

Second Life Turtle Worksheet

Our Second Life–based turtle is designed to be used to teach programming to those with no significant prior experience – first-year computer science students in particular. This worksheet tries to cover two of the most basic aspects:

- breaking down tasks (such as drawing a square) into a series of much simpler ones (drawing lines or turning the turtle)
- building *procedures*: saved lists of commands (either simple ones or calls to other procedures)

A list of the available commands for the turtle is on the accompanying sheet.

Section A

This section will introduce you to the turtle system and test your skills in drawing 2D shapes with examples given by the turtle.

Exercise 1: Square

To draw a square you need to issue the two commands below **four** times. Try doing so, and make sure the result is right.

```
forward 10  
right 90
```



You could also use `left` rather than `right`, and issue the two together by separating them with a semicolon.

Exercise 2: Triangle

Draw an equilateral triangle. You will want to use the same basic approach as for the square, but changing the angle.



Exercise 3: Six-Pointed Star

Try to draw a six-pointed star, as shown on the right. You will need to use the `penup` and `pendown` commands.



The recommended approach is to draw a triangle, then move a third of the way along one side (with the pen up), then start drawing another triangle the other way up.

Section B

Now you've learnt the basic skills, it's time to draw some more complex 2D shapes on your own.

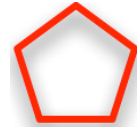
Exercise 1: Rhombus

Attempt to draw this shape.



Exercise 2: Pentagon

Attempt to draw this shape.



Exercise 3: House

Attempt to draw this shape. For bonus points, try drawing it so you do not draw over a line you have previously drawn.



Exercise 4: Octagon

Draw a regular octagon. While this is not too hard, it can get quite tedious, so you will probably want to define a procedure to draw one side and then turn for the next one, and call that procedure eight times. An outline of the needed code is:

```
define octagonside
  forward _____
  right _____
end
call 8 octagonside
```

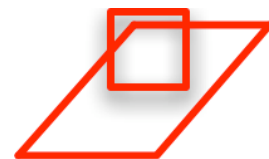
You could also try redoing some of the earlier exercises using procedures.

Section C

Well done! You've now mastered 2D drawing – now time to try 3D.

Exercise 1: Perpendicular Square

This is just another square, but this time drawn perpendicular to the grey plane the turtle starts on. There are various ways of doing this, but the simplest is probably to start with an **lroll 90** command, and then reuse the earlier code for squares.



Exercise 2: Cube

Try drawing a cube, including all the edges (not just the facing ones as shown in the picture to the right)



Exercise 2: Square-based Pyramid

Attempt to draw this shape. A 45 degree slope is a good choice. *Hint: You will need to use the **tilt** command.*

