

Ackworth Howard C of E School

Educating for 'life in all its fullness.'



Design and Technology Curriculum Essential Knowledge

Intent

At Ackworth Howard J&I School, we believe that design and technology (DT) should develop: the mind (creativity, imagination, resourcefulness, innovation and enterprise); body (consideration of others, risk taking); and spirit (understanding of the impact on the wider world and the contribution to culture, wealth and well-being of the nation) of each child.



Mind

DT at our school is an inspiring, rigorous and practical subject that encourages children to learn to think and intervene creatively to solve problems, both as individuals and as members of a team. We encourage children to use their creativity and imagination, to design and make products that solve real and relevant problems within a variety of contexts. We also aim to make links to designs and designers throughout history, providing opportunities for children to critically reflect upon and evaluate their designs. Wherever possible, we link work to other disciplines such as mathematics, science, engineering, computing and art. This gives the learning purpose and relevance to the children.



Body

Children learn to take risks in a safe environment, becoming resourceful, innovative, enterprising and capable citizens considering their own and others' needs, wants and values. The unique talents of every child are embraced.



Spirit

Through the evaluation of past and present design and technology, children develop a critical understanding of its impact on daily life and the wider world and the impact it has on the contribution to the creativity, culture, wealth and well-being of the nation.

What our children say about DT...

'I didn't believe in myself at the start of DT but I do now!'

'I have learnt new skills I never had before like how to use a hot glue gun safely.'

'I have learned from my mistakes and made my product better.'

'I really like doing things that I wouldn't normally have the opportunity to do.'

'I want a job using DT in the future!'

Early Years Art and Design

Statutory Guidance from the EYFS Framework for Expressive Arts and Design

The development of children's artistic and cultural awareness supports their imagination and creativity. It is important that children have regular opportunities to engage with the arts, enabling them to explore and play with a wide range of media and materials. The quality and variety of what children see, hear and participate in is crucial for developing their understanding, self-expression, vocabulary and ability to communicate through the arts. The frequency, repetition and depth of their experiences are fundamental to their progress in interpreting and appreciating what they hear, respond to and observe.

Ackworth Howard's Knowledge Essentials

Expressive Arts and Design: Creating with Materials (Collage)

Nursery

- I can use glue sticks with support
- My product is all one texture
- I can explore different materials, using all my senses to investigate them.
- I can manipulate and play with different materials.
- I can use glue spatulas with support
- My product is all one texture
- I can make simple models which express my ideas.
- I can use glue sticks and glue spatulas independently
- I adds other materials to develop my models (tissue paper, glitter...)
- I can describe textures as smooth or bumpy
- I am beginning to weave (gross motor)

Early Years Art and Design

Statutory Guidance from the EYFS Framework for Expressive Arts and Design

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Ackworth Howard’s Knowledge Essentials

Expressive Arts and Design: Creating with Materials (Collage)

Reception

- I can use glue sticks and glue spatulas independently
- I can add other materials to develop models (tissue paper, glitter...)
- I can describe smooth or bumpy textures
- I am beginning to weave (gross motor)

- I can join items with glue or tape
- I know how to improve models (scrunch, twist, fold, bend, roll)
- I can describe smooth, rough, bendy, hard textures
- I am beginning to weave (fine motor)

- I can join items in a variety of ways – Sellotape, masking tape, string, ribbon
- I know how to secure boxes, toilet rolls, decorate bottles
- I can use words such as flexible and rigid

Early Years Art and Design

Statutory Guidance from the EYFS Framework for Expressive Arts and Design

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Ackworth Howard's Knowledge Essentials

Expressive Arts and Design: Creating with Materials (Sculpture)

Nursery

- I can build towers by stackings objects
- I am exploring clay
- I can explore different materials, using all my senses to investigate them.
- I can manipulate and play with different materials.
- I can build walls to create enclosed spaces
- I make marks in clay
- I can make simple models which express my ideas.
- Builds simple models using walls, roofs and towers.
- Manipulates clay (rolls, cuts, squashes, pinches, twists...)

Early Years Art and Design

Statutory Guidance from the EYFS Framework for Expressive Arts and Design

The development of children's artistic and cultural awareness supports their imagination and creativity. It is important that children have regular opportunities to engage with the arts, enabling them to explore and play with a wide range of media and materials. The quality and variety of what children see, hear and participate in is crucial for developing their understanding, self-expression, vocabulary and ability to communicate through the arts. The frequency, repetition and depth of their experiences are fundamental to their progress in interpreting and appreciating what they hear, respond to and observe.

Ackworth Howard's Knowledge Essentials

Expressive Arts and Design: Creating with Materials (Sculpture)

Reception

- I can build simple models using walls, roofs and towers.
- I can manipulate clay (rolls, cuts, squashes, pinches, twists...)

- I can build models which replicate those in real life.
- I can use a variety of resources – loose part play
- I can make something that I give meaning to

- I can build models which replicate those in real life.
- I can use a variety of resources – loose part play
- I can make something with clear intentions

Early Years

Statutory Guidance from the EYFS Framework for Expressive Arts and Design

The development of children's artistic and cultural awareness supports their imagination and creativity. It is important that children have regular opportunities to engage with the arts, enabling them to explore and play with a wide range of media and materials. The quality and variety of what children see, hear and participate in is crucial for developing their understanding, self-expression, vocabulary and ability to communicate through the arts. The frequency, repetition and depth of their experiences are fundamental to their progress in interpreting and appreciating what they hear, respond to and observe.

Ackworth Howard's Knowledge Essentials

Early Learning Goals

Creating with Materials

Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.

Share their creations, explaining the process they have used.

Make use of props and materials when role playing characters in narratives and stories.

Early Years Art Vocabulary

Essential Vocabulary - Collage

Nursery

Glue, glue stick, join,

Glue, spatula, join, PVA glue

Glue, stick, craft, glitter, design, idea, pom-poms, feathers, pasta, sequins, PVA glue, feels, texture, smooth, bumpy, weave

Reception

Glue, spatula, independent, junk, modelling, build, materials, textures, smooth, bumpy, soft, rough, weave,

Join, glue, tape, improve, scrunch, twist, fold, bend, roll, texture, describe, smooth, rough, bendy, hard, weave

Join, selloptape, masking tape, string, ribbon, fix, connect, tower, structure, stronger, sturdy, flexible, rigid, secure

Early Years Art Vocabulary

Essential Vocabulary -Sculpture

Nursery

Build, tower, stack, construct, idea, create, explore, clay

Build, create, make, construct, walls, join, connect, enclosed, clay, tools, marks, prints

Model, 3D, build, wall, roof, tower, moveable, creation, colour, shape, pattern, manipulate, clay, roll, cut, squash, pinch, twist

Reception

Model, 3D, build, wall, roof, tower, moveable, creation, colour, shape, pattern, manipulate, clay, roll, cut, squash, pinch, twist

Real life, replicate, loose parts, moveable, style, copy, similar

Real life, replicate, loose parts, moveable, style, copy, similar, imagination, observation, evaluate, like, dislike, change, different, improve, better

Early Years

Essential DT Vocabulary

Join, combine, materials, shapes, lines, detail, feelings, colour mixing, colour, light, dark. (Nursery)
 Colour, warm, cool, mix, blend, shade, texture, background, outline. (Reception)

Cooking and Nutrition

Nursery: Naming different types of common food, taste, cut, knife, fork, spoon, plate

Reception: Meal, healthy, snack, like, dislike, taste, cut, cook, bake

Mechanisms

Nursery: Move, push, pull

Reception: Forwards/ Backwards/
Wheels/ Side to side

Structures

Nursery: Build, bricks, cardboard, box, glue, Lego or Duplo

Reception: Create, cello tape, junk modelling, branches, natural materials, fort, tarpaulin, tools

Textiles

Nursery: Fabric, clothes, puppets, cushions, bags (items made from fabric)

Reception: Material, sock puppet, soft, clean, dirty

Intended Learning Outcomes

- Use and explore a variety of resources, techniques and equipment in 2D and 3D, making choices and decisions along the way.
 - Explore colour, texture, shape and patterns.
 - Develop hand-eye coordination and fine motor skills.
- Develop mathematical language e.g. position, size, shape, comparisons.
 - Manipulate a range of equipment and tools.
 - Develop their own ideas over a period of time.
- Use resources purposefully, expressing real life experiences.
 - Talk through their ideas.

Key Vocabulary and Questions

- Names of materials & equipment e.g. boxes, glue, scissors etc.
- Imaginative/descriptive language – when children are talking about creative work e.g. pattern, mark, dab, shade, colour, stick, cut, press etc.
 - 2D and 3D shape names e.g. square, circle, rectangle, cube, cuboid, cylinder.
 - Other shape/size language e.g. curved, round, big, small. What are you going to make? What colours can you use? / What textures can you feel? What did you use to make your model? How did you ...? What do you think about your ...?

Year 1

National Curriculum

Design

- design purposeful, functional, appealing products for themselves and other users based on design criteria
- generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.

Make

- select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]
- select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics
- use the basic principles of a healthy and varied diet to prepare dishes
- understand where food comes from.

Evaluate

- Explore and evaluate a range of existing products
- Evaluate their ideas and products against design criteria

Ackworth Howard's Knowledge Essentials

- Work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment.
- State what product they are designing and making.
- Say whether their product is for themselves or other users.
- Use scaffolded design criteria to help develop ideas.
- Generate ideas by drawing on their own experience.
- Describe what their structure is for.
- Develop and communicate ideas by talking and drawing.
- Explain how to adapt mechanisms, using bridges or guides to control the movement.
- Use ICT, where appropriate, to develop and communicate ideas.

- Follow a design to create moving models that use levers and sliders.
- Select from a range of tools and equipment to perform practical tasks (for example cutting, shaping, joining and finishing).
- Select from a range of ingredients according to their characteristics.
- Explore a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components.
- Mark out and cut materials and components.
- Assemble, join and combine materials and components.
- Make functioning turbines and axles which are assembled into a main supporting structure.
- Follow instructions to cut and assemble a puppet.
- With support, follow procedures for safety and hygiene.
- Chop fruit and vegetables safely to make a smoothie.
- Assemble, mix and combine ingredients.
- Identify if a food is a fruit or a vegetable.

- Make simple judgements about their products and ideas.
- Explore existing products discussing what they are, how they work and what they like/dislike about them.
- Test a finished product.
- Taste and evaluate different food combinations.
- Describe appearance, smell and taste.
- Suggest information to be included on packaging.

Year 1

National Curriculum

Technical Knowledge

- Build structures, exploring how they can be made stronger, stiffer and more stable
- Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.
- Cooking and Nutrition: Use the basic principles of a healthy and varied diet to prepare dishes
- Cooking and Nutrition: Understand where food comes from

Ackworth Howard's Knowledge Essentials

- Know that a mechanism is the parts of an object that move together.
- Know that a slider mechanism moves an object from side to side.
- Know that a slider mechanism has a slider, slots, guides and an object.
- Know that bridges and guides are bits of card that purposefully restrict the movement of the slider.
- Know that in Design and technology we call a plan a 'design'.
- Understand that the shape of materials can be changed to improve the strength and stiffness of structures.
- Understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses).
- Understand that axles are used in structures and mechanisms to make parts turn in a circle.
- Begin to understand that different structures are used for different purposes.
- Know that a structure is something that has been made and put together.
- Know that design criteria is a list of points to ensure the product meets the clients needs and wants.
- Know that a windmill harnesses the power of wind for a purpose like grinding grain, pumping water or generating electricity.
- Know that windmill turbines use wind to turn and make the machines inside work.
- Know that a windmill is a structure with sails that are moved by the wind.
- Know the three main parts of a windmill are the turbine, axle and structure.
- Know that 'joining technique' means connecting two pieces of material together.
- Know that there are various temporary methods of joining fabric by using staples, glue or pins.
- Understand that different techniques for joining materials can be used for different purposes.
- Understand that a template (or fabric pattern) is used to cut out the same shape multiple times.
- Know that drawing a design idea is useful to see how an idea will look.
- Understand the difference between fruits and vegetables.
- Understand that some foods typically known as vegetables are actually fruits (e.g. cucumber).
- Learn where and how fruits and vegetables grow.
- Know that a blender is a machine which mixes ingredients together into a smooth liquid.
- Know that a fruit has seeds and a vegetable does not.
- Know that fruits grow on trees or vines.
- Know that vegetables can grow either above or below ground.
- Know that vegetables can come from different parts of the plant (e.g. roots: potatoes, leaves: lettuce, fruit: cucumber).
- Know that all food comes from plants or animals.
- Know that everyone should eat at least five portions of fruit and vegetables every day.
- Know how to use techniques such as cutting, peeling and grating.

Year 1

Essential Vocabulary

Cooking and Nutrition	Mechanisms	Structures	Textiles
Blender Carton Fruit Healthy Ingredients Peel Peeler Recipe Slice Smoothie Vegetable	Assemble Design Evaluation Mechanism Model Sliders Stencil Target Audience Template Test	Client Design Evaluation Net Stable Strong Test Weak Windmill Turbine Axle	Decorate Design Fabric Glue Model Hand Puppet Safety Pin Staple Stencil Template

Year 2

National Curriculum

Design

- design purposeful, functional, appealing products for themselves and other users based on design criteria
- generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.

Make

- select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]
- select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics
- use the basic principles of a healthy and varied diet to prepare dishes
- understand where food comes from.

Ackworth Howard's Knowledge Essentials

- Work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment.
- Design for a specific audience in accordance with a design criteria.
- Consider how a design for a moving monster includes the linkage that will be used to make the monster move.
- Say how they will make their products suitable for their intended users.
- Use simple design criteria to help develop ideas. Create a class design criteria for a moving monster.
- Say how their product will work.
- Say how they will make their structure suitable for their intended users.
- Model ideas by exploring materials and components and by making templates and mock-ups.
- Use knowledge of existing products to help come up with ideas.
- Use ICT, where appropriate, to develop and communicate ideas.
- Plan by suggesting what to do next.
- Select from a range of tools and equipment, explaining their choices.
- Select from a range of materials, components and ingredients according to their characteristics.
- Use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components.
- Measure, mark out, cut and shape materials and components neatly.
- Assemble, join and combine materials and components and use finishing techniques including those from art and design.
- Make linkages using card for levers and split pins for pivots.
- Experiment with linkages adjusting the widths, lengths and thicknesses of card used.
- Create joints and structures.
- Build a strong and stiff structure by folding paper.
- Thread a needle, with support.
- Sew running stitch, with evenly spaced, neat, even stitches to join fabric.
- Neatly pin and cut fabric using a provided template.
- Follow procedures for safety and hygiene.
- Use a range of ingredients.
- Slice food safely using the bridge or claw grip.

Year 2

National Curriculum

Evaluate

- Explore and evaluate a range of existing products
- Evaluate their ideas and products against design criteria

Technical Knowledge

- Build structures, exploring how they can be made stronger, stiffer and more stable
- Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.
- Cooking and Nutrition: Use the basic principles of a healthy and varied diet to prepare dishes
- Cooking and Nutrition: Understand where food comes from

Ackworth Howard's Knowledge Essentials

- Make simple judgements about their products and ideas against design criteria.
- Suggest how their products could be improved.
- Explore existing products discussing what they are, who they are for, what they are for, how they work, how they are used, where they might be used, what materials they are made from and what they like/dislike about them.
- Identify aspects of their peers' work that they particularly like and why.
- Talk about their design ideas and what they are making.
- Describe the taste, texture and smell of fruit and vegetables.
- Taste test food combinations and final products.
- Describe the information that should be included on a label.
- Evaluate which grip was most effective.

- Know that mechanisms are a collection of moving parts that work together as a machine to produce movement.
- Know that there is always an input and output in a mechanism.
- Know that an input is the energy that is used to start something working.
- Know that an output is the movement that happens as a result of the input.
- Know that a lever is something that turns on a pivot.
- Know that a linkage mechanism is made up of a series of levers.
- Know some real-life objects that contain mechanisms.
- Know how freestanding structures can be made stronger, stiffer and more stable.
- Know that shapes and structures with wide, flat bases or legs are the most stable.
- Understand that the shape of a structure affects its strength.
- Know that materials can be manipulated to improve strength and stiffness.
- Know that a structure is something which has been formed or made from parts.
- Know that a 'stable' structure is one which is firmly fixed and unlikely to change or move.
- Know that a 'strong' structure is one which does not break easily.
- Know that a 'stiff' structure or material is one which does not bend easily.
- Know that natural structures are those found in nature.
- Know that man-made structures are those made by people.

Year 2

National Curriculum

Technical Knowledge

- Build structures, exploring how they can be made stronger, stiffer and more stable
- Explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.
- Cooking and Nutrition: Use the basic principles of a healthy and varied diet to prepare dishes
- Cooking and Nutrition: Understand where food comes from

Ackworth Howard's Knowledge Essentials

- Know that a 3-D textiles product can be assembled from two identical fabric shapes.
- Identify parts of a needle (point and eye).
- Understand the alternative ways of joining fabrics and embellishments.
- Know that sewing is a method of joining fabric.
- Know that different stitches can be used when sewing.
- Understand the importance of tying a knot after sewing the final stitch.
- Know that a thimble can be used to protect my fingers when sewing.
- Understand how fruit and vegetables grow.
- Know that 'diet' means the food and drink that a person or animal usually eats.
- Understand what makes a balanced diet.
- Know where to find the nutritional information on packaging.
- Know that the five main food groups are: Carbohydrates, fruits and vegetables, protein, dairy and foods high in fat and sugar.
- Understand that I should eat a range of different foods from each food group, and roughly how much of each food group.
- Know that nutrients are substances in food that all living things need to make energy, grow and develop.
- Know that 'ingredients' means the items in a mixture or recipe.
- Know that I should only have a maximum of five teaspoons of sugar a day to stay healthy.
- Know that many food and drinks we do not expect to contain sugar do; we call these 'hidden sugars'.
- Know that food has to be farmed, grown elsewhere (e.g. home) or caught.
- Know how to prepare simple dishes safely and hygienically, without using a heat source.

Year 2

Essential Vocabulary

Cooking and Nutrition	Mechanisms	Structures	Textiles
Alternative Diet Balanced Diet Expensive Healthy Ingredients Nutrients Packaging Refrigerator Sugar Substitute	Input Lever Linear Motion Linkage Mechanical Motion Oscillating Motion Output Pivot Reciprocating Motion Rotary Motion Survey	Function Man-made Mould Natural Stable Stiff Strong Structure Test Weak	Accurate Fabric Knot Pouch Running-stitch Sew Shape Stencil Template Thimble

Year 3

National Curriculum

Design

- Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups
- Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Make

- Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately
- Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities
- Cooking and Nutrition: Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques

Ackworth Howard's Knowledge Essentials

- Design a product and describe its purpose. Indicate the design features and explain how particular parts of the product work.
- Create a healthy and nutritious recipe for a savoury tart using seasonal ingredients, considering the taste, texture, smell and appearance of the dish.
- Gather information about the wants of particular individuals and groups.
- Develop their own design criteria from a design brief.
- Share ideas through discussion.
- Generate ideas, focusing on the wants of the user.
- Generate ideas using thumbnail sketches and exploded diagrams.
- Design and/or decorate on CAD software.
- Carry out research based on a given topic (e.g. Geography – Pollution) to develop a range of initial ideas.
- Plan the positioning of the bulb (circuit component) and its purpose.
- Select tools suitable for the task.
- Select materials and components suitable for the task.
- Measure, mark out, cut and shape materials and components with some accuracy.
- Assemble, join and combine materials and components with some accuracy.
- Create a pneumatic system to create a desired motion.
- Build secure housing for a pneumatic system.
- Create different types of pneumatic systems to make a functional and appealing pneumatic toy.
- Manipulate materials to create different effects by cutting, creasing, folding, weaving.
- Construct a range of 3D geometric shapes using nets.
- Create special features for individual designs.
- Make facades from a range of recycled materials.
- Follow design criteria.
- Thread needles with greater independence.
- Tie knots with greater independence.
- Sew cross stitch to join fabric.
- Decorate fabric using appliqué.
- Follow the instructions within a recipe.

Year 3

National Curriculum

Make

- Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately
- Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities
- Cooking and Nutrition: Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques

Evaluate

- Investigate and analyse a range of existing products
- Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- Understand how key events and individuals in design and technology have helped shape the world

Technical Knowledge

- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
- Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
- Apply their understanding of computing to program, monitor and control their products
- Cooking and Nutrition: Understand and apply the principles of a healthy and varied diet
- Cooking and Nutrition: Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed

Ackworth Howard's Knowledge Essentials

- Assemble, mix and combine ingredients with some accuracy.
- Know how to prepare themselves and a work space to cook safely in, learning the basic rules to avoid food contamination.
- Consider how to improve a products strength and withstand weight.
- Fit an electrical component (bulb).
- Learn ways to give the final product a higher quality finish (e.g. framing to conceal a roughly cut edge).

- Investigate how well products have been designed, how well products have been made, why materials have been chosen, what methods have been used, how well products work, how well products achieve their purposes and how well products meet user needs and wants.
- Know about inventors, designers, engineers and manufacturers who have developed ground-breaking products.
- Refer to their design criteria as they design and make.
- Use the views of others to improve designs.
- Understand the purpose of exploded-diagrams through the eyes of a designer and their client.
- Evaluate an end product and think of other ways in which to create similar items.
- Suggest points for improvement.
- Describe the benefits of seasonal fruits and vegetables and the impact on the environment.

- Apply prior knowledge and increasing knowledge of nets.
- Understand how pneumatic systems work.
- Understand that pneumatic systems can be used as part of a mechanism.
- Know that pneumatic systems operate by drawing in, releasing and compressing air.
- Understand how sketches, drawings and diagrams can be used to communicate design ideas.
- Know that exploded-diagrams are used to show how different parts of a product fit together.
- Know that thumbnail sketches are small drawings to get ideas down on paper quickly.
- Learn that different types of drawings are used in design to explain ideas clearly.
- Know how to make strong, stiff shell structures.
- Understand that wide and flat based objects are more stable.

Year 3

National Curriculum

Technical Knowledge

- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
- Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
- Apply their understanding of computing to program, monitor and control their products
- Cooking and Nutrition: Understand and apply the principles of a healthy and varied diet
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Ackworth Howard's Knowledge Essentials

- Know how to use learning from History (Stone Age) to help design and make the house.
- Understand the features of a stone age house.
- Know that a façade is the front of a structure
- Know that a paper net is a flat 2D shape that can become a 3D shape once assembled.
- Know that a design specification is a list of success criteria for a product.
- Know that a single fabric shape can be used to make a 3D textiles product.
- Understand that fabrics can be layered for effect.
- Know different stitch types.
- Know that applique is a way of mending or decorating a textile by applying smaller pieces of fabric.
- Know that when two edges of fabric have been joined together it is called a seam.
- Know that it is important to leave space on the fabric for the seam.
- Understand that some products are turned inside out after sewing so the stitching is hidden.
- Know that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world.
- Know that not all fruits and vegetables can be grown in the UK.
- Know that climate affects food growth.
- Know that vegetables and fruit grow in certain seasons.
- Know that cooking instructions are known as a 'recipe'.
- Know that imported food is food which has been brought into the country.
- Know that exported food is food which has been sent to another country.
- Understand that imported foods travel from far away and this can negatively impact the environment.
- Know that each fruit and vegetable gives us nutritional benefits because they contain vitamins, minerals and fibre.
- Understand that vitamins, minerals and fibre are important for energy, growth and maintaining health.
- Know safety rules for using, storing and cleaning a knife safely.
- Know that similar coloured fruits and vegetables often have similar nutritional benefits.
- Know what a 'target audience' is.

Year 3

National Curriculum	Ackworth Howard's Knowledge Essentials
<p>Technical Knowledge</p> <ul style="list-style-type: none"> • Apply their understanding of how to strengthen, stiffen and reinforce more complex structures • Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] • Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] • Apply their understanding of computing to program, monitor and control their products • Cooking and Nutrition: Understand and apply the principles of a healthy and varied diet • Cooking and Nutrition: Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed 	<ul style="list-style-type: none"> • Know how to use learning from science to help design and make products that work. • Know how to use learning from mathematics to help design and make products that work. • Understand that an electrical system is a group of parts (components) that work together to transport electricity around a circuit. • Understand common features of an electric product (switch, battery or plug, dials, buttons etc.). • List examples of common electric products (kettle, remote control etc.). • Understand that an electric product uses an electrical system to work (function). • Know the name and appearance of a bulb, battery, battery holder and crocodile wire to build simple circuits. • Understand the importance and purpose of information design. • Understand how material choices (such as mounting paper to corrugated card) can improve a product to serve its purpose (remain rigid without bending when the electrical circuit is attached).

Essential Vocabulary

Cooking and Nutrition	Mechanisms	Structures	Textiles	Electrical Systems
Climate Dry climate Exported Imported Mediterranean climate Nationality Nutrients Polar climate Recipe Seasonal food Seasons Temperate climate Tropical climate	Exploded-diagram Function Input Lever Linkage Mechanism Motion Net Output Pivot Pneumatic system Thumbnail sketch	2D Shapes 3D Shapes Design Criteria Evaluate Façade Feature Recyclable Scoring Stable Structure Weak Tab	Applique Cross-stitch Cushion Decorate Detail Fabric Patch Running-stitch Seam Stuffing	Battery Bulb Circuit Circuit component Information design Initial ideas Information Public Research Wire

Year 4

National Curriculum	Ackworth Howard's Knowledge Essentials
<p>Design</p> <ul style="list-style-type: none">• Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups• Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design <p>Make</p> <ul style="list-style-type: none">• Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately• Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities• Cooking and Nutrition: Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques	<ul style="list-style-type: none">• Design a product and describe its purpose. Indicate the design features and explain how particular parts of the product work.• Develop their own design criteria and use these to inform their ideas.• Share and clarify ideas through discussion.• Generate realistic ideas, focusing on the needs of the user.• Make decisions that take into account the availability of resources.• Draw a net to create a structure from.• Choose shapes that increase or decrease speed as a result of air resistance.• Personalise a design.• Gather information about the needs and wants of particular individuals and groups.• Make decisions that take into account the availability of resources. <ul style="list-style-type: none">• Select tools and equipment suitable for the task.• Select materials and components suitable for the task explaining their choice of materials and components.• Order the main stages in making.• Apply a range of finishing techniques, including those from art and design, with some accuracy.• Make a model based on a chosen design.• Make a variety of free standing frame structures of different shapes and sizes.• Reinforce corners to strengthen a structure.• Make and test a paper template with accuracy and in keeping with the design criteria.• Measure, mark and cut fabric using a paper template.• Select a stitch style to join fabric, working neatly sewing small neat stitches.• Incorporate fastening to a design.• Follow a baking recipe.• Adapt a recipe.• Make a torch with a working electrical circuit and switch.

Year 4

National Curriculum

Evaluate

- Investigate and analyse a range of existing products
- Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- Understand how key events and individuals in design and technology have helped shape the world

Technical Knowledge

- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
- Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
- Apply their understanding of computing to program, monitor and control their products
- Cooking and Nutrition: Understand and apply the principles of a healthy and varied diet
- Cooking and Nutrition: Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed

Ackworth Howard's Knowledge Essentials

- Investigate how well products have been designed, how well products have been made, why materials have been chosen, what methods have been used, how well products work, how well products achieve their purposes and how well products meet user needs and wants.
- Know about inventors, designers, engineers and manufacturers who have developed ground-breaking products.
- Use their design criteria to evaluate their completed products.
- Investigate who designed and made the products, where products were designed and made and whether products can be recycled or reused.
- Use the views of others to improve designs. Test and modify the outcome, suggesting improvements.
- Evaluate the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.
- Consider effective and ineffective designs.
- Articulate the advantages and disadvantages of different fastening types.
- Evaluate electrical products.

- Know how to use learning from science to help design and make products that work.
- Know how to use learning from mathematics to help design and make products that work.
- Understand that all moving things have kinetic energy.
- Understand that kinetic energy is the energy that something (object/person) has by being in motion.
- Know that air resistance is the level of drag on an object as it is forced through the air.
- Understand that the shape of a moving object will affect how it moves due to air resistance.
- Understand that products change and evolve over time.
- Know that aesthetics means how an object or product looks in design and technology.
- Know that a template is a stencil you can use to help you draw the same shape accurately.
- Know that a birds-eye view means a view from a high angle (as if a bird in flight).
- Know that graphics are images which are designed to explain or advertise something.
- Build on prior knowledge of net structures and broadening knowledge of frame structures.
- Understand what a frame structure is.
- Know that a 'free-standing' structure is one which can stand on its own.

Year 4

National Curriculum

Technical Knowledge

- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
- Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
- Apply their understanding of computing to program, monitor and control their products
- Cooking and Nutrition: Understand and apply the principles of a healthy and varied diet
- Cooking and Nutrition: Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed

Ackworth Howard's Knowledge Essentials

- Know that a pavilion is a decorative building or structure for leisure activities.
- Know that cladding can be applied to structures for different effects.
- Know that aesthetics are how a product looks.
- Know that a product's function means its purpose.
- Understand that the target audience means the person or group of people a product is designed for.
- Know that architects consider light, shadow and patterns when designing.
- Understand the factors that contribute to product design.
- Understand stitches and their benefits.
- Know how to use templates.
- Know that a fastening is something which holds two pieces of material together for example a zipper, toggle, button, press stud and Velcro.
- Know that different fastening types are useful for different purposes.
- Know that creating a mock up (prototype) of their design is useful for checking ideas and proportions.
- Know that the amount of an ingredient in a recipe is known as the 'quantity'.
- Know that it is important to use oven gloves when removing hot food from an oven.
- Know the following cooking techniques: sieving, creaming, rubbing method, cooling.
- Understand the importance of budgeting while planning ingredients for biscuits.
- Know how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking.
- Know that a healthy diet is made up from a variety and balance of different food and drink, as depicted in The Eatwell Plate.
- Know that to be active and healthy, food and drink are needed to provide energy for the body.
- Know that electricity is energy.
- Understand that electrical conductors are materials which electricity can pass through.
- Understand that electrical insulators are materials which electricity cannot pass through.
- Know that a battery contains stored electricity that can be used to power products.
- Know that an electrical circuit must be complete for electricity to flow.
- Know that a switch can be used to complete and break an electrical circuit.

Year 4

National Curriculum	Ackworth Howard's Knowledge Essentials
<p>Technical Knowledge</p> <ul style="list-style-type: none"> • Apply their understanding of how to strengthen, stiffen and reinforce more complex structures • Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] • Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors] • Apply their understanding of computing to program, monitor and control their products • Cooking and Nutrition: Understand and apply the principles of a healthy and varied diet • Cooking and Nutrition: Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed 	<ul style="list-style-type: none"> • Know the features of a torch: case, contacts, batteries, switch, reflector, lamp, lens. • Know facts from the history and invention of the electric light bulb(s) - by Sir Joseph Swan and Thomas Edison. • Know how simple electrical circuits and components can be used to create functional products. • Know how to program a computer to control their products.

Essential Vocabulary

Cooking and Nutrition	Mechanisms	Structures	Textiles	Electrical Systems
Adapt Budget Cooling rack Creaming Flavour Method Prototype Quantity Recipe Rubbing Sieving Unit of measure Utilities	Aesthetic Air resistance Chassis Design Design Criteria Function Graphics Kinetic Energy Mechanism Net Structure	Aesthetic Cladding Design Criteria Evaluation Frame structure Function Inspiration Pavilion Reinforce Stable Structure Target Audience Target Customer Texture Theme	Aesthetic Assemble Book sleeve Design Criteria Evaluation Fabric Fastening Prototype Net Running-stitch Target audience Target customer Template	Battery Bulb Buzzer Cell Component Conductor Copper Electrical item Electricity Function Insulator Series circuit Switch Torch Wire

Year 5

National Curriculum

Design

- Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups
- Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Make

- Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately
- Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities
- Cooking and Nutrition: Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques

Ackworth Howard's Knowledge Essentials

- Design products with a variety of features and describe their purpose. Indicate the design features and explain how particular parts of the product work.
- Identify the needs, wants and preferences of particular individuals and groups.
- Develop a simple design specification to guide their thinking.
- Share and clarify ideas through discussion and modelling ideas.
- Generate ideas, drawing on research.
- Name each mechanism, input and output accurately.
- Storyboard ideas for a book.
- Carry out research, using surveys and questionnaires.
- Make decisions, taking account of availability of constraints such as time, resources and cost.
- Design arch and truss bridges.
- Create a frame structure with a focus on triangulation.
- Consider the proportions of individual components.
- Write an amended method for a recipe to incorporate the relevant changes to ingredients.
- Design appealing packaging to reflect a recipe.
- Plan using storyboards and designs, communicating through words and illustrations.

- Select tools and equipment suitable for the task explaining their choice of tools and equipment.
- Select materials and components suitable for the task explaining their choice of materials and components according to functional properties.
- Produce appropriate lists of tools, equipment and materials that they need.
- Measure, mark out, cut and shape materials and components with increasing accuracy.
- Assemble, join and combine materials and components with increasing accuracy.
- Apply a range of finishing techniques, including those from art and design, with increasing accuracy.
- Make mechanisms and/or structures using sliders, pivots and folds to produce movement.
- Use layers and spacers to hide the workings of mechanical parts for an aesthetically pleasing result.
- Create a 3D stuffed toy from a 2D design.
- Create strong and secure blanket stitches.
- Thread needles independently.

Year 5

National Curriculum	Ackworth Howard's Knowledge Essentials
<p>Make</p> <ul style="list-style-type: none">• Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately• Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities• Cooking and Nutrition: Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques <p>Evaluate</p> <ul style="list-style-type: none">• Investigate and analyse a range of existing products• Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work• Understand how key events and individuals in design and technology have helped shape the world	<ul style="list-style-type: none">• Use applique to attach pieces of fabric decoration.• Select ingredients suitable for the task explaining their choice according to functional properties.• Cut and prepare vegetables and meat safely.• Use equipment safely, including knives, hot pans and hobs.• Know how to avoid cross-contamination .• Follow a step by step method carefully to make a recipe.• Make a functional series circuit. <ul style="list-style-type: none">• Investigate how well products have been designed, how well products have been made, why materials have been chosen, what methods have been used, how well products work, how well products achieve their purposes and how well products meet user needs and wants.• Know about inventors, designers, engineers and manufacturers who have developed ground-breaking products.• Critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make.• Investigate and analyse who designed and made the products, where products were designed and made and whether products can be recycled or reused.• Evaluate the work of others and receive feedback on own work. Suggest points for improvement.• Compare 3D objects to a 2D design.• Test to destruction to evaluate the successful properties of a design and its materials.• Adapt and improve own bridge structure by identifying points of weakness and reinforcing them as necessary.• Taste and adapt a dish during the cooking process.• Identify the nutritional differences between different products and recipes.• Identify and describe healthy benefits of food groups.• Compare 3D objects to a 2D design.• Experiment with circuits to consolidate knowledge of function.

Year 5

National Curriculum

Technical Knowledge

- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
- Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
- Apply their understanding of computing to program, monitor and control their products
- Cooking and Nutrition: Understand and apply the principles of a healthy and varied diet
- Cooking and Nutrition: Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed

Ackworth Howard's Knowledge Essentials

- Know that mechanisms control movement.
- Understand that mechanisms can be used to change one kind of motion into another.
- Understand how to use sliders, pivots and folds to create paper-based mechanisms.
- Know that a design brief is a description of what I am going to design and make.
- Know that designers often want to hide mechanisms to make a product more aesthetically pleasing.
- Understand some different ways to reinforce structures such as the importance of compression and tension in bridge structures.
- Understand how triangles can be used to reinforce bridges.
- Know that properties are words that describe the form and function of materials.
- Understand why material selection is important based on their properties.
- Understand the material (functional and aesthetic) properties of wood.
- Understand the difference between arch, beam, truss and suspension bridges.
- Understand how to carry and use a saw safely.
- Know how to use learning from History (Industrial Revolution).
- Know what a hidden seam is.
- Know that blanket stitch is useful to reinforce the edges of a fabric material or join two pieces of fabric.
- Understand that it is easier to finish simpler designs to a high standard.
- Know that soft toys are often made by creating appendages separately and then attaching them to the main body.
- Know that small, neat stitches which are pulled taut are important to ensure that the soft toy is strong and holds the stuffing securely.
- Know how to use learning from Geography (Rainforest).
- Understand where meat comes from - learning that beef is from cattle and how beef is reared and processed, including key ethical/welfare issues.
- Know that I can adapt a recipe to make it healthier by substituting ingredients.
- Know that I can use a nutritional calculator to see how healthy a food option is.
- Understand that 'cross-contamination' means that bacteria and germs have been passed onto ready-to-eat foods and it happens when these foods mix with raw meat or unclean objects.
- Know that seasons may affect the food available.

Year 5

National Curriculum	Ackworth Howard's Knowledge Essentials
<p>Technical Knowledge</p> <ul style="list-style-type: none">• Apply their understanding of how to strengthen, stiffen and reinforce more complex structures• Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]• Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]• Apply their understanding of computing to program, monitor and control their products• Cooking and Nutrition: Understand and apply the principles of a healthy and varied diet• Cooking and Nutrition: Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed	<ul style="list-style-type: none">• Know that recipes can be adapted to change the appearance, taste, texture and aroma.• Know the key components used to create a functioning circuit.• Know that copper is a conductor and can be used as part of a circuit.• Understand that breaks in a circuit will stop it from working.• Understand that a series circuit only has one path for the electrical current to flow from positive to negative.• Know that we use symbols to represent components in a circuit diagram.• Know the names of the components in a basic series circuit: crocodile wires, LED (light-emitting diode), battery holder, battery, cell.• Know that product analysis is critiquing the strengths and weaknesses of a product.• Know that 'mass production' is when a product is made in large quantities by a machine, usually in a factory.• Know that one-off production is when only one of a product is made by hand.• Know that 'bespoke' means a product was made for a particular reason or person.• Understand the development of personal message exchange through to the invention of the Penny Black stamp, and exchanging of greeting cards.• Know that a mood board may include words, sketches, textures, colours, material samples etc. and can act as inspiration when designing.

Year 5

Essential Vocabulary

Cooking and Nutrition

Beef
Cross-contamination
Ethical issues
Farm
Healthy
Nutrients
Reared
Substitute
Vegan
Vegetarian
Welfare
Sustainable

Mechanisms

Computer-aided design (CAD)
Caption
Exploded-diagram
Function
Input
Linkage
Mechanism
Motion
Output
Pivot
Prototype
Slider
Structure
Template

Structures

Abutment
Arched bridge
Beam bridge
Coping saw
File
Mark out
Material properties
Reinforce
Sandpaper
Set square
Suspension bridge
Tenon saw
Truss bridge
Tension

Textiles

Annotate
Appendage
Blanket-stitch
Design criteria
Detail
Evaluation
Fabric
Sew
Shape
Stuffed toy
Stuffing
Template

Electrical Systems

Circuit
Coin cell battery
Component
Conductor
Copper
Function
Innovative
Insulator
LED
Modify
Series circuit
Switch
Test

Year 6

National Curriculum

Design

- Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups
- Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

Make

- Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately
- Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities
- Cooking and Nutrition: Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques

Ackworth Howard's Knowledge Essentials

- Design a product and describe its purpose. Indicate the design features and explain how particular parts of the product work.
- Experiment with a range of cams, creating a design for an automata toy based on a choice of cam to create a desired movement and be able describe the purpose of the product. Indicate the design features and explain how particular parts of the product work.
- Understand how linkages change the direction of a force.
- Identify the needs, wants, preferences and values of particular individuals and groups.
- Develop a design specification to guide their thinking.
- Share and clarify ideas through discussion, modelling ideas through prototypes and pattern pieces.
- Generate innovative ideas, drawing on research.
- Understand and draw cross-sectional diagrams to show the inner-working
- Carry out research, using surveys, questionnaires, interviews and web-based resources.
- Make design decisions, taking account of availability of constraints such as time, resources and cost.
- Write a recipe, explaining the key steps, method and ingredients. Generate innovative ideas, drawing on research.
- Draw a design from three different perspectives.
- Understand the purpose of products (toys), including what is meant by 'fit for purpose' and 'form over function'.
- Select tools and equipment suitable for the task explaining their choice of tools and equipment in relation to the skills and techniques they will be using.
- Select materials and components suitable for the task explaining their choice of materials and components according to functional properties and aesthetic qualities.
- Select appropriate materials based on the materials being joined and the speed at which the glue needs to dry/set.
- Measure, mark and check the accuracy of the jelutong and dowel pieces required.
- Assemble components accurately to make a stable frame.
- Formulate step-by-step plans as a guide to making that includes a list of tools, equipment and materials needed.
- Accurately apply a range of finishing techniques, including those from art and design.

Year 6

National Curriculum	Ackworth Howard's Knowledge Essentials
<p>Make</p> <ul style="list-style-type: none">• Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately• Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities• Cooking and Nutrition: Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques <p>Evaluate</p> <ul style="list-style-type: none">• Investigate and analyse a range of existing products• Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work• Understand how key events and individuals in design and technology have helped shape the world	<ul style="list-style-type: none">• Use techniques that involve a number of steps.• Demonstrate resourcefulness when tackling practical problems.• Sew a strong running stitch, making small, neat stitches and following the edge.• Tie strong knots.• Sew accurately with even regularity of stitches.• Select ingredients suitable for the task explaining their choice according to functional properties and aesthetic qualities.• Follow a recipe, including using the correct quantities of each ingredient.• Adapt a recipe based on research.• Work to a given timescale.• Work safely and hygienically with independence.• Make and test a circuit Incorporating a circuit into a base. <ul style="list-style-type: none">• Critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make, evaluating their ideas and products against their original design specification.• Investigate and analyse how much products cost to make, how innovative products are, how sustainable the materials in products are and what impact products have beyond their intended purpose.• Evaluate the work of others and receive feedback on own work applying points of improvements. Describe changes they would make/do if they were to do the project again.• Evaluate a recipe, considering: taste, smell, texture and origin of the food group .• Evaluate health and safety in production to minimise cross contamination.

Year 6

National Curriculum

Technical Knowledge

- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
- Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
- Apply their understanding of computing to program, monitor and control their products
- Cooking and Nutrition: Understand and apply the principles of a healthy and varied diet
- Cooking and Nutrition: Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed

Ackworth Howard's Knowledge Essentials

- Understand that the mechanism in an automata uses a system of cams, axles and followers.
- Understand that different shaped cams produce different outputs.
- Know that an automata is a hand powered mechanical toy.
- Know that a cross-sectional diagram shows the inner workings of a product.
- Understand how to use a bench hook and saw safely.
- Know that a set square can be used to help mark 90° angles.
- Understand that complex structures can be strengthened using bracing.
- Know that structures can be strengthened by manipulating materials and shapes.
- Understand what a 'footprint plan' is.
- Understand that in the real world, design, can impact users in positive and negative ways.
- Know that a prototype is a cheap model to test a design idea.
- Know how to use learning from History (WWII).
- Know how to create hidden seams.
- Understand that it is important to design clothing with the client/ target customer in mind.
- Know that using a template (or clothing pattern) helps to accurately mark out a design on fabric.
- Understand the importance of consistently sized stitches.
- Understand the risks of meat or fish when not cooked or stored properly.
- Understand safe storage of meat/fish.
- Know that 'flavour' is how a food or drink tastes.
- Know that many countries have 'national dishes' which are recipes associated with that country.
- Know that 'processed food' means food that has been put through multiple changes in a factory.
- Understand that it is important to wash fruit and vegetables before eating to remove any dirt and insecticides.
- Understand what happens to a certain food before it appears on the supermarket shelf (Farm to Fork).
- Know how food is processed into ingredients that can be eaten or used in cooking.
- Know that different food and drink contain different substances – nutrients, water and fibre – that are needed for health.
- Know that batteries contain acid, which can be dangerous if they leak.
- Know the names of the components in a basic series circuit including a buzzer
- Know that 'form' means the shape and appearance of an object.

Year 6

National Curriculum	Ackworth Howard's Knowledge Essentials
<p>Technical Knowledge</p> <ul style="list-style-type: none">• Apply their understanding of how to strengthen, stiffen and reinforce more complex structures• Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]• Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]• Apply their understanding of computing to program, monitor and control their products• Cooking and Nutrition: Understand and apply the principles of a healthy and varied diet• Cooking and Nutrition: Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed	<ul style="list-style-type: none">• Know the difference between 'form' and 'function'.• Understand that 'fit for purpose' means that a product works how it should and is easy to use.• Know that form over purpose means that a product looks good but does not work very well.• Know the importance of 'form follows function' when designing: the product must be designed primarily with the function in mind.• Understand the diagram perspectives 'top view', 'side view' and 'back'.• Know that mechanical and electrical systems have an input, process and output.

Year 6

Essential Vocabulary

Cooking and Nutrition

Accompaniment
Collaboration
Cookbook
Cross-contamination
Flavour
Nationality
Preparation
Processed
Reared
Storyboard

Mechanisms

Assembly-diagram
Automata
Axle
Bench hook
Cam
Dowel
Drill bits
Follower
Frame
Hand drill
Jelutong
Linkage
Research

Structures

Reinforce
Stability
Temporary
Permanent
Innovation
Functional
Bracing
Natural materials
Corrugated iron
Bench hook
Cladding
Coping saw
Dowel
Jelutong
Landscape
Modify
Tenon saw
Vice

Textiles

Adapt
Annotate
Fastening
Knot
Properties
Running-stitch
Seam
Thread
Unique
Waistcoat
Waterproof

Electrical Systems

Backboard
Buzzer
Assemble
Magnetic field
Pliers
Battery pack
Benefit
Circuit symbol
Fine motor skills
Fit for purpose
Form
Function
Gross motor skills
Insulator
LED
User

Aspirational Outcomes...

- All children have an opportunity to think creatively about how to solve design problems.
- All children have the opportunity to acquire a broad range of subject knowledge and draw on other disciplines.
- All children can evaluate and test their own and the work of others critically and make suggestions for improvements.
- All children know how to use equipment in a safe way and manage risk.
- All children have been taught the relevant technological skills to build their design.
- All children have an appreciation of innovative technological design that they have seen or experienced in their everyday lives.
- All children have an understanding and apply the principles of nutrition and learn how to cook.