

Sculpture Project: - Where the art meets the math

Overview: If you choose this project you will have to....



1. Find 5 different recycled objects
2. Find the surface area and volume of each object (formulas are provided)
3. Put them together (wire, hot glue, coat hangers, etc) to form a pleasing sculpture or mobile
4. Calculate the surface area and volume of the finished sculpture.



Directions:

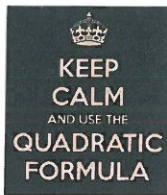
Determine the Objects.

1. All items must be used – or recycled
2. There must be at least 3 different types of objects (cubes, cones, cylinders, prisms, pyramids)

Find the area and volume. (formulae follow on the next page)

1. Use the formulae and chart on the next page to calculate and record the surface area and volume of each item.
2. All items must be measured using the metric system
3. Surface area -
 - a. The surface area of an object is the summation of the areas of each face – or the entire surface. Thus the surface area of a prism would be the addition of the areas of the top, the bottom, the front, the back, the right side, and the left side. All surface areas can be found this way – just make sure you don't leave out any faces.
 - b. Surface area (SA) is expressed in square units
4. Volume –
 - a. The volume is the measure of the capacity of an object. Volume is the total of the cubic units the object could hold.
 - b. Volume (V) is expressed in cubic units.

Formulae:



Area Formulae

Triangle $\frac{1}{2}bh$

Rectangle bh or lw

Trapezoid $\frac{1}{2}(b_1 + b_2)h$

Circle πr^2

Parallelogram bh

Square s^2

* in these formulae, h is the height (which is always measured at a right angle) of the face and b is the base measurement

* SA of a cone is $\pi r^2 + \pi rs$ – where r is the radius and s is the slant height of the cone (note that πr^2 is the area of the base of the cone and the πrs is the lateral - or side - area)

* SA of a sphere is $4\pi r^2$

Volume Formulae

Rectangular or square Prism lwh

Cylinder $\pi r^2 h$

Non-rectangular prism Bh , where B is the area of the base

Sphere $(\frac{4}{3})\pi r^3$

Pyramid $\frac{1}{3}Bh$ where B is the area of the base

Cone $\frac{1}{3}\pi r^2 h$

* in these formulae, h is the height of the object



My Objects:

Type of object and measurements – you might want to sketch the object and show the measurements of each part	Surface Area (be sure to label this correctly)	Formulae Used (list all formulae used for SA of this object)	Volume (be sure to label this correctly)	Formulae Used (list all formulae used for V of this object)
1.				
2.				
3				

4				
5				

My final answers:

1. Total Surface Area _____

This was computed by....

2. Total Volume _____

This was computed by....

Deliverables: (the work you need to hand in)

1. The chart and total SA and V – pages 3 and 4 (stapled together) - you can ignore the wire or hangers etc. **BUT** if you have faces glued to other faces make sure you compensate for that in your final calculations.

2. Your sculpture

Make sure your name is on both your written work and your sculpture

If you have any questions you can email Mrs. Breault at jbreault@stmichael.net

Hope you had fun and I've cleared off a shelf in my office for your creations.