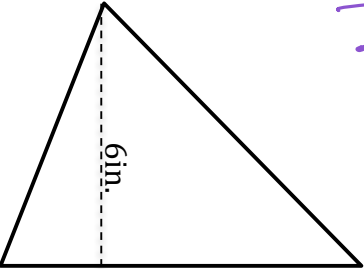**LEARNING OBJECTIVE:** We will find the surface area of three dimensional objects including triangular and rectangular prisms. (G7M3L21)

ACTIVATING PRIOR KNOWLEDGE

We can find the area of rectangles and triangles

$$A = \frac{b \cdot h}{2}$$

6in.

7in.

$$\frac{7 \cdot 6}{2} = 21 \ in^2$$

$$A = b \cdot h$$

7.5cm

11cm

$$11 \cdot 7.5$$

$$A = 82.5 cm^2$$

CONCEPT DEVELOPMENT

A **right** **triangular prism** is a three-dimensional object that has a triangle top and bottom. Its three other sides are rectangles.

A **right** **rectangular prism** is a three-dimensional object that has rectangles on top and bottom. Its four other sides are also rectangles.

Base faces: the top and the bottom of a right prism are called the base faces.

triangle
rectangle
hexagon
etc.

Lateral faces: The rectangles that form the 'sides' are lateral faces.

base faces
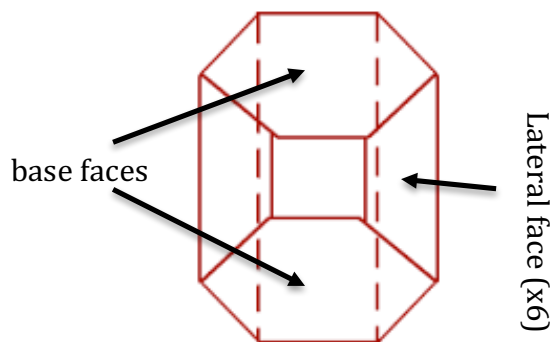
Lateral face (x6)
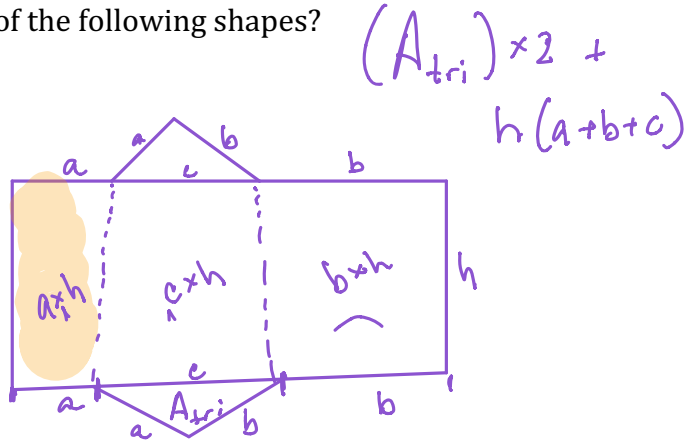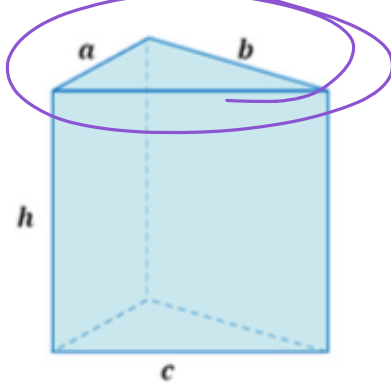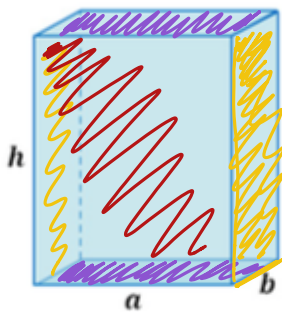
What is a **net**? How can it help?

2 Dimensional "flat" version of the surfaces
of a 3 Dimensional object

How would you find the surface area of the following shapes?

$(A_{tri}) \times 2 +$

$h(a+b+c)$

$a \times h$ $c \times h$ $b \times h$
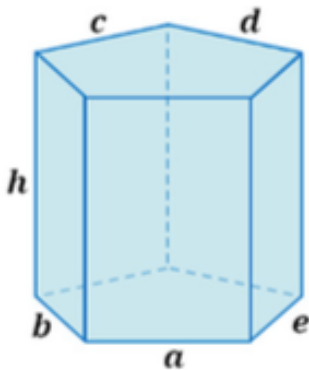
A_{tri}

$(a \times h) + (b \times h) + (c \times h)$

$h(a+b+c)$

$A_{base} = a \cdot b \times 2$

$h \cdot b \quad \times 2$

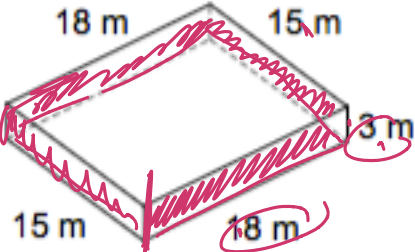$h \cdot a \quad \times 2$
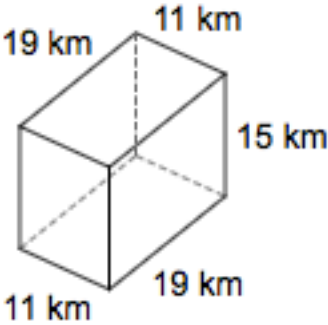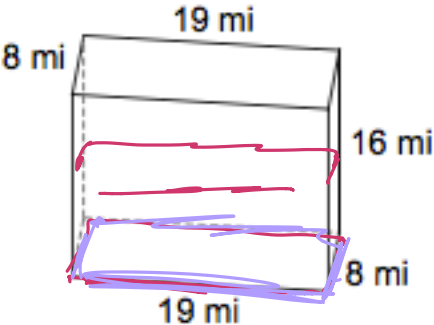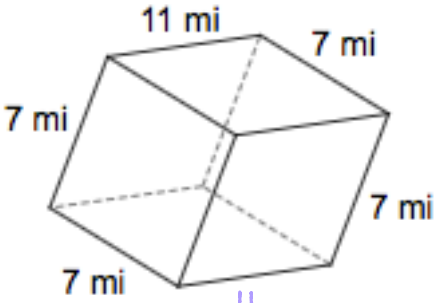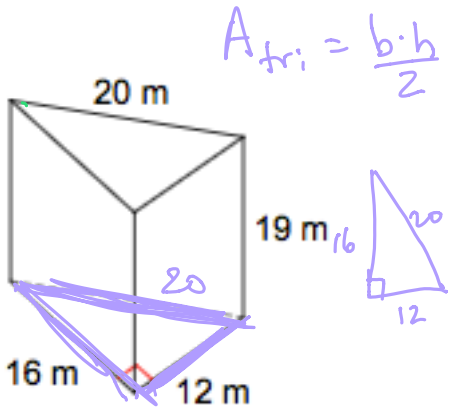
$h(2a + 2b) = A_{lateral\ faces}$

GUIDED PRACTICE

Steps for Finding the Surface Area of a Right Prism
1. Identify all relevant measurements.
2. Identify the shape of the base. Find the area of the base faces.
3. Find the area of the lateral faces.
4. Add the area of the base faces and the lateral faces.

RECTANGULAR   PRISM

18 m   15 m

3 m

15 m   18 m

$A_{Base} = 18 \times 15 = 270 m^2 \times 2 = 540 m^2$

h=3
Perimeter = 15+18+15+18 = 66
$A_{faces} = 3 \times 66 = 198 m^2$

270
270 540
45   198
54
45
54

SA = 738 m^2

---

19 km   11 km

15 km

11 km   19 km

$1318 Km^2$

---

19 mi
8 mi

16 mi

8 mi
19 mi

Base = 19×8 = 152 × 2 =   304 sq.mi.

h=16

Perim 19+8+19+8 = 54
Area of sides = 16×54 = 864 sq. mi.
         304 + 864 = 1168 sq.mi.

---

11 mi   7 mi

7 mi

7 mi

7 mi   11

Base 7×11 = 77 × 2 = 154 sq.mi.

h=7
Perimeter of base= 7+11+7+11 = 36
Area of sides   36× 7 = 252 sq. mi.

Surface Area 252+154 = 406 sq.mi.

$A_{tri} = \frac{b \cdot h}{2}$

20 m

19 m $_{16}$ 20

20

16 m   12 m
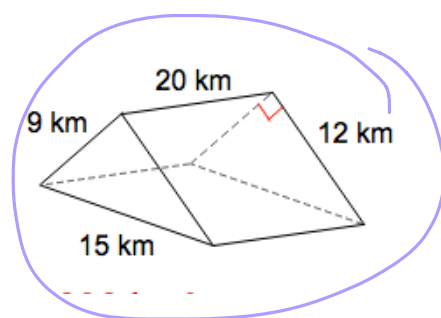
$A_{tri} = \frac{1}{2}(16 \cdot 12) = 96 \times 2 =$ 192 sq. meters

$h = 19$

Perim $= 20 + 12 + 16 = 48$

$A_{sides} = 19 \times 48 =$ 912 sq. meters

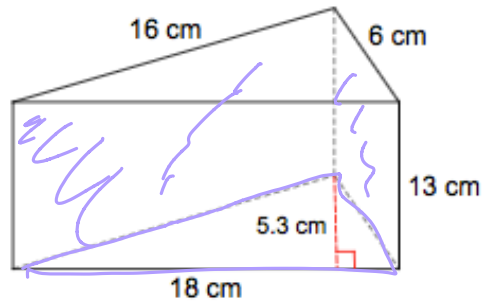SA $= 192 + 912 =$ $\boxed{1104 \ m^2}$

---

20 km

9 km   12 km

15 km

Area $\frac{9 \cdot 12}{2} = 54 \times 2 = 108 \ km^2$
Δ

$h = 20$

Perim $= 9 + 12 + 15 = 36$

$A_{sides} = 720 \ km^2$

SA $= 108 + 720 = \boxed{828 \ km^2}$
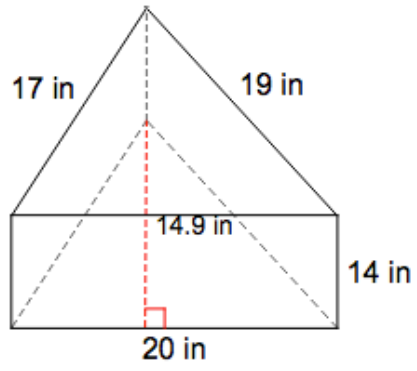
---

16 cm   6 cm

13 cm

5.3 cm

18 cm

$6 + 18 + 16 = 40$ cm (perim)

$h = 13$

$A_{sides} = 13 \times 40 = 520$

$A_{tri} \ \frac{1}{2}(18 \cdot 5.3) = 47.7 \times 2 = 95.4$

---

17 in   19 in

14.9 in

14 in

20 in

7.5 cm

7 cm

9 cm

12.9 cm

4 cm

12 cm

10 cm

15 cm

26 cm

9.5 cm
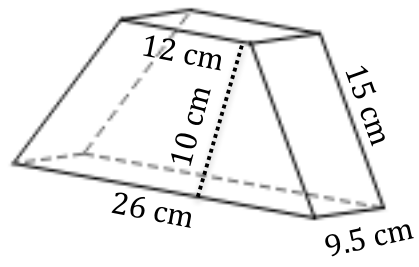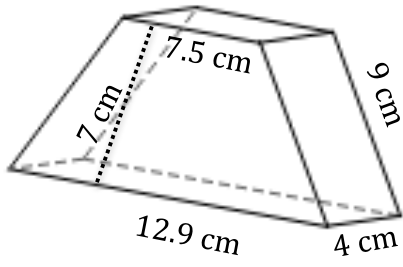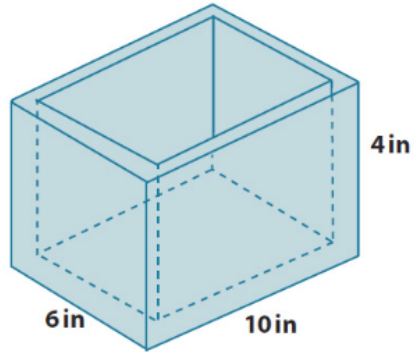
There are 13 cubes glued together forming the solid in the diagram. The edges of each cube are $\frac{1}{2}$ inch in length. Find the surface area of the solid.
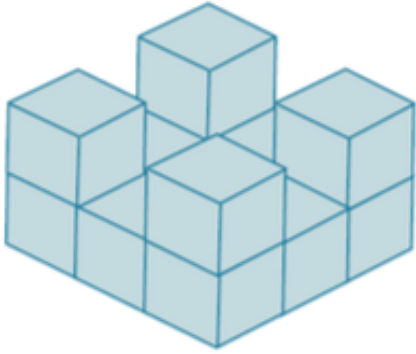
Find the total surface area of the wooden jewelry box. The sides of the jewelry box and the bottom of the box are all $\frac{1}{4}$ inch thick.

INDEPENDENT PRACTICE

Kuta software sheet for independent practice. Don't go too heavy on lesson 22.

CLOSURE

NOTES

This maps to lesson 21 and part of 22 from module 3, Grade 7. Will also borrow from lesson 23 and 24 from Module 6.