

Topic: Building structures	Year group	Term
Ball bearing games (Frame structures)	Year 5	Spring 2 6 sessions

Background knowledge

This unit builds on knowledge of building stable 3D structure, children will develop knowledge on how to add effective support to more complex structures. They will also further develop their skills using wood and tools such as saws with increasing accuracy.

What should I already know?

How to construct a 3D structure (greenhouse project)

Materials can be joined using glue, tape, simple pins or nails and shaped using scissors or saws. Different materials require different tools to shape and finish them.

Materials have different qualities, strengths and weaknesses.

Different ways to join wood to allow for a strong structure (picture frame project)

National Curriculum Objectives / Key Skills	The Journey
- 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 drawings, cross-sectional diagrams. Apply their understanding of how to strengthen, stiffen and reinforce more complex structures - Select from and use a wider range of tools and equipment to perform practical tasks, such as cutting, shaping, joining and finishing, accurately - Select from and use a wider range of materials and components, including construction materials according to their functional properties and aesthetic qualities - 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 - I can use research to design innovative products aimed at a particular purpose - I can research a key individual and the impact they had on Bridge building in Britain. - I can evaluate existing products and collect information to help plan design criteria as a class or group. - I can produce a detailed step by step plan including an exploded diagram. - I can justify my choices for materials, tools and techniques - I can show that I know how to work safely and independently with a range of tools and materials.	- WALT: Investigate existing games Brief shared- Design a ball bearing game for..... Work through Specification. Key person study. - WALT: Come up with Design ideas Look at the different designs and types, what are their strengths and weaknesses? Discuss material choices. - WALT: Design the game (Use Tinkercad create a 3D design). Model working with wood and saws safely, highlight importance of accuracy. - WALT: Make my game. Model working safely with the tools - WALT: Make my game (Continued) - WALT: Test and evaluate my game.

• I can work with increasing accuracy. • I can evaluate my structure against my original criteria to a specific purpose • I can discuss how key events/individuals in DT have impacted the world	
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Outcomes
An overview of what children will know / can do Working towards: With support create a simple bridge design that spans a gap. Expected: Make a stable bridge design in a pair, explaining choices made. Exceeding: Make a stable, sturdy and well designed bridge that can hold more weight than originally requested.

Key Vocabulary	Timeline / Diagrams
Strengthen Reinforce Shape Join design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional	

Key people / places

Assessment questions / outcomes
Who is your game designed for? Name one of the things on the specification. What makes wood a good material to make the game out of? Why is using CAD useful? How successful was your design? How do you think it could be made more effective?