Chapter 5: Surface Area and Nets

**Views of 3D Objects**

To describe a 3 dimensional object, you need a **minimum of 3 views**:

1. One side
2. Top or bottom
3. Front or back

You need to be able to:

 -**draw 3 different views from looking at an object**

Ex. Choose an object in the room and draw the SIDE, TOP and FRONT view

 TOP = SIDE = FRONT =

 -**sketch / build an object in 3D from looking at 3 views**

Ex. Build / Draw the 3D object that would have the following views:

 TOP = SIDE = FRONT=

 **-predict what will happen to the views if the object is rotated**

Ex. Imagine the object above is rotated 90 clockwise (turn to the left), and then draw the 3 views. Check by actually building and turning the object.

**Nets of 3D Objects**

**Nets** are **flat drawings** that you could fold up (without any overlap) to build an object.

Different nets can be made for the same object.

Creating nets can help you to find the **surface are**a of 3D shapes.

You need to be able to make a net for the following 3D shapes:

* Cube
* Rectangular prism
* Triangular prism
* Cylinder

**Surface Area**

The surface area is the **2D (flat) area** of the outside of a shape.

You can **add up** all the areas of **the faces** to find surface area.

**Faces of Objects:**

* ***Cube*** – **6** **faces**: all square (all the same)
* ***Rect. Prism*** – **6 faces**: 2 ends (rect. Front/back), 2 sides (rect. Left/right), 2 sides (rect. Top/ bottom)
* ***Triang. Prism*** – **5 faces**: 2 ends (triangles), 3 sides (rectangles – could all be different!)
* ***Cylinder*** – **3 faces:** 2 ends (circles), 1 side (rectangle)*\*tricky - uses circumference of circle!*

**Formulas for Faces:**

 ***Area Square*** – side x side

 ***Area Rectangle*** – length x width

 ***Area Triangle*** – (base x height) ÷ 2

 ***Area Circle*** – πr2

 ***Circumference of Circle*** – πd

***Examples***- Find the surface area of the following, using the correct formulas from above and then adding up all the faces:

CUBE

Step 1 – find **area of one face**

Step 2 – all **6 faces are equal**, so add up all 6 to find total surface area. (or times by 6)

RECT. PRISM

Step 1 – find the area of the front (rectangle).

Step 2 – find the area of the right side (rectangle).

Step 3 – find the area of the top (rectangle).

Step 4 – add up the 6 faces. (Front, back, right, left, top, bottom)

TRI. PRISM

Step 1 – find the area of the triangle (end).

Step 2 – find the area of the left side (rectangle).

Step 3 – find the area of the right side (rectangle).

Step 4 - find the area of the bottom (rectangle).

Step 5 – add up the 5 faces (front end, back end, left, right, bottom)

CYLINDER:

Step 1 – find the area of the circle (end).

Step 2 – find the perimeter of the circle – this will be the width of the rectangle side.

Step 3 – find the area of the side(rect.) using the cylinder height and the circumference of circle.

Step 4 – add up the 3 faces (front end, back end and rectangle side).

Textbook questions:

**3D Views** - P. 168-169

**G – 2, 4, 5, 6**

**B – 2, 4, 5, 6, 9**

**R – 2, 4, 5, 7, 9**

**Nets** - P. 174-175

**G – 3, 4, 7**

**B – 3, 4, 7, 9, 13**

**R – 3, 4, 7, 9, 12, 13**

**Prism SA** - P. 180-181

**G – 3, 5, 10, 11**

**B – 3, 5, 10, 11, 12**

**R – 3, 5, 10, 11, 12, 13**

**Cylinder SA** - P. 186 - 187

**G – 2, 5, 8**

**B – 2, 5, 8, 11**

**R – 2, 5, 8, 11**

Chapter 5 Chapter Review & Practice Test to prepare for test.

**Project – Wrap it up. P. 191.**

Using nets, create a miniature community out of recycled materials (paper, cardboard, etc.). Calculate the surface area of your community, and show all work.

**Criteria:**

* Must **calculate the surface area** for **each community structure created** – **include units** and **show all work!**
* Community structures to include:
	+ **a hospital (3D)**
	+ **a house (3D)**
	+ **a hotel (3D)**
	+ **a school (3D)**
	+ **a restaurant (3D)**
	+ **at least 2 roads (2D)**
	+ **a park (2D)**
	+ **a parking lot (2D)**
* Must include at **least one** building of **each** **3D shape** studied (**cube, rect. prism, tri prism, cylinder)**