Key Stage 2 ICT
Systems and Control
Junior Control Insight
Teaching Materials
Key Stage 2 ICT
Systems and Control
Junior Control Insight

The programme is designed to meet the requirements of ICT at Key Stage 2 with regard to modelling & controlling devices.

At Key Stage 2 children are required to learn how to control simple devices using control boxes and sequence a set of instructions to achieve a specific outcome. They are also required to understand the principles of control mechanisms and apply them to a working model.

The programme allows children to undertake the following tasks:

Find out how simple systems work

Make changes to systems by altering their properties

Develop systems by making their own changes

Design their own system and go on to make a real computer-controlled model

Outline of programme

1. 2 tutorial tasks to show how simple instructions can control a device.

2. 1 or more control projects to show how a variety of control mechanisms can operate and change a range of devices.

3. A design task for children to set up their own model on screen with programmed devices.

## Control Technology in the Primary Curriculum

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EYFS</strong></td>
<td>2Simple 2Go Tizzy’s First Tools</td>
<td>Simple remote control toys, Bee Bot, Make &amp; Go (Bee Bot), Metal Detectors, Voice changers, Microphones, Digital cameras/camcorders</td>
</tr>
</tbody>
</table>

### Knowledge & Understanding of the World
- ICT: Know how to operate simple Equipment
- Complete a simple program on the computer and/or perform simple functions on ICT apparatus
- Find out about and identify the uses of everyday technology and use information and communication technology and programmable toys to support their learning

### Unit 1F: Understanding Instructions and making things happen
- Charlie the Chimp 2Simple 2Go Tizzy’s First Tools
- Bee Bot Roamer

### Unit 2D: Routes: Controlling the floor turtle
- Charlie the Chimp 2Simple 2Go Textease;turtle
- Bee Bot Roamer ProBot

### Unit 4E: Modelling Effects on screen
- Textease;turtle 2Simple 2Go Roamer World
- Roamer ProBot

### Unit 5E: Controlling Devices
- Junior Control Insight2 Flowol Roamer World
- Roamer Using Flowol models Lego RCX

### Unit 6C: Control & Monitoring, What happens when
- Junior Control Insight2 Flowol Lego Robolab Lego Mindstorms
- Roamer Lego RCX & NXT robots
Unit 5E Controlling devices

ABOUT THE UNIT
In this unit children learn how to control simple devices, such as buzzers, small motors and lights, using basic control boxes. They learn how to control devices by turning them on and off according to a set of instructions. This will be developed so that children understand how to sequence a set of instructions to get a desired outcome.
They will apply what they have learnt in this unit when learning about the built environment, for example traffic lights, or simple manufacturing processes.

WHERE THE UNIT FITS IN
This unit builds on Unit 4E ‘Modelling effects on screen’.
This unit assumes that children understand procedures.

<table>
<thead>
<tr>
<th>TECHNICAL VOCABULARY</th>
<th>RESOURCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>switch on</td>
<td>control box</td>
</tr>
<tr>
<td>wait</td>
<td>simple switches and output devices</td>
</tr>
<tr>
<td>switch off</td>
<td>such as buzzers, lights and small motors</td>
</tr>
<tr>
<td>repeat</td>
<td></td>
</tr>
<tr>
<td>procedures</td>
<td></td>
</tr>
</tbody>
</table>

EXPECTATIONS at the end of this unit

most children will:

- design and create a simple advertising display which produces a combination of events; write simple procedures and be able to link output devices together; amend their procedures to get a desired outcome

some children will not have made so much progress and will:

- design and create a simple advertising display which produces a limited number of events; need help to write simple procedures and design the display

some children will have progressed further and will:

- design and create an imaginative advertising display which produces a combination of events; write, correct and improve procedures to link output devices together; realise the limitations of the system
## LEARNING OBJECTIVES

**CHILDREN SHOULD LEARN**

### POSSIBLE TEACHING ACTIVITIES

- **key idea:** that devices can be controlled through direct instructions

- Explain to the class that a number of everyday devices rely on simple control features to make them operate. Some of these devices rely on a single instruction, for example a barrier in a car park where money or a ticket will make it operate. Other devices rely on a sequence of instructions to operate, for example a pelican crossing where a button activates the lights then the walk signal.

- Ask the class to identify the devices at home and at school that operate on instructions and discuss whether they rely on a single instruction or on a sequence.

### LEARNING OUTCOMES

**CHILDREN**

- recognise that control technology is all around them and that things do not happen without cause and effect

- recognise that these devices rely on a set of instructions that can be repeated

### POINTS TO NOTE

Discussion with the children is likely to focus on who or what makes things work ‘automatically’.

It is important to discuss why machines do some things and not people: what are the advantages and disadvantages? A good example is what would happen if the school replaced their ‘lollipop’ person with a pelican crossing. Children could discuss safety, economy and efficiency.

## SHORT FOCUSED TASKS

- **key idea:** that a control box and software can be used to control an output device

- **technique:** to control simple devices, such as small motors, light bulbs, buzzers, by giving direct instructions

- Introduce the children to the control box and show them how to plug a light bulb into output socket 1. Explain that the light can be switched on and off using a control language, for example ‘switch on 1’ turns the light on, ‘switch off 1’ turns the light off. Show the children that the command relates to the socket in which a device is plugged, for example if the bulb was in socket 3 the command would be ‘switch on 3’. Demonstrate setting up a procedure to flash the light. Demonstrate repeat commands and name the procedure. Introduce the idea of using sensible names for procedures so that everyone will have an idea what they do. Call the procedure to make the bulb flash ‘flash’. Divide the children into pairs and ask them to write their own procedures to flash a light bulb and sound a buzzer in short bursts. Children should record their procedures and describe the effects.

- **recognise that devices can be controlled by a computer**

- **recognise the need for precision when writing simple procedures**

This procedure will involve using a wait command and timings. This should be related to the work done on LOGO in Unit 4E. Children will also need to know how to edit their procedures.

Discuss accuracy of timing and language and how inaccuracy can lead to incorrect results.

Children who find this work easy could use a simple model of a motor and barrier, and write a procedure to raise and lower the barrier. They will need to understand that the barrier is raised by the motor going forward, and lowered when the motor goes backwards. They will need to be shown how to slow down the motor.

Children will need to know that there is more than one output socket and that the computer needs to know, through the language, which socket an output device is plugged into. Activities should be related to ‘real life’ situations where possible.
**LEARNING OBJECTIVES**  
CHILDREN SHOULD LEARN

- **key idea:** to control more than one output device
- **techniques:** to use simple procedures to control more than one output device
- to use simple control language to activate multiple devices concurrently

**POSSIBLE TEACHING ACTIVITIES**

- Show the class a simple traffic light set-up, using a pre-built model or three different coloured bulbs, and discuss the sequence of lights. Ask the children to work in pairs to produce a story board of a pelican crossing. The storyboard should show the lights before, during and after the button is pressed.
- Ask each pair to write the control language to produce the correct sequence. They will need to use language learnt in the previous exercise and will need to know how to turn on more than one output at a time, for example to produce red and amber at the same time. Children should be encouraged to write separate small procedures for each part of the sequence, for example stop, wait and go. The children should then enter and test their procedure on the computer. They should record any amendments and describe the results. Finally, ask them to get the computer to repeat the sequence a number of times.

- **technique:** to control output devices, by building a sequence of events, to solve a problem
- Write a program which will turn the classroom heater on before the children arrive in the morning, off at lunch, on again after lunch and off when they all go home. Give the children a set of simple instructions for the heater and ask them to predict what the instructions will do. Also ask them to identify errors or omissions in the sequence which might lead to problems in turning the heating on and off.

**LEARNING OUTCOMES**  
CHILDREN

- write a sequence to produce a recognisable event
- recognise the need for precision when writing a number of procedures in one sequence of instructions
- recognise that there are consequences when machines, events or devices are controlled

**POINTS TO NOTE**

- Discuss what happens at a junction with more than one set of lights. What would happen if a procedure allowed all cars to go at the same time at a set of crossroads? Also discuss the difference between a set of lights and a pelican crossing, for example a pedestrian pressing the button.
- Discuss whether the results of control technology are always beneficial, for example when things go wrong.
<table>
<thead>
<tr>
<th>LEARNING OBJECTIVES</th>
<th>POSSIBLE TEACHING ACTIVITIES</th>
<th>LEARNING OUTCOMES</th>
<th>POINTS TO NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHILDREN SHOULD LEARN</td>
<td></td>
<td>CHILDREN</td>
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</tbody>
</table>

**INTEGRATED TASK**

- to create a sequence of instructions which can control a number of output devices

- Explain to the class how an advertising display sometimes uses coloured lights and buzzers to draw attention to the product being sold, for example a fairground ticket machine. Tell the class that they are going to work in small groups to create their own advertising display with lights, buzzers and a small motor.

- Give each group a control box, the output devices and the appropriate leads and ask them to think about what sequence their display will perform. Children should storyboard the sequence and ask them to think about what sequence their display will perform. Children should storyboard the sequence and ask them to think about what sequence their display will perform. Children should storyboard the sequence and ask them to think about what sequence their display will perform. Children should storyboard the sequence and ask them to think about what sequence their display will perform.

- Ask children to programme their sequences and discuss how they might ‘tidy up’ any small procedures.

- sequence instructions to control a number of output devices

The success of this activity is based on children’s ability to relate what they have done in smaller tasks with a much larger, and probably interconnected, set of devices and procedures which will impact on each other. If children find the activity difficult, limit the number of output devices to avoid complicated programming; two buzzers, up to four lights and one motor is recommended.
# Ideas for Control Technology

## Controlling devices (Unit 5E)

<table>
<thead>
<tr>
<th>Time</th>
<th>Learning Intention</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pupils discuss how devices are controlled</td>
<td>Introduction to Control Technology Powerpoint</td>
</tr>
<tr>
<td>30 mins</td>
<td></td>
<td>Discuss inputs &amp; Outputs and go through examples.</td>
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<tr>
<td></td>
<td></td>
<td>Demonstrate how to use Junior Insight2.</td>
</tr>
<tr>
<td>30 mins</td>
<td>Pupils make devices work on screen using Junior Insight2</td>
<td><strong>Task 1: Control simple devices</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>switch &gt; light</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Push button &gt; motor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pressure mat &gt; buzzer</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>EXT:</strong> Use one switch to control various devices</td>
</tr>
<tr>
<td>30 mins</td>
<td>Modify module box to make devices work in a specific way.</td>
<td><strong>Task 2: Fairground scene</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pressure mat &gt; round about</td>
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<tr>
<td></td>
<td></td>
<td>Lever switch &gt; big wheel</td>
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<tr>
<td></td>
<td></td>
<td>Push button &gt; clown</td>
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<td><strong>EXT:</strong> make round about work for just 6 secs</td>
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<tr>
<td></td>
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<td>Make all 3 devices work with one switch</td>
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<tr>
<td>30 mins</td>
<td>Modify module box to make devices work in a specific way.</td>
<td><strong>Task 3: Design your own Bedroom</strong></td>
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<td></td>
<td></td>
<td>Use various switches to control devices in a certain way. Edit / change</td>
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<td></td>
<td></td>
<td>control instructions</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Learning Intention</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Devices can be controlled using a sequence of instructions</td>
<td>Demonstrate how to add steps for instructions, go through sequence of</td>
</tr>
<tr>
<td>15 mins</td>
<td></td>
<td>instructions needed for Traffic lights to work correctly.</td>
</tr>
<tr>
<td>30 mins</td>
<td>Pupils add steps to create a sequence of instructions</td>
<td><strong>Traffic lights Tasks</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Make a set of traffic lights work correctly.</td>
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<tr>
<td></td>
<td></td>
<td>Add a bus, make it go on green</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Add another bus make it go when first bus off screen. Modify timings.</td>
</tr>
<tr>
<td>15 mins</td>
<td>Sound files can be added to steps of instructions.</td>
<td><strong>Haunted House.</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Demonstrate how to add sound files to the Haunted House scene.</td>
</tr>
<tr>
<td>30 mins</td>
<td>Pupils add steps and sound files.</td>
<td>Pupils create their own Haunted Houses using steps and adding sound</td>
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<tr>
<td></td>
<td></td>
<td>files. Demonstrating their scenes/systems to the whole class. Save all</td>
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<td></td>
<td></td>
<td>files for printing &amp; display.</td>
</tr>
<tr>
<td>Time</td>
<td>Learning Intention</td>
<td>Activity</td>
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<tr>
<td>3 15 mins</td>
<td>Understand how Lego car is connected.</td>
<td>Discuss the Lego cars. Pupils identify inputs and outputs, discuss motors &amp; wires. Answer questions.</td>
</tr>
<tr>
<td>30 - 45 mins</td>
<td>Lego cars can be controlled using a sequence of instructions.</td>
<td>Demonstrate how to program the Lego Cars. <strong>Lego Task 1:</strong> Add steps to control the wheels of a lego car, push left/ push right/ push both&gt;straight. Demo how to send instructions via USB tower. Drive car around obstacles.</td>
</tr>
<tr>
<td>30 - 45 mins</td>
<td>Pupils modify their instructions and make the car react as they plan.</td>
<td>Demonstrate how to control the Lego car to travel a certain distance. <strong>Lego Task 2:</strong> Pupils have to make the Lego car go from start to finish line, ext: make the car turn and return to start line. Add an action at the end.</td>
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<tr>
<td></td>
<td>Pupils write a sequence of instructions to solve a problem.</td>
<td>Design a more complex maze for the cars to maneuver around. Pupils can record their instructions.</td>
</tr>
<tr>
<td>30 - 45 mins</td>
<td>Plan a sequence of instructions to make Lego Car dance to music.</td>
<td>Pupils plan a ‘dance’ for their Lego car to short piece of music. Record their instructions. Pupils can teach their dance moves to another pair to see if they can follow their instructions.</td>
</tr>
</tbody>
</table>
### Key Stage 2 ICT

**Module Title:** Modelling – Systems and Control

<table>
<thead>
<tr>
<th>Key Ideas</th>
<th>Activities</th>
<th>Sessions</th>
<th>Resources</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pupils recognise that many everyday devices respond to signals and instructions</td>
<td>Using equipment in which pressing a button or switch makes something happen – <em>turning the fan on &amp; off on screen</em></td>
<td>1</td>
<td>Junior Insight programme</td>
<td>Level 1</td>
</tr>
<tr>
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<tr>
<td>Pupils plan and give instructions to make things happen and describe the effects</td>
<td>Make an onscreen device move by giving one instruction at a time – <em>making changes to the way the fan operates</em></td>
<td></td>
<td>Lego robots</td>
<td>Level 2</td>
</tr>
<tr>
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</tr>
<tr>
<td>Pupils use sequences of instructions to control devices &amp; achieve specific outcomes</td>
<td>Make an onscreen device move by giving a sequence of instructions – <em>build a set of traffic lights to work correctly</em></td>
<td></td>
<td></td>
<td>Level 3</td>
</tr>
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<tr>
<td>Pupils use ICT to control events in a predetermined manner and to sense physical data</td>
<td>Use procedures to control an onscreen device and predict outcomes – <em>make specific changes to onscreen devices such as traffic lights or other projects to make them work differently</em></td>
<td>1</td>
<td></td>
<td>Level 4</td>
</tr>
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<tr>
<td>Pupils create sequences of instructions to control events, and understand the need to be precise when framing and sequencing instructions</td>
<td>Explore more complex control systems &amp; the effects of variables on an onscreen device – <em>able to link devices and make them work in a predetermined manner / programme robots to move accurately, eg operate within a set border</em></td>
<td></td>
<td></td>
<td>Level 5</td>
</tr>
<tr>
<td>Pupils develop, try out and refine sequences of instructions to monitor, measure and control events, and show efficiency in framing these instructions</td>
<td>Develop &amp; refine sequences of control. Can make variations &amp; and assess validity – <strong>devise a system to operate with a number of inputs &amp; outputs</strong> / use a range of sensors such as infra-red to programme robots to move accurately, eg operate within a set border</td>
<td>Level 6</td>
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</tbody>
</table>
# How Junior Control Insight meets the National Curriculum

<table>
<thead>
<tr>
<th>National Curriculum level</th>
<th>Developing Ideas and making things happen: Control</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Level 1</strong></td>
<td>Using equipment in which pressing a button or a switch makes something happen.</td>
</tr>
<tr>
<td><strong>Level 2</strong></td>
<td>Make a physical or onscreen device move by giving one instruction at a time.</td>
</tr>
<tr>
<td><strong>Level 3</strong></td>
<td>Make a physical or onscreen device move by giving sequences of instructions.</td>
</tr>
<tr>
<td><strong>Level 4</strong></td>
<td>Use procedures to control a physical or on screen device, and predict outcomes. Incorporate feedback. Use sensors to detect physical change.</td>
</tr>
<tr>
<td><strong>Level 5</strong></td>
<td>Explore more complex control systems and the effects of variables on a physical or on screen device</td>
</tr>
<tr>
<td><strong>Level 6</strong></td>
<td>Develop &amp; refine sequences of control. Can make variations and assess validity using external factors.</td>
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</table>
Identifying National Curriculum Levels in ICT using Systems & Control

The tasks listed below are not designed to determine an NC level alone, but to identify levels in this area of ICT and support overall judgements for ICT.

**Level 1**
ICT requirement: They recognise that many everyday devices respond to signals and instructions
Systems & Control tasks: using equipment in which pressing a button or switch makes something happen – *turning the fan on & off on screen*

**Level 2**
ICT requirement: They plan and give instructions to make things happen and describe the effects
Systems & Control tasks: make an onscreen device move by giving one instruction at a time – *making changes to the way the fan operates*

**Level 3**
ICT requirement: They use sequences of instructions to control devices & achieve specific outcomes
Systems & Control tasks: make an onscreen device move by giving a sequence of instructions – *build a set of traffic lights to work correctly*

**Level 4**
ICT requirement: They use ICT to control events in a predetermined manner and to sense physical data
Systems & Control tasks: use procedures to control an onscreen device and predict outcomes – *make specific changes to onscreen devices such as traffic lights or other projects to make them work differently*

**Level 5**
ICT requirement: They create sequences of instructions to control events, and understand the need to be precise when framing and sequencing instructions
Systems & Control tasks: explore more complex control systems & the effects of variables on an onscreen device – *able to link devices and make them work in a pre-determined manner / programme robots to move accurately, eg operate within a set border*
Level 6
ICT requirement: They develop, try out and refine sequences of instructions to monitor, measure and control events, and show efficiency in framing these instructions
Systems & Control tasks: develop & refine sequences of control. Can make variations & and assess validity – devise a system to operate with a number of inputs & outputs / use a range of sensors such as infra-red to programme robots to move accurately, eg operate within a set border
Identifying National Curriculum Levels in ICT using Systems & Control

The attached tasks are not designed to determine an NC level alone, but to identify levels in this area of ICT and support overall judgements for ICT.

A = working confidently;  B = with some difficulty

<table>
<thead>
<tr>
<th>Name of pupil</th>
<th>ICT level for Systems &amp; Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Level 1</td>
</tr>
<tr>
<td></td>
<td>B</td>
</tr>
<tr>
<td>NC req</td>
<td>Task</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>4e</td>
<td>I understand: Input – process – output</td>
</tr>
<tr>
<td>4e</td>
<td>I understand that there are different types of input and output</td>
</tr>
<tr>
<td>4e</td>
<td>I understand how to programme a simple system to start and finish</td>
</tr>
<tr>
<td>5e</td>
<td>I can change a programme to make a device act in a different way</td>
</tr>
<tr>
<td>5e</td>
<td>I can look at a system window and make sense of how the modules work</td>
</tr>
<tr>
<td>5e</td>
<td>I can link devices to make them work from a single output</td>
</tr>
<tr>
<td>5e</td>
<td>I can design a series of systems in the design window</td>
</tr>
<tr>
<td>5e</td>
<td>I can design a series of systems in the system window</td>
</tr>
<tr>
<td>6c</td>
<td>I can connect a real model to the computer and use the system to control it</td>
</tr>
</tbody>
</table>
Programme for Key Stage 2 Systems & Control

Session 1  (90 mins)

Aims: to introduce learners to concepts of input/output and how these are used to control devices; use of symbols to programme
Objectives: learners to understand examples of input/output plus use module box to programme simple/complex devices

Preparation/resources: Logotron Version 1; downloaded/task sheet

Introduction to Input/Output (4e)  10 mins
Introduction to module box and operating method (fan – 4e/5e)  10 mins
Practice on module box  15 mins
Introduction to system view/build system onscreen  15 mins
Tasks & experimentation on more complex models (bedroom etc – 5e)  30 mins

Session 2  Sequencing

Aims: to introduce learners to sequencing as a means to programming devices
Objectives: learners to understand how devices are programmed to operate in a sequence of actions; to programme devices such as traffic lights

Preparation/resources: Logotron Version 2; downloaded/task sheet

Learning is at the heart of all we do...
Review prior learning 10 mins
Introduction to sequencing 10 mins
Building a sequence (traffic lights + challenges – 5e) 25 mins
Alternative tasks:
  • Adding to sequences (sound etc. haunted house)
  • Programming robots (building sequences for a physical model 6c)
Plenary – sequencing in programming 10 mins

Session 3  Introduction to Robotics

Aims: to introduce learners to programming remote devices using a sequence of instructions
Objectives: learners to programme a remote device to operate in a controlled manner

Preparation/resources: robots assembled/firmware downloaded/task sheet

Review prior learning 10 mins
Introduction to RCX – structure (inputs/outputs/ports) 5 mins
Learners programme RCX to operate in simple sequence 10 mins
Complex tasks – time/weave etc 10 mins
Challenge explained 10 mins
Differentiated challenge: RCX to operate over specific distance
  RCX to operate in specified area 35 mins
Plenary – remote models & uses 10 mins
Cashpoint

What is the input?  What is the output?

What is the process?
Drink dispenser

What is the input?  What is the output?

What is the process?
### Unit 6A: Controlling Devices. What happens if?

Complete the table to show you understand the Input, Process and Output.

<table>
<thead>
<tr>
<th>Input</th>
<th>Process</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch on the light switch</td>
<td>Circuit connected</td>
<td></td>
</tr>
<tr>
<td>Switch off the fan</td>
<td></td>
<td>Fan stops</td>
</tr>
<tr>
<td>Turn the key in the ignition</td>
<td>The ignition circuit is closed and the engine is started.</td>
<td></td>
</tr>
<tr>
<td>Card into cash dispenser</td>
<td></td>
<td>Simple control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Traffic lights</td>
</tr>
</tbody>
</table>
Task: Programme the module to make the light go on when the switch is closed.

Open Junior Control – blank window

Click on Design mode

Click on System view

Drag a switch from the left side

Drag a module from Design
Choose Signal Switch

Drag a light from the right side

Hold shift down and click on switch – module – light
Go to edit and click “Link”

Turn over the worksheet to find how to programme the modules
How to programme the module
Click on Design mode and open the module

Click start

Start must look like this

Finish must look like this

Click Run to test

Can you programme the light to go off after 10 seconds?

Click finish

Finish must look like this
Bedroom tasks

Task: Change the instructions on the room light module so that the light goes on when the door is opened.

Select: File – New – Bedroom x from Projects

*Click on Design mode/then Run to test*

The start and finish buttons must look like the ones below

---

**Start**

Type - Source - Condition

Must look like this

---

**Finish**

Type - Source - Condition

Must look like this

---

Click Run to test
Turn over the worksheet to find another task
Connecting 2 outputs

Task: Change the instructions on the TV control module so that the television goes on when the light goes off.

Click on Design mode/then Run to test

1. Click on TV switch
2. Go to edit and “delete” (the switch disappears)
3. Click on the cord switch
4. Press shift and click on the TV control module (both are highlighted)
5. Go to edit and click on “link” (the cord switch and TV module are linked)
6. Open the TV module, change the programme as shown below

Click Run to test
Traffic light tasks
Sequencing instructions

Task: Programme the lights to switch on and off

Click on Design mode/then Run to test

1. Go to ‘New’
2. Open “A full gallery”
3. Select ‘display gallery’
4. Choose a red, amber and green traffic light
5. Select a module (simple control)
6. Link the lights and module, and programme the lights to go on and off in sequence.

Simple control

See other side for next instruction

Click ‘add’ to add an instruction
Your task is to make the traffic lights work in sequence: red - amber - green.

Can you make the amber light flash on and off?
Clue – output on & off
**Task: Adding a bus**

1. Open “A full gallery”
2. Select bus & link to module
3. Choose ‘Outputs’, tab 3 (green light)
4. Tick bus as output

---

**Task: The ‘2 bus’ challenge**

A second bus can be placed on the screen to move separately from the first.

Step 4 should be changed to ‘bus at B’ plus ‘green’ as outputs.
Bus at A should also be ticked to stop it returning.
Step 5 should be added with output ‘amber light’
Input – Process – Output

Draw your system on to the picture and label it:
Input – Output – Process

The Input I used is a ..................

The Output I used is a .................

The settings on the Module Box are...
Input – Process – Output

Draw your system on to the picture and label it:
Input – Output – Process

The Input I used is a .................

The Output I used is a ............... 

The settings on the Module Box are...
Sequencing

Using Junior Insight2 Open A full gallery
Use the boxes to explain how you programme a set of lights to work correctly.

The lights are turned on using the ............... button

These buttons show .............

............. control

These buttons are used to.............
Use the boxes and arrows to explain how you programme the bus to move on the green light.

To make the bus go on the green light you must ....
Appendix

The following worksheets are activities that will allow children to investigate the various aspects of Logotron programming.
Design your own bedroom

Follow the steps below to design devices for your bedroom and programme the modules

Step 1: Design mode

Step 2: Display: “Gallery”

Step 3: Select a sensor and a device

Step 4:
Design – “module” – “signal switch”

Step 5:
Hold ‘Shift’
Click on – sensor – module – device
Go to ‘Edit’ and select “Link”

Step 6:
Programme the module
Click “Run” to test

Look on the other side of this worksheet for ideas about your bedroom
Dream bedroom

Develop your own dream bedroom. Bring sensors and devices into your bedroom and programme them. Here are some ideas.

• Switch on a device such as the tv when the door is opened
• Switch off the tv after a set time
• Switch on the heater when it gets cold
• Switch on the fan when it gets hot
Make changes to the haunted house

Follow the steps below to add new sounds to the haunted house

Add thunder plus another sound to follow the lightning

1. Open the lightning control box
2. Click on tab 5
3. Click “Add” to make instruction 6
4. Go to **Type** and choose “sound”
5. Click on **Sound** tab and click on **Set**
6. Choose “thunder” from the list, click on **Open**
7. Click the **Start** tab and “Play sound straight away”
8. Click the **Finish** tab - Time “2 seconds”

**Run** to test

1. Open the module box again
2. Click on tab 6. Then click on “Add” to make instruction 7
3. Add another sound from the list

**Run** to test

What other changes can you think of to add to the haunted house
Make some changes to the funfair
Follow the steps below to make changes to the funfair

- Swap the positions of the roundabout and swing boats. Bring the swings to the front of the picture.

- Change the speed and direction of the motors. Make the big wheel turn more slowly and the roundabout go backwards. You will need to alter the output settings on the module.

- Change the helter skelter lights. Have 2 lights come on at the same time. You will have to alter the output settings. The first 2 sentences should read:
  “switch on the red light and the blue light for 0.5 seconds”
  “switch on the blue light and the green light for 0.5 seconds”

- Change the clown. Make him laugh each time someone passes through the turnstile. Use the system window. Link the turnstile switch to the clown control module. Change the start settings to read:
  “when the turnstile gets opened, switch on the clown for 2 seconds”

Look on the other side of this worksheet for more ideas about the funfair
Develop your own ideas about how the rides could work

Make your own changes, or use some of the ideas below.

• Add a switch to control the big wheel so that people can get on and off.

• Add a switch to control the roundabout.

• Programme the big wheel so that the speed increases slowly when it is switched on. Make the speed decrease slowly when it is switched off.

• Create a sound module so that music plays every time the roundabout starts running.

• Make a safety system with 2 switches for the swing boats. Both switches must be closed before the swing works.
Design your own bedroom in System View

Follow the steps below to design devices for your bedroom in the system view and programme the modules

Step 1: Click system view

Step 2: Select an Input from the list

Step 3: Select a device from the list

Step 4: Design – “module” – “signal switch”

Step 5: Hold ‘Shift ‘ Click on – input – module – device Go to Edit and select “Link”

Step 6: Programme the module Click “Run” to test
Using Junior Insight2 Open Quick Start.

You need to control the fan by changing the Process.
Write in the Module box what you have on your screen.

**Task 1:**
Test what the device does.

**Task 2:** Change the device to stay on until switch clicked.

**Task 3:** Make the device stay on for 6 seconds.
### Task 4: Make the device switch on after 3 seconds and stay on for 6 seconds.

#### Switch ON settings:
- Use one signal
- Signal Type:
- Wait for:

#### Switch OFF settings:
- Use one signal
- Signal Type:
- Wait for:

### Task 5: Make the device turn on after 3 seconds and off when the switch is pressed.

#### Switch ON settings:
- Use one signal
- Signal Type:
- Wait for:

#### Switch OFF settings:
- Use one signal
- Signal Type:
- Source:
- Condition:

### Task 6: Make the device turn on when switch released & on when it is pressed.

#### Switch ON settings:
- Use one signal
- Signal Type:
- Source:
- Condition:

#### Switch OFF settings:
- Use one signal
- Signal Type:
- Source:
- Condition: