

Challenge

Only Mercury, Venus and the Moon have been programmed. Add commands to the other planets using the information below

Mars x0.3, Jupiter x2.3, Saturn x1, Uranus x0.8, Neptune x1.1

Functions and Procedures are ways of putting common frequently used bits of programming into one place.

A procedure is a collection of commands that can be used time and time again.

A function is a special procedure that sends a value back to the other parts of the program.

Challenges

Change the planets into a program that will tell you how long the days are on each planet.

Mercury	60 Earth Days
Venus	243
Mars	1.025
Jupiter	0.375
Saturn	0.417
Uranus	0.542
Neptune	0.625

Can you make a program that will convert Feet and inches to metric measurements?

Can you extend the above program to convert other distances as well, such as miles and yards.

SCRATCH

Functions and Procedures

When programmers work they do not normally write programs in one long line. They normally try to divide the program up into sections.

This leaflet explores how you can create functions and procedures in Scratch.

Load the programme: <http://scratch.mit.edu/projects/17017140/>

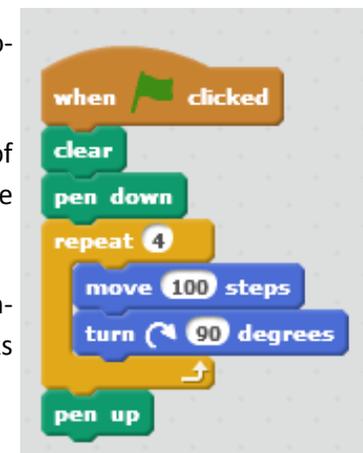
When you press the Green Flag the programme will draw a square.

However we are going to draw a lot of squares. What we are going to do is to make one command a 'Square' block.

This is called a procedure and can be completed in Scratch by using the More Blocks option.

Click on 

Name the New Block Square



The pencil has been set so that each time you click on it, it clears the screen and returns to its starting position



Using this block create these two programs.

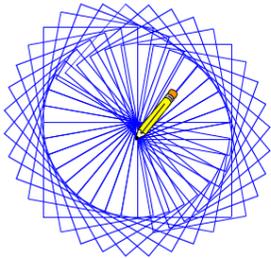
Note how all the instructions that create the square are now held in one purple block.

```

when green flag clicked
  clear
  pen down
  Square
  pen up

define Square
  repeat 4
    move 100 steps
    turn 90 degrees
  
```

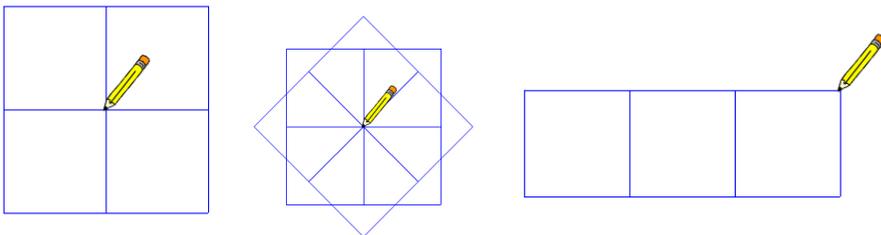
Change the program to look like this and to create this effect.



```

when green flag clicked
  clear
  pen down
  repeat 36
    Square
    turn 10 degrees
  pen up
  
```

Challenge Can you change it to create these effects?



Challenges

Can you create new blocks that create different sized squares?

Can you create new blocks that create triangles or circles?

Can you draw a picture?

Can you create procedures that would allow you to draw your name?

Functions

A function is a like a procedure but it does a calculation and reports this value to another part of the program.

This can be illustrated in this program:

<http://scratch.mit.edu/projects/17021991/>

After clicking on the Green flag the user is asked for the weight on something on Earth.

```

when green flag clicked
  ask What is its weight in kilograms and wait
  set Kilograms to answer
  
```

Then by clicking on one of the planets (or Moon) the weight is then adjusted for that celestial body.

```

when this sprite clicked
  set Kilograms to Kilograms * 0.83
  broadcast message1
  
```

Each planet has its own function for working out its weight.

```

when I receive message1
  say join The weight was join Kilograms KG
  wait 5 secs
  say join It is now join answer KG
  
```

The broadcast command tells the Earth Sprite that the calculation has been completed.