

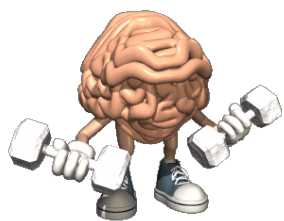
Curriculum Outcome

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

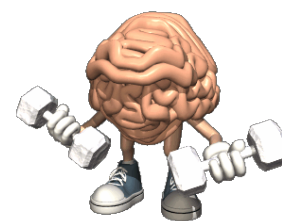
(N6) Determine an approximate square root of positive rational numbers that are non-perfect squares.

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

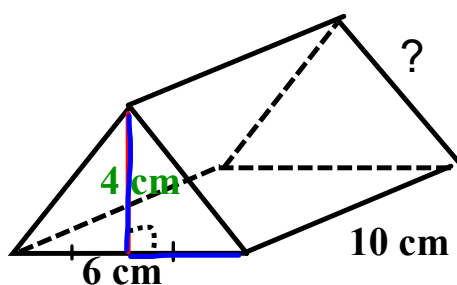
(N4) **Explain and apply the order of operations, including exponents, with and without technology.**



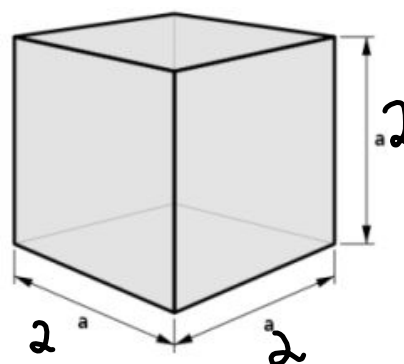
Grade 9 Warm Up



Calculate the total surface area of the following: (Show all work)



Cubes



Number of Faces: 6

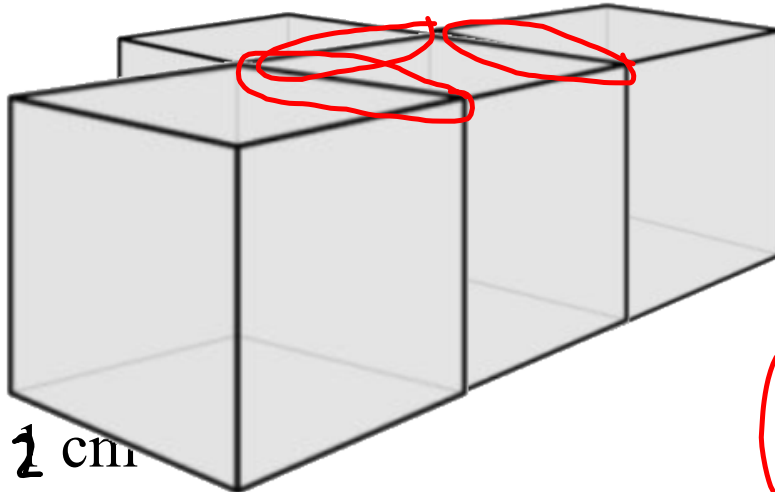
$$A = b \times h$$

$$= 2 \times 2$$

$$= 4$$

$$TSA = 6(4)$$

$$= 24$$



$$A = b \times h$$

$$A = 2 \times 2$$

$$A = 4 \text{ cm}^2$$

3 overlap
↓
6 faces

4 cubes x 6 face

= 24 face

- 6 faces

18 faces

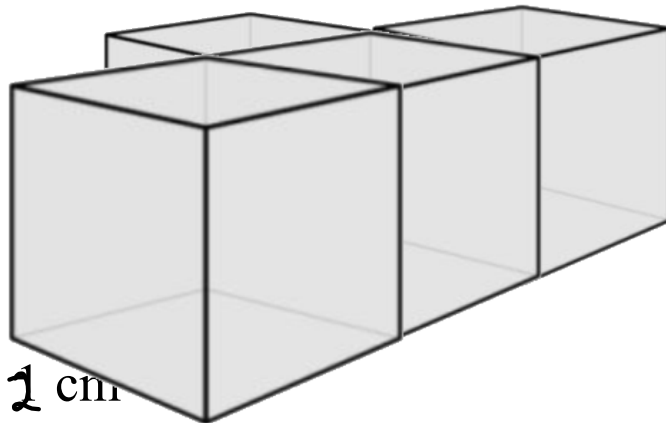
Area →

x 4 cm²

TSA =

72 cm²

Find the Surface Area of the Connected Cubes

Method 1 (Think Individually about each shape)

4 cubes connected

* each have 6 faces **FIND THE AREA OF EACH FACE**

$$4 \times 6 \text{ faces} = 24 \text{ faces}$$

$$\text{face} \rightarrow A = b \times h$$

$$A = 1 \text{ cm} \times 1 \text{ cm}$$

$$A = 1 \text{ cm}^2$$

$$24 A = 24 \text{ cm}^2$$

BUT

WHAT HAPPENS WHEN YOU JOIN FACES?

Do you have to count where they join in "surface area"? NO

But have overlaps

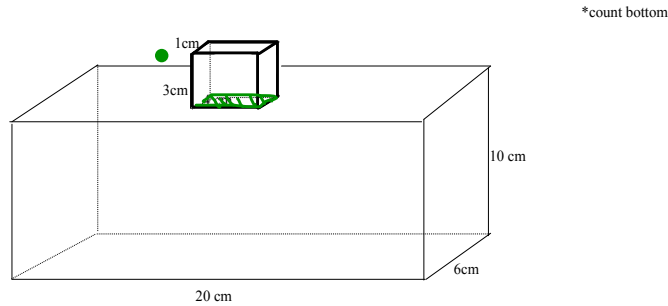
With every connected cube 2 faces disappear

3 overlaps so 6 faces disappear

$$\begin{aligned} \text{Total surface area} &= 24 \text{ cm}^2 - 6 \text{ cm}^2 \\ &= 18 \text{ cm}^2 \end{aligned}$$

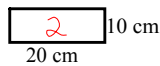
Determine the surface area of the composite object.

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



STEP 1: You can calculate all of the surface areas of the larger rectangular prism

~~surface areas of the larger~~
20, 6, 10

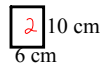


$$A = b \times h$$

$$A = 20 \times 10$$

$$A = 200 \text{ cm}^2$$

$$2A = 400 \text{ cm}^2$$

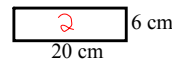


$$A = b \times h$$

$$A = 6 \times 10$$

$$A = 60 \text{ cm}^2$$

$$2A = 120 \text{ cm}^2$$



$$A = b \times h$$

$$A = 20 \times 6$$

$$A = 120 \text{ cm}^2$$

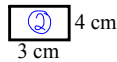
$$2A = 240 \text{ cm}^2$$

$$T_{SA} \text{ Big} = 400 + 120 + 240$$

$$= 760 \text{ cm}^2$$

Step 2: Then calculate all of the surface areas of the smaller rectangular prisms

1, 3, 4

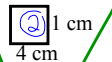


$$A = b \times h$$

$$A = 3 \times 4$$

$$A = 12$$

$$2A = 24 \text{ cm}^2$$



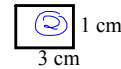
$$A = b \times h$$

$$A = 4 \times 1$$

$$A = 4 \text{ cm}^2$$

$$2A = 8 \text{ cm}^2$$

overlap



$$A = b \times h$$

$$A = 3 \times 1$$

$$A = 3$$

$$2A = 6 \text{ cm}^2$$

$$T_{SA} \text{ without overlap} = 24 + 6 = 30$$

Small

Step 3: Is there an overlap? SO must subtract the "overlapped Areas"
recall overlap involves "two faces" subtract 2 x (overlap area)

Always the faces on your small shape that touches the bigger shape

$$T_{SA} = \text{Big} + \text{Small (without ol)}$$

$$= 760 + 30$$

$$= 790 \text{ cm}^2$$



page 30 & 31

questions
4abde,8a