

St John & St James' C of E Primary School
Structures - Skills and Knowledge Progression Map



Nursery

ELG – Expressive Art and Design: Creating with Materials

Physical Development: Fine motor skills, Gross Motor Skills

Child initiated exploration of a range of construction and design opportunities through continuous provision construction area and separate block play area.

Explore different materials freely, in order to develop their ideas about how to use them and what to make.

Develop their own ideas and then decide which materials to use to express them.

Beginning to develop control with single-handed utensils or writing implements and growing control of simple constructions.

Reception

ELG – Expressive Art and Design: Creating with Materials

Physical Development: Fine motor skills, Gross Motor Skills

A construction area in each classroom throughout the year and a separate block area for construction buildings.

Free choice junk modelling with a range of connecting including tape, glue, string

Make a plan for a project and communicate that plan to others.

Explore different materials freely, in order to develop their ideas about how to use them and what to make.

Develop their own ideas and then decide which materials to use to express them.

Three Little Pigs Ogden Trust experiment. Building bridges using simple materials (lollipop stick and pinch pegs)

Refine ideas and develop their ability to represent them.

Create collaboratively, sharing ideas, resources and skills.

Year 1

Project: Design, Make and Evaluate a stable bridge for the three Billy Goats Gruff to cross safely. (Structures)

Designing	Making	Evaluating	Technical Knowledge
<ul style="list-style-type: none"> • Learn how to create simple design criteria • Learn about creating models and mark ups of a design 	<ul style="list-style-type: none"> • Plan step by step instructions • Know what tools and equipment are suitable • How to use simple finishing techniques for your product 	<ul style="list-style-type: none"> • To explore existing products and evaluate your design against these • Learn how to consider the effectiveness of your product in relation to its purpose 	<ul style="list-style-type: none"> • To know how to make free standing structures stable, stiffer and more stable. • To use appropriate technical vocabulary to describe a process • To understand that as a freestanding structure becomes

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- Learn about the use of a product and how it is met in a design

- To assess whether your product meets the design criteria

taller its centre of gravity rises. Stability in a structure can be increased by making the base wider.

Key Vocabulary: Structure Framework Weak Strong Edge Surface Cuboid Cylinder Function Purpose Product

Equipment: Paper, card, plastic sheet, paper and plastic straws, pipe cleaners, small containers, card boxes, glue, tape, scissors

Year 3

Project: Design, Make and Evaluate a gift box for Christmas. (Structures)

Designing	Making	Evaluating	Technical Knowledge
<ul style="list-style-type: none"> • Generate realistic and appropriate ideas and their own design criteria through discussion, focusing on the needs of the user. • Use annotated sketches and prototypes to develop, model and communicate ideas. • Use simple design criteria. 	<ul style="list-style-type: none"> • Order the main stages of making. • Select from and use appropriate tools with some accuracy to cut and join materials and components such as tubing, syringes and balloons. • Select from and use finishing techniques suitable for the product. • Assemble, join and combine components needed for your design. 	<ul style="list-style-type: none"> • Investigate and analyse existing shell structures and their purpose. • Evaluate your own products and ideas against criteria and user needs 	<ul style="list-style-type: none"> • Develop and use knowledge of how to construct strong, stiff shell structures. • Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes. • Know and use technical vocabulary relevant to the project.

Key Vocabulary: Cuboid Net Prism Scoring Shell structure Vertex Stable Strong

Equipment: card, squared paper, coloured paper, adhesive tape, masking tape, PVA glue, glue spreaders, acetate sheet, pencils, felt-tip pens, rulers, scissors

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Year 5

Project: To design, make and evaluate a new playground shelter (frame structures)

Designing	Making	Evaluating	Technical Knowledge
<ul style="list-style-type: none"> Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources. Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost. Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches. 	<ul style="list-style-type: none"> Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used. Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks. Use finishing and decorative techniques suitable for the product they are designing and making. Use techniques that involve a number of steps Demonstrate resourcefulness when tackling practical problems 	<ul style="list-style-type: none"> Investigate and evaluate a range of existing frame structures. Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests. Investigate and analyse: how much products cost to make. how innovative products are, how sustainable the materials in products are. 	<ul style="list-style-type: none"> Understand how to strengthen, stiffen and reinforce 3-D frameworks. Know and use technical vocabulary relevant to the project.

Key Vocabulary: frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent

Equipment: card, paper straws, newspaper, square sectioned wood, masking tape, PVA glue pencils, rulers, right/left handed scissors, bench hooks, G-clamp, junior hacksaws

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