#5 Three-Dimensional Geometry
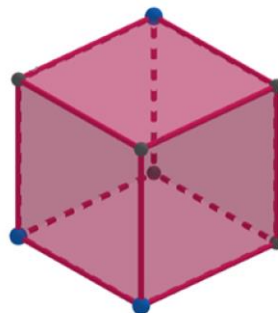
Age: 8 – 11   12 – 15   16- 18

In geometry, a three dimensional shape can be defined as **a solid figure or an object or shape that has three dimensions**— length, width, and height. Unlike two dimensional shapes, three-dimensional shapes have height, which is the same as thickness or depth.
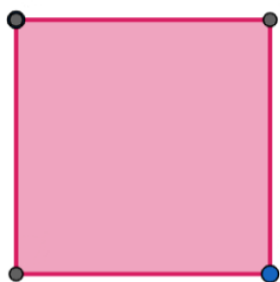
2D square   **3D square**

In three-dimensional geometry, we calculate the amount of cubic units required to fill an object. Thus, we can determine how much space an object takes up using the concept of **volume**.

Surfaces are like the outer skin of three-dimensional objects. They can be flat, curved, or a combination of both. Surfaces help define the shape of an object and its boundaries.

A **cube, rectangular prism, sphere, cone, and cylinder** are the basic three-dimensional figures we see around us.

We can use **coordinates** to locate points in three-dimensional space. Instead of just using two numbers like in a flat plane, we need three numbers (x, y, and z) to locate a point along the three axes of a three-dimensional coordinate system. This allows us to precisely describe the position of objects in space.

To view the Augmented Reality (AR) content associated with this case-study, please download the Zappar App on your mobile device (AppStore/ Google Play) and point it toward this flyer. Enjoy and have fun learning!
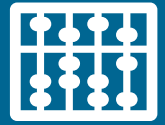
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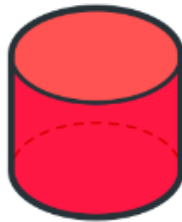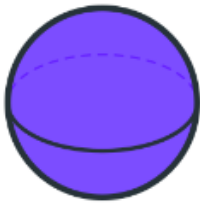Zap the code to explore the figures!

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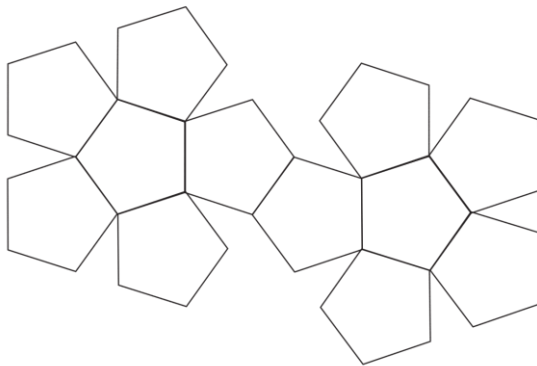Project No 2022-1-PL01-KA220-SCH-000087644

Take the AR-based Quiz below to test your knowledge on three-dimensional geometry.

1) Which of the following 3D figures is a cylinder?

2) Here is the net of a 3D shape. Can you identify which shape it will form when folded?

Tetrahedron

Cube

Octahedron

Dodecahedron

3) Solve this riddle: "My faces are all the same, curved and smooth, I have no vertices or edges, just surfaces that move. Who am I?"
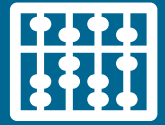
Triangle   Cylinder

Sphere

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Zap the code with the Zappar app to do the exercises

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Take on this challenge and create your own three-dimensional geometric shapes!

You can start by creating basic shapes visualizing their edges, vertices and faces. Then, try creating more difficult figures combining different shapes, such as creating a pencil with a 3D prism and a cone.

By exploring different shapes and combinations, you will be able to think from multiple angles, encourage your artistic development and improve your physical awareness. It's also a fun way to familiarise yourself with geometry!

Zap the code with the Zappar app to learn more!

Tip: Use the Geogebra 3D Calculator

Geogebra is an online platform for math education that includes graphs, visual representations and a calculator.

Geogebra 3D Calculator will help you explore and learn more about 3D geometry in a fun and interactive way.

Geogebra 3D Calculator: https://www.geogebra.org/3d

Good luck exploring three-dimensional geometry through this challenge!

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