

Outcomes**A student will –**

- Use and play with everyday materials in new ways or re-using discarded materials, for example using discarded materials to design, make and model a designed solution.
- Learn and safely practise a range of technical skills using tools and equipment, for example joining techniques when making products
- assemble components of systems and check they function as planned, for example when making a raft and musical instrument
- explore systems used in the classroom or community for creatively dealing with problems and needs, for example storage systems for equipment
- identify, gather and play with materials, components, tools and equipment to generate personal design ideas, for example designing a greeting card for a friend
- explore opportunities around the school for designing solutions, for example how school play areas could be improved;
- explore which tools, equipment and techniques to use with selected materials
- discuss possible designed solutions based on experience and some research, for example asking adults for advice communicating design ideas by modelling, and producing and labelling two-dimensional drawings using a range of technologies to show different views (top view and side).

Content**Design and Technologies Processes and Production Skills –****Competencies and Skills*****Producing and Implementing***

Use materials, components, tools, equipment and techniques safely to make designed solutions (ACTDEP007)

Materials and technologies specialisation

Explore the characteristics and properties of materials and components that are used to produce designed solutions (ACTDEK004)

Responsibility and enterprise***Investigating and defining***

Explore needs or opportunities for designing, and the technologies needed to realise designed solutions (ACTDEP005)

Generating and designing

Generate, develop and record design ideas through describing, drawing and modelling (ACTDEP006)

Evaluating

Use personal preferences to evaluate the success of design ideas, processes and solutions including their care for environment (ACTDEP008)

Collaborating and managing

Sequence steps for making designed solutions and working collaboratively (ACTDEP009view), for example a new environment such as a school play area.

Resources

Various Handouts, discarded materials (boxes, foil, straws, pop sticks, tooth picks etc), videos, books

Session	Content	Resources	Registration & Annotation
1	<ul style="list-style-type: none"> - Introduce the new topic for the term – Design and Engineering - Explain the Engineering Design Process – Use the Poster and hang in the classroom for reference throughout the unit. - Explain Design – is the planning and drawing of the idea and Engineering – is the creating/building . - Introduce Task 1 – Design a Spacecraft - Students work on steps 1, 2 & 3 of the Engineering Design Process - Ask, Imagine, Plan (draw) their idea. - Collect Design 	<p>Engineering Design Process Poster – www.twinkl.com</p> <p>Spacecraft Design Poster (Hang in Classroom)</p> <p>Spacecraft Planning Worksheet – www.teachstarter.com</p>	
2	<ul style="list-style-type: none"> - Discuss designs from last session. - Explain how when drawing a plan or idea it must be labelled with what you intend to use to make the design (pop stick, pipe cleaner, tape etc) it is not a picture but a design that you will make. - Students work on steps 4 and 5 of the <i>Engineering Design Process</i> - Introduce the students to the loose parts that they are able to use to create their design. - Explain that they must treat the materials with care, they don't get to keep the creation and the parts used get returned so they can be used by other classes. - Students create their design using loose parts. - Display design on design table - Students complete step 6 of the <i>Engineering Design Process</i> and 'Share' their design with the class - Collect Design sheet - Students return materials to their correct place. 	<p>Various materials are available to use – pop sticks, foil, paper plates, plastic bottles, lids, paper, card stock, wool, cotton wool etc</p>	<p>Photographic evidence of students working and of their finished designs.</p>
3 - 7	<p>Build a Raft Challenge</p> <p>Session 1</p> <p>The Problem – The Gingerbread Man is trying to cross the river without asking the dangerous fox for help! He needs a raft that will take him across the river safely and without getting wet. He must stay dry, otherwise will get soggy and dissolve!</p>	<p>Storybook (Hard Copy) The Gingerbread Man.</p> <p>Digital Copy – The Gingerbread Man</p> <p>Pop sticks, rubber bands, plastic cups, masking tape, toothpicks, plastic bags,</p>	

	<p>Your Goal – Using supplies from your loose parts trolley, build a raft that will float across a tub of water and support a cut-out of the Gingerbread Man.</p> <p>Discuss ideas Students to draw a labelled diagram of their raft Collect ideas</p> <p>Session 2 (week4) Discuss the task - to build a raft to cross the river Outline problems to consider; Will it float? Investigate whether an object sinks or floats Define: Buoyancy and Density Consider why these matter Test materials the students have chosen on the designs to see if they float Record results</p> <p>Session 3 (week 5) Review findings from last week – Float or Sink Outline another problem to consider; - Is it waterproof? Investigate materials that are waterproof Define: Waterproof Test materials to see if it is waterproof Record results</p> <p>Session 4 (week 6) Using plans students make their rafts from materials on the loose parts trolley Cut out a Gingerbread Man cut out and attach to the raft Place the raft in the tub of water and move the raft around. Consider; Did it float? Did the Gingerbread Man stay dry? Was your raft waterproof?</p> <p>Session 5 (week 7) After testing the designs Students reflect on whether their designs worked or not. Suggest changes</p>	<p>foil, pipe cleaners, tissues, tape, glue, sticks etc ‘Plan and Create’ worksheet www.teachstarter.com</p> <p>Worksheet – Research the facts – Sink Vs Float Materials from the loose parts trolley Tub of water Pencils to record results</p> <p>Worksheet – Research the facts – Waterproof Materials from the loose parts trolley Tub of water Pencils to record results</p> <p>Loose parts trolley - Pop sticks, rubber bands, plastic cups, masking tape, toothpicks, plastic bags, foil, pipe cleaners, tissues, tape, glue, sticks etc Gingerbread Man cut out Work sheet – ‘Test it’</p> <p>Worksheet - ‘Reflect and Share’</p>	<p>Take pictures of the rafts floating</p>
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	Compare with others		
8 - 9	<p>Pasta and Marshmallow Bridges Watch Go Jettors – Tower Bridge Episode Session 1 Explain that the train is unable to cross as the bridge has fallen down. Students need to design and build a new bridge. Watch a power-point showing different types of bridges Draw a labelled design of their idea Collect designs</p> <p>Session 2 Hand out designs In partners select one bridge to build Using Pasta and Marshmallows students build their bridge Test bridges by seeing if a toy car can cross it Share bridges with the class</p>	<p>Go Jettors – Tower Bridge Episode Power point – Bridges Paper for labelled diagram</p> <p>Marshmallows Variety of raw pasta shapes fettucine, penne, spirals</p>	<p>Take photos of finished products</p>

Week 10

Class watch a video and have popcorn

Assessment

- Knowledge and understanding
- Investigating and designing
- Producing
- Evaluating
- Reflecting.

DVD - TBA

Checklist

Level 1 Design & Technology Assessment
Year Group

Name	I can generate ideas & recognise characteristics of familiar products	My plans show that with help, I can put my ideas into practice	I can use pictures & words to describe what I want to do	I can explain what I am making & which tools I am using	I can use tools & materials with help, where needed	I can talk about my own & other people's work in simple terms & describe how a product works

