MindSET-do

Lesson Structure 90 minute lessons

Year 6 – Controlling Light			
Lesson Number	**Focus**	**Australian Curriculum General Capabilities**	**Australian Curriculum Content Descriptors**
1	Controlling light 40 - 60 min lesson	• **Critical and creative thinking** – generating ideas, possibilities and actions • **Critical and creative thinking** – reflecting on thinking and processes	• **Design and technologies** - Examine how people in design and technologies occupations address competing considerations, including sustainability in the design of products, services, and environments for current and future use (ACTDEK019) • **Design and technologies** - Investigate how electrical energy can control light in a designed product or system (ACTDEK020)
2	Electrical energy 90 min lesson	• **Critical and creative thinking** – generating ideas, possibilities and actions • **Critical and creative thinking** – reflecting on thinking and processes • **Personal and social capability** – Social management	• **Science** - Electrical energy can be transferred and transformed in electrical circuits and can be generated from a range of sources (ACSSU097)

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3	Digital systems 90 min lesson	• **Critical and creative thinking** – inquiring – identifying, exploring and organising information and ideas • **Critical and creative thinking** – generating ideas, possibilities and actions • **Critical and creative thinking** – reflecting on thinking and processes • Personal and social capability – Social management • **ICT capability** – managing and operating ICT	• Science - Electrical energy can be transferred and transformed in electrical circuits and can be generated from a range of sources (ACSSU097) • Digital technologies - Examine the main components of common digital systems and how they may connect together to form networks to transmit data (ACTDIK014) • Digital technologies - Design, modify and follow simple algorithms involving sequences of steps, branching and iteration (repetition) (ACTDIP019) • Digital technologies - Implement digital solutions as simple visual programs involving branching, iteration (repetition), and user input (ACTDIP020)
4	Flashing lights 90 min lesson	• **Critical and creative thinking** – inquiring – identifying, exploring and organising information and ideas • **Critical and creative thinking** – generating ideas, possibilities and actions • **Critical and creative thinking** – reflecting on thinking and processes	• **Science** - Electrical energy can be transferred and transformed in electrical circuits and can be generated from a range of sources (ACSSU097) • **Digital technologies** - Examine the main components of common digital systems and how they may connect together to form networks to transmit data (ACTDIK014)

		• **Critical and creative thinking** – analysing, synthesising and evaluating reasoning and procedures • **Personal and social capability** – social management • ICT capability – managing and operating ICT	• **Digital technologies** - Design, modify and follow simple algorithms involving sequences of steps, branching and iteration (repetition) (ACTDIP019) • **Digital technologies** - Implement digital solutions as simple visual programs involving branching, iteration (repetition), and user input (ACTDIP020)

Design Brief: Create a visual sound system for the deaf and hard of hearing by designing an electrical system using an Arduino and programming it to control light (colour, on/off rhythm, brightness) matched to a 2-minute piece of music.

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Design and technologies project: Designing a visual sound system for the deaf and hard of hearing		• **Critical and creative thinking** – generating ideas, possibilities and actions • **Critical and creative thinking** – reflecting on thinking and processes • **Critical and creative thinking** – analysing, synthesising and evaluating reasoning and procedures • **Personal and social capability** – social management	• **Design and technologies** – investigate how electrical energy can control light in a designed product (ACTDEK020) • **Design and technologies** – investigate characteristics and properties of a range of materials, systems, components, tools and equipment and evaluate the impact of their use (ACTDEK023) • **Design and technologies** – processes and production skills (ACTDEP024), (ACTDEP025), (ACTDEP026), (ACTDEP027), (ACTDEP028)

Lesson Number	Focus	Learning outcomes	Resources
5	Investigating components of an electronic system which can be used to control light	• Identify the components in an electrical system and list their functions	Year 6 Investigating components worksheet – **group task** Arduino kits
6	Generate and refine ideas	• Understand the requirements of the design brief • Create 3 x electrical system design ideas, Draw and label each system and describe how it works • Evaluate and select a final design	Year 6 generate and refine ideas worksheet – **group task** Arduino kits
7	Production plan	• Collaborate with group members • Draw and label final electrical system design and describe how it works • List materials and equipment • List risks and risk management strategies • Write pseudo-code for Arduino programming • Create production steps and allocate group roles	Year 6 Production plan worksheet – **group task** Arduino kits

Lesson Number	Focus	Learning outcomes	Resources
8	Producing and Implementing	• Safely use appropriate materials to collaboratively execute the production of the electrical system • Create and debug the Arduino program collaboratively • Test product meets the design brief specifications	Completed Year 6 production plan worksheet for each group – **group task** Arduino kits
9	evaluating	• Evaluate and reflect on electrical system design • Explain use of code, evaluate and reflect on programming Arduino • Evaluate and reflect on collaboration skills and strategies Explain future use of designed product in the community	Year 6 evaluation worksheet – **individual task**

10	Presenting	• Groups present their designed product to an audience • Groups explain their electrical system design and Arduino program to the class	Completed year 6 production plan worksheet for each group – **group task** Each group's designed product