



Science and DT topic: Electricity	Year 6 Age 10-11	Title: Conductive dough
Enquiry Focus Use equipment and make systematic observations		Concept context Use salt dough as a conductor in a circuit
Assessment Focus <ul style="list-style-type: none"> Can children use the conductive dough to make a circuit? Can the children systematically trouble shoot if something is not working? 		
Activity <i>Today we will be electrical engineers.</i> Recap previous work on conductors/insulators and what is needed to make a bulb or LED light. Can we use something other than a metal to be a conductor in a circuit? Make salt dough (with the children if possible) – see recipes and practical guidance below. Challenge the children to use a battery, wires, an LED and balls of dough to make a circuit to test whether the dough is a conductor. NB. LEDs have a polarity – short leg to negative, long leg to positive. The dough has a higher resistance than a wire, so you may need more powerful batteries than usual. Explore using more LEDs and making different shapes with the dough e.g. animals. (Remind children that the electric current will take the path of least resistance, so check for shortcuts – dough touching). Children could take photos or draw diagrams of different designs.		
Adapting the activity		<p>Positive polarity</p> <p>Long Leg of LED</p> <p>Short Leg of LED</p> <p>Negative polarity</p>
Support: Give small amount of dough and LEDs to start with. Pause to look at other circuits. Extension: Make a parallel circuit (use rolls of dough and multiple LEDs) Other ideas: Explore making different recipes of conductive (salt) or insulating (sugar) dough.		
Questions to support discussion		
Assessment Indicators		
Not yet met: Pupils need support to create a circuit with the dough and find it difficult to explain how the LED/bulb lights up.		
Meeting: Pupils work systematically to create a range of circuits. They identify the dough as a conductor and recognise the need for a complete circuit (without a short circuit) in order for the LED/bulb to light.		
Possible ways of going further: Pupils explore the differences between circuits they have made e.g. comparing series and parallel circuits or different types of dough.		

Practicalities

There are many recipes, most involve heating the dough but the ones listed below can be mixed cold.

Recipes (for one table)

Conductive dough 1

80g plain flour
80g salt
40ml lemon juice
10+ml vegetable oil plus food colouring

Conductive dough 2 (to match insulating dough)

80g plain flour
80g salt
10ml veg oil/food colouring mix
Gradually add water until dough consistency reached

Insulating dough

80g plain flour
80g granulated sugar
10ml veg oil/food colouring mix
Gradually add water until consistency reached

The conductive dough has a higher resistance than a wire (hence using low resistance LEDs), so you will need more than 2x1.5V batteries to light the LED.
If using 9V batteries, use zinc chloride/zinc carbon batteries (due to the risk of short circuit).

For safety advice check CLEAPSS guidance.