



Stage 8: Lighting a restaurant

Learning objectives:

- To associate the brightness of a lamp with the number and voltage of cells used in the circuit
- To use recognised symbols when representing a simple circuit in a diagram
- To design and make a lighting circuit for a restaurant

Stage overview:

In this stage, the children will revisit their learning about electricity and explore the relationship between the brightness of a lamp and the voltage of cells used in the circuit. They will then work in groups to build a 3D scaled model of their restaurant using their floor plan from the previous lesson and use their electricity learning to design and make a lighting circuit to set the desired mood in their restaurant.

Materials needed:

- Shoe boxes, cardboard and other 'junk modelling' materials
- Electrical circuit sets

Presentation notes:

Slide 2: Introduction	<ul style="list-style-type: none"> • Introduce the task: in this stage the children will build a scaled model of their restaurant using recycled 'junk modelling' materials and then use their electricity learning to design and build a lighting circuit for it.
Slide 3: Electricity revision	<ul style="list-style-type: none"> • Use the questions on the power point to revise the children's prior learning on electricity. • What is electricity? Electricity is a flow of charged particles that can be used to power electrical items. • How many electrical items can you name?
Slide 4-6: Elements of a circuit	<ul style="list-style-type: none"> • Revise the different elements of an electrical circuit using questioning and introduce the recognised symbols for each one. • Build a simple circuit containing one cell and one lamp. Before closing the circuit, revise prior learning by asking the children why the lamp is not yet lit and establishing that the circuit needs to be closed in order to create a path for electrons (charged particles) to continuously flow.
Slide 7: Adding a switch	<ul style="list-style-type: none"> • Add a switch to the circuit and demonstrate how it can turn the lamp on and off by opening and closing the circuit. Ask the children to explain why they think this happens.
Slide 8: Practical exploration	<ul style="list-style-type: none"> • Task 1: Give each group/ pair and electrical circuit kit and ask them to predict what will happen when: <ol style="list-style-type: none"> An additional lamp is added to the circuit An additional cell is added to the circuit • Give the children the opportunity to test their predictions and ask them to use what they

	<p>know about electricity to explain what they have found.</p> <ul style="list-style-type: none"> • Share explanations and address any misconceptions. Give business groups the opportunity to discuss the brightness of lighting they would like in their restaurant and how they will achieve this. • This website is an additional way that the children could explore circuit configurations and extend their electricity knowledge: www.theuniverseandmore.com/crackthecircuit
Slide 9: Drawing a circuit diagram	<ul style="list-style-type: none"> • Task 2: Ask the children to use the recognised symbols to draw circuit diagram for the lighting in their restaurant. Remind them to use their learning to help them achieve the level of brightness they wish to achieve in their restaurant.
Slide 10- 11: Volume	<ul style="list-style-type: none"> • Task 3: Revise the definition of volume and ask the children to calculate the total volume of their restaurant from their floor plan from the previous lesson and assuming that the height of the building is 7m. • Challenge the business groups to build a scaled 3D model of their restaurant based on their floor plan. This will help to bring the concept of volume to life. • The children could also use CoSpaces Edu design software to create a scale model of their restaurant.
Slide 12: Building a circuit	<ul style="list-style-type: none"> • Task 4: Challenge the business groups to build a lighting circuit for their restaurant and add it to their model.

National Curriculum Links:

Science	Electricity	<ul style="list-style-type: none"> • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches • Use recognised symbols when representing a simple circuit in a diagram • Pupils might work scientifically by: systematically identifying the effect of changing one component at a time in a circuit; designing and making a set of traffic lights, a burglar alarm or some other useful circuit (non- statutory).
Maths	Measurement	<ul style="list-style-type: none"> • Recognise when it is possible to use formulae for area and volume of shapes • Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³].