

Light-Up Signs : Design & Technology : Year 3/4

	Learning Objective	Overview	Assessment Questions	Resources
Lesson 1	To investigate and analyse illuminated signs.	Children will consider the purposes of illuminated signs, and identify a number of ways in which signs may be illuminated. They may then either: make simple circuits with one or more bulbs, considering how some of the components might be hidden in the construction of signs; or explore your local area (e.g. town centre), identifying and drawing illuminated signs.	<ul style="list-style-type: none"> Can children suggest reasons why it is helpful to illuminate signs? Can children identify distinguishing features of a variety of illuminated signs? Can children investigate ways in which very simple circuits for illuminated signage might be constructed? 	<ul style="list-style-type: none"> Slides Circus Sign 1A/1B/1C sheets Electrical components (see Teacher's Notes) Teacher's Notes Light-Up Signs Checklist 1 (FSD...? activity only)
Lesson 2	To understand how LEDs may be used instead of traditional incandescent bulbs in series circuits.	Children will look at electronic products with LEDs, then learn how LEDs may be used in simple series circuits (along with a resistor). They may then either make their own simple circuits using LEDs and other inexpensive components, or work in groups to design and make an illuminated sign for a given purpose.	<ul style="list-style-type: none"> Can children suggest some problems with using traditional, incandescent bulbs in products? Can children suggest some aesthetic and practical reasons for using LEDs instead? Can children construct a circuit with an LED? 	<ul style="list-style-type: none"> Slides Worksheet 2A/2B Electrical components (see Teacher's Notes) Teacher's Notes <p>FSD...? activity only:</p> <ul style="list-style-type: none"> Inexpensive strings of battery-powered LED lights Challenge Card 2 Art/DT materials and scrap materials (see card)
Lesson 3	To develop ideas for a decorative illuminated sign.	Children will consider ways in which electrical components in a simple circuit can be partially 'hidden' inside products to make them more attractive, then go on to develop designs for their own decorative, light box-style sign. They may either draw their designs or use CAD software.	<ul style="list-style-type: none"> Can children identify potential audiences and purposes for a product design? Can children suggest practical considerations about how to fit essential components in/on a product? Can children consider tools and techniques they may need to use when constructing a product of their own design? 	<ul style="list-style-type: none"> Slides Worksheets 3A/3B/3C Cuboid Cards 1-4 Teacher's Notes <p>FSD...? activity only:</p> <ul style="list-style-type: none"> CAD software/website, e.g. tinkercad.com Challenge Card 3
Lesson 4	To select and use tools, equipment, materials and components to make the enclosure of a decorative illuminated sign.	Children will consider a number of questions about the pros and cons of using different materials in the construction of a decorative light box sign. They may then either construct a light box sign using 'new' DT materials, or using scrap/found materials such as cardboard packaging.	<ul style="list-style-type: none"> Can children identify ways in which their existing designs could be adapted for the materials available? Can children select appropriate tools and materials for construction of their design? Can children identify ways in which they can work safely while constructing their design? 	<ul style="list-style-type: none"> Slides Worksheets 4A/4B/4C Teacher's Notes Lightbox construction tools and materials (refer to Teacher's Notes) Scrap Art/DT materials (FSD...? activity only)
Lesson 5	To construct a working circuit with one or more lights, and fit it in a decorative illuminated sign.	Children will consider ways in which they can make more permanent circuits to fit and fix inside their finished decorative illuminated light box signs. Alternatively, they may design, make and test switches made using scrap materials, drawing pins, paper clips etc.	<ul style="list-style-type: none"> Can children recall how to create a simple series circuit with a light? Can children select and use appropriate tools, materials and components to construct a circuit? Can children decide on an appropriate way to fit electrical components inside their designs? 	<ul style="list-style-type: none"> Slides Electrical circuit components (see Teacher's Notes) Teacher's Notes Evaluation sheet Art/DT materials (FSD...? activity only) Challenge Card 5 (FSD...? activity only)
Lesson 6	To investigate ways in which computers can be used to program and control lights in a product.	Children will consider ways in which lights in electronic products may be programmed and controlled, then 'debug' simple 'code block' programs to make an LED 'blink'. They may then either program an actual LED, or program virtual fairy lights in a Scratch programming project.	<ul style="list-style-type: none"> Can children identify products which contain microcontrollers which control lights? Can children make algorithms with simple sets of instructions which describe how a flashing LED is controlled? Can children write or edit programs to control an LED? 	<ul style="list-style-type: none"> Slides Worksheet 6A/6B/6C (plus blank, customisable versions) Teacher's Notes Programmable microcomputers/microcontrollers e.g. Raspberry Pis and electronic components (see Teacher's Notes) Challenge Card 6 (FSD...? activity only)