and a little on perimeter and area.

Classification of Triangles

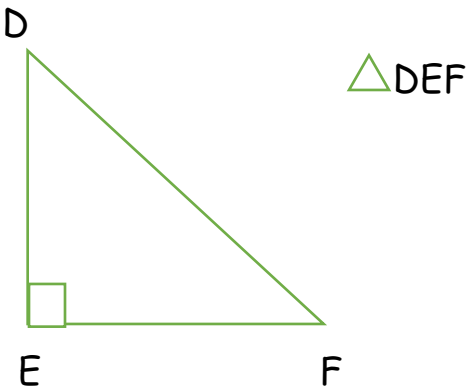
Triangles can be classified by the size of their angles, and by the number of equal sides. We have already discussed angles in our last lesson, so let's start there.

Classifying triangles by the size of their angles requires us to look at the angles inside the triangle. These include:

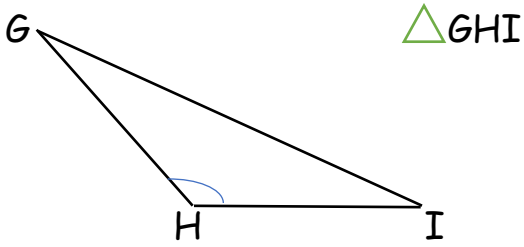
1. An acute triangle has all angles less than 90°



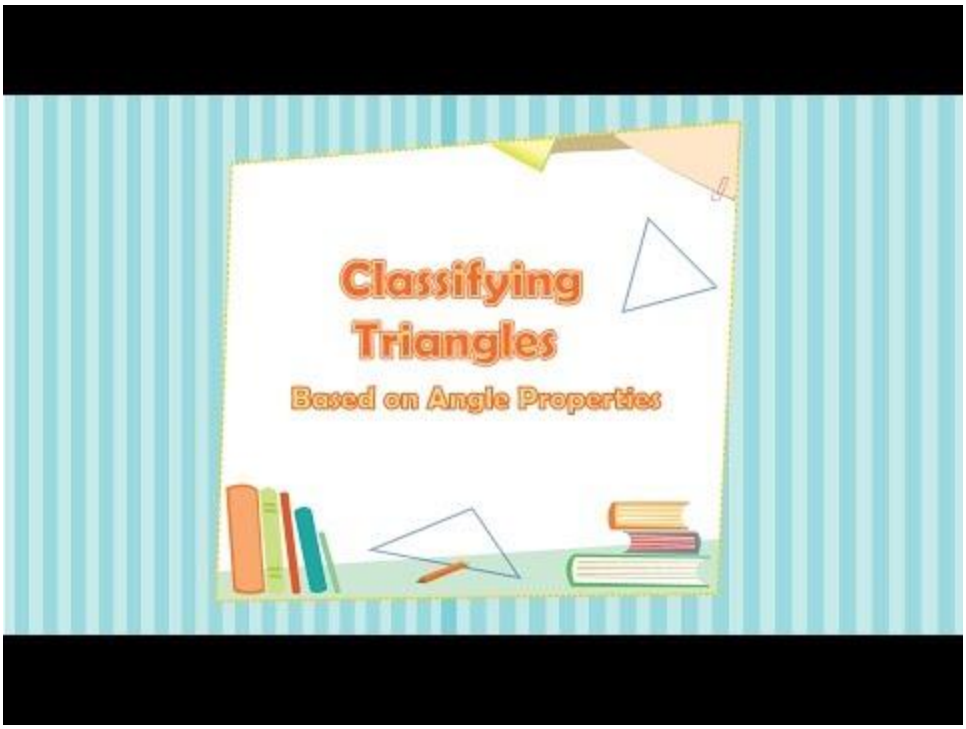
2. A right triangle has one 90° angle.



3. An obtuse triangle has one obtuse angle, greater than 90°.



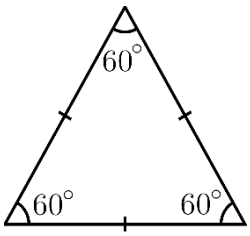
To review, watch the following video:



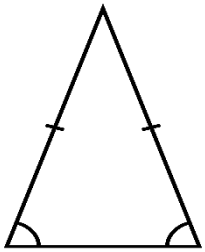
Classifying triangles by the number of equal sides include:

1. An equilateral triangle has 3 equal sides and 3 equal angles
   Note: we know the sum of the angles in a triangle is 180°, so if all

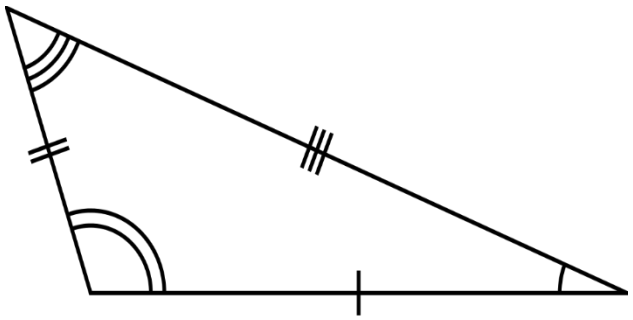
angles in a triangle are the same, 180° ÷ 3 = 60° for each angle.



2. An isosceles triangle has 2 equal sides and 2 equal angles.
   Note: the 2 equal angles are the ones that are opposite the 2 equal sides.



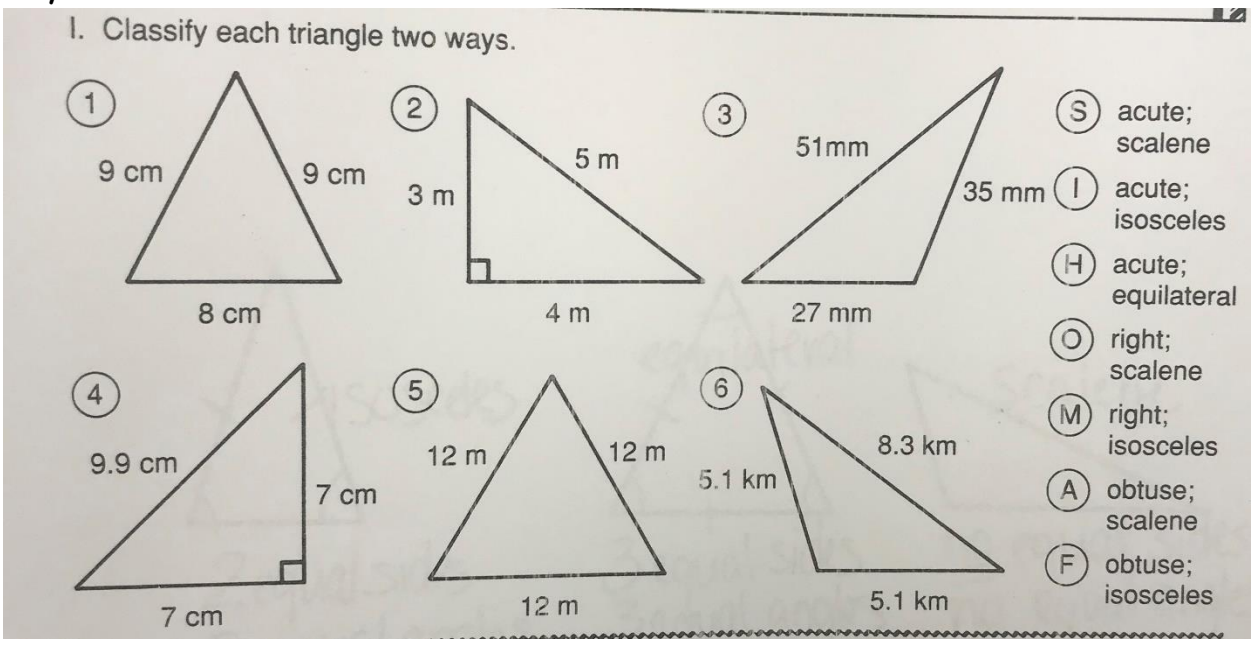
3. A scalene triangle has **no** equal sides and **no** equal angles.



To review, watch this video: (see next page)

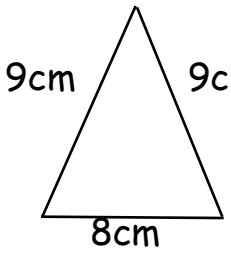
Now that we have a good understanding of triangle classification, we can combine what we know to classify triangles in two ways, as shown at the end of the last video.

Try these:



Note: there are 7 answers on the side but only 6 questions. One will not be used.

We will walk through the first one together, then you can try the rest. *Keep in mind what you have learned about classification.



First, notice that all angles in this triangle are acute, so it is an acute triangle so far.

Next, when we look at the sides, 2 sides are the same, so it is an isosceles triangle too.

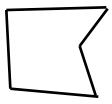
When we put the information together, we have an acute isosceles triangle.

You try the others! 😊

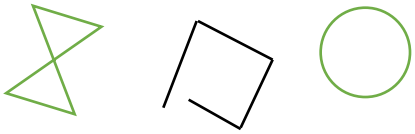
Compare and Contrast Regular and Irregular Polygons

A polygon is a closed shape with three or more sides that are straight line segments. Exactly 2 sides meet at a vertex, and the sides intersect (cross) only at the vertices.

Ex:



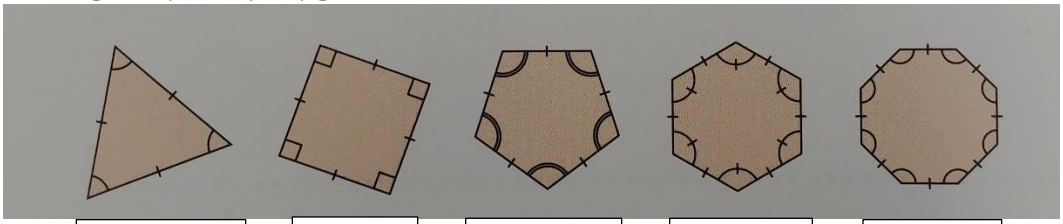
polygon



non – polygons

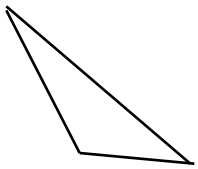
We group polygons in two ways:

1. Regular polygons – all sides are equal and all angles are equal. A regular polygon has line symmetry.
   This group of polygons include:

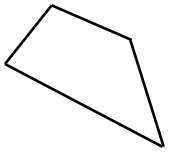


Equilateral triangle | Square | Regular pentagon | Regular hexagon | Regular octagon

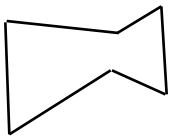
2. Irregular polygons – do not have all equal sides or angles.
   For example:



Scalene triangle



Quadrilateral



Hexagon

To review, watch the following video:

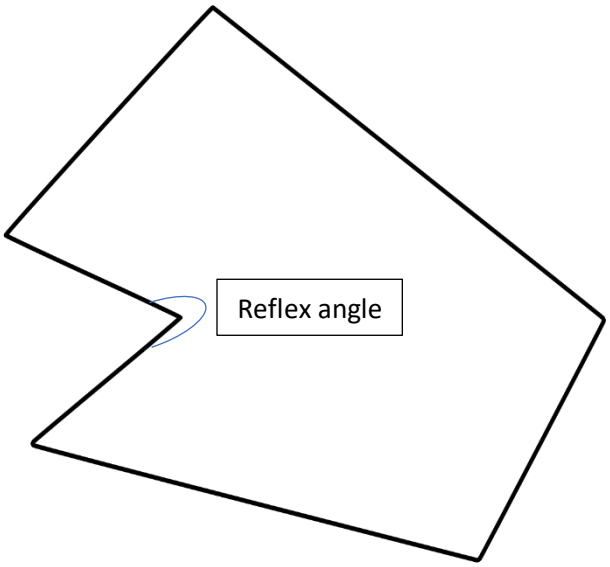
To go further, within these two groups of polygons, they can be classified further as:

Convex polygons – polygons that have all angles less than 180°.

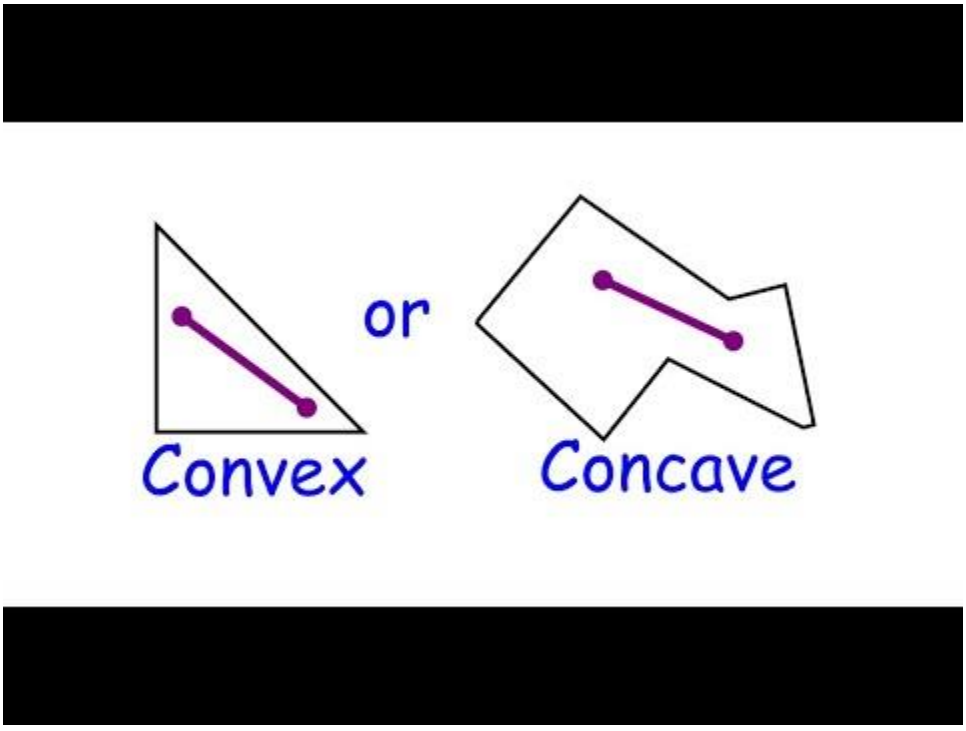
Ex:

Concave polygons – polygons that have at <u>least</u> one interior angle greater than 180°. (has a reflex angle)

Ex:



Another hint to help us see these more clearly:



At this point, there are two activities on Dreambox at https://play.dreambox.com/ on triangles and polygons. Just look for the blue calendar icon for the activities.

On Netmath at www.netmath.ca there is an activity called "Classifying Polygons".

The last part of this week's lesson is on the perimeter of polygons and the area of rectangles. We have some knowledge of these outcomes from last year.

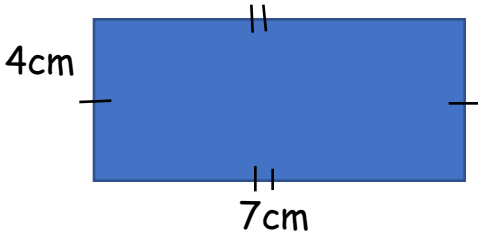
Let's review: the following video will give us some reminders

Some points to remember:

Perimeter – the measure of the distance around a polygon. I often remind myself by thinking "where do fences go?" (around the outside of my yard!)

The video used a rectangular yard on Mars and he found the perimeter two ways:

P = s + s + s + s



To find the distance around, just add up all the sides.

P = 4cm + 7cm + 4cm + 7cm

= 22cm

Notice though, that for a rectangle there are two pairs of equal sides so like in the video, you can find the perimeter by:

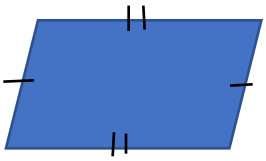
P = 2 x base + 2 x height

= 2 x 7cm + 2 x 4cm

= 14cm + 8cm

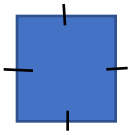
= 22cm

*this would also be true for a parallelogram (opposite sides are equal)



Consider a square:

We know a square has four equal sides, so perimeter could be:

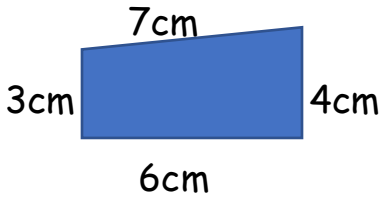


P = s + s + s + s OR P = 4 x s

= 4s (means 4 times a number)

If the polygon had no equal sides, however, we could only use
P = s + s + s + s

Ex:



Area – is the amount of surface a shape or region covers, measured in square units. Ex: cm^2

In the video, the measure of the rectangular plot of land was found by:

$A = b \times h$ (or $A = l \times w$)

$A = b \times h$

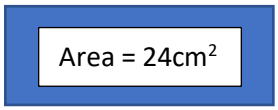
$= 7cm \times 4cm$

$= 28cm^2$

Note: If you know the area and one dimension (the base or the height), you can find the missing dimension.

Since $A = b \times h$, $b = A \div h$

$h = A \div b$



h = ?

b = 6cm

To find the missing height:

$h = A \div b$

$= 24cm^2 \div 6cm$

$= 4cm$

For some practice on perimeter and area, go to Netmath at www.netmath.ca and look for:

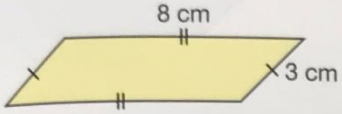
Determining the perimeter of plane shapes.

Calculating the area of a rectangle.

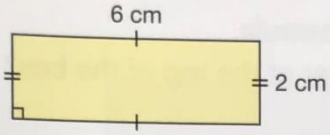
OR, if you would like a break from the computer 😊 try some of the questions from the text (see next pages)

1. Find the perimeter of each polygon.

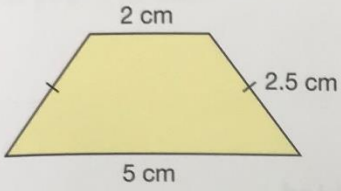
a)



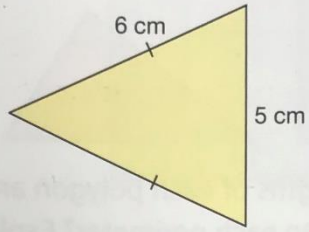
b)



c)



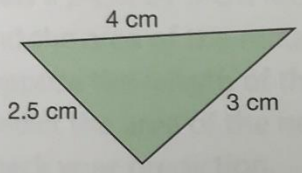
d)



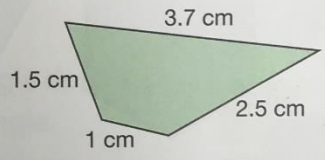
2. Describe the strategy you used to find the perimeter of each polygon in question 1.

3. Find the perimeter of each polygon.

a)



b)



Can you write a rule to find the perimeter of each of these polygons? Why or why not?

4. Use Pattern Blocks like those below.

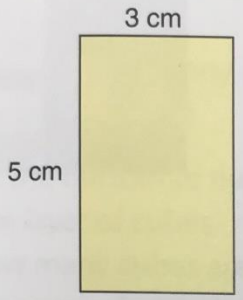
Write a rule to find the perimeter of each Pattern Block.

5. Aldo wants to install a skylight in the roof of his house. The base of the skylight is a regular hexagon with side length 40 cm. What is the perimeter of the base of the skylight? Give your answer in metres.
Which strategy did you use to find out?

(next page for area)

1. Find the area of each rectangle.

a)



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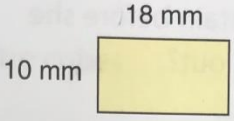

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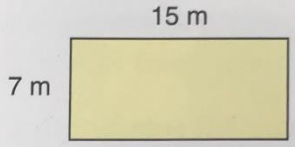
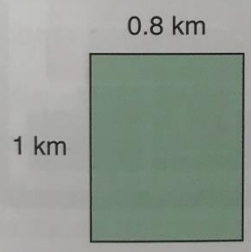


2. Which rectangle below do you think has the greatest area?
Estimate first. Use a formula to check.
Order the areas from least to greatest.
How does the order compare with your prediction?

a)



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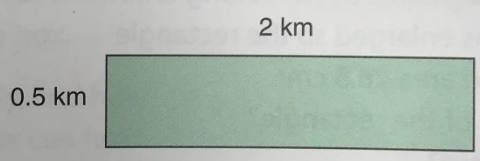

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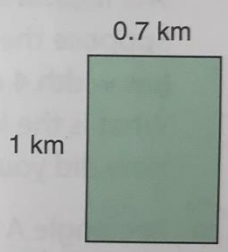

3. Copy and complete this chart.

Rectangle	Length (cm)	Width (cm)	Area (cm^2)
A	7	5	?
B	?	6	12.6
C	3	?	13.5
D	5.3	7	?

This is your last lesson for the year! As always, take your time, space out the work and do your best. What we haven't covered, we will pick up in the fall. Have a fantastic week, and an amazing summer! 😊