

Edbot Dream

Scratch 2.0

Teacher's Guide



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Introduction

This unit is suitable for students in KS2 and KS3 and covers the following criteria:

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems
- solve problems by decomposing them into smaller parts
- use sequence, selection and repetition in programs; work with variables and various forms of input and output
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

Number of lessons

Recommend 4 x 1 hour teaching lessons, although this will work with slightly shorter or longer lessons.

The timings shown are colour coded to help you split up the lesson timings to fit your length of lesson.

Pink	Short activities
Yellow	Medium length activities
Blue	Longer activities

Suitability

This unit is suitable for mixed ability classes.

Differentiation

Lessons are differentiated by outcome and this is reflected in the success criteria and part of each lesson involves the students working independently, freeing up the teacher to offer more one-to-one help to the students who need it. There are also instructions in the lesson plans on how to adapt the lesson for lower or higher ability students.

Preparation needed by the teacher

The teacher needs to make sure that they are familiar with the contents of each lesson and the activities and questions involved which will help them with assisting the students in the lesson.

The teacher will need to be familiar with the Edbot Dream Scratch blocks. The documentation is available via the Edbot Software by selecting "Documentation..." in the "Help" menu. The teacher can use the edbot_dream_scratch2_intro.pptx presentation to introduce the new Scratch blocks.

Each student should be issued with a mark sheet at the beginning of the unit.

The Edbot Software should be installed on all the PCs and it is a good idea to have the students log in with their individual user names if they have them. This makes it easier to find their PC in the Edbot Software to give them control of the Edbot Dream. You also need to ensure the Edbot Software is configured correctly on the teacher's PC with the Edbot Dream connected via Bluetooth.

Make sure the Edbot Dream's battery is fully charged and installed correctly.

Before the first lesson you will need to convert the Scratch projects so they reference the particular name you've given to your Edbot Dream. Use the Edbot Software to do this. You'll find the project converter in the Scratch menu. Copy the converted files into a shared area that the students will be able to access.

Assessing without Levels

“As part of our reforms to the national curriculum, the current system of ‘levels’ used to report children’s attainment and progress will be removed. It will not be replaced.

We believe this system is complicated and difficult to understand, especially for parents. It also encourages teachers to focus on a pupil’s current level, rather than consider more broadly what the pupil can actually do. Prescribing a single detailed approach to assessment does not fit with the curriculum freedoms we are giving schools.”¹

With this in mind, we have developed a three-tier system which can easily be adapted to any system your school has implemented. We have referred to these bands as

- Foundation Essentials
- Mainstream Learners
- Extended Experts

Assessing Progress

Each student should be given a mark sheet on which they will need to write their name, so that they can get the same sheet back each lesson and could be kept in a work folder which they can refer to every lesson.

The assessment sheet is based on “A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom’s Taxonomy of Educational Objectives”² and avoids use of the old national curriculum levels altogether. This means that the same unit can be used in years 3, 4, 5, 6, 7, 8 or 9 and the students can still show they have made progress.

Edbot Dream Scratch Mark Sheet			
Name:	Class:		
Assessment Objective	Foundation Essentials	Mainstream Learners	Extended Experts
A.O.1	<input type="checkbox"/> I can program the crocodile model to open and close its mouth.	<input type="checkbox"/> I can program the crocodile model to repeat a series of actions and react.	<input type="checkbox"/> I can program the crocodile model to react when you clap.
A.O.2	<input type="checkbox"/> I can make the scorpion model's tail move.	<input type="checkbox"/> I can program the scorpion model to move and react.	<input type="checkbox"/> I can program the scorpion model to talk and use a procedure.
A.O.3	<input type="checkbox"/> I can make the puppy model move.	<input type="checkbox"/> I can make the puppy model move and react using procedures.	<input type="checkbox"/> I can create an efficient program with clearly explained code.
A.O.4	<input type="checkbox"/> I can make the puppy react to the IR sensor.	<input type="checkbox"/> I can make the puppy move and stay inside the circle.	<input type="checkbox"/> I can make the puppy consistently move and stay in the circle.

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The assessment should be completed at the end of every lesson by the students as a form of self-assessment and the last slide in each presentation tells the students the skills that they have covered. The students tick the box next to the objective if they feel they have fully met that criteria. The teacher can then use this as a basis to help them assess the students’ ability along with class observations, questioning students and viewing the students’ work.

¹ Taken from www.education.gov.uk/schools/teachingandlearning/curriculum/nationalcurriculum2014/a00225864/assessing-without-levels downloaded on 5th March 2014

² Anderson, L.W. (Ed.), Krathwohl, D.R. (Ed.), Airasian, P.W., Cruikshank, K.A., Mayer, R.E., Pintrich, P.R., Raths, J., & Wittrock, M.C. (2001). A taxonomy for learning, teaching, and assessing: A revision of Bloom’s Taxonomy of Educational Objectives (Complete edition). New York: Longman.

Edbot Dream Scratch

Lesson 2 of 4

Lesson objective:	I can control multiple outputs with a sensor. I can use “forever” loops, “if..then” statements and procedures.	
All will be able to: Make the scorpion’s tail move.	Most will be able to: Program the scorpion to move and react.	Some will be able to: Program the scorpion to talk and use a procedure.

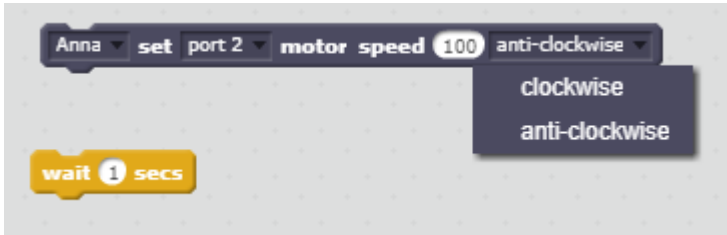
Differentiation

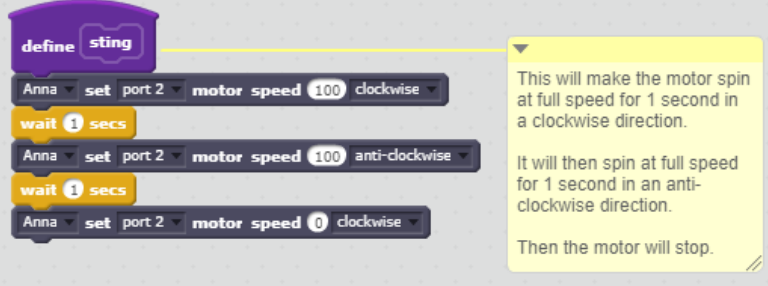
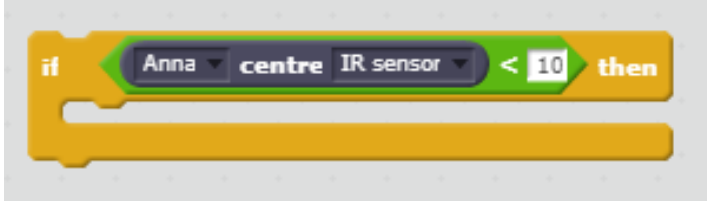
Low Ability: Will be given a program file which has all the blocks they will need already included. Focus on getting the tail and legs to move only. Students will experiment with blocks and combine them correctly.	High Ability: They should be using BYOB in their program and attempt to make the scorpion talk.
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Starter

Time	Description	Resources
Short Activity	<i>The lesson presumes that the scorpion model is already built and ready to use. Models take between 45-60 minutes to build depending on ability. Factor in 15 minutes or so to disassemble old models.</i> Demo the scorpion with the default program. What are the inputs and outputs being used? Students to discuss. Inputs – IR Sensor, Outputs - 2 motors and speakers from computer.	Scorpion model edbot_dream_scratch2_lesson2_scorpion.sb2 edbot_dream_scratch2_lesson2.pptx Slides 2 - 3

Main Activities

Time	Description	Resources
Medium Activity	Set students a challenge - Can you make the tail sting? Discuss what that means? Tail moves and then stops. Students to work to build a program that makes the tail sting. Give students a hint if needed of the blocks/instructions they need.  <i>Motor is plugged into port 2 according to the instructions.</i> Ask students to turn this into a procedure (using BYOB).	edbot_dream_scratch2_lesson2a_scorpion.sb2 Slide 4
Short activity	Review solutions with the class and show how to turn the program into a procedure. Get the class to help you code a solution to the sting. <i>Solutions will vary</i>	edbot_dream_scratch2_lesson2a_scorpion_solution.sb2 Slide 5

	 <p>Why does the motor need to move clockwise and anti-clockwise each time? The lever on the scorpion's tail limits the movement of the motor to 180° so the motor needs to reset to the initial position each time. When the motor moves in a clockwise direction the tail will sting. The tail will sting again when the motor moves in an anti-clockwise direction.</p>	
<p>Long Activity</p>	<p>Can you make the scorpion react when someone gets too close?</p> <p>You must:</p> <ul style="list-style-type: none"> - make it move - make it sting - make the scorpion react to something getting too close <p>Show demo again if needed.</p> <p>Discuss with the students decomposing the problem. What have we already worked out? Sting. What is the next step? Movement. This could be changed into a procedure (BYOB).</p> <p>Give this code block clue to students who are finding the IR sensor difficult to work out.</p>  <p>Extension</p> <ul style="list-style-type: none"> - Can you make it speak as well? - Can you add procedures to your code? 	<p>edbot_dream_scratch2_lesson2b_scorpion.sb2 for LA students.</p> <p>Slide 6 - 7</p>
<p>Medium Activity</p>	<p>Students should comment their code. Can you add a note to explain what it does? Summarise it. Right click on the block and choose 'add comment'.</p>	<p>Slide 8</p>

Review

Time	Description	Resources
<p>Medium Activity</p>	<p>Get students to share their solutions. Get them to explain their code, by summarising what it does. If needed show possible solution, edbot_dream_scratch2_lesson2b_solution_scorpion.sb2, which uses BYOB.</p>	<p>edbot_dream_scratch2_lesson2b_scorpion_solution.sb2 Slide 9 & 10</p>

Self-Assessment

Time	Description	Resources
<p>Short activity</p>	<p>Give out the mark sheet "Edbot Dream Scratch Mark Sheet" and make sure your students write their name on it. They read through the highlighted objectives and if they feel they have met the criteria fully they need to tick the box. If they do not feel they have met the objective they should not tick the box.</p>	<p>edbot_dream_scratch2_mark_sheet.pdf Slide 11</p>