

**1. Year Groups**  
**Years**  
**2**

**2. Aspect of D&T Structures**  
  
**Focus**  
**Freestanding structures**

**4. What could children design, make and evaluate?**  
**Make a shelter for a penguin**

**5. Intended users**  
**A toy penguin**

**6. Purpose of products**  
**imaginary role-play**

**16. Possible resources**  
photographs of various structures  
construction kits that can be used to construct freestanding structures e.g. walls, towers, frameworks  
paper, card, plastic sheet, paper and plastic straws, pipe cleaners  
reclaimed materials including small containers, card boxes, cotton reels  
string, masking tape  
PVA glue, Plasticine, left/right handed scissors, hole punch, stapler  
finishing media and materials

**17. Key vocabulary**  
cut, fold, join, fix  
structure, wall, tower, framework, weak, strong, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved  
metal, wood, plastic  
circle, triangle, square, rectangle, cuboid, cube, cylinder  
design, make, evaluate, user, purpose, ideas, design criteria, product, function

**3. Key learning in design and technology**  
**Prior learning**  
• Experience of using construction kits to build walls, towers and frameworks.  
• Experience of using of basic tools e.g. scissors or hole punches with construction materials e.g. plastic, card.  
• Experience of different methods of joining card and paper.

**Designing**  
• Generate ideas based on simple design criteria and their own experiences, explaining what they could make.  
• Develop, model and communicate their ideas through talking, mock-ups and drawings.

**Making**  
• Plan by suggesting what to do next.  
• Select and use tools, skills and techniques, explaining their choices.  
• Select new and reclaimed materials and construction kits to build their structures.  
• Use simple finishing techniques suitable for the structure they are creating.

**Evaluating**  
• Explore a range of existing freestanding structures in the school and local environment e.g. everyday products and buildings.  
• Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria.

**Technical knowledge and understanding**  
• Know how to make freestanding structures stronger, stiffer and more stable.  
• Know and use technical vocabulary relevant to the project.

**7. Links to topic:**  
**Let's go Engineering!**

**8. Possible contexts**  
**imaginary story-based Link to Lost and Found by Oliver Jeffers**

**9. Project title**  
**Design, make and evaluate a shelter (Product) for a toy penguin (User) to keep the penguin dry in the winter. (Purpose)**  
  
To be completed by the teacher. Use the project title to set the scene for children's

**10. Investigative and Evaluative Activities (IEAs)**  
• Go on a walk and/or look at photographs of the local area to explore structures such as playground equipment, street furniture, walls, towers and bridges e.g. *What are the structures called and what is their purpose? Who might use them? What materials have been used? Why have these been chosen? How have the parts been joined together? How have the structures been made strong enough? How have they been made stable?*  
• Where possible, ask the children to draw or photograph the structures they have been exploring and label with the correct technical vocabulary in relation to the structure, materials used and shapes e.g. wall, tower, framework, base, joint, metal, wood, plastic, brick, triangle, square, rectangle, cuboid, cube.

**11. Related learning in other subjects**  
• **Geography** – use simple fieldwork and observational skills to study the geography of their school and its grounds and the key physical features of its surrounding environment.  
• **Spoken language** – participate in discussion about various structures, taking turns and listening to what others say. Ask relevant questions to extend their knowledge and understanding. Build technical vocabulary.

**12. Focused Tasks (FTs)**  
• Demonstrate measuring, marking out, cutting, shaping, joining and finishing techniques with a range of tools and new and reclaimed materials that children are likely to use to make their structures. Discuss the suitability of materials for their products according to their characteristics.  
• Ask the children to build and explore a variety of freestanding structures using construction kits, such as wooden blocks, interconnecting plastic bricks and those that make frameworks e.g. *How can you stop your structures from falling over? How they can be made stronger and stiffer in order to carry a load?* Children could make models of the structures they have seen in school and the local area.  
• Ask children to fold paper or card in different ways to make freestanding structures, using masking tape where necessary to make joints. Encourage them to think about how folding materials can make them stronger, stiffer, stand up and be more stable e.g. *Can they support an object on top of their structures without it falling over or breaking?*

**13. Related learning in other subjects**  
• **Mathematics** – use appropriate standard and non-standard measures. Recognise and name common 2-D and 3-D shapes.  
• **Science** – think about the properties of materials that make them suitable or unsuitable for particular purposes.  
• **Spoken language** – ask relevant questions to extend their knowledge and understanding. Build technical vocabulary.

**14. Design, Make and Evaluate Assignment (DMEA)**  
• Discuss with the children what structure they will be designing, making and evaluating e.g. *Who will your product be for? What will be its purpose? What materials will you use? How will you make it strong and stable?*  
• Generate some simple design criteria with the children e.g. the structure should stand up on its own, it should be strong enough to carry Teddy.  
• Encourage the children to develop their ideas through talking, drawing and making mock-ups of their ideas with construction kits and other materials.  
• As a whole class, plan the order in which the structures will be made. Children could make their final products from construction kits, new and reclaimed materials or any combination of these, according to their characteristics.  
• Ask children to evaluate their developing ideas and final products against original design criteria.

**15. Related learning in other subjects**  
• **Spoken language** – ask relevant questions to extend their knowledge and understanding. Build technical vocabulary. Use spoken language to develop understanding through imagining and exploring ideas.  
• **Art and design** – use colour, pattern, line, shape. Use and develop drawing skills.  
• **Science** – think about the properties of materials that make them suitable or unsuitable for particular purposes.

**18. Key competencies**  
problem-solving teamwork negotiation  
consumer awareness organisation motivation  
persuasion leadership perseverance  
other – specify

**19. Health and safety**  
Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project.

