SCHOLAR Lesson Outline

curriculum for excellence

subject: Maths

Title: Volumes of Solids

level: National 5

Activity type	classroom ✓ homework ☐ independent ☐ other ☐ learning
Activity objectives(s)	To be able to calculate volumes of cones, pyramids, spheres and prisms
Activity resources(s)	This lesson is best done with an interactive whiteboard and a set of laptops or in a computer suite.

Delivery mode	teacher led ✓ student led ☐	Collaboration type	individual ✓ pairs ✓ groups ☐

Task description	Whole Class Lesson
	 Display Nat 5 Unit 1 Topic 4.1 on the board
	 Work through the activity Volumes: Cone, Pyramid, Sphere & Prism
	    - The volume of a cylinder is revisited
	    - The volume of a cone is investigated through pouring cones into a cylinder of the same height
	    - The volume of a sphere is investigated through pouring cones into a sphere of the same height
	    - The volume of a pyramid is derived by identifying a cone as a special pyramid
	    - The volume of a prism is derived by identifying a cylinder as a special prism
	
	 Students should copy the formulae given in the key point
	
	 Computer Task
	 Five worked examples and five questions follow
	 Students should be encouraged to show all their working along with diagrams in their jotters before entering answers
	
	 Students can then attempt the Volumes of standard solids exercise which has 5 questions and has a possible 17 marks

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Differentiation (Alternative use)	Most students will cope with cones, spheres and pyramids but the less able may struggle with prisms. If students get stuck you could stop the class and go over example 5 & question 5 on the board. The exercise gives steps for pyramids and prisms to help the less able.
Hints & Tips	Students should have a scientific calculator for this topic so give them prior warning. Students will be given partial help if they enter the wrong answer to the questions which follow the examples. This is to help them identify where they have gone wrong. Reveal is available but only gives the answer without the working so it is a good idea to check what pupils are putting down on paper. Questions 1, 2 & 3 in the exercise test the volume of a cylinder, cone & sphere and require answers rounded to 1 decimal place, 2 decimal places and the nearest whole number. If pupils reveal the answers they get 0 marks. Questions 4 & 5 test the volume of a triangular prism and a pyramid and require answers rounded to significant figures. These questions give pupils a bit of help if required in the shape of steps whilst still allowing them to get full marks at this stage.
Notes	This Lesson may take the whole period. It is expected that students will be able to round to a whole number and a given number of decimal places or significant figures. Rounding can be revised from Nat 5 Unit 1 Topic 1.1 Prior knowledge of areas of rectangles, circles and triangles and volumes of cylinders are required for this topic.