Surface Area Worksheet **Answers**
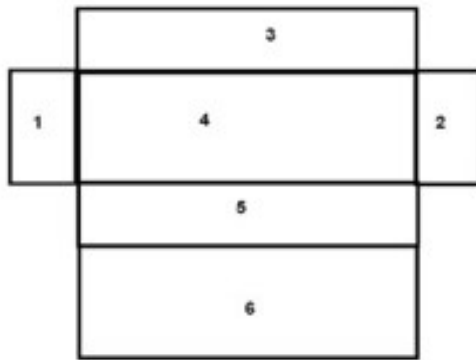
If a rectangular box is opened:
1,2 = base or ends
3,5 = sides
4 = bottom or floor
6 = top or ceiling

Shape	Lateral Surface Area (LSA)	Total Surface Area (TSA)
Cuboid	2height(length + base)	2(lb + bh + lh)=2Bh + (perimeter)(height)
Cube	$4a^2$	$6a^2$
Prism	Base perimeter × Height	LSA + 2 (area of one end)
Cylinder	$2\pi rh$	$2\pi r(r + h)$

1. **Define the following terms:**
    a. lateral surface area - surface area for all sides of a 3D object excluding the base and top sides; part of prism that are not the bases; units are squared (x^2)

    b. total surface area - measure of the *total* area that the surface of a 3D object occupies; units are squared (x^2)

    c. two-dimensional (2D) - flat object having the dimensions of width (x) and height (y) only

    d. three-dimensional (3D) - solid object with dimensions of width (x), height (y) and depth (z)

2. **Draw the geometric shapes for the following objects:**
    a. cuboid - 3D box-shaped object; has six rectangular faces at right angles to each other; sometimes called a rectangular prism because it has the same cross-section along a length

    b. cube - 3D solid; symmetrical three-dimensional shape with six equal squares

    c. prism - 3D solid; same shape at beginning and end (ex. rectangle or triangle) with each end referred to as bases; bases are separated by a height

    d. cylinder - 3D solid; has two equivalent round shapes at either end and two parallel lines connecting the round ends; has 1 curved side but no corners

Show the equation and solving of the following problems:

3. The dimensions of a right rectangular prism are 4 inches by 5 inches by 6 inches. What is the surface area, in square inches, of the prism?

S.A. = Base Perimeter x Height + 2 (Area of Base)
S.A. = (4+4+5+5) x (6) + 2 (4x5)
Answer = 148 in^2 (955cm^2)

4. A cube has a surface area of 54 square meters. What is the volume, in cubic meters, of the cube?

6A = 54 square meters (m^2)   V= l x w x h
A = 54 m^2 /6   V= 3m x 3m x 3m =27m^3
A = 9 m^2
A = l x w   where for a cube, l = w = h
A = l^2 = 9 m^2
l = square root of 9
l = w = h = 3 meter per side

5. A cubic prism has the dimensions of 4 inches by 4 inches and a height of 10in. What is the surface area?
S.A. = 2B + (perimeter)(height) = 2(4 x 4) + (4 x 4) (10) = 2(16) + (16)(10) = 32in^2 +160in^2 = 192in^2 (1239cm^2)

6. Find the surface area of a right triangular prism with a sides of 3in. x 4in. x 5in. and a height of 12in.
S.A. = 2B + (perimeter)(height) = 2(1/2bh) + ph = 2(1/2 x 3 x 4) + (3+4+5)(12) = 12 + (12)(12) = 156in^2 (1006cm^2)

7. What is the surface area of a cylinder with a radius of 3in. and a height of 6in.?
S.A. = 2πr(r + h) = 2 (3.14)(3) x (3+6)
S.A. ≈ (169 in^2)