Attachment 3: 3D Shapes lesson plan and worksheet

Date: 27 April to 30 April	**Year Level:** Grade 6	**Lesson Duration:** 1 hour

Title of Lesson:

3D Shapes

Learning Outcomes and Specific Purpose:

By the end of this lesson students:

- Should be familiar with at least four 3D shapes
- Should understand and be capable of measuring the volume of basic 3D shapes
- Should be able to recognise and name the four shapes that they made in the future
- Should have attempted to make at least 2 3D shapes of their own, and measure their volume
- Should have a greater knowledge on estimation, and be able to compare estimated answers to actual answers
- Should be helpful towards peers and work cooperatively in group work

Links to VELS:

Strand: Physical, Personal and Social Learning
Domain: Interpersonal Development
Dimension: Working in teams

- Students work effectively in different teams and take on a variety of roles to complete tasks of varying length and complexity.
- They work cooperatively to allocate tasks and develop timelines. Students accept responsibility for their role and tasks.
- They explain the benefits of working in a team.
- They provide feedback to others and evaluate their own and the team's performance.

Strand: Physical, Personal and Social Learning
Domain: Personal Learning
Dimension: The individual learner

- Students identify, with support, their preferred learning styles and use strategies that promote learning.
- They monitor and describe progress in their learning and demonstrate learning habits that address their individual needs.
- They seek and respond to teacher feedback to develop their content knowledge and understanding.
- They identify and explain how different perspectives and attitudes can affect learning.
- They negotiate learning improvement goals and justify the choices they make about their own learning.

- They actively develop, monitor and refine protocols that create a positive learning environment in the classroom.

Strand: Physical, Personal and Social Learning
Domain: Personal Learning
Dimension: Managing personal learning

- Students develop and implement plans to complete short-term and long-term tasks within timeframes set by the teacher, utilising appropriate resources.
- They undertake some set tasks independently, identifying stages for completion.
- They describe task progress and achievements, suggesting how outcomes may have been improved.
- They persist when experiencing difficulty with learning tasks.
- They seek and use learning support when needed from peers, teachers and other adults. They practise positive self talk.
- They demonstrate a positive attitude to learning within and outside the classroom.

Strand: Discipline-Based Learning
Domain: Mathematics
Dimension: Number

- They use estimates for computations and apply criteria to determine if estimates are reasonable or not.

Strand: Discipline-Based Learning
Domain: Mathematics
Dimension: Space

- Students classify and sort shapes and solids (for example, prisms, pyramids, cylinders and cones) using the properties of lines (orientation and size), angles (less than, equal to, or greater than 90°), and surfaces.
- They create two-dimensional representations of three dimensional shapes and objects found in the surrounding environment.
- They develop and follow instructions to draw shapes and nets of solids using simple scale.
- They describe the features of shapes and solids that remain the same (for example, angles) or change (for example, surface area) when a shape is enlarged or reduced.

Strand: Discipline-Based Learning
Domain: Mathematics
Dimension: Measurement, chance and data

- Students use metric units to estimate and measure length, perimeter, area, volume.
- They measure as accurately as needed for the purpose of the activity.
- They convert between metric units of length.

Strand: Interdisciplinary Learning
Domain: Communication
Dimension: Listening, viewing and responding

- Students ask clarifying questions about ideas and information they listen to and view.
- They develop interpretations of the content and provide reasons for them.
- They explain why peers may develop alternative interpretations.
- They describe the purpose of a range of communication strategies, including non-verbal strategies, and evaluate their effectiveness for different audiences.

Prerequisite knowledge/concept/skills/vocabulary required:

How does it link to previous lessons?

- Group work
- Work on volume/area
- Learning about 3D shapes

Grouping/s and Physical Space:

The classroom is already grouped into four tables. The children will work at the tables that they are already sitting at. One activity will be placed on each table. The activities will rotate around over four lessons.

Equipment/Resources Required:

- Glue
- Sticky tape
- Scissors
- Nets of four 3D shapes: cube, cuboid, pyramid, triangular prism (attached)
- Cardboard for students to make their own nets
- Pens, pencils, rulers, erasers
- Worksheet (attached)

Lesson Structure:

Students are to follow the instructions on the worksheet.

Monitoring of Student Learning:

What I will be looking out for during the lesson:

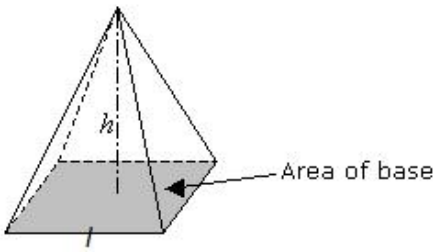
- Were students able to follow instructions?
- Were students capable of making the 3D shapes out of the nets provided?
- Were students' estimations of volume close to the actual volumes?
- Were students' estimations more accurate the more the activity went on?
- Were students able to use the information they had learned about nets and 3D shapes to make their own nets and 3D shapes?

3D Shapes

Look at the nets of various 3D shapes on your table. Cut out the nets. Fold along the lines to make the 3D shape, sticking it together with glue or sticky tape. Label each one with what shape it is, as well as with your name.

Estimate the volume of each shape, and then measure their actual volume using the formulas below. How accurate were your estimations?

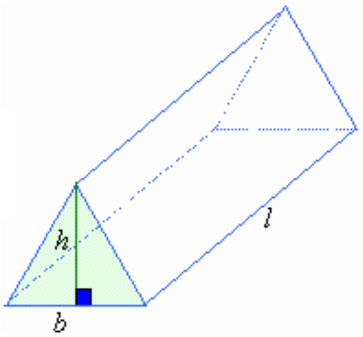
Once you have made the shapes out of the nets provided, try to make your own nets for at least two 3D objects. Measure their volume.



Volume of a Pyramid

V = $\frac{1}{3}$ x area of base x height

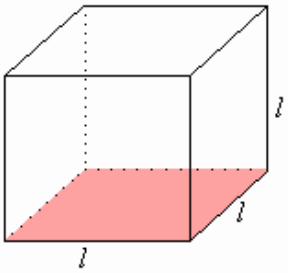
V = ($\frac{1}{3}$ x l x w) x height



Volume of a Triangular Prism

V = area of base x length

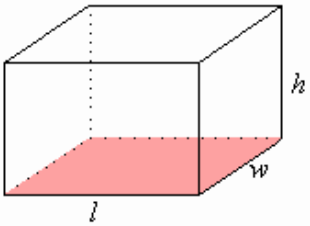
V = ($\frac{1}{2}$ x b x h) x length



Volume of a Cube

V = length x length x length

V = l x l x l



Volume of a Rectangular Prism (Cuboid)

V = area of base x height

V = length x width x height

V = l x w x h