GETTING STARTED

1. BIGGER OR SMALLER
   - change this number
   - number of sides
   - draw a line
   - turn

2. SQUARE
   - these numbers have changed
   - forward 100
   - right 60
   - repeat 6

3. TRIANGLE
   - these numbers have changed
   - forward 100
   - right 38
   - repeat 4

4. Hexagon
   - forward 100
   - right 60
   - repeat 6

5. Quadrilateral
   - forward 100
   - right 90
   - repeat 4

6. Triangle
   - forward 100
   - right 120
   - repeat 3

7. Pentagon
   - forward 100
   - right 38
   - repeat 4

8. Polygon
   - forward 100
   - right 36
   - repeat 6

9. Circle
   - 360 is all the way around

90 x 4 = 360
Drawing Circles

It takes a lot of little steps

But it still turns 360

360 x 1 = 360

SMALLER:
change these numbers

360 is all the way around

BIGGER:
change this number

360 x 2 = 360

choose a color

set color

DRAWING CIRCLES

forward
right

repeat

360

forward
right

repeat

180

forward
right

repeat

360

set color

2

7
Spinning Circle

If you repeat it 360, the turtle does a full circle.

Repeat it 45 times.

Set color 80
Set pen size 1
Set pen size 10

Spinning Circles

Change colors
Change pen size
Change the pen size

heading = 0

If you repeat 360 times, the turtle does a full circle

the next time through the heading will be 1, then 2, 3, 4... until 359

right 1 makes the heading change by one each time

the first 20 repeats
Rainbow Math

TRY THIS

colors will range from 0 to 100
number of degrees in a circle
number or colors available

heading/360 x 100 goes from 0 to 100

the turtle goes off the screen and back to the center

COLORS

0

100

Change this number and see what happens

RAINBOW MATH
Turtle Shades

- Set pen to 12
- Set color to 60
- Repeat
  - Set shade to 360
  - Heading
  - Forward 500
  - Back 500
  - Right

Shades range from 0 to 200
Heading range from 0 to 100

The turtle goes off the screen and back to the center.

Try to create this image.
forward 100
arc 270 100
forward 100

the turtle ends pointing up as it started

radius = 100
angle = 270
Arcs in a Circle

choose a color
and fill the screen

choose a shade

do it once

turn 100

do it 10 times

If you repeat it 36 times, the turtle does a full circle

10 x 36 = 360
it is a circle inside

the turtle goes forward but it doesn’t come back all the way

think about

CHANGE SOME NUMBERS AND SEE WHAT HAPPENS
pensize gets smaller as the turtle turns (359, 358, 357..)

the color and shade are set by the turtle's X and Y position

EXPERIMENT! SWITCH AROUND THESE BLOCKS:
Smooth Candy

- Changes the colors more slowly.
- Sets a slightly bigger pen size.
- Changes the shades more slowly, favouring lighter shades.

Use these blocks to change this stack:

[blocks diagram]
this is like doing

box1 starts at 0

adds 10 each time

change this number and this one too
Try making a bent triangle spiral

right 90 make a square spiral
right 91 makes a bent square spiral
It is good to use a name that indicates what is stored in the box. Each segment is slightly different color. The blocks automatically change names. Click and type to change its name.

**SPIN RAINBOW**

It is good to use a name that indicates what is stored in the box.
The color and shade of the pen change. The color depends on the X coordinate. The shade depends on the heading.

Try changing this number.

Try adding arithmetic here.
Flag

Try other things where the turtle ends where it starts

The turtle ended where it started

1. forward 100
2. forward 100
3. forward 100
4. back 100
5. forward 100

Repeat 3 times:
- Forward 100
- Right 120

Repeat 2 times:
- Forward 100
- Right 120

The turtle ended where it started.

Try other things where the turtle ends where it starts.
Create our own blocks and use them in different stacks

1. Place this block on top

2. Click and type a name

3. A new block with that name appears

4. Use it in other stacks

makes 9 flags
WINDMILL

a box inside
a box inside
a box...

Change the windmill or create something new
If you repeat it 10 times, the turtle does a full circle. 

10 x 36 = 360
draw a square of any size

start at 0

make size bigger

make some changes and see what happens

square length of a side
Hexrainbow

Color will range from 0 to 86

Start at 0

Draw 6 hexagons of any size

Changes its value adding 2 each time

Size = 0 + 2 = 2

Size = 2 + 2 = 4

Size = 4 + 2 = 6

... Size = 258 + 2 = 260

Size determines how big it is
Random Stars

Try using random with pen sizes and shades...

Try this several times...
What values did you get?

Random Stars

Pick a random color from 0 to 100.

Draw a star of a random color at a random place.

Pick a random X position, from -300 to 300, and a random Y position, from -200 to 200.
draw a star of a random color at a not that random place

possible X values: -300 -240 -180 -120 -60 0 60 120 180 240 300
possible Y values: -240 -180 -120 -60 0 60 120 180 240

pick a random color from 0 to 100

pick a dark shade
pick a thick pensize
pick a lighter shade
pick a thinner pensize
Bubbles

1. Try making the bubbles lighter and bigger towards the bottom.
2. Store in box1 a value between 200 and 800.
3. Set the pensize and shade so the bubbles get smaller and darker towards the bottom of the screen.
4. Pick a random position on the screen.

BUBBLES try making the bubbles lighter and bigger towards the bottom.
pick a color in a small range
place the turtle at the bottom left corner (off the screen)
draw a curved line, then retrace it
draw tulips at the corners of this pattern

pick a color, a shade and draw a star
pick a color, a shade and a pen size
stores 0 or 1 in box1

if box1 = 0 --> draw a vertical line
if box1 = 1 --> draw an horizontal line
Swirl

draw a squiggle

then retrace it

If you repeat it 360 times, the turtle does a full circle

360 x 1 = 360

map 0 to 360 range to 0 to 600 range
draw 200 good apples
and the one bad apple
draw a spiral from the outside to the inside
change the shade and color as you spiral in