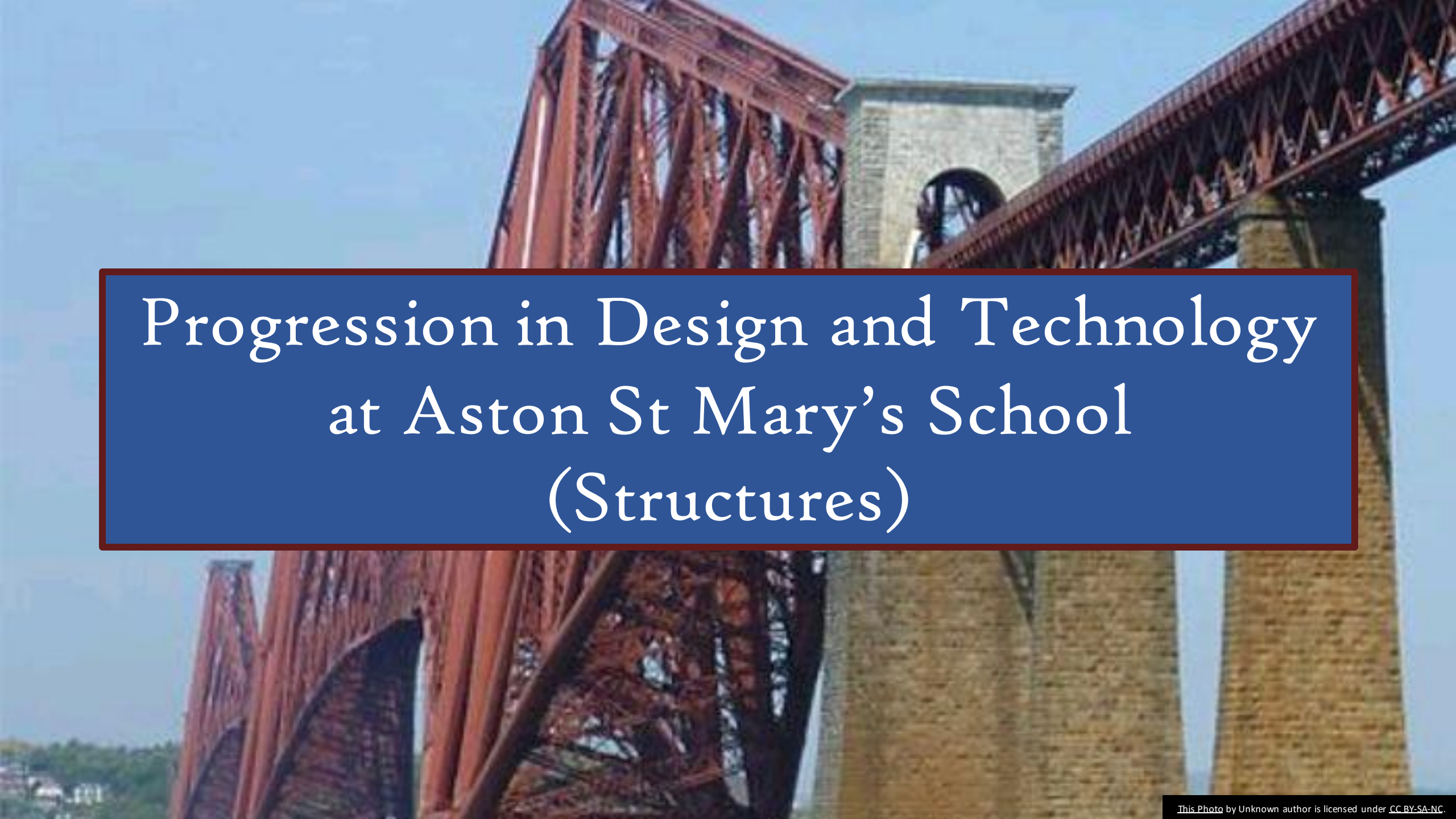
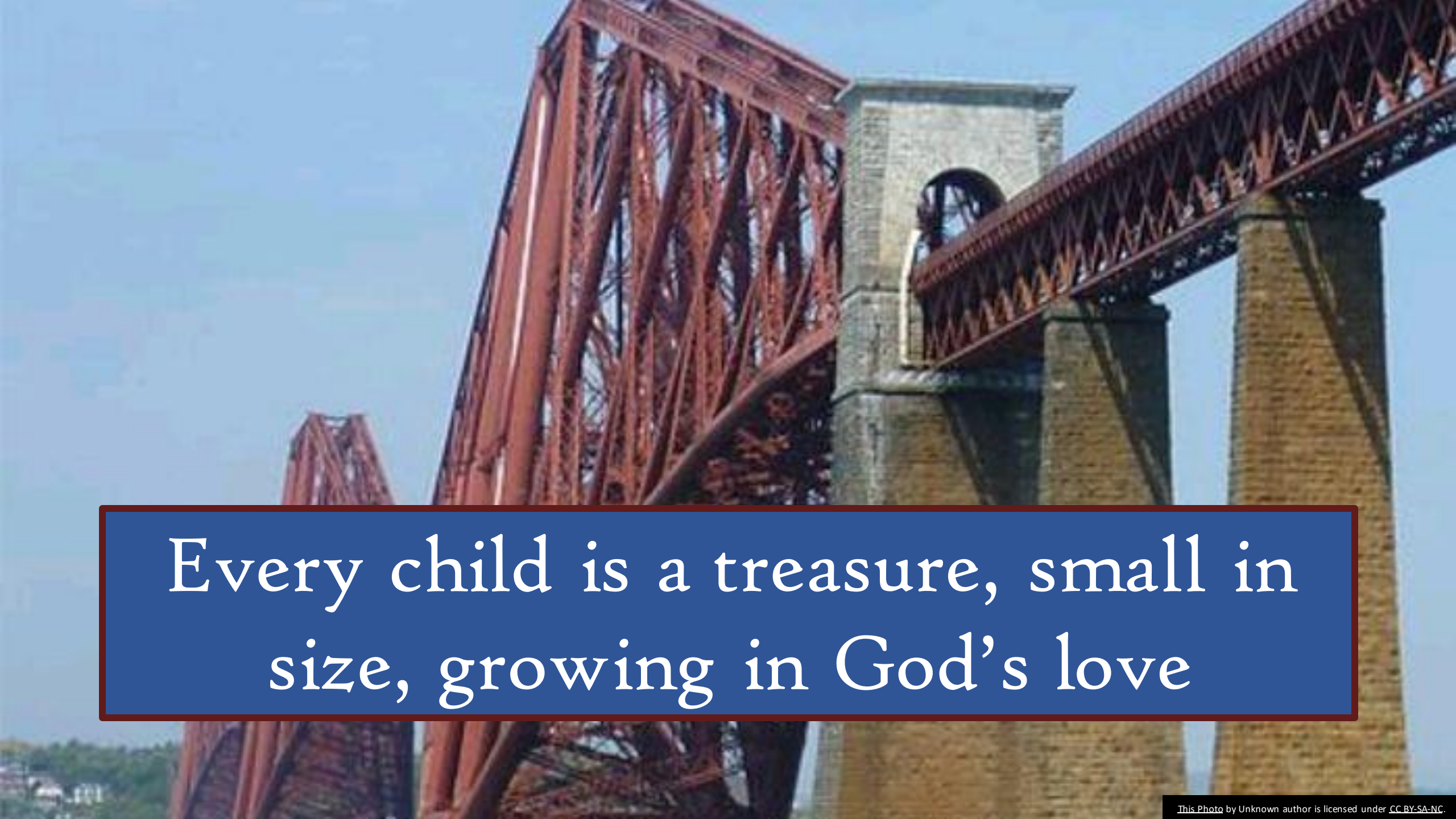
Progression in Design and Technology at Aston St Mary's School (Structures)





Aims:

The national curriculum for design and technology aims to ensure that all pupils:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook.

Attainment targets:

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

At Aston St Mary's School the EYFS curriculum is carefully planned to cover the 7 areas of learning. Our curriculum document outlines how we teach through adult directed input and tasks, topic-based learning, using the classroom environment and continuous provision, as well as following the interests of the child and taking advantage of all opportunities in the 'hidden curriculum'. Design and Technology knowledge and skills are taught through all these means in a variety of ways.

Development matters links to these subjects:

Physical development

- · Progress towards a more fluent style of moving, with developing control and grace.
- · Develop their small motor skills so that they can use a range of tools competently, safely and confidently.
- · Use their core muscle strength to achieve a good posture when sitting at a table or sitting on the floor.

Expressive arts and design

- · Explore, use and refine a variety of artistic effects to express their ideas and feelings.
- · Return to and build on their previous learning, refining ideas and developing their ability to represent them.
- · Create collaboratively, sharing ideas, resources and skills.

Aston St Mary's curriculum ambition links:

Make our own books - Folding, cutting and joining paper and card in order to create their own books.

Become Forest School rangers - designing and making homes for insects and small animals using a variety of materials. Sculptures using natural materials without joining.

Make an intricate junk model - designing, cutting and joining skills focussed on making junk models. Children are taught to use scissors to cut out designs and pieces needed for models. Joining skills taught using different types of glue, staples, Sellotape and split pins.

Key Stage 1

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment].

When designing and making, pupils should be taught to:

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

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.

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.

Key Stage 2

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].

When designing and making, pupils should be taught to:

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

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.

Shackadell Class (Reception)

Examples of topics and skills covered:

Space - Rocket models designed and made during the first term to introduce simple joining skills. Sandwich making during 'whatever next'.

healthy eating - fruit kebabs, trying different fruits and vegetables. prepare fruit and vegetables for eating.

Sewing - threading opportunities are created at first with laces and then moving on to using plastic needles and threads for simple stitch.

Woodwork - an introduction to woodwork creating wooden faces by cutting using a saw, joining using drawing pins and beginning to use nails. Focus on safety when sing woodwork skills.

Skills and Knowledge –

Discuss what they are doing.
Use materials to make and construct items with a purpose.
Investigate and adapt to make improvements.
Test creations to see if they are fit for purpose.

Shackadell Class (Reception)

Shackadell Class (Reception)

Peartree Class (Year One and Year Two)

Skills and Knowledge –

State what products they are designing and making.

Construct a range of simple structures using simple construction kits/junk modelling.

Select and use simple tools to cut and join materials edge to edge.

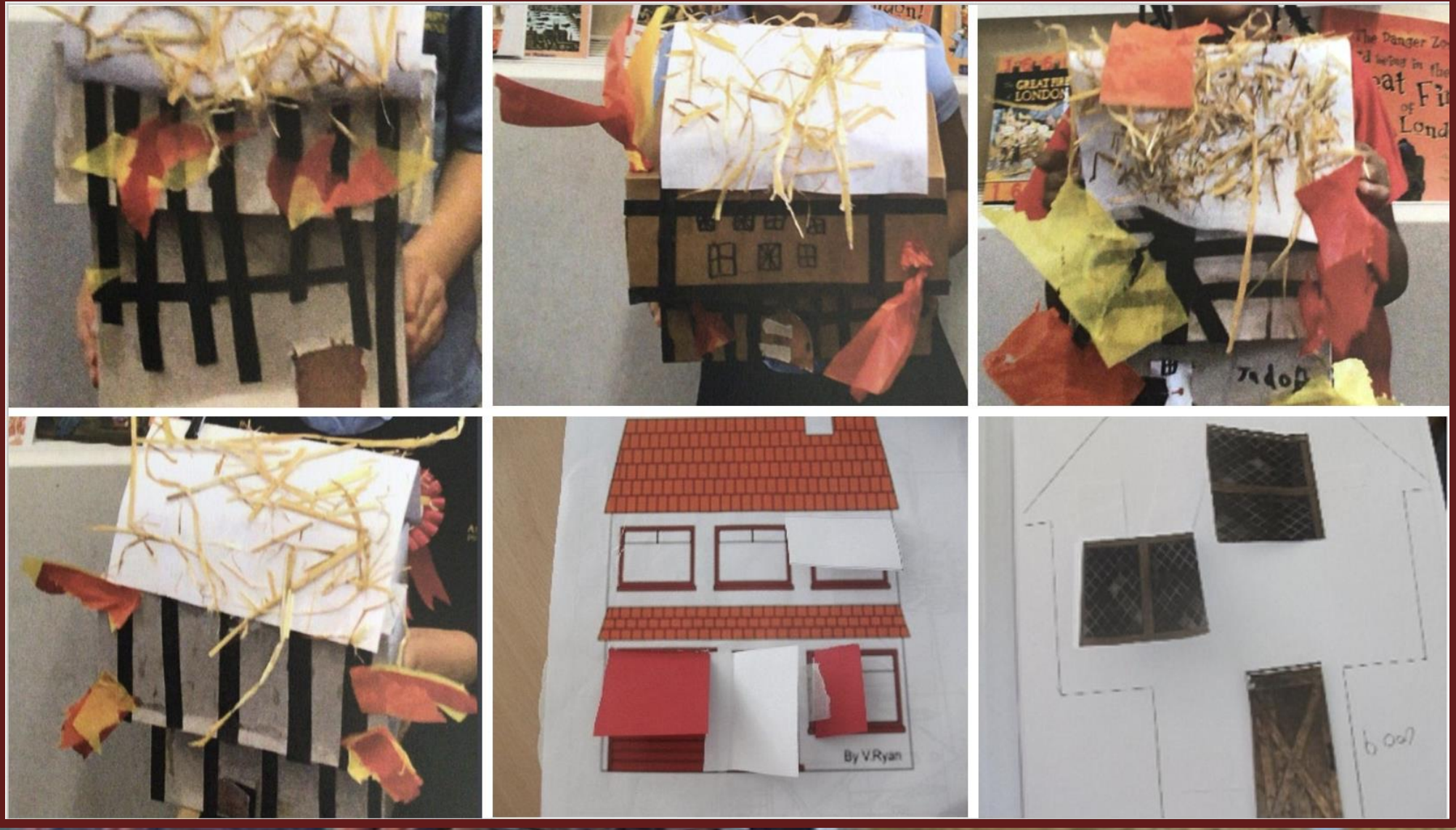
Attach materials using different adhesives.

Make a structure more stable by widening the base.

Make a simple card hinge.

Use simple design criteria to develop ideas.

Peartree Class (Year One and Year Two)



Haffydown Class (Year Two and Year Three)

Skills and Knowledge –

Make a structure more stable by widening the base.

Make a simple card hinge.

Strengthen 2D shapes by adding simple struts.

Make a frame from art straws.

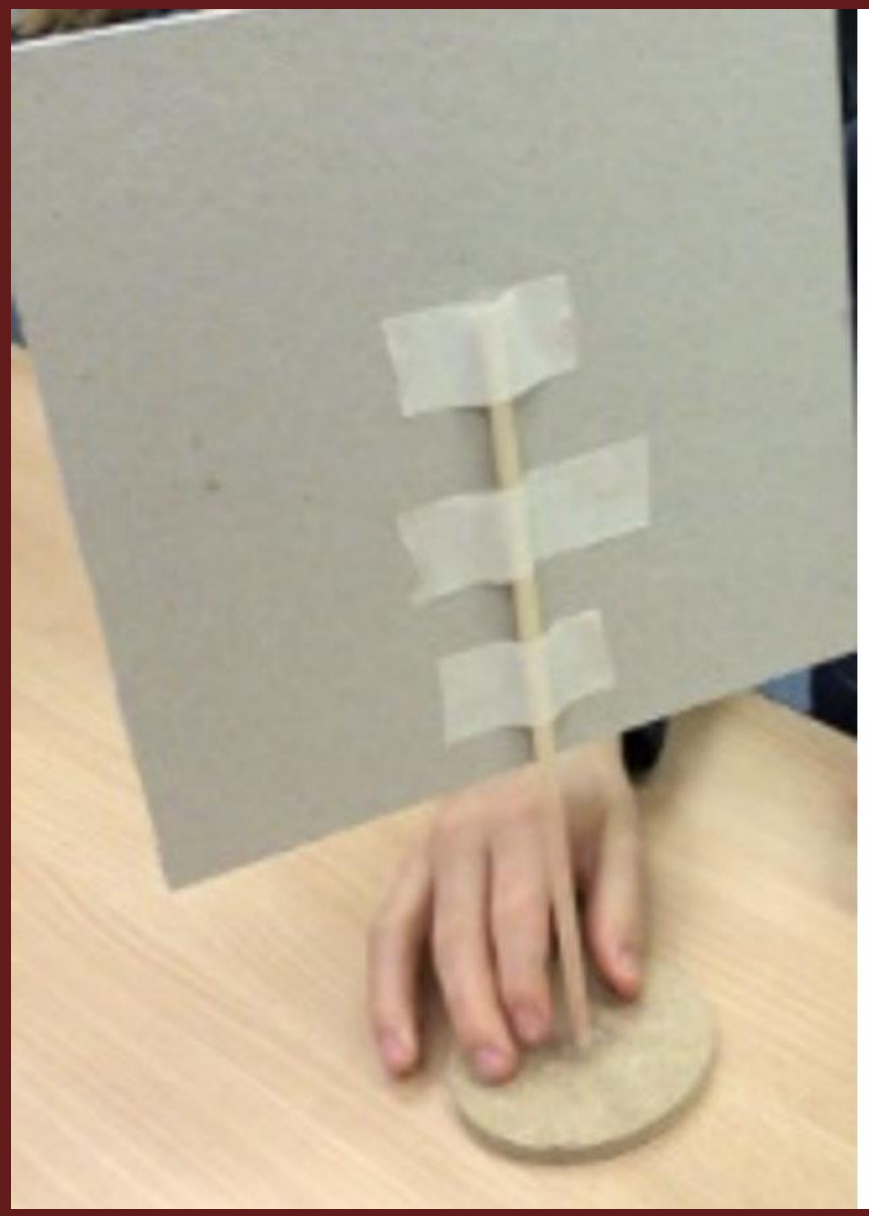
Use simple materials to make joints. (glue, tape, paper clips)

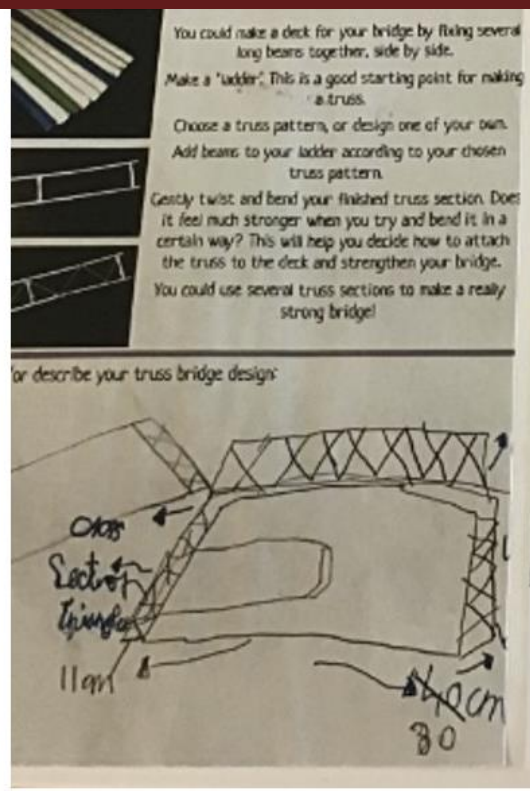
Make simple prototypes.

Make frames of different sizes from art straws, reinforcing with cross braces.

Use a range of materials/techniques to make different joints.

Haffydown Class (Year Two and Year Three)





Puddlebridge Class (Year Four and Year Five)

Skills and Knowledge –

Use annotated sketches and diagrams to discuss designs and ideas.

Make frames of different sizes from a strip of wood, reinforcing with cross braces.

Use a range of materials to make joints.

Explain how particular parts of their product work.

Use knowledge of similarities and differences between products.

Join 2D frames to create 3D structures.

Select and use most appropriate materials, tools, and equipment to build and strengthen 3D structures and frames.

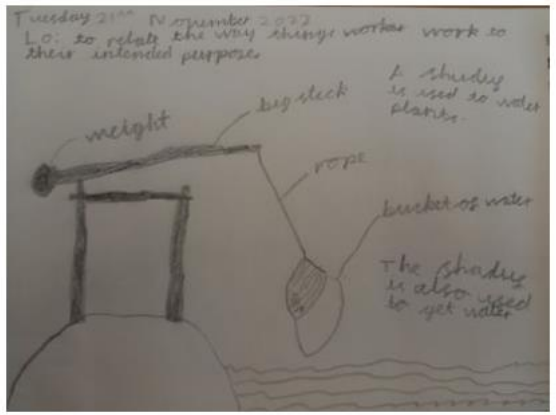
Investigate and use analysis of existing products to inform own work.

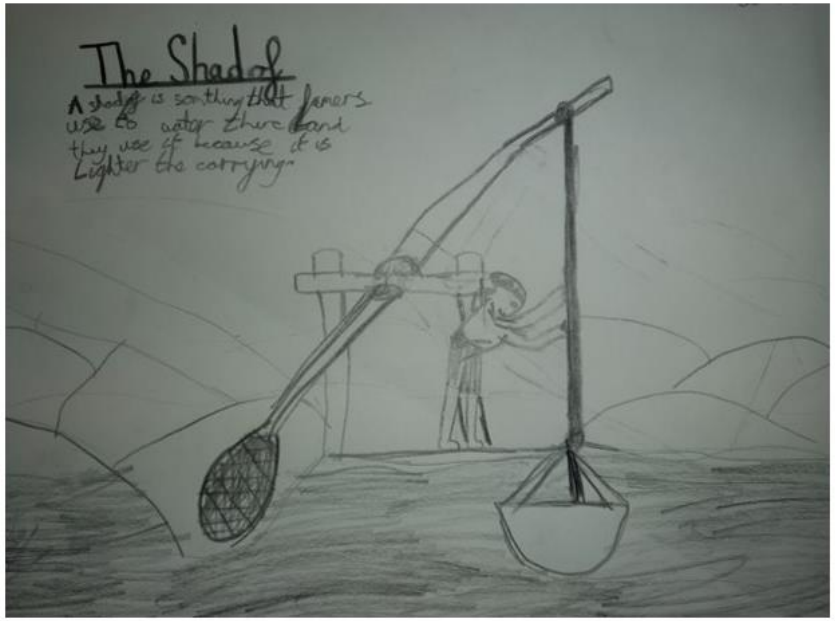
Creates nets of increasingly complex 3D shapes which include the addition of glue tabs.

Use a range of materials to make joints (card strips, elastic bands, thread and ties and plastic tubing)

Explain why some structures fail.

Puddlebridge Class (Year Four and Year Five)





Danes Class (Year Five and Year Six)

Skills and Knowledge –

Create nets and templates accurately in a range of sizes.

Investigate, measure, and record the load tolerance of different structures and find ways of improving the load bearing capacity.

Select and use most appropriate materials, tools, and equipment to build and strengthen 3D structures and frames.

Apply a range of finishing techniques, to a broad range of materials including textiles and wood.

Use a wider more complex range of materials and components taking into account their properties.

Use annotated sketches and diagrams to discuss designs and ideas.

Select tools and materials suitable for task explaining functional properties and aesthetic qualities. Order the main stages of making.

Investigate and use analysis of existing products to inform own work.

Identify from a range of key features and functions needed to create an effective, efficient working product.

Give reasons supported by factual evidence for the success of aspects of a product.

Identify the needs, wants, preferences and values of individuals or groups.

Develop and communicate ideas using annotated sketches and detailed plans.

Accurately measure, mark out, cut, shape, assemble, join, and combine materials and components.

Test, evaluate and refine ideas and products against a specification, considering the views of intended users.

Danes Class (Year Five and Year Six)