Cache Code Math Computer Lab Activity: Geometry (Guess the Triangle)

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Guess the triangle

Create a quiz for your classmates to try
Go to the link below:
https://scratch.mit.edu/projects/638131486

Click **Sign in**. Skip signing in if your teacher tells you to.

Click **Remix** if you’re logged in and then the **See inside** button.

The program has 6 pre-made blocks that you will use later

**Set 1**

```
ask Is this an acute or obtuse triangle? Type 1 for acute and 2 for obtuse: and wait
say You got it! for 5 seconds
say No, the correct answer is 1: an acute triangle. for 5 seconds
```

**Set 2**

```
ask Is this an acute or right triangle? Type 1 for acute and 2 for right: and wait
say You got it! for 5 seconds
say No, the correct answer is 2: a right triangle. for 5 seconds
```

**TRY IT**

Click the code blocks to see what they do
Nano is located at the origin, which is x=0, y=0 or (0,0).

Nano will go to coordinates (0,0).

Set the pen size to 5.

The sprite (Nano) will look at 90 degrees.

Change the size of the sprite to 30 or lower so that you can see what nano is drawing.
Click the green flag to start

GET READY

Choose Variables

Click the Make a Variable

New variable name:

exteriorAngle

Name this variable exteriorAngle and then click OK

ADD THIS CODE

ADD THIS CODE

Clicking the green flag after adding the code makes Nano rotate 45 degrees.

Try a few different values. When done, disconnect and delete the set and turn blocks.

The sprite (Nano) will rotate 45 degrees.

The sprite (Nano) will rotate 45 degrees.

Try a few different values. When done, disconnect and delete the set and turn blocks.

TRY IT

Click the green flag to start
This code defines the `convertTo` block that converts to interior angle by subtracting the given value from 180.

Math uses the interior angle to measure the angle in a triangle, but in Scratch, sprites are rotated by exterior angles. To make Scratch work more like math, we subtract the exteriorAngle from 180 which gives us the value for interiorAngle.

The number given to the “convertTo” My Block is the value you want for the interior angle we are familiar with using in Math.

Notice how 45 degree rotation looks different here than the previous slide? It is because of the difference between interior angles and exterior angles.

Drag the `convertTo` block you created (find it in My Blocks) to the end of the code from the previous slide and enter 45 as the input.
This is a triangle. Triangles are polygons with three sides and three angles.

Notice how we are calling the “convertTo” My Block inside the “acute” My Block. Once a My Block is defined, you can use it anywhere like any Scratch block.

Drag the acute block you created (find it in My Blocks) to the end of the code from the previous slide.

This code defines the acute block to draw an acute triangle.
This is an *acute* triangle. All three interior angles are smaller than 90 degrees in an *acute* triangle.

Is this an acute or an obtuse triangle? Type 1 for acute and 2 for obtuse.

You will need these blocks for this step.

After you connect the code, nano asks a question. Since all the interior angles of the triangle are acute, the correct answer is 1.
Nano is located at the origin, which is $x=0$, $y=0$ or $(0,0)$. Disconnect and delete this part of the code.
This is a right triangle. Right triangles have one angle that is exactly 90 degrees.
Is this an acute or right triangle? Type 1 for acute and 2 for right.

You got it!

No, the correct answer is 2: a right triangle.

You will need these blocks for this step.

Use the blocks above to complete the hidden code. You should get the output you see on the left hand side of this slide.
Go to the link below: https://scratch.mit.edu/projects/638165336

The program has 3 pre-made blocks, the set-up code, and the convertTo block.

Set-up code

TRY IT

Click the code blocks to see what they do.
Challenge Task:
Change the code so that nano draws an obtuse triangle.

Hint: All three interior angles in a triangle add up to 180 degrees.

Try It:
Drag the obtuse block you created (find it in My Blocks) to the end of the code from the previous slide.

Add This Code:
Enter the correct obtuse angle value based on the other angles in the triangle.

This code defines the obtuse block to draw an obtuse triangle.

This is an obtuse triangle. Obtuse triangles have one angle that is greater than 90 degrees.
Is this an acute or obtuse triangle? Type 1 for acute and 2 for obtuse.

You will need these blocks for this step:

Use the blocks above to complete the hidden code. You should get the output you see on the left hand side of this slide.

You got it!

No, the correct answer is 2: an obtuse triangle.
Math Definitions

Coordinate Plane

**x-axis** - the horizontal number line on the grid

**y-axis** - the vertical number line on the grid

**Origin** - the location where the x-axis and y-axis intersect at the point (0,0)

**Ordered Pair** - every point on the coordinate plane is described by an ordered pair with an x-coordinate (horizontal location) and y-coordinate (vertical location)
Math Definitions

**Triangles**

**Acute Angle** - an angle that measures less than 90°

**Obtuse Angle** - an angle that measures more than 90°

**Right Angle** - an angle that measures exactly 90°

**Obtuse Triangle** - a triangle with one obtuse angle

**Acute Triangle** - a triangle with three acute angles

**Right Triangle** - a triangle with one right angle

**Equilateral Triangle** - a triangle with three congruent sides

**Isosceles Triangle** - a triangle with two congruent sides

**Scalene Triangle** - a triangle with no congruent sides
Challenge Task Solution

Obtuse angle value: 108°