|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Key Topics and Learning Sequence** | | | | | | |
| **= First Steps** | **= Moving On** | | **= Stretch** | | **= Challenge** | |
| 1. **Recap of 2D shapes** 2. Learn the **names** of 2D shapes      1. Know the **properties** that define 2D shapes 2. Understand what **perimeter** is and how to calculate it 3. Understand what **area** is and how to calculate it 4. Memorise the area **formulae** for 2D shapes | 1. **Properties of 3D shapes** 2. Learn the **names** of 3D shapes      1. Identify **edges, vertices** and **faces,** and explore **Euler’s Formula** 2. Draw **nets, plans and elevations** of 3D shapes, and 3D shapes from their nets 3. Use **isometric paper** to draw 3D shapes 4. Problem solve using the properties of 3D shapes | 1. **Surface Area** 2. Find the surface area by **counting squares** on faces 3. **Use a net** to find the surface area of a 3D shape 4. Find the surface area of a **cube or cuboid** 5. Find the surface area of any **prism** 6. Find surface areas of shapes such as **spheres, cones, pyramids** 7. Apply your understanding of surface area to problem solve | | **4. Volume**   1. **Count cubes** to find a volume 2. Use the **correct units** for volume 3. Find the **volume** of a **cube or cuboid** 4. Find the volume of a **prism** 5. Use a volume to find a **missing length** 6. Find the volume of **compound shapes** 7. Find the volume of more complex shapes such as **spheres, cones, frustums and pyramids** | | **5. Volume in context.**   1. Solve problems that involve **fractions, decimals, and percentages** 2. Solve problems that involve **standard form** 3. Carry out **algebraic manipulation** in problems with surface area and volume 4. Apply concepts from **ratio, similarity, Pythagoras** to problems involving surface area and volume 5. Understand what **density** is and solve density problems. |
| **How does this unit fit into your mathematical learning journey?** | | | **Further Exploration, Enrichment and Cultural Capital** | | | |
| You first learn about **area and perimeter** in **Year 8** and take this further in **Year 9** with **circles and also in work on Similarity and Pythagoras in year 9**. In this unit, we take these ideas and apply them in 3-dimensions and learn about what volume means and how to find volumes in different contexts as well as exploring surface areas of 3D shapes . | | | **Reading:**The Elements of Euclid  **Enrichment:**  Research Euler and his contribution to maths.  **Cultural Capital:**  Visit the Science Museum or experience the IMAX cinema in 3D. | | | |

**LPS Mathematics: Year 10 Unit 5 – From 2D to 3D**

**Enquiry Question:** “**What is the link between edges, faces and vertices in a 3D shape?”**

**Enquiry Question:** What is the link between edges, faces and vertices in a 3D shape?

**Date: Initial Thoughts:**

**………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………**

**Date: New Thoughts:**

**…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………**

**Date: Final Thoughts:**

**………………………………………………………………………………………………………………………**

**………………………………………………………………………………………………………………………**

**………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………**

**………………………………………………………………………………………………………………………**