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Creating and Classifying Polygons
Using a Block-Coding Program

Follow the link to access the file: What type of polygon?
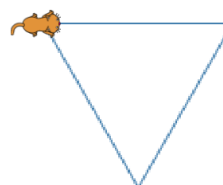https://scratch.mit.edu/projects/546910232/editor

Let's explore.

Enter 3 for the number of sides. What polygon did you make?

sides   3

Does your polygon look like this?

Try again. This time enter 5.
It seems as like the program isn't quite right.
We need to alter the code so that the words
and drawings are accurate.

sides   5

Does your polygon look like this?

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Try one more time. Enter 8.

sides 8

> Your polygon is a polygon.
> HA!

Ha! I guess it would take forever to code this for
ALL possible polygons.
But maybe we can code a few more polygons.

Let's look inside the code.

This program uses a conditional statement where something is either true or false. We are going to use these to classify different polygons.

It either has 3 sides or it doesn't.

- If it does, a triangle is named and drawn.
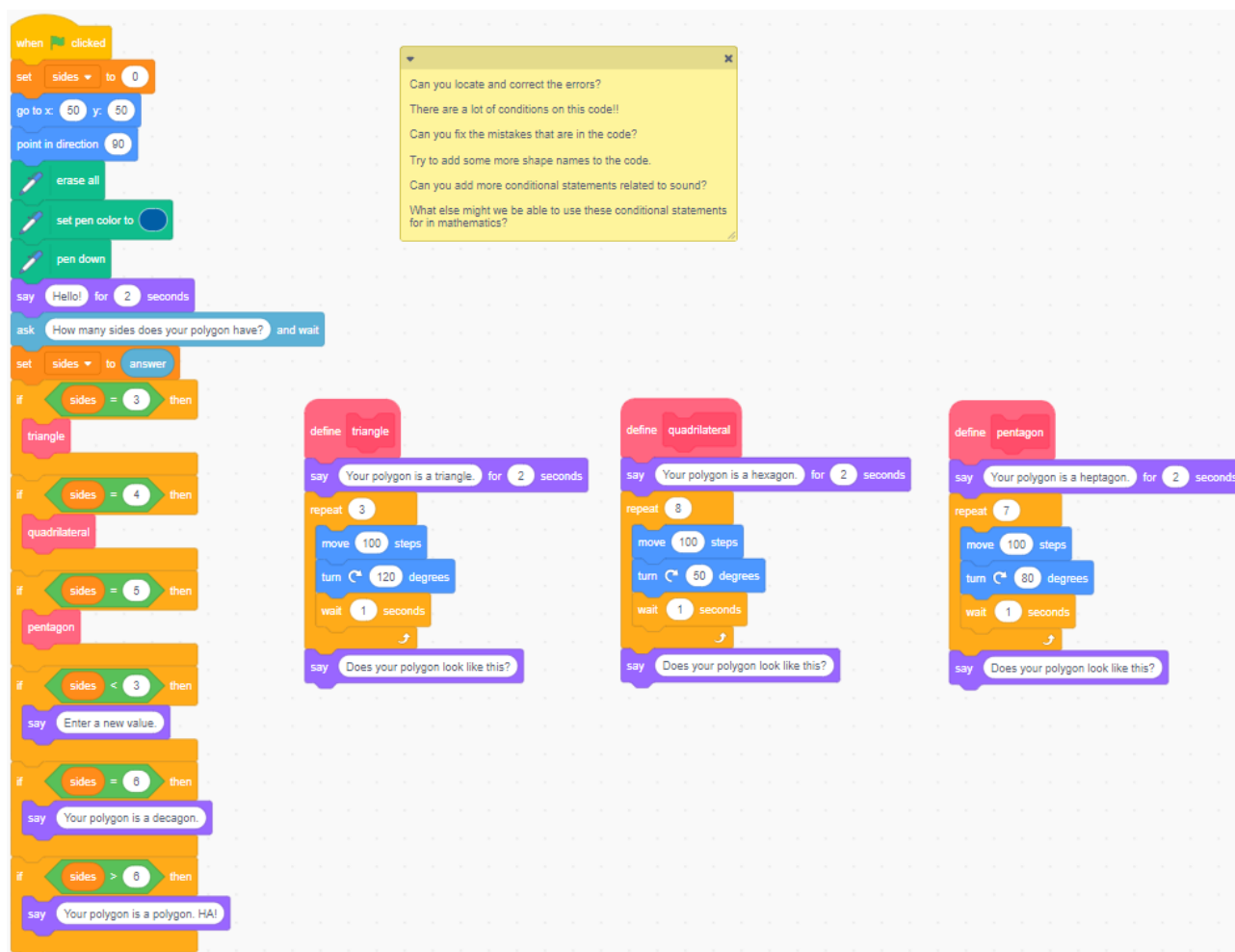- If it doesn't, nothing happens.

Notice that the code for 3 sides is working for our program.

You might use this code as you determine how to make the other polygons work properly.

You will see that some Blocks have already been created and labelled by their polygon name. These are part of the conditional statements that this program runs on, but there are mistakes.

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```
when 🏳 clicked
set sides ▾ to 0
go to x: 50 y: 50
point in direction 90
erase all
set pen color to ⬤
pen down
say Hello! for 2 seconds
ask How many sides does your polygon have? and wait
set sides ▾ to answer
if sides = 3 then
  triangle
if sides = 4 then
  quadrilateral
if sides = 5 then
  pentagon
if sides < 3 then
  say Enter a new value.
if sides = 6 then
  say Your polygon is a decagon.
if sides > 6 then
  say Your polygon is a polygon. HA!
```

Can you locate and correct the errors?

There are a lot of conditions on this code!!

Can you fix the mistakes that are in the code?

Try to add some more shape names to the code.

Can you add more conditional statements related to sound?

What else might we be able to use these conditional statements for in mathematics?

```
define triangle
say Your polygon is a triangle. for 2 seconds
repeat 3
  move 100 steps
  turn ↻ 120 degrees
  wait 1 seconds
say Does your polygon look like this?
```

```
define quadrilateral
say Your polygon is a hexagon. for 2 seconds
repeat 8
  move 100 steps
  turn ↻ 50 degrees
  wait 1 seconds
say Does your polygon look like this?
```

```
define pentagon
say Your polygon is a heptagon. for 2 seconds
repeat 7
  move 100 steps
  turn ↻ 80 degrees
  wait 1 seconds
say Does your polygon look like this?
```
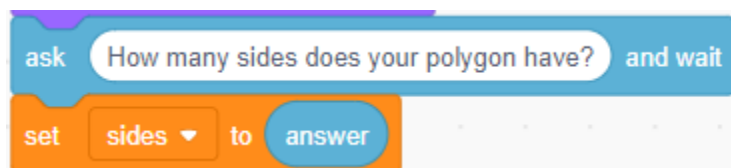
What are some of the blocks you recognize? Any new ones?

Notice for the triangle code, we used a "repeat 3" block. If we wrote this without a repeat block, it would require more blocks. We'd have to use the "move" and "turn" blocks three times! Repeats help our code to be more efficient.

When we are coding, we try to make our code as efficient as possible. The more experience we have with coding, the more efficient we are to make our applications!

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Tips

This code allows the "answer" to be used in the rest of the code, since the classification is based on the answer that is given.

ask (How many sides does your polygon have?) and wait

set sides ▼ to answer

We've stored the user's answer in a variable called "sides."

You might notice that you can use this variable block (found under Variables) to make your code even more *efficient* by incorporating it in your repeat values. There's that word again – "efficient". Variables are another great way to help us make our code more efficient.

This code incorporates a conditional statement that means:
"If the answer entered by the user is 3, then the triangle code will be executed."

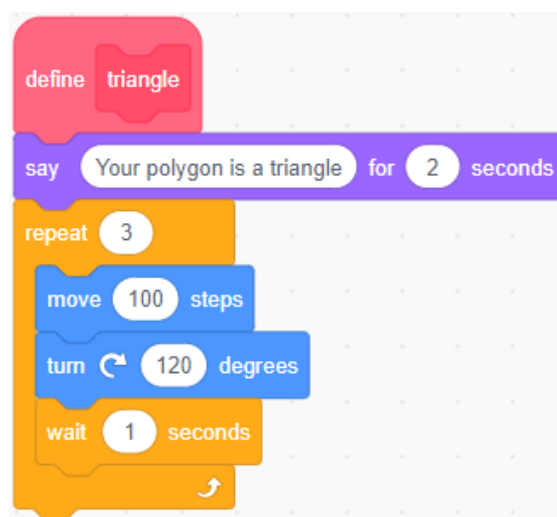if < sides = 3 > then

triangle

This is the resulting code.

This defines the code to create a triangle.
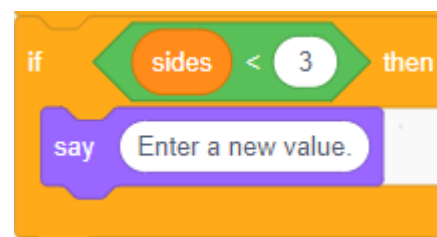When you click the green flag, the main program begins.
The main program "calls" the triangle code (or subprogram).
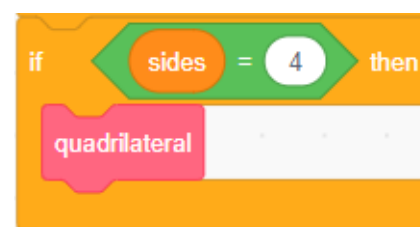The code for the triangle is executed if the user typed 3 for number of sides.

define triangle

say (Your polygon is a triangle) for 2 seconds

repeat 3

move 100 steps

turn ↻ 120 degrees

wait 1 seconds

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For this conditional statement, the user is told to enter a new value if they enter a number less than 3. This is because we cannot create a polygon with fewer than 3 sides! Why is that?
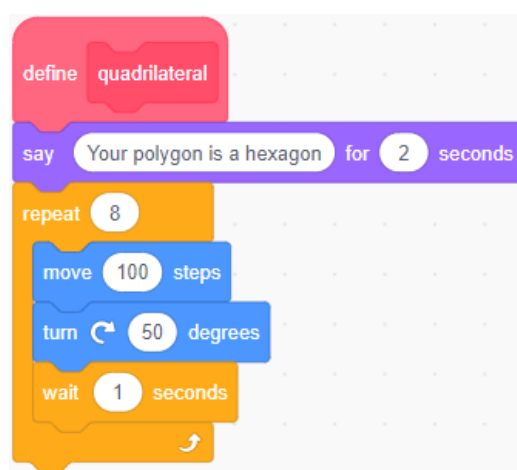

For the other conditional statements, you will need to ensure the proper polygon is named and drawn according to the number of sides.
For example, if the user enters 4 for number of sides, a quadrilateral should be named and drawn:

But what happens when the user types in 4 now?
Look at the quadrilateral code as it is currently written:

What a mess! We can see several mistakes:
- The polygon is named incorrectly.
- The repeat value is incorrect.
- The angle turn is incorrect.

Make the required changes for the quadrilateral.

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What to Do

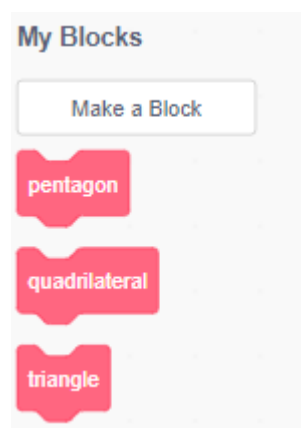Alter all the code so it is accurate.

Remember to change only one value at a time,
so that you can reflect on the impact of your change.

After you fix the broken parts of the code, try to add more
blocks to make this program define and draw more polygons.

You will find these in the My Blocks Tab My Blocks

My Blocks

Make a Block

pentagon

quadrilateral

triangle

You can see that the block for triangle,
quadrilateral and pentagon have already
been created.

Alter the code for each of the blocks that are there so they are
accurate with naming, classifying, and drawing.

Try to add more blocks (My Blocks, Make a Block) for other polygons,
so that more polygons are included in the classification.

**Patterning and Algebra
Unit 3 Line Master 5g** **Creating and Classifying Polygons** (cont'd)

Using a Block-Coding Program

Self-check in

What have you learned about block coding so far?

What is one way to make your code more efficient?

Did you get stuck? If so, what did you do?

Did you turn to your classmates for help? If so, how did they help?

What are you doing to help the learning of others?

This is "hard fun." What do you think we mean by "hard fun"?

What other activities do you do that are "hard fun"?

Go on "spy walks" to see what your classmates have done.