# Curriculum Outcome

(N5) Determine the square root of positive rational numbers that are perfect squares.

(N6) Determine an approximate square root of positive rational numbers that are non-perfect squares.

(SS2) Determine the surface area of composite 3-D objects to solve problems

(N4) **Explain and apply the order of operations, including exponents, with and without technology.**
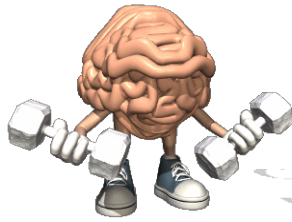
Grade 9 Warm Up
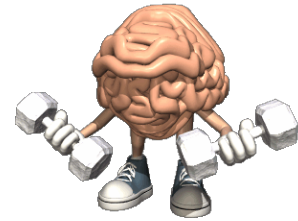
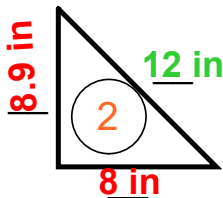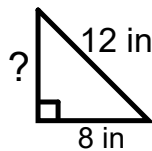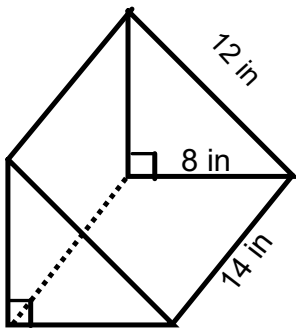Remember: $c^2 = a^2 + b^2$

$b^2 = c^2 - a^2$

$b^2 = c^2 - a^2$

$b^2 = 12^2 - 8^2$

$b^2 = 144 - 64$

$b^2 = 80$

$\sqrt{b^2} = \sqrt{80}$

$b = 8.9$

12 in
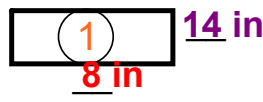
8 in

? 12 in

8 in

14 in

8.9 in **12 in** ② **8 in**

$A_{tri} = \dfrac{b \times h}{2}$

$A_{tri} = \dfrac{8 \times 8.9}{2}$

$A_{tri} = \dfrac{71.2}{2}$

$A_{tri} = 35.6$

$2A_{tri} = 71.2$

① 14 in **8 in**

$A_1 = b \times h$

$A_1 = 8 \times 14$

$A_1 = 112$

① 14 in **12 in**

$A_2 = b \times h$

$A_2 = 12 \times 14$

$A_2 = 168$

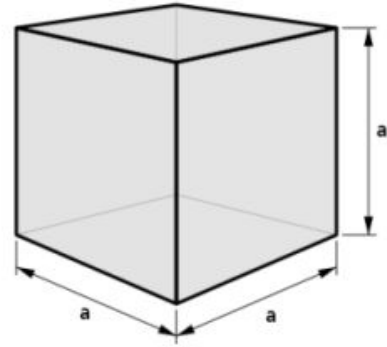① 14 in **8.9 in**

$A_3 = b \times h$

$A_3 = 8.9 \times 14$

$A_3 = 124.6$

$Sa = 2A_{tri} + A_1 + A_2 + A_3$

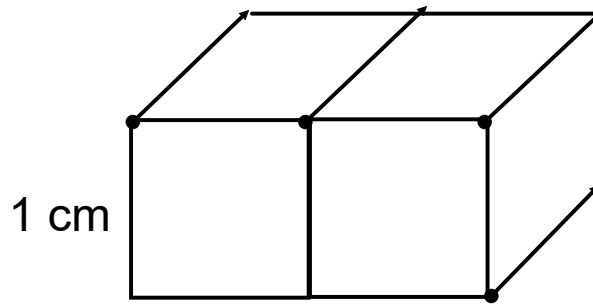$Sa = 71.2 + 112 + 168 + 124.6$

$Sa = 475.8 \text{ in}^2$

2

Cubes

Number of Faces: 6

What is the shape of the face? Square

Surface area of a cube

= 6 x (Area of one face)

What happens here?

1 overlap= 2 faces

1 cm

How many visible faces?   10

Area of a face
$A = b^2$
$A = 1^2$
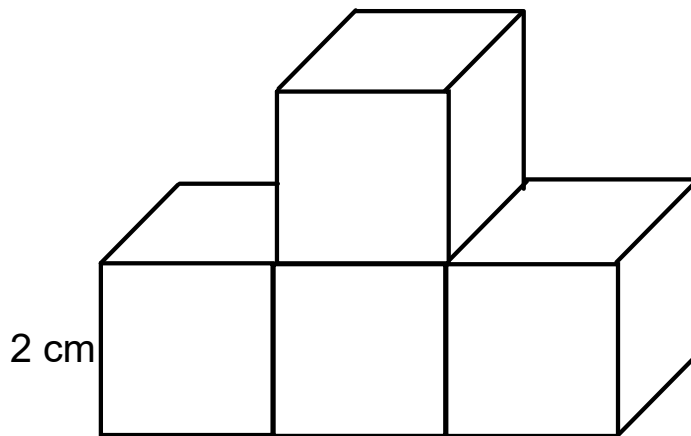$A = 1 \text{ cm}^2$

___2___ Cubes   X   __6__ Faces

1 overlaps = 2 overlap faces

= __12__ Faces - __2__ overlap faces

= __10__ Faces Showing

Tsa = Faces Showing x Area of one face

Tsa = 10 faces x 1cm^2

Tsa = 10 cm^2

2 cm

Area of a face
$$A = b^2$$
$$A = 2^2$$
$$A = 4 \text{ cm}^2$$

__4__ Cubes X __6__ Faces

3 overlaps = 6 overlap faces

= __24__ Faces - __6__ overlap faces

= __18__ Faces Showing

Tsa = Faces Showing x Area of one face

Tsa = 18 faces x 4cm^2

Tsa = 72 cm^2

You try!!!

3 cm

3 cm

3 cm

3 cm

3 cm

3 cm
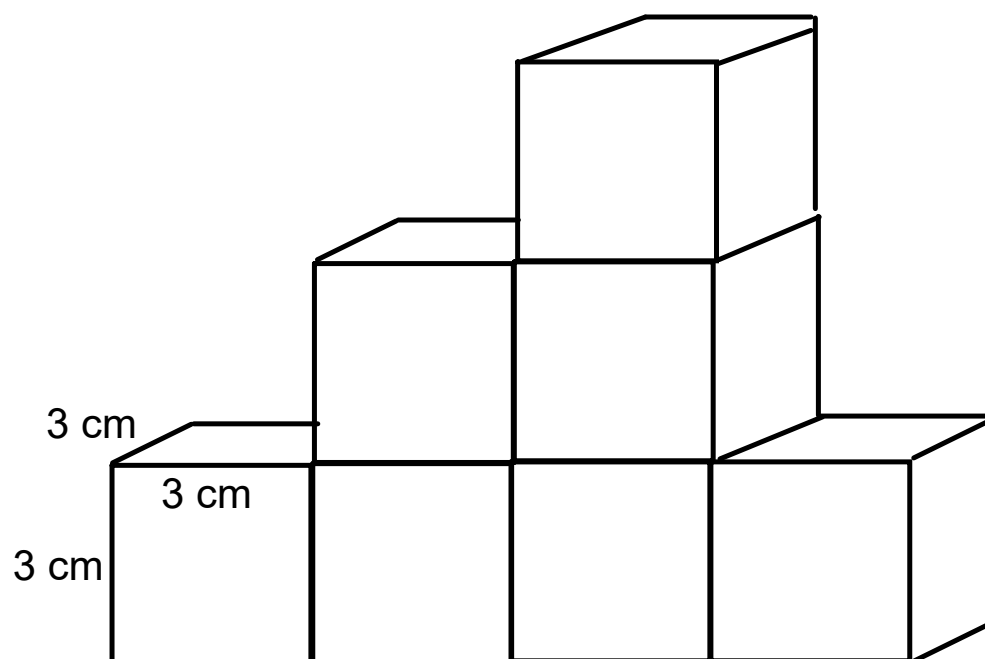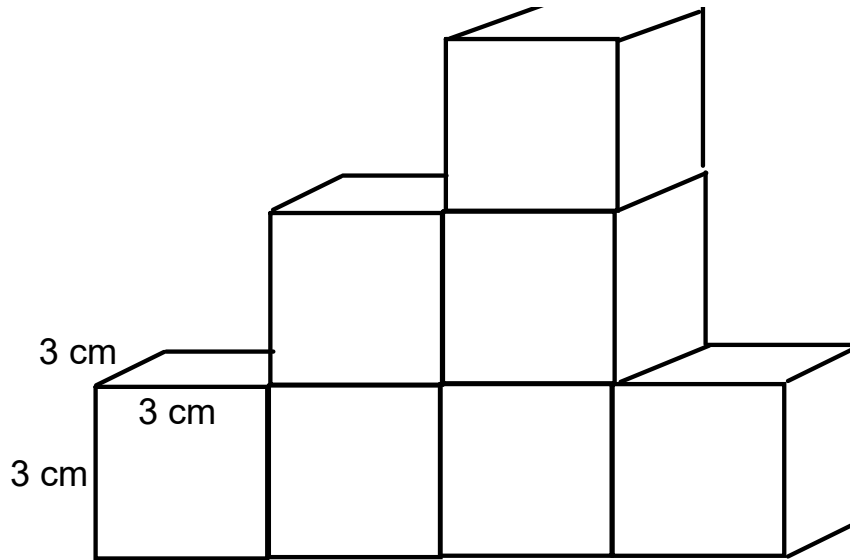
$$A = b^2$$
$$A = 3^2$$
$$A = 9 \text{ cm}^2$$

__7__ Cubes   X   __6__ Faces

7 overlaps = 14 overlap faces

= __42__ Faces - __14__ overlap faces

= __28__ Faces Showing
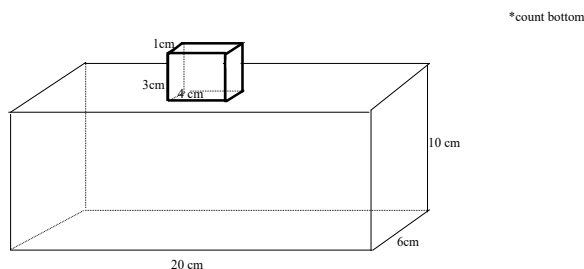
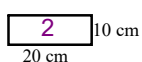Tsa = Faces Showing x Area of one face

Tsa = 28 faces x 9cm²

Tsa = 252 cm²

Determine the surface area of the composite object.

What effect does the overlap have on the calculation of the surface area?

*count bottom

1cm
3cm
4 cm
10 cm
6cm
20 cm

STEP 1: Calculate the surface areas of the LARGER rectangular prism

<u>20</u>, <u>6</u>, <u>10</u>

| 2 | 10 cm |
20 cm

A= b x h
A= 20cm x 10cm
A= 200 cm^2

2A= 400 cm^2

| 2 | 10 cm |
6 cm

A= b x h
A= 6cm x 10cm
A= 60 cm^2

2A= 120 cm^2

| 2 | 6 cm |
20 cm
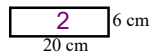
A= b x h
A= 20cm x 6cm
A= 120 cm^2

2A= 240 cm^2

SA_{big}= 400 $_{cm^2}$ +120 $_{cm^2}$ + 240 $_{cm^2}$

SA_{big}= 760 $_{cm^2}$

Step 2: Calculate the surface areas of the SMALLER rectangular prisms

<u>3</u>, <u>4</u>, <u>1</u>
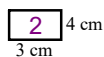
| 2 | 4 cm |
3 cm

A= b x h
A= 3cm x 4cm
A= 12 cm^2

2A= 24 cm^2

| 2 | 1 cm |
4 cm

A= b x h
A= 4cm x 1cm
A= 4 cm^2

2A= 8 cm^2

| 2 | 1 cm |
3 cm
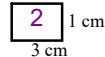
A= b x h
A= 3cm x 1cm
A= 3 cm^2

2A= 6 cm^2

$SA_{smaller}$= 24 $_{cm^2}$ + 8 $_{cm^2}$ + 6 $_{cm^2}$

$SA_{smaller}$= 38 $_{cm^2}$

Step 3: Identify the over lap (Hint: Always on your smaller shape)

| 2 | 1 cm |
4 cm

Step 4: Calculate TSA (**T**otal **S**urface **A**rea)

TSA = SA_{big} + SA_{small} - Overlap Area

TSA = 760 $_{cm^2}$ + 38 $_{cm^2}$ - 8 $_{cm^2}$

TSA = 760 $_{cm^2}$ + 38 $_{cm^2}$ - 8 $_{cm^2}$

TSA = 790 $_{cm^2}$
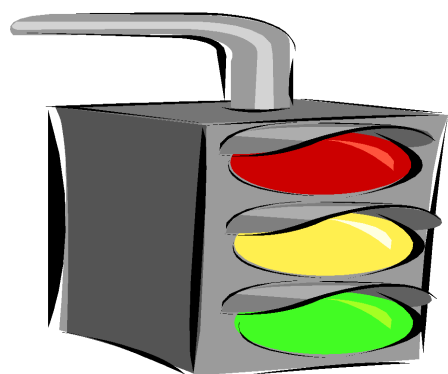
page 30 & 31

questions
4abde,8abc