St James' Church of England Primary School
Design & Technology Overview Sheet

Year 4 – Mechanical Systems: Making a Sling-shot Car

Rationale: Pupils who are **secure** will be able to:

- Work independently to produce an accurate, functioning car chassis.
- Design a shape that is suitable for the project.
- Attempt to reduce air resistance through the design of the shape.
- Produce panels that will fit the chassis and can be assembled effectively using the tabs they have designed.
- Construct car bodies effectively.
- Conduct a trial accurately and draw conclusions and improvements from the results.

Learning Objectives:

- 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
- Understand how key events and individuals in design and technology have helped shape the world
- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design
- Investigate and analyse a range of existing products
- Select from and use a wider range of tools and equipment to perform practical tasks

Overview:

Lesson 1: Chassis and launch mechanism - To build a car chassis

Lesson 2: Designing the car body – To design a shape that reduces air resistance

Lesson 3: Making the car body – To make a model based on a chosen design

Lesson 4: Assembly and testing – To assemble and test my completed product

Cross Curricular Links

Resources

• Pre-made demonstration car • 4mm wooden dowel or rod (30cm recommended) • Wheels (38-40mm recommended) with central holes, although some children may find the 50mm wheels less fiddly to assemble • Drinking straws (two per pupil) • Paperclips (one per pupil) • Lollipop sticks (nine per pupil) • Elastic bands (one per pupil) • Masking tape • Glue guns (one per available adult to supervise children's use) and/or PVA glue and spreaders • Children's toy cars brought in from home • At least one pre-made demonstration car • Drawing and colouring pencils (enough for each child to use) • Plastic cups/building blocks/ card boxes/cushions for a crash target • Card (two A4 pages or one A3 page per child) • Drawing and colouring pencils • Coloured card, for decoration/graphics • Scissors (per pupil) • A few pre-cut tab strips for children who have forgotten to add tabs to their nets or accidentally cut them off • Glue gun if available or PVA glue • Glue sticks • Children's chassis' and panels/nets from 'Lesson 3: Making the car body'

Impact/Assessment

Most Children will: • Their ability to work independently to produce an accurate, functioning car chassis. • Designing a shape that is suitable for the project and making some attempt to reduce air resistance through the design of the shape. • Producing panels that will fit the chassis and can be assembled effectively using the tabs they have designed. • Constructing the car bodies effectively. Conducting the trial accurately and drawing conclusions and improvements from the results.

More Able Children will: • Making a high quality and functioning car chassis through the implementation of neat angles and secure gluing/assembly. • Designing a shape that is sophisticated and fully embraces the concept of reducing air resistance. • Producing the above neatly and accurately with a more sophisticated shape and graphic design. • Constructing the car bodies independently and to a high-quality finish.