ST LAWRENCE C.E. PRIMARY SCHOOL SUBJECT MANAGER OVERVIEW

SUBJECT: DT UNIT: Computer Controlled Models CONCEPT: Legacy YEAR:6

BIG QUESTION	How can we create computer controlled working models?	
END OF UNIT OUTCOME	Create an advertisement poster as a group to present each project	
NC OBJECTIVES	**Computing:** • 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 **Science:** • compare and give reasons for variations in how components function • use recognised symbols when representing a simple circuit in a diagram **Design and Technology:** Design • design innovative, functional, appealing products that are fit for purpose • generate, develop, model and communicate their ideas Make • select from and use a wide range of tools and equipment to perform practical tasks • select from and use a wide range of materials and components according to their functional properties and aesthetic qualities Evaluate • evaluate their ideas and products and consider the views of others to improve their work Technical knowledge • apply their understanding of how to strengthen, stiffen and reinforce more complex structures • understand and use mechanical systems in their products [for example pulleys] • understand and use electrical systems in their products [for example series circuits incorporating bulbs and motors] • • apply their understanding of computing to program, monitor and control their products	
WEEK	**KEY KNOWLEDGE**	**RESOURCES**
1	Recognise electrical components and their symbols. Identify conductors and insulators. Learn to follow a circuit diagram. Investigate motors, bulbs and LEDs. Create and run a computer program.	**Set up the controller Crumble Workbook 1** **Crumble Blog 1** **PowerPoint 1** Class Kit: ▪ 1 Crumble controller ▪ 1 micro-USB cable ▪ 1 sheet of corrugated plastic ▪ 4 crocodile leads

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<td>RICH TASKS</td>
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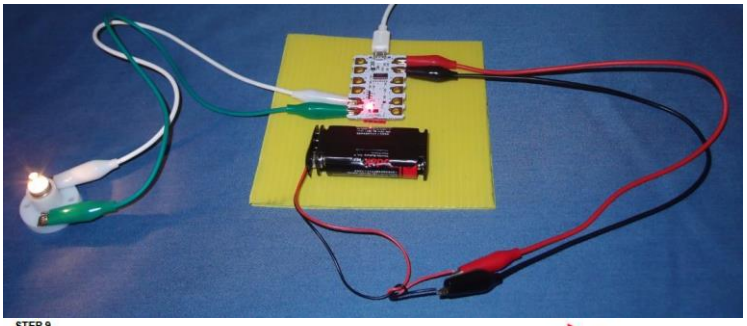
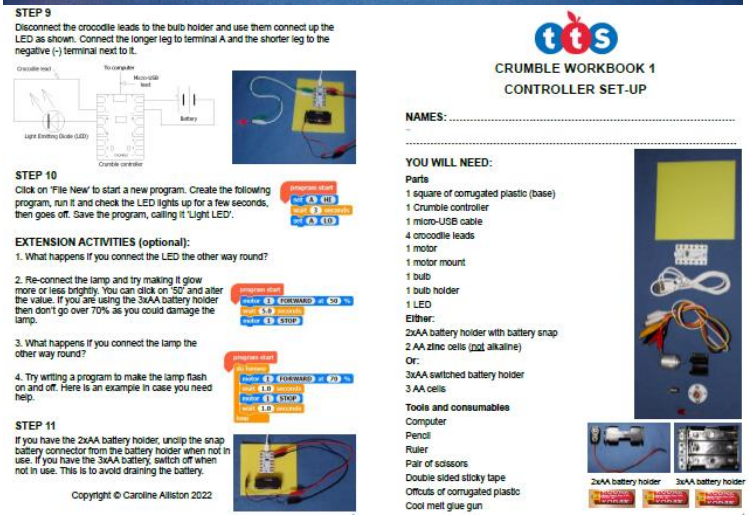
STEP 9
Disconnect the crocodile leads to the bulb holder and use them connect up the LED as shown. Connect the longer leg to terminal A and the shorter leg to the negative (-) terminal next to it.
STEP 10
Click on 'File New' to start a new program. Create the following program, run it and check the LED lights up for a few seconds, then goes off. Save the program, calling it 'Light LED'.
EXTENSION ACTIVITIES (optional):
1. What happens if you connect the LED the other way round?
2. Re-connect the lamp and try making it glow more or less brightly. You can click on '50' and alter the value. If you are using the 3xAA battery holder then don't go over 70% as you could damage the lamp.
3. What happens if you connect the lamp the other way round?
4. Try writing a program to make the lamp flash on and off. Here is an example in case you need help.
STEP 11
If you have the 2xAA battery holder, unclip the snap battery connector from the battery holder when not in use. If you have the 3xAA battery, switch off when not in use. This is to avoid draining the battery.
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CRUMBLE WORKBOOK 1
CONTROLLER SET-UP
NAMES: .....
YOU WILL NEED:
Parts
1 square of corrugated plastic (base)
1 Crumble controller
1 micro-USB cable
4 crocodile leads
1 motor
1 motor mount
1 bulb
1 bulb holder
1 LED
Either:
2xAA battery holder with battery snap
2 AA zinc cells (not alkaline)
Or:
3xAA switched battery holder
3 AA cells
Tools and consumables
Computer
Pencil
Ruler
Pair of scissors
Double sided sticky tape
Offcuts of corrugated plastic
Cool melt glue gun
2xAA battery holder
3xAA battery holder
</td>
<td>
▪ 1 motor
▪ 1 motor mount
▪ 1 bulb holder
▪ 1 bulb
▪ 1 LED

And either (older kits):
▪ 1 battery holder 2xAA
▪ 1 battery snap

Or (newer kits):
▪ 1 switched battery holder 3xAA

Other parts, tools and consumables
▪ 1 computer with internet connection (Netbook computers will work, but not Chromebooks)
▪ Pencil
▪ Ruler
▪ Large scissors
▪ Double sided sticky tape
▪ Low melt glue gun
▪ Pencil sharpener
▪ Sandpaper
▪ AA cells – either 2 for the 2xAA battery holder or 3 for the 3xAA battery holder (use zinc cells, not alkaline or re-chargeable)
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<tr>
<td>2</td>
<td>Design and make a structure for a particular purpose.

Program your motor to change its rotational speed and direction.

Experiment with mixing coloured light.</td>
<td>Coloured Spinner
Crumble Workbook 2
Crumble Blog 2
PowerPoint 2</td>
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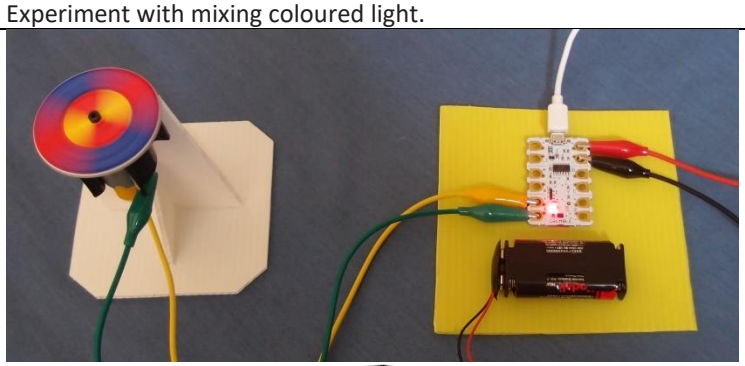
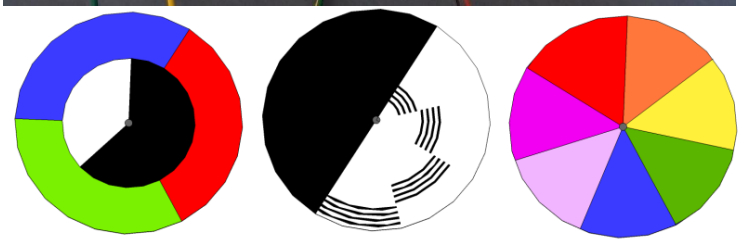
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<td>
Parts included in class kit
▪ 1 Crumble controller unit (see Crumble blog 1)
▪ 1 sheet of corrugated plastic 16.5 cm x 16.5 cm
▪ 2 crocodile leads
▪ 1 motor
▪ 1 motor mount
▪ 1 motor pulley
▪ 1 card disc

Other parts, tools and consumables
▪ Coloured felt tip pens
▪ Pencil
▪ Ruler
▪ Coin about 2.5 cm diameter e.g. 2p piece
▪ Large scissors
▪ Low melt glue gun & glue sticks
▪ Computer (see Crumble blog 1)
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St Lawrence CE Primary School
"Let your light shine"
Matthew 5:16

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<table>
<tr><td>3</td><td>Follow a circuit diagram to wire up a more complex circuit

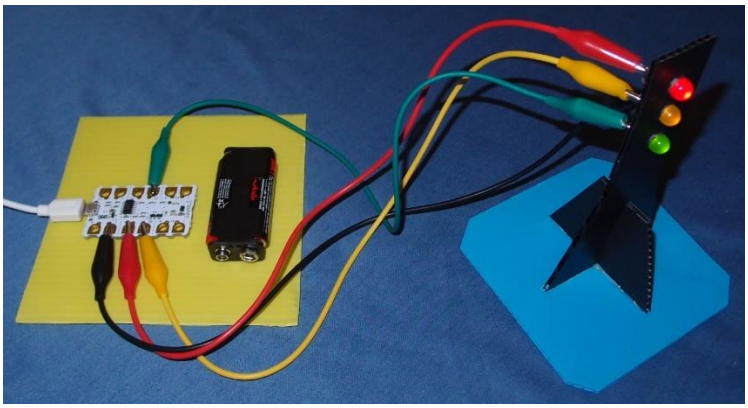
Design, write and debug programs controlling physical systems

Solve problems by decomposing them into smaller parts

Use sequence and repetition in programs

Learn to create flowcharts</td><td rowspan="2">Traffic Lights
Crumble Workbook 3
Crumble Blog 3
PowerPoint 3

You will need:
Parts included in class kit
• 1 Crumble controller unit (see Crumble blog 1)
• 1 sheet of corrugated plastic 16.5 cm x 16.5 cm
• 4 crocodile leads
• 1 red LED
• 1 yellow LED
• 1 green LED

Other parts, tools and consumables
• Ruler
• Pencil
• Large scissors
• Pointed nail scissors
• Low melt glue gun & glue sticks
• Computer (see Crumble blog 1)</td></tr>
<tr><td>RICH TASKS</td><td></td></tr>
<tr><td>4</td><td>Understand the forces acting on a chair-o-plane

Use mechanical systems – pulleys, drive belts, shafts and bearings

Make and strengthen complex structures

Interpret cross sectional views

Problem solving and troubleshooting</td><td rowspan="2">Chair-o-plane
Crumble Workbook 4
Crumble Blog 4
PowerPoint 4

You will need:
Parts included in class kit
▪ 1 Crumble controller unit (see Crumble blog 1)
▪ 1 sheet of corrugated plastic 16.5cm x 16.5cm
▪ 1 sheet of corrugated plastic 12.5cm x 12.5cm
▪ Offcuts of corrugated plastic
▪ 1 piece wooden rod 15cm long
▪ 2 crocodile leads
▪ 1 motor
▪ 1 motor mount
▪ 1 wooden pulley
▪ 6 card discs
▪ 1 cardboard craft roll
▪ 3 rubber bands about 8.5cm long
▪ Coloured gems
Other parts, tools and consumables
▪ Ruler
▪ Pencil
▪ Pair of compasses</td></tr>
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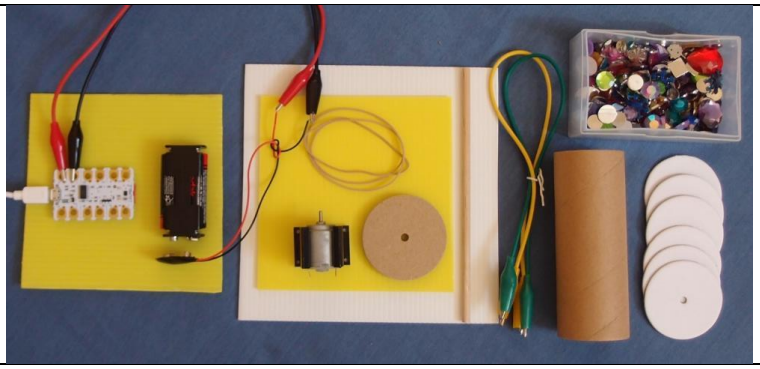
<tr><td></td><td></td><td>▪ Protractor
▪ Large scissors
▪ Pencil sharpener
▪ Cool melt glue gun & glue sticks
▪ Transparent sticky tape
▪ Computer (see Crumble blog 1)
▪ Optional: 6 lightweight passengers e.g. plastic figures or bugs</td></tr>
<tr><td>5</td><td>Design innovative, functional, appealing products.

Think of unusual and creative uses for everyday materials.

Use computing to program, monitor and control your products.

Use sequence, selection and repetition in programs.

Work with variables and various forms of input and output.</td><td rowspan="2">Nightlight
Crumble Workbook 5
Crumble Blog 5
PowerPoint 5

You will need:
Parts included in class kit
▪ 1 Crumble controller unit (see Crumble blog 1)
▪ 1 square of corrugated plastic 12.5cm x 12.5cm
▪ 1 cardboard craft roll
▪ 1 strip of corrugated plastic 1.5cm x 39cm (the corrugations must be across the strip, not along it)
▪ 4 crocodile leads
▪ 1 light sensor (this can be either an LDR [older kits] or a phototransistor [newer kits])
▪ 1 lamp
▪ 1 lamp holder
▪ 3 card discs
▪ Coloured gems

Other parts, tools and consumables
▪ Paint & paintbrush (optional)
▪ Pair of compasses
▪ Large scissors
▪ Double sided tape
▪ Ruler
▪ Pencil
▪ Cool melt glue gun & glue sticks
▪ Computer (see Crumble blog 1)</td></tr>
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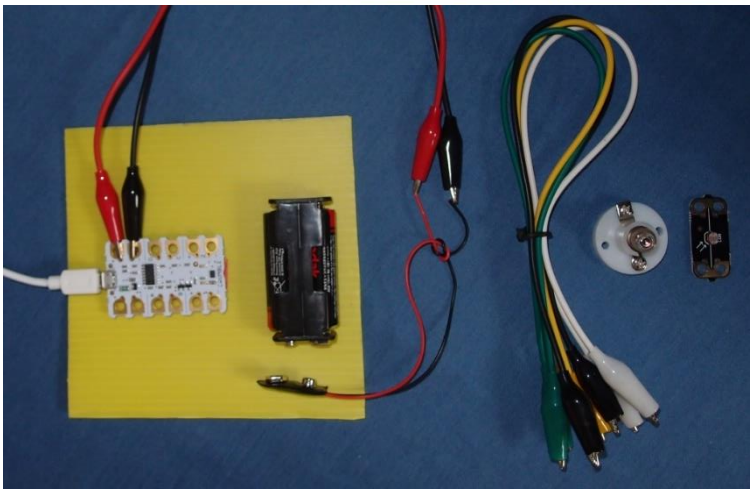</td></tr>
<tr><td>6</td><td colspan="2">Revision of key knowledge – evaluate designs and projects</td></tr>
<tr><td>END OF UNIT OUTCOME</td><td colspan="2">Create an advertisement poster as a group to present each project</td></tr>
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