



Unit 3F: Modelling: Controlling a screen turtle

About this Unit:

In this unit children learn to enter instructions to control a screen turtle and will compare the operation of the screen turtle with a floor turtle. They learn how to take the turtle for a 'walk' on screen and leave a trail showing the path the turtle has taken. They will learn to use the tools to create a 'line by line' series of commands to take the turtle from one point to another, this will develop estimation skills. They will use angles of 90 degrees and the Penup, Pendown tools. They will also save their work independently. Children will be able to apply what they have learnt in this unit when working with angles, estimation and shape and space in mathematics.

Where this Unit fits in:

Builds on Unit 2D 'Routes: controlling a floor turtle'.

This unit assumes that children:

- know the difference between left and right turns
- know that degrees measure turns and that a right angle is 90 degrees and is also a quarter turn

Vocabulary:

Left | right | penup | pendown | home | clear | turn |

Resources:

Floor turtle | a version of LOGO that includes the commands clear, home, penup and pendown and which allows final results to be printed out | Pre-made screens with mazes and tasks for the children to follow |

Expectations: at the end of this unit,

Most pupils will be able to: move the turtle around on screen, estimating distance, leaving a trail, using penup and pendown, to move the turtle to escape from a maze or move between points on the screen using right angle turns:

Some pupils will only be able to: randomly move a turtle on screen but show little development of estimation skills:

Some pupils will also be able to: create overlapping patterns using shapes such as rectangles and squares

These units have been adapted from material available on the QCA Schemes of Work website



Learning Objectives <i>Pupils should learn...</i>	Possible Activities	Learning Outcomes <i>Pupils can...</i>	Consider
Setting the Scene			
<ul style="list-style-type: none">• key idea: that the screen turtle can be moved on screen.• technique: to transfer floor turtle instructions to the screen and understand common language.	<ul style="list-style-type: none">• Show the class how a floor turtle can be programmed to move in a square and write the instructions on the board - forward 4, right 90, forward 4, right 90, forward 4, right 90, forward 4, right 90. Discuss with the children their experiences of making the floor turtle move through a sequence of instructions.• Introduce the children to the screen turtle. Talk about the direction the turtle is facing and how it moves. Click on the direction arrows to show the turtle moving on screen. Introduce them to the clear screen command. Discuss the differences between using a floor turtle and a screen turtle. Remind the children that instructions are relative. Explain to them that they are going to make the screen turtle follow a number of instructions.	<ul style="list-style-type: none">• Should recognise that the same language is used to programme a screen turtle and a floor turtle.• Recognise that the screen turtle responds to commands immediately.	<ul style="list-style-type: none">• Children will need to relate the horizontal plane of the floor turtle to the vertical plane of the screen turtle. They will naturally want to use 'up' and 'down'.• Single instructions used in screen LOGO will be obeyed immediately, unlike the floor turtle which will not obey instructions until the 'go' button is pressed.
Short Focused Tasks			
<ul style="list-style-type: none">• key idea: that the screen turtle obeys the same language commands as the floor turtle.• technique: to enter commands to complete a simple task.	<ul style="list-style-type: none">• Give the children some pre-prepared screens with things such as mazes or sets of objects that the screen turtle has to move around to escape or find food, friends or home, or a simple map to visit different locations etc. The children will have to enter commands to move the turtle to complete the task. The turtle will leave a trail of its movements. Only angles of 90 degrees should be used in these tasks to get the children used to quarter turns and the orientation of the screen turtle.	<ul style="list-style-type: none">• Recognise that commands typed in LOGO are in the same language as they have been using with the floor turtle.• Recognise that the screen turtle reacts with the same movement that is shown by the line it draws.	<ul style="list-style-type: none">• Children will need to think about a starting point and the orientation on the screen.• Estimation of the number of turtle steps to move the required distance should be encouraged.• Some children will need lots of practice to understand screen orientation.

These units have been adapted from material available on the QCA Schemes of Work website



Learning Objectives <i>Pupils should learn...</i>	Possible Activities	Learning Outcomes <i>Pupils can...</i>	Consider
Short Focused Tasks (Cont).			
<ul style="list-style-type: none">• key ideas: that the turtle has a 'home' position and can be returned to that position.• technique: that they can use the command to take the turtle home.• to use pendown and penup to move the turtle.	<ul style="list-style-type: none">• Take the turtle for a 'walk' on screen. Demonstrate to the children how to take the turtle to its 'home' position. Discuss with the children the fact that it leaves a trail (that may or may not be wanted). Show the children how to use the Penup and Pendown commands to move the screen turtle without leaving a trail. Demonstrate how to clear screen.• Let the children practice using Penup and Pendown by moving the turtle on screen to make 'loose' patterns and returning the turtle to the home position to start a new line.	<ul style="list-style-type: none">• Move the screen turtle to the home position and clear screen.• Learn to move the screen turtle without drawing a line.• Save their work independently.	<ul style="list-style-type: none">• Changing the colour of the line could be shown depending on the LOGO software being used.
<ul style="list-style-type: none">• key ideas: that the screen turtle can be given commands to produce a specific shape on screen.• technique: to use pendown and penup to move the turtle.	<ul style="list-style-type: none">• Discuss with the children the random lines and patterns that they have been making with the screen turtle. Show them that the turtle can be programmed to move in a specific way, by drawing a square or a rectangle. Demonstrate using 'line by line' commands to draw a shape, such as: forward 40, right 90, forward 40, right 90, forward 40, right 90, forward 40, right 90.• Let them make squares and rectangles using Penup and Pendown as they move the turtle to draw the shapes.	<ul style="list-style-type: none">• Create squares and rectangles by moving the screen turtle.• Use Penup and Pendown as desired.	<ul style="list-style-type: none">• Changing the line colour could be encouraged.

These units have been adapted from material available on the QCA Schemes of Work website



Learning Objectives <i>Pupils should learn...</i>	Possible Activities	Learning Outcomes <i>Pupils can...</i>	Consider
<p>Assessment Task</p> <ul style="list-style-type: none">• to move the turtle on screen to perform a simple task.• to change the line colour for effect.• to use the Penup and Pendown.• to be able to create simple shapes such as squares and rectangles.	<ul style="list-style-type: none">• Ask the children to create a series of turtle trails to make a pattern. They should be encouraged to use the skills they have learned, such as Penup, Pendown, Clear screen, home, change pen colour.• Some children could create an environment for the turtle in a graphics package, or make a maze or obstacle course for other children to use with the turtle.	<ul style="list-style-type: none">• Learn how to write procedures using standard commands.• Learn to combine procedures to produce a desired outcome.• Use line style, colour size and floodfill for effect.	<ul style="list-style-type: none">• Extension work could include patterns being created with overlapping squares and rectangles.• Environments for the turtle could be designed and created by the children in graphics packages and imported by the teacher to be used by other children.

These units have been adapted from material available on the QCA Schemes of Work website