



**D&T Curriculum**  
**KS2 Knowledge Organisers**

## Knowledge Organiser

D&T Unit: Structures - Shelters

Year: B1

Term: Autumn

Learning Objectives - Knowledge	
C3 – Year 3/4	Key Driver
To know that, in real-life survival situations, many different designs of shelter are used, according to conditions and availability of materials.	C / NW
To know that triangles are helpful shapes when building structures as they provide strength and stability.	C
To know that children's toys are often based on real-life products used by adults and that some children's toys involve an element of assembly.	C
To know how to evaluate an existing toy shelter design against certain criteria.	C
To know how to create our own designs of toy shelter to meet certain criteria.	C
To know how to make a prototype of our own designs of toy shelter, using tools skilfully and safely, and problem-solving throughout the making process.	C
To know how to evaluate our prototype toy shelters against the original criteria.	C

Key Vocabulary	
Word	Meaning
Prototype	A practice version, made to test the design.
Model	In this case, this refers to a small version of something that is normally bigger. (i.e. a toy version of a real-life object).
Assemble	To put something together, or build something.
Disassemble	To take something apart again.
Reassemble	To put something together again.

Equipment Required
Cardboard bases, Dowel, Material for 'tarps', Pipe cleaners for fixing together, Sugar paper for making 'trunks' (rolled into tubes), Snips, Secateurs (adult use only: for cutting dowel).

Useful Websites or Resources
Shelter Building booklet - 1 per child. Bear Grylls Survival Skills Handbook - Shelter Building.

## Knowledge Organiser

D&T Unit: Structures - Shelters

Year: B1

Term: Autumn

Learning Objectives - Knowledge	
C4 – Year 4/5	Key Driver
To know the purpose of shelters and identify their features.	C / NW
To know how to transfer knowledge of shelters and build a shelter outdoors using natural materials e.g. sticks, grass, leaves etc	C / NW
To know the design criteria for building a shelter (for a toy): waterproof, warm, look realistic etc	C / HL
To know how to design for a shelter and consider the criteria objectives and materials to be used.	C
To make a prototype of a shelter and evaluate.	C
To make the shelter and evaluate.	C

Key Vocabulary	
Word	Meaning
model	a small but exact copy of a thing
prototype	the first one of the project you make
assemble	to fit together the parts of something
disassemble	to take apart
reassemble	to put back together again
durable	not easily broken or worn out: sturdy and lasting
waterproof	something that keeps water out

Equipment Required
cardboard, pipe cleaners, dowelling, string

Useful Websites or Resources
Bushcraft for Kids <a href="https://www.youtube.com/watch?v=O5OLy5hZxI">https://www.youtube.com/watch?v=O5OLy5hZxI</a>
Bear Grylls: Survival Skills Handbook 'Shelter Building'

## Knowledge Organiser

D&T Unit: Structures - Shelters

Year: B1

Term: Autumn

Learning Objectives - Knowledge	
C5 – Year 5/6	Key Driver
To know the features of shelters (common and specific to different types of shelter)	C / NW
To know how to test materials for waterproofness and why this is important	C / NW
To know how to test materials for strength and durability and why this is important	C
To know how to strengthen a structure	C
To know how to take other elements into consideration when building a shelter e.g. weight and cost	C / NW
To know how to create and evaluate model shelters and how to adapt this for larger shelters	C

Key Vocabulary	
Word	Meaning
Shelter	a place giving temporary protection from bad weather or danger
Waterproof	a material that will not let water through
Durable	long lasting
Strong	able to withstand pressure or force

Equipment Required
A variety of materials that might be used in the construction of a shelter (child-generated), measuring jugs, weights, sandpaper, dowelling, elastic bands, tape, card triangles, tarpaulins, rope, bungees

Useful Websites or Resources
<a href="https://www.primalsurvivor.net/wilderness-survival-shelter-no-supplies/">https://www.primalsurvivor.net/wilderness-survival-shelter-no-supplies/</a> - different types of shelters
<a href="http://www.primaryresources.co.uk/dandt/pdfs/shelters_booklet.pdf">http://www.primaryresources.co.uk/dandt/pdfs/shelters_booklet.pdf</a> - example shelter booklet
<a href="https://www.outdoorlife.com/survival-shelters-15-best-designs-wilderness-shelters/">https://www.outdoorlife.com/survival-shelters-15-best-designs-wilderness-shelters/</a> - different types of shelters

## Knowledge Organiser

**D&T Unit:** Electrical Components: a simple metal detector (links to Prehistoric Shropshire unit) **Year:** B1 **Term:** Spring

Learning Objectives - Knowledge	
C3 – Year 3/4	Key Driver
To know examples of a variety of electronic testing/detecting devices, including moisture detectors, basic to advanced metal detectors, etc.	C
To know how a simple detector or toy can work by completing a circuit, studying real examples and observing how they work.	C
To know how to make a simple 'permanent' circuit, including how to join wires together by twisting them and using insulating tape to secure components onto a board.	C
To know how to design a product bearing in mind its intended function and users.	C
To know how to safely carry out practical construction work, including using electrical components and electronics tools eg wire cutters and strippers	C / HL
To know how to produce outer casing to house the circuit, using recycled materials.	C
To know how to evaluate our own product design against the design criteria.	C

Key Vocabulary	
Word	Meaning
components	a part of an electrical circuit e.g. battery, bulb, buzzer etc .
switches	a mechanism that connects an electrical circuit - in this case, to activate an alarm
alarm	a warning of danger, usually a loud noise or flashing light
alarm system	the whole system that allows an alarm to be sounded, involving electronic components
activate	to start working, or, in this case, to set off (the alarm).
prototype	a model of a design, usually made on a smaller, cheaper scale, to test whether it will meet the design criteria.
deterrent	something that makes someone decide not to do something e.g the alarm is a deterrent against theft
sensor	a device that detects changes e.g. movement or temperature.

Equipment Required
Full range of electrical components including bulbs and buzzers. Copper tape and wires for circuits. Equipment for producing housing for alarm eg hole punches, cardboard snips etc. Housing options: cardboard boxes, plastic trays (recycled materials).

Useful Websites or Resources
<a href="https://www.stem.org.uk/resources/community/resource/457960/burglar-alarm-made-clothes-peg">https://www.stem.org.uk/resources/community/resource/457960/burglar-alarm-made-clothes-peg</a>

## Knowledge Organiser

**D&T Unit:** Electrical Components - Alarms      **Year:** B2      **Term:** Spring

Learning Objectives - Knowledge	
C4 – Year 4/5	Key Driver
To know what alarm systems are used for and how different types of switches are activated	C
To know how electrical circuits can be created and controlled	C
To know how to design an alarm system for a particular purpose - a 'burglar alarm' for a house (linked to Topic - buildings in Shrewsbury Since 1066)	C
To know how to create an alarm system based on a simple design	C
To know how to improve an alarm system	C
To know how to evaluate the design of an alarm system	C

Key Vocabulary	
Word	Meaning
components	a basic electronic element e.g. bulbs, batteries, clips, wires, buzzers etc which can be connected together to make circuits
switches	is something that changes the flow of an electrical current
alarm	a warning of danger, usually a loud noise or flashing light
closed circuit	a complete electrical connection around which current flows or circulates
open circuit	an electrical circuit in which the continuity is broken so that current does not flow
inactive	not working
activate	to start working
detect	to discover or observe
deterrent	something that makes someone decide not to do something e.g the alarm is a deterrent against theft

Equipment Required
Electrical components: bulbs, batteries, buzzers, wires, paper clips, pegs, tape, cardboard, cardboard box ( preferably shoe boxes)

Useful Websites or Resources
<a href="https://www.schoolsofkingedwardvi.co.uk/ks2-science-year-6-5-electricity-circuit-diagrams/">https://www.schoolsofkingedwardvi.co.uk/ks2-science-year-6-5-electricity-circuit-diagrams/</a>

## Knowledge Organiser

D&T Unit: Electrical Components - Alarms

Year: B2

Term: Spring

Learning Objectives - Knowledge	
C5 – Year 5/6	Key Driver
To know examples of computer control in everyday life	C
To know how switches can be used in a range of circuits to control components	C
To know the hazards and safety issues associated with electricity.	C/HL
To know what safety measures to implement when constructing circuits	C/HL
To know how to program a simple control device (Microbit)	C
To know how to use Microbits to sense changes in the environment (e.g. light)	C
To know how to plan, design and create an alarm system using Microbits, including how to pair them and send radio signals	C

Key Vocabulary	
Word	Meaning
Component	A basic device that is often connected with others, to fulfil the requirements of a circuit
Sense	To detect changes
Sensor	A component that will detect changes
Microbit	A tiny programmable computer
Input	To provide or give something into the computer,
Output	The place where power or information leaves a system
Environment	The conditions (light, heat, movement etc) surrounding something

Equipment Required
Batteries, cables, Microbits, battery packs for Microbits

Useful Websites or Resources
<a href="https://microbit.org/">https://microbit.org/</a> , <a href="https://www.youtube.com/watch?v=kaNtg1HGxbY">https://www.youtube.com/watch?v=kaNtg1HGxbY</a> (getting started with the micro:bit) <a href="https://www.kitronik.co.uk/blog/microbit-alarm-kitronik-university/">https://www.kitronik.co.uk/blog/microbit-alarm-kitronik-university/</a> (Alarm tutorial) <a href="https://www.makeuseof.com/tag/bbc-microbit-beginner-projects/">https://www.makeuseof.com/tag/bbc-microbit-beginner-projects/</a>

**Knowledge Organiser****D&T Unit:** Mechanisms**Year:** B1**Term:** Summer

Learning Objectives - Knowledge	
C3 – Year 3/4	Key Driver
To know that mechanisms control movement and give examples of various types of mechanism.	C / NW
To know, at a basic level, how pneumatic mechanisms work and give examples of pneumatic mechanisms in everyday life.	C / NW
To know how to construct various simple pneumatic systems using squeeze bottles, balloons, pumps and syringes.	C
To know how to evaluate existing designs of pneumatic animal toy.	C
To know how to make a simple pneumatic animal toy using basic materials, following a set of instructions. (Group work)	C
To know how to design our own moving rainforest animal toy that uses a pneumatic system.	C
To know how to work safely with tools and other equipment (e.g. syringes, balloons) during investigative and construction procedures.	C / HL
To know how to evaluate our designs.	C

Key Vocabulary			
Word	Meaning	Word	Meaning
mechanism	A part of a machine or tool that controls movement.	inflate	to blow air into something to make it blow up
motion	Another word for moving or movement.	deflate	to release air from something like a balloon, which causes it to shrink.
pneumatic	a system that works using gases (air)	syringe	a tube with a nozzle and a plunger for sucking and blowing air or liquids
compress	to squash or press on something (in this case, air is compressed in the tube).	hinge	a jointed piece on which a lid or door, turns, lifts or swings.
input	what goes into a system		
output	what comes out a system		

Equipment Required
Squeeze bottles, silicone tubing, syringes of various sizes, balloons, foot pump, paper plates, various small boxes, egg boxes.

Useful Websites or Resources
<a href="https://www.bbc.co.uk/programmes/p011msq3">https://www.bbc.co.uk/programmes/p011msq3</a> BBC Bitesize video on forces, including children experimenting with pneumatics.
<a href="https://www.youtube.com/watch?v=5QqinrOcbIM">https://www.youtube.com/watch?v=5QqinrOcbIM</a> How to make a simple moving monster with a syringe.



## Knowledge Organiser

D&T Unit: Mechanisms

Year: B1

Term: Summer

Learning Objectives - Knowledge	
C4 – Year 4/5	Key Driver
To know a variety of familiar objects that use air to make them work; to understand how animals move.	NW
To know techniques for making simple pneumatic systems.	C, NW
To know how to gather realistic and appropriate ideas to create a prototype to develop, model and communicate ideas for a moving animal.	C, NW
To know how to design a moving animal, using sketches, to develop, model and communicate ideas, including a pneumatic system.	C,NW
To know how to make a moving animal with a pneumatic system (syringes).	C, NW
To know how to evaluate a finished product.	C,NW

Key Vocabulary	
Word	Meaning
pneumatic	A system that works using gases (air).
components	A part or element of a whole; constituent.
syringe	A tube with a nozzle and plunger for sucking and blowing air or liquids.
compressed	Something that is squashed, such as air in a tube.
input	What goes into a system.
output	What comes out of a system.
pivot	A point about which a lever turns.
lever	A beam which turns about a point.
hydraulic	A system that works using liquids (water).
pressure	The force used on an object or surface.
inflate	To fill something with air or a gas to make it swell up.
deflate	To remove the pressurised air to allow an object like a balloon to shrink.
system	A set of related parts or components used to create an outcome. They have an input process and an output. In a pneumatic system the 'input movement' is where the user pushes or pulls a syringe pump. The 'output movement' is where the object at the end of the tube moves.
process	A series of stages in time where the last stage is the product, result or goal.
pump	A device that raises, transfers, delivers, or compresses fluids or gases especially by suction or pressure or both.
seal	Something that closes tightly.
air-tight	An object that is so slightly sealed that no air can get in or out.
prototype	A simple model that lets you test out your idea!
T connector	A three-way connector.

Equipment Required
<p>Example 1: squeeze bottle, plastic tubing, balloon and a light toy.</p> <p>Example 2: Using syringes - x3 syringes, T-connector (to move two objects move backwards and forwards)</p> <p>*Adding levers and linkages allows for more complex mechanical systems</p> <p>card, scissors, tape, T-connector, levers</p>

Useful Websites or Resources
<p><a href="https://www.tts-group.co.uk/blog/2019/04/16/creating-a-moving-monster-dt-class-kit.html">https://www.tts-group.co.uk/blog/2019/04/16/creating-a-moving-monster-dt-class-kit.html</a> Moving monster using a balloon, tube and pump</p> <p><a href="https://www.youtube.com/watch?v=5QqinrOcblM">https://www.youtube.com/watch?v=5QqinrOcblM</a> How to make a simple moving monster with a syringe.</p>

## Knowledge Organiser

D&T Unit: Mechanisms - Pneumatics

Year: B1

Term: Summer

Learning Objectives - Knowledge	
C5 – Year 5/6	Key Driver
To know simple uses of pneumatics in everyday life	NW
To know that mechanisms control movement and give examples of various types of mechanisms.	NW
To know, at a basic level, how pneumatic mechanisms work and give examples of pneumatic mechanisms in everyday life.	NW
To know how to construct various simple pneumatic systems using squeeze bottles, balloons, pumps and syringes.	C
To know how to evaluate existing designs of pneumatic animal toys.	C
To know how to make a simple pneumatic animal toy using basic materials, following a set of instructions. (Group work)	C
To know how to design our own moving rainforest animal toy that uses a pneumatic system.	C
To know how to work safely with tools and other equipment (e.g. syringes, balloons) during investigative and construction procedures.	C / HL
To know how to evaluate our designs.	C

Key Vocabulary	
Word	Meaning
pneumatics	system that works using gases (air).
compressed	Something that is squashed, such as air in a tube.
mechanism	a part of a machine or tool that controls movement.
motion	another word for moving or movement.
pneumatic	a system that works using gases (air)
compress	to squash or press on something (in this case, air is compressed in the tube).
input	what goes into a system
inflate	to blow air into something to make it blow up
deflate	to release air from something like a balloon, which causes it to shrink.
syringe	a tube with a nozzle and a plunger for sucking and blowing air or liquids
hinge	a jointed piece on which a lid or door, turns, lifts or swings.

Equipment Required
Squeeze bottles, silicone tubing, syringes of various sizes, balloons, foot pump, paper plates, various small boxes, egg boxes.

Useful Websites or Resources
<a href="https://www.bbc.co.uk/programmes/p011msg3">https://www.bbc.co.uk/programmes/p011msg3</a> BBC Bitesize video on forces, including children experimenting with pneumatics.
<a href="https://www.youtube.com/watch?v=5QqinrOcbIM">https://www.youtube.com/watch?v=5QqinrOcbIM</a> How to make a simple moving monster with a syringe.