Knowledge Organiser

Year: 4 Subject: Design & Technology Unit: Making Mini Greenhouses

Overview

Children will be learning about greenhouses and their purpose. They will learn about stable structures and then apply this knowledge to how greenhouses are made The children will plan and make their own mini greenhouses and evaluate them.

What should I already know?

Design

- Can identify the different components of a photograph frame: -
  - the frame – made of 4 sides
  - glass front
  - the backboard
  - a stand
  - the artwork or picture inside the frame
- Can compare photograph frames and talk about their features
- Apply what they know about photograph frames to design a photograph frame that has a stable structure
- Can create an accurate labelled diagram
- Identify areas that could be improved upon in their design

Make

- Can follow a design to make a functional and decorative photo frame.
- To create a stable structure with paper/card using strengthening techniques.
- To create accurate joins using glue and tape.

Working with tools

- Can select the most appropriate materials, tools and techniques to use and can use them safely (card, paper, glue, tape, ruler)
- Can measure accurately using cm and mm.

Evaluate

- Be able to look at a range of existing photo frames and talk about what makes them successful – sturdy, decorative etc.
- Recognise what has gone well, but suggest further improvements for the finished article
- Suggest which elements they would do better in the future
- Can assess how well their product works in relation to the purpose

Technical Knowledge

- A wide base makes free standing objects more stable.
- Paper and card can be strengthened by: -
  - Rolling to create poles. Short poles are stronger than long poles
  - Layering and gluing to the required thickness
  - Twisting into tight folds
  - Folding repeatedly to make a strip.

What will I know by the end of the unit?

Vocabulary:

nutrients	food taken from the ground that plants need to survive
ventilation	to allow air to flow in
irrigation	to allow water to access and feed plants in a large area (greenhouse)

transparent	to see through
regulated	to be controlled
environment	everything around us
mass production	a lot of the same product which is produced to be consumed by large numbers of people (solar energy)

Design

- Can identify features of a greenhouse
- Can investigate ways of making 3D structures stable and allow maximum amount of sunlight to enter.
- Can investigate and identify materials that are suitable for a mini greenhouse (e.g., lolly sticks, dowelling, plastic wallets, clingfilm, straws, pipe cleaners and explain how they can be joined (glue, tape, staples)
- Can design a mini greenhouse for a particular purpose (to grow small plants/seeds in) that is: -
  - Stable, transparent, can be accessed for watering, ventilated and has an air tight seal
- Can create a detailed plan with relevant drawing and labels, including the materials they will use.
- Can identify the sequence of steps needed to make their mini greenhouse.
- Can identify possible challenging parts of their design and talk through possible solutions.

Make

- Can use a template to investigate how stable different shapes are.
- Can consider which materials are fit for purpose and join them appropriately
- Can strengthen joins and corners in a variety of ways using tape, glue, string, staplers
- Can create a mini greenhouse that has: -
  - A frame strong enough to keep the structure stable
  - Transparent sections within the frame

Working with tools

- Can measure in cm, cut and assemble accurately
- Can use equipment and tools with increased accuracy and safety e.g.: - lolly sticks, dowelling, plastic wallets, clingfilm, straws, pipe cleaners and explain how they can be joined (glue, tape, staples, string)

Evaluate

- Can investigate and analyse a range of existing products as a source of ideas.
- Can explain what has gone well and how their product could be improved.
- Can identify problems faced and talk through how they were overcome.
- Can assess how well their product works in relation to the design criteria and the intended purpose:
  - Is the greenhouse stable?
  - Does it allow sufficient light in for plants to grow?
  - Are seals air tight?
  - Can it be ventilated?
  - Can it be accessed?

Technical Knowledge

- For a structure to be stable and unlikely to collapse, it needs to be steady, strong and safe.
- The stability of a structure depends on its shape and the materials it is made from.
- The weight of a 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.
- If the sides or walls of a structure have some parts missing, the structure will be less stable and more likely to collapse or fall down.
- Glass and plastic sheeting are less stable than wood, metal, plastic tubing.
- A greenhouse frame needs to be strong and stable and stop the structure from collapsing; the sections within the frame need to be transparent.

analyse	to pick apart and study
stable	to not move easily
sturdy	strongly and solidly built
investigate	to find out
specific design criteria	a clear set of instructions that follow a dedicated plan
combination materials	more than one type of thing resources required to construct something
effective	successful in producing a desired product
suitability	the quality of being appropriate for the task