Science - Year 6

Electricity – Block 6E

Electric Celebrations

Session 1

Resource pack

Dragons' Den Design Brief

Brief summary

To design and make a festive light decoration that uses electrical circuits

Key design features (each dragon to outline one or two each)

1. *Your design must be developed with a specific celebration and audience in mind*
2. *You must use a minimum of five bulbs, one buzzer, two motors and one switch, although you can use as many of each as you wish*
3. *The design must include some kind of decorative moving part*
4. *The volume of the buzzer/s and the brightness of the bulbs is entirely up to you*
5. *You must include at least two additional materials in your circuit to conduct electricity*
6. *The final product needs to look aesthetically pleasing*

During the design process you will need to:

1. *Test out electrical circuits, exploring the various effects that you can create by changing the numbers of each device and the voltage of the power source*
2. *Investigate current examples of festive lights for design features and aesthetics*
3. *Draw circuit diagrams to show how your electrical system will work*
4. *Sketch annotated designs*
5. *Create a working prototype*
6. *Create a presentation that outlines how your prototype works and why it is a design that will sell*

Electrical Challenge Cards (investigations)

Can you make a simple circuit using a battery, wires and a bulb to ensure the bulb lights up? Repeat with a motor and a buzzer.

Can you design and make a simple switch to turn the bulb in your simple circuit on and off, using the given materials?

Can you investigate the accompanying items to establish whether they conduct electricity or not?

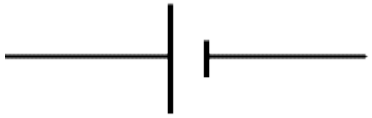
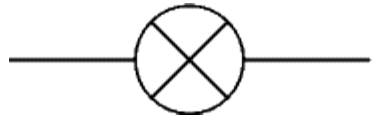
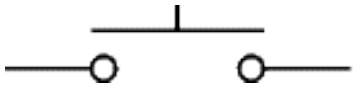
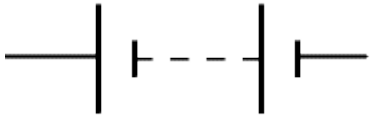
Can you suggest what devices the enclosed symbols represent in a circuit diagram?

Resources for challenge cards

Switch equipment offered: *Cork, drawing pins x2, paperclip*

Items to test for conductivity: *'lead' pencil,* **c***ork, coin, salt water, fresh water, paperclip, plastic button, metal button, polystyrene, tin foil, small mirror, and other items of children's choosing*

Symbols to identify:

Battery Supplies electrical energy. A battery is more than one cell. The larger terminal (on the left) is positive (+).	Bulb A transducer which converts electrical energy to light. This symbol is used for a bulb providing illumination, for example a car headlamp or torch bulb.	Push switch A push switch allows current to flow only when the button is pressed. This is the switch used to operate a doorbell.	Cell Supplies electrical energy. The large terminal (on the left) is positive (+). A single cell is often called a battery, but strictly a battery is two or more cells together.
Buzzer A transducer which converts electrical energy to sound.	Wire To pass current very easily from one part of a circuit to another.	Motor A transducer which converts electrical energy to movement or kinetic energy.	Simple switch An on-off switch allows current to flow only when it is in the closed (on) position. These are used for wall light switches.

Sticky-note investigations (after Goldsworthy and Feasy, 1997)

Stick filled in stick-notes on the blank boxes to help organise thoughts - the Post its™ can be moved as the investigation plan progresses

Enquiry question:		
VARIABLES		
Things I could change/vary		

Things I could observe or measure		

Ensuring my test is fair		
I will change		
I will observe		
I will keep these things the same		

Predicting	
When I change	
What will happen to	
I think…	

Results and patterns	
What I changed	**What I observed**

What happened to	
When I changed	

I discovered: