# Design and Technology Knowledge Organiser

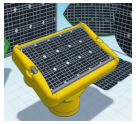
**Topic :** How can I share my ideas using computer aided design for a solar powered invention? | **UKS2** | **Strand: Computer Aided Design** | **Southwold Primary School**

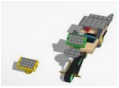
## What should I already know?

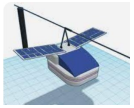
- What an avatar is.
- How to use vocabulary to express ideas.
- How to create a 2D representation of a character.
- How to use Tinkercad to create a 3D representation of a character.
- How to use mathematical computation to solve real-world problems.

## What will I know by the end of this unit?

- How to create a solar powered invention.
- How to communicate ideas through the use of CAD. (Tinkercad).
- That the design process requires a number of steps.
- How to draw a 2D sketch of my invention with measured dimensions.
- How to create a design in 3D using Tinkercad.
- How to refine a product following feedback.







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

**Design**:
- Create a detailed list of things I feel would be important when creating a solar-powered invention.
- Respond to key attributes for my invention.

**Make:**
- Move through invention steps. (Not necessarily in a linear order).
- Draw a 2D sketch of my invention and measure the dimensions.
- Create my design in 3D using Tinkercad.

**Evaluate:**
- Use facilitative questions to help evaluate my design.
- Ask peers, friends, adults, or experts to provide feedback on my design. Then, use this information to refine my invention designs.
- Prepare a short presentation to share my invention with others.

## Significant Designer

**Mária Telkes** (born December 12, 1900 in Budapest, died December 2, 1995).

Maria was a physical chemist and biophysicist best known for her invention of the solar distiller and the first solar-powered heating system designed for residences. She also invented other devices capable of storing energy captured from sunlight.

Maria was the first recipient of the Society of Women Engineers Achievement Award. In 1977 she received a lifetime achievement award from the National Academy of Sciences Building Research Advisory Board for her contributions to solar-heated building technology.

## 3D Design Software

Tinkercad is a free web app that can be used for 3D design, electronics and coding.

Simply go to www.tinkercad.com, create an account and start tinkering.

In the 3D Design mode, 3D shapes and objects can be selected and dropped onto a surface called a Workplane.

The 3D shapes can be modified and combined. Tinkercad encourages creativity, design skills, logical thinking and problem-solving.

3D models designed in Tinkercad can be printed using a 3D printer.

## Vocabulary

| | |
|---|---|
| **Solar Power** | Using energy from the sun to convert into heat or electricity. How does solar energy work? - BBC |
| **Physical** | Drawing plans by hand. |
| **Digital sketch** | Recording ideas using CAD. |
| **Prototype** | An original model on which later stages or forms are based or developed. |
| **Dimension** | The measure of a size such as length or width. |
| **handle** | A point on a 3D model where it can be modified by clicking and dragging. |
| **object** | A shape or line that can be moved, resized or modified. |
| **Perspective** | In 3D modelling software, a three-dimensional view. |
| **Workplane** | The area used to place objects in Tinkercad. |

## Solar powered Inventions