Lab 02 – Drawing with Variables & Broadcast

Drawing

- ☐ Try to move the cat around the screen and back using these pieces.

  move 10 steps   turn ↻ 15 degrees

- ☐ Sometimes we want to see where the cat has moved. Try clicking on this "pen down" piece and then having the cat move in a square.

  pen down

- ☐ These pieces might be helpful too! Try to figure out what they do.

  clear   pen up

- ☐ Try to draw a simple picture using only these two pieces.
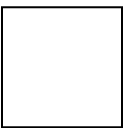
  move 10 steps   turn ↻ 15 degrees

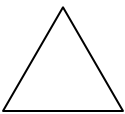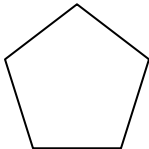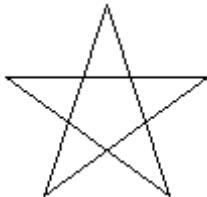- ☐ Someone found out that you don't see the cat move when you put these two pieces together and run them. Make sure you understand why.

  turn ↷ 15 degrees
  turn ↻ 15 degrees

- ☐ Change the turn piece above to turn 360 degrees. What happens? Why?

- ☐ Draw the shapes below.
  - o Hint: You might want to use the repeat that we used in the animations.

  repeat 5
    move 100 steps
    turn ↷ 100 degrees

☐ square	☐ triangle	☐ pentagon	☐ star

Variables

□ Below is the start of the song "Mary had a little lamb". Try to recreate this song like below:

play note 64 for 0.5 beats
play note 62 for 0.5 beats
play note 60 for 0.5 beats
play note 62 for 0.5 beats
play note 64 for 0.5 beats
play note 64 for 0.5 beats
play note 64 for 0.5 beats

□ Now if we want the notes to play for a shorter amount of time we have to change every 0.5 to 0.2.

play note 64 for 0.2 beats
play note 62 for 0.2 beats
play note 60 for 0.2 beats
play note 62 for 0.2 beats
play note 64 for 0.2 beats
play note 64 for 0.2 beats
play note 64 for 0.2 beats

□ But it doesn't have to be this difficult. We should be able to control all of the notes by using a variable.
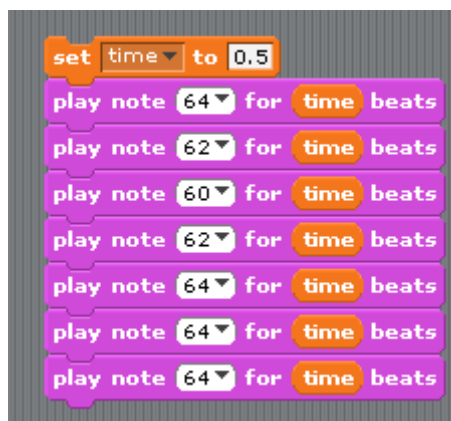 o In the Variables tab – click on "Make a variable"
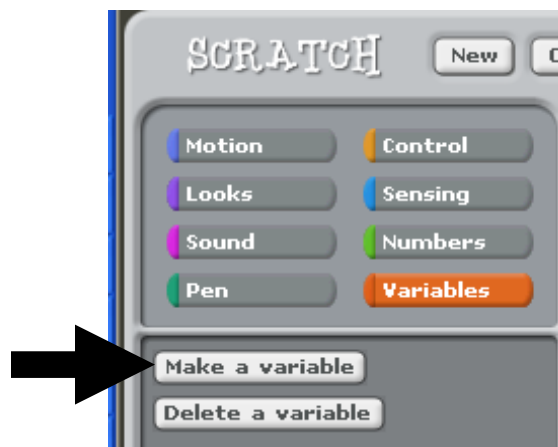
◻ Name your variable "time":
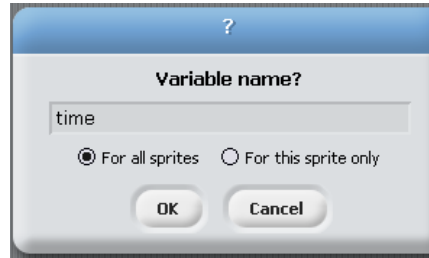
◻ When you click "OK" you should see a new variable:

◻ Now instead of typing 0.5 or 0.2 in our song, we can use the variable time .

   o Drag the time piece into the spots like below

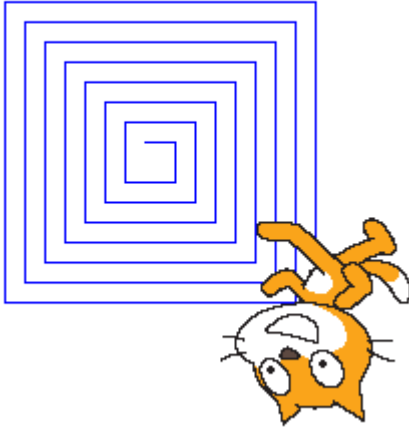   o Put set time to 0.5 on top of your song. Remember to type 0.5 for the new value of time .

◻ Now try changing how fast the song plays a few times, you should only have to change the value in the first block:

Drawing with Variables

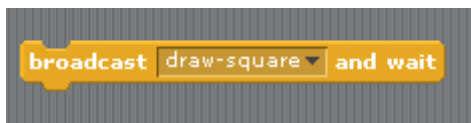- Now try using variables in your drawings. Try to draw the square-spiral (squiral) below.

- Go back to the shapes that you drew and allow the length of each side to be controlled by a variable.
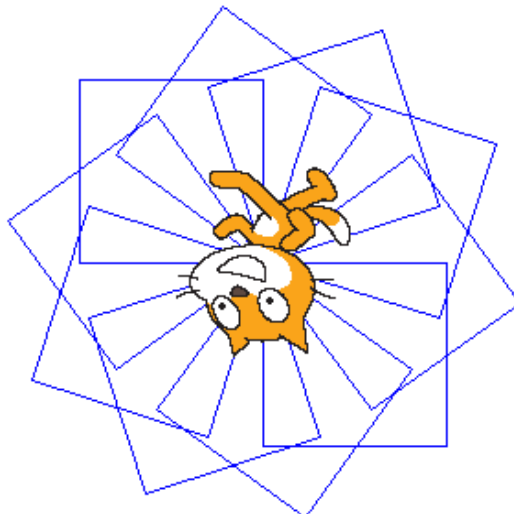
Using Broadcast in Drawing

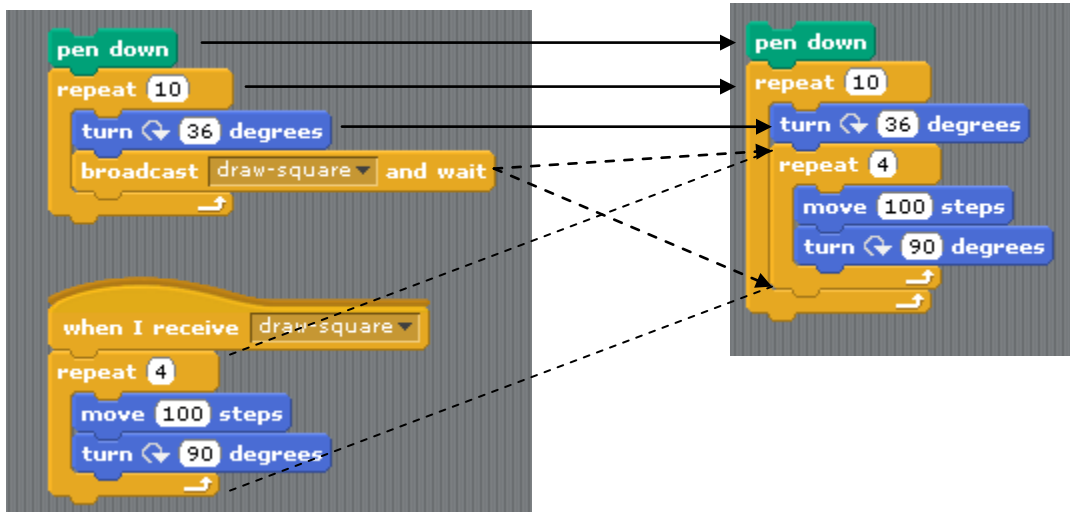- Click on the black triangle and click "new". Then type "draw-square" to name your message.

- Now we can use these two pieces in our blocks

- Here is an example of what we can draw when we draw multiple squares. Before you look at the code, try to count the squares.

☐ Without the "Broadcast and wait" piece we would have had to put the block for the square right inside the other block.

☐ Try the version on the left and then see what other pictures you can draw using these pieces.

☐ Make a new shape and see what happens when you use that instead of `draw-square` in your design.