

Design and Technology Knowledge Organiser

Southwold Primary School



Topic: How can we use our knowledge of stable structures to create a mini greenhouse?

Year: LKS2

Strand: Structures

What should I already know?

- What features make a structure stable.
- What a functional product is and ways to communicate my ideas through talking and drawing.
- The purpose of my end product.
- Which materials are best for making my structure strong and stable.
- How to reinforce and assemble materials to make a structure stable.
- How to use tools accurately and safely.

What will I know by the end of this unit?

- How a greenhouse helps plants to grow & different types of greenhouses.
- Factors that make a structure more stable.
- How to identify suitable materials for a mini greenhouse.
- How to successfully communicate my ideas in response to a design brief.
- Ways of successfully joining materials.
- Build on and develop ways to strengthen, secure and stabilise my design from those learnt in KS1.
- The shape of a structure can affect its stability.

Architect Study

Grimshaw Architects designed, 'The Eden Project' the breath-taking sight of bubble-like Biomes (giant greenhouses) in Cornwall. The design was inspired by nature and uses low energy. Many other examples of sustainable architecture can be found across the Eden site, including the plant-inspired Core building.



Design

Greenhouses are buildings used in gardens, mainly made of glass or plastic windows to help plants grow. Mini greenhouses are used to grow seeds or to keep small plants.

Mini greenhouses work in the same way as big greenhouses – allowing sunlight to enter and be trapped within the structure, heating up the air and the plants, to help them grow.



What will I be able to do by the end of this unit?

Design:

Explain why materials are suitable for my design.
Apply my knowledge of stable structures and suitable materials when designing a mini greenhouse.
Create detailed plans and diagrams to communicate my design ideas.

Make:

Follow a design criteria.
Use tools accurately and safely.
Use techniques to strengthen, stabilise and secure my design.

Evaluate:

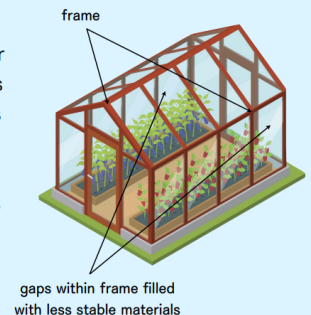
Explore existing products.
Identify possible challenging parts of my design/help others to find solutions.
Amend my design to improve it.

Vocabulary

transparent	Sunlight can shine through and warm both the air and plants inside.
ventilate	Allow fresh air to enter and circulate.
stable	Steady, strong, safe. Unlikely to collapse or fall over.
base	The bottom of the structure: the weight of the structure needs to be evenly spread on the base for it to be stable. The wider the base of a structure, the more stable it will be.
frame	A basic shape or structure, especially one that outlines or surrounds a door or window.

Stable Structures & Attachment Techniques

The **frame** of a greenhouse is most commonly made from wood, metal or plastic tubing. However, the sections within the frame are filled with glass or plastic sheeting. These materials can be **less stable** than those that the frame is made from. This means that the frame itself has to be strong and stable, as it has to stop the structure collapsing.



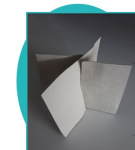
Flange

A way to connect tubes or pipes



Slot

A way to connect flat pieces together



Using Triangles to strengthen joints



L Brace

A way to connect two pieces with a 90° angle

