6th Basic

7th Advanced

Helping With Math

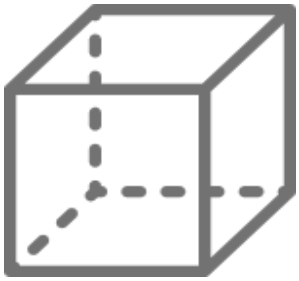
USA GRADES

Surface Area of Solid Shapes

Suitable for students **aged 10-12**

This pack is suitable for learners aged 10-12 years old or 6th to 7th graders (USA). The content covers fact files and relevant basic and advanced activities involving surface area of solid shapes.

Solid figures are three-dimensional objects with length, width, and height. Some of the commonly recognized solid shapes are pyramid, prisms, cone, sphere, etc.



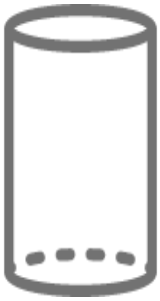
Cube

Prism

Pyramid

Cone

Sphere



Cylinder

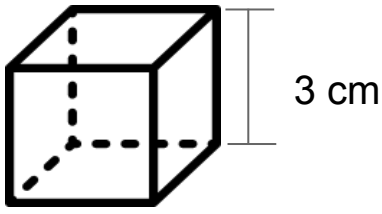
FORMULA OF GETTING THE SURFACE AREA

Surface Area

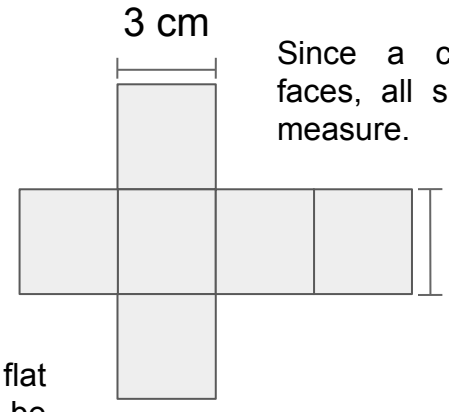
It is a measure of the total area that the surface of the object occupies.

Solid Figure	Formula
Cube (with side length,s)	$6s^2$
Rectangular Prism (with length, l, width, w, and height, h)	2 (lw +lh +wh)
Regular Square Pyramid (with perimeter of the base, P, area of the base, B, and and slant height, s)	½ Ps + B
Cone (with radius, r, and slant height, s)	$\pi r^2 + \pi rs$
Sphere (with radius, r)	$4\pi r^2$
Cylinder (with radius, r, and height, h)	$2\pi r^2 + 2\pi rh$

Examples: Calculate the surface area of the following solid figures.



When you cut a cube and make it a flat figure, the image on the right will likely be the result.



Since a cube has square faces, all sides are 6 cm in measure.

ILLUSTRATIVE EXAMPLES

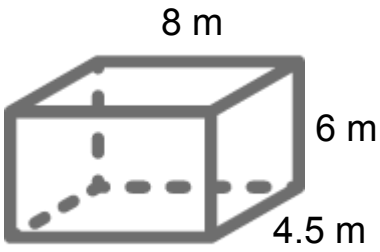
To solve for the cube's surface area use the formula S.A. = $6s^2$,

S.A. = $6(3\text{ cm})^2$

= $6(9\text{ cm})^2$

= **54 cm^2**

S.A. = 2(LH + LW +HW)



L = 8 m H = 6 m W = 4.5 m

S.A. = 2(LH + LW +HW)

= 2[(8 m)(6 m) + (8 m)(4.5 m) + (6 m)(4.5 m)]

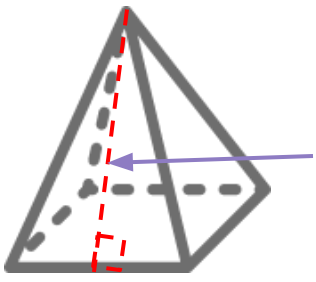
= 2 (48 + 36 + 27) sq.m

= 2 (111) sq. m

= 222 sq. m

Try This!

Note: the altitude is 15 in



Solve for the surface area.

TABLE OF ACTIVITIES

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3	Delivered Goods	
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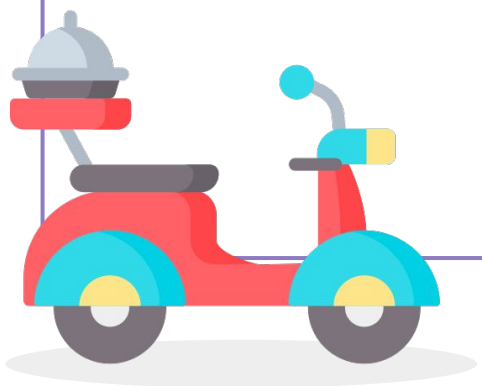
8	Working with Cylinders	
9	Some Solid Moments	
10	Delivered At Home	

THE NEW DELIVERY BOY TASK

G6
Basic

As a newly-hired delivery boy, Danny is tasked to draw different solid figures he knows. If you are Danny, what are the figures that you will draw? Show them below.

Note: Please use pen and ruler for your drawing and remember to put the important parts/labels of each solid figure.

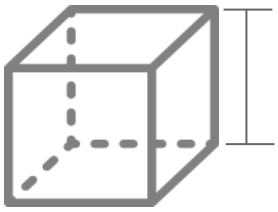


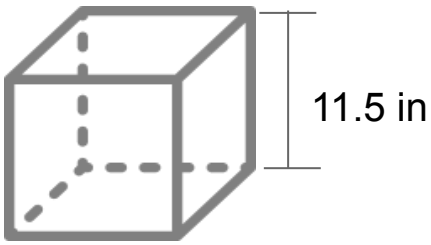
DAY 1: CUBE DELIVERY

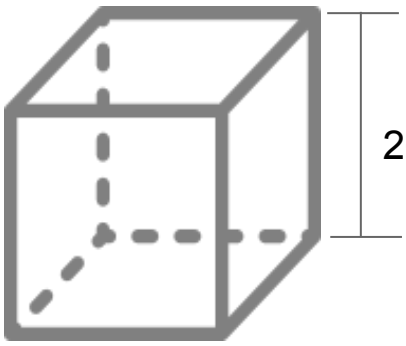
G6 Basic

On his official first day of work, Danny will be shipping cargo boxes. For this day, all boxes are in shape of cube. To know the shipping fee of each box, refer to the given below.

Surface Area of the box	Shipping Cost
Small (at most 446.34 sq. inches)	$7.16 per box
Medium (446.34 sq. in < x < 759.38 sq. in)	$11.69 per box
Large (x > 759.38 sq. inches)	$18.09 per box

1. 

2. 

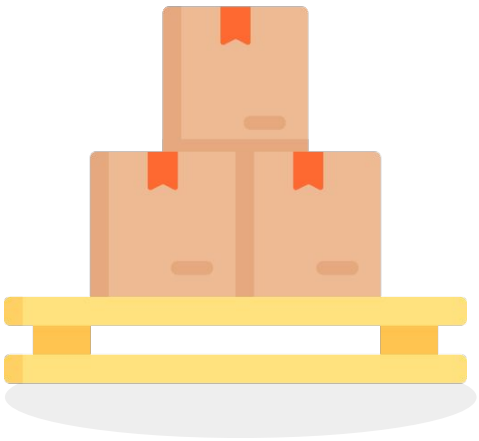
3. 

Total Shipping fee: _____

DELIVERED GOODS

G6
Basic

At their warehouse, Danny received the following cargo boxes. These boxes are in shape of rectangular prism. He is curious about the total surface area of all the delivered boxes. Can you help Danny figure out the answer?



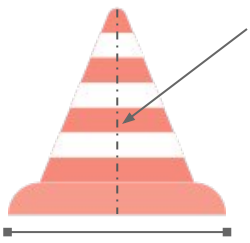
Box 1: l = 5.8 ft w = 2.03 ft h = 4.4 ft
Box 2: l = 1.6 yd w = 1.1 yd h = 1.3 yd
Box 3: l = 9.8 ft w = 7.12 ft h = 7.4 ft
Box 4: l = 3.6 yd w = 2.1 yd h = 2.3 yd

1.	2.
3.	4.

AT THE WAREHOUSE

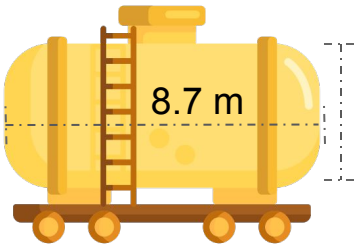
G6 Basic

Danny found these common objects at their company warehouse. As a math enthusiast, he is very curious to know the surface area of each item. Help him to solve each.



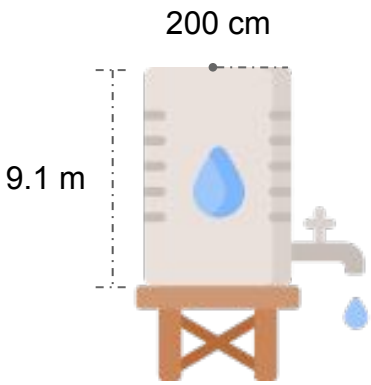
d = 25 in

1.



2.

3.



4.

FIND WHAT'S MISSING

G6
Basic

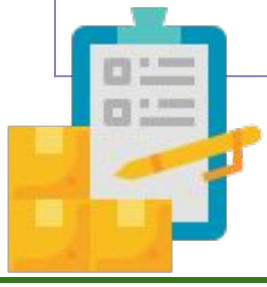
As part of the shipping company's inventory, Danny is required to list down the dimensions of every item that they will ship. Read and understand each situation below and solve.

1. The surface area of a cube-like box is 530.16 sq. in. What is the length of its side?

2. A cargo box that is in the shape of rectangular prism has a surface area of 108.62 sq.m. If the length and the width of the box is 5.3 m and 2.7 m respectively, how high is the box?

3. The diameter of a right cylinder is 10 in. Its surface area is approximately 282.74 sq. in. How high is the given figure?

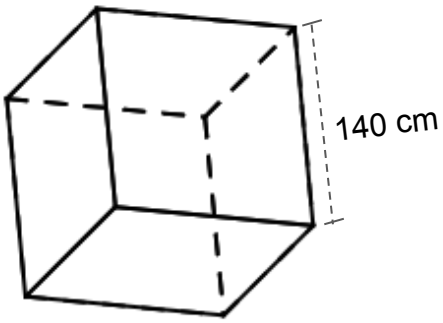
4. What is the diameter of a sphere-like object if its surface area is 55.42 sq. in?

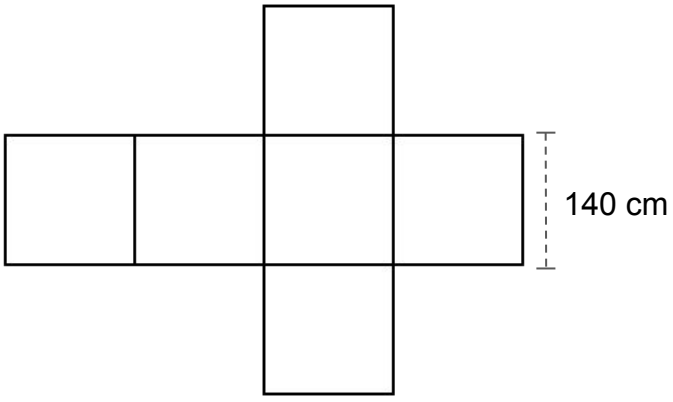


UNBOXING

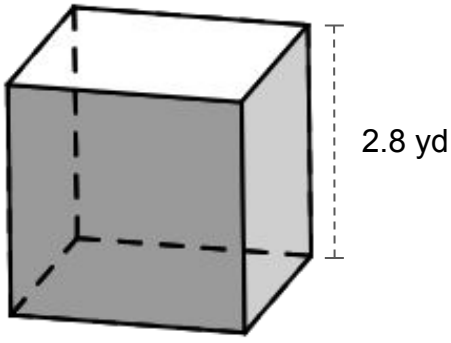
G7
Advanced

Unbox the cube-like cargo box and draw its equivalent geometric net. After that, compute for its surface area.





1. Compute for the S.A. in meters.



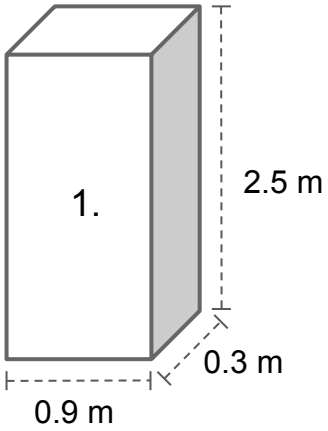
2. Draw the geometric net.

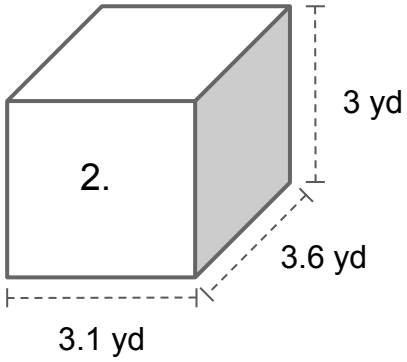
3. Compute for the S.A.

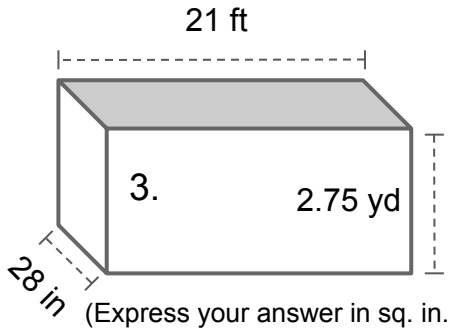
PRISM-ISTIC

G7 Advanced

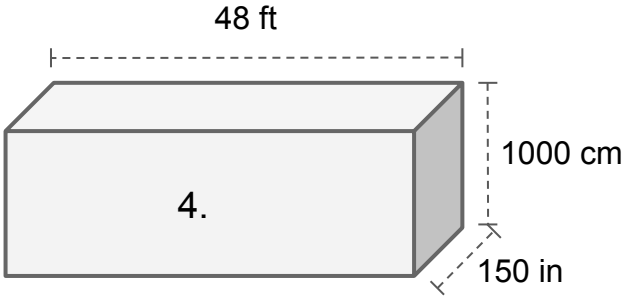
Here are some figures that Danny found in their warehouse. Compute for their surface area.



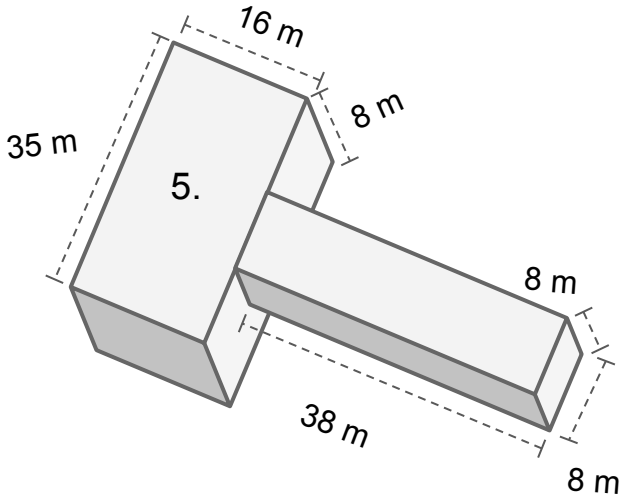




(Express your answer in sq. in.)



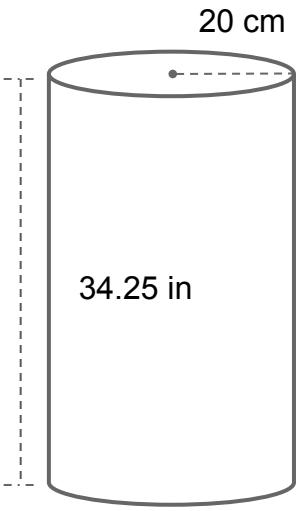
(Express your answer in sq. ft.)

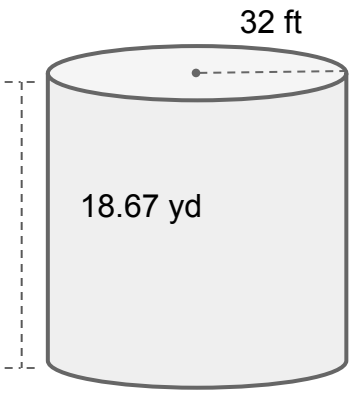


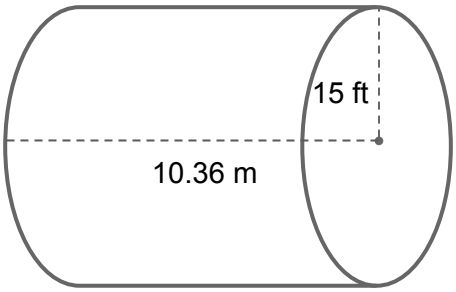
WORKING WITH CYLINDERS

G7 Advanced

Danny's work is about to end today. The only task left is to compute the surface area of the following cylinders.



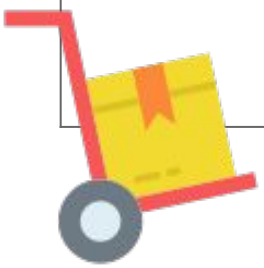




1. Express your answer in sq. cm.

2. Express your answer in sq. ft.

3. Express your answer in sq. m.



SOME SOLID MOMENTS

G7 Advanced

Here are some moments on Danny's shipping work. Use your understanding of surface area to answer each problem.

1. A gift box is to be delivered in celebration of the Valentine's Day. The box is a cube which has six congruent face. Each has a length and width of 13.5 inches. What is the surface area of the gift box?

2. Another box came in. This has to be covered by a special colorful paper for Valentine's Day. The top and bottom of the box is 8 in by 3 in, the sides are both 3 in by 2 in, and the front and back are 8 in by 2 in. Make a sketch of the box. What is the minimum amount of paper needed to wrap the present?

3. A set of tomato sauce can was received by Danny. It has a radius of 2.5 in and a height of 5 in. How much metal was used to make the can? If there are six cans in a set, what is the total amount of metal used?

DELIVERED AT HOME

G7
Advanced

Look around your house and find three objects. Make sure that they are almost solid-figure shaped. Make a sketch of each object, measure its dimensions and solve for their surface area.

ANSWER GUIDE

Activity 1 & 10

Answers may vary.

Activity 3

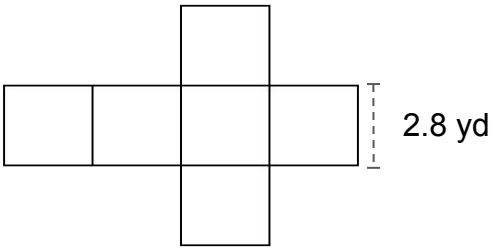
1. 92.45 sq. ft. 2. 10.54 sq. yd
3. 389.97 sq. ft 4. 41.34 sq. yd

Activity 5

1. 9.4 in 2. 5.1 m
3. 4 in 4. r = 2.1, d = 4.2 in

Activity 6

1. 11.76 sq. m.
2. 47.04 sq. yd



Activity 8

1. 13,446.02 sq. cm
2. 17,693.45 sq. ft.
3. 428.95 sq. m.

Activity 2

1. 37.5 sq. in., $7.16
2. 793.5 sq. in, $18.09
3. 4253.54 sq. in, $18.09
   Total bill: $43.34

Activity 4

1. 1197.73 sq. in
2. 67.73 sq. m
3. 16286.02 sq. mm
4. 139.49 sq. m

Activity 7

1. 6.54 sq. m
2. 62.52 sq. yd.
3. 69552 sq. in.
4. 5170.01 sq. ft.
5. 1936 sq. m. + 1344 sq. m.
   = 3280 sq. m.

Activity 9

1. 1093.5 sq in.
2. At least 92 sq. in of special paper
3. Approximately 117.81 sq. in per metal, 708.86 sq. in in total

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