



6th
Basic

7th
Advanced

Helping With Math

USA
GRADES

Surface Area of a Cuboid

Suitable for students
aged 10-12



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

Let's celebrate President's Day!



President's Day was formerly known as Washington's Day. It is a US federal holiday celebrated every third Monday of February in honour of the achievement and birthday of the first US president.

President's Day or Presidents' Day?

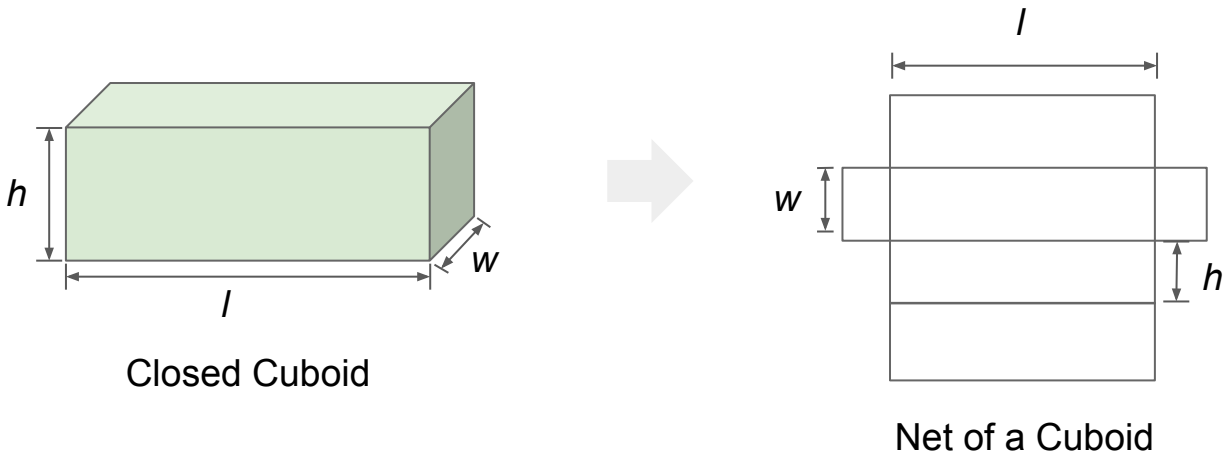
- In the 1880s, the birthday (February 22nd) of George Washington (Commander of the Continental Army during the American Revolution) was celebrated as a federal holiday.
- In 1968, because of the Uniform Monday Holiday Bill, it was proposed that it be celebrated every third Monday of February, which is somehow near to the date of birth of former President Abraham Lincoln. Some states celebrate the two presidents' birthdays while some give honor to all of the US presidents.



SURFACE AREA OF CUBOID

CUBOID

- Cuboid is a 3D shape with length, height, and width.
- It has six faces where each resembles a rectangle.
- Since each face of the cuboid is a rectangle, all of its angles are right angles (measures 90 degrees).
- Cuboid is called a rectangular prism because the two have the same geometric properties.



Surface Area

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

To calculate the surface area of a cuboid, the formula is:

$$SA_{\text{cuboid}} = 2(lw + lh + hw) \quad \text{where } l \text{ is the length; } h \text{ is the height; and } w \text{ is the width of the cuboid.}$$

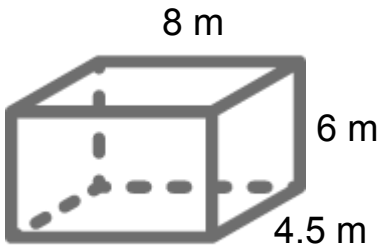
The surface area of a cuboid is the sum of the area of its six faces.



COMPUTING FOR THE SURFACE AREA OF CUBOID

- 1) What is the total surface area of a cuboid whose dimensions are 8 m, 6 m, and 4.5 m?

$$\text{S.A.} = 2(\text{LH} + \text{LW} + \text{HW})$$



$$L = 8 \text{ m} \quad H = 6 \text{ m} \quad W = 4.5 \text{ m}$$

$$\text{S.A.} = 2(\text{LH} + \text{LW} + \text{HW})$$

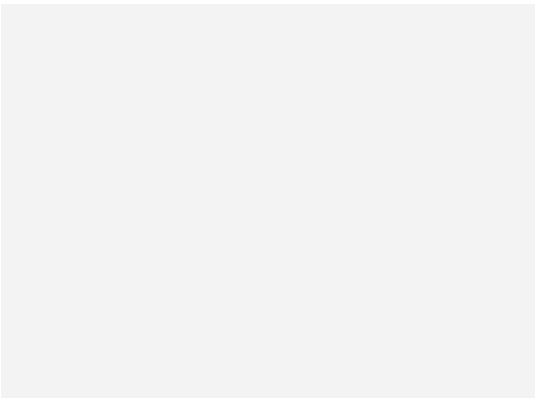
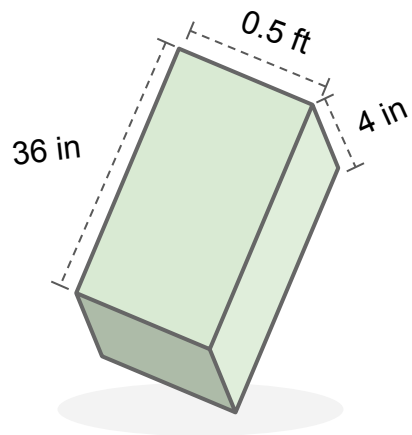
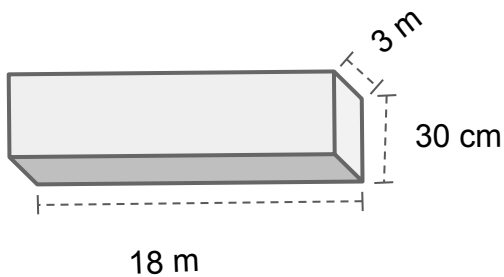
$$= 2[(8 \text{ m})(6 \text{ m}) + (8 \text{ m})(4.5 \text{ m}) + (6 \text{ m})(4.5 \text{ m})]$$

$$= 2(48 + 36 + 27) \text{ sq. m}$$

$$= 2(111) \text{ sq. m}$$

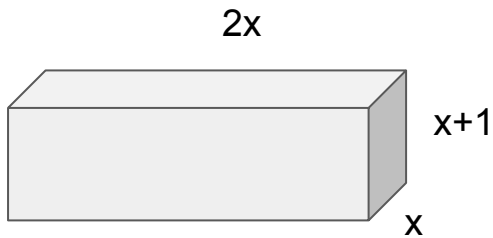
$$= 222 \text{ sq. m}$$

- 2) Compute for the surface area of the cuboids below.



COMPUTING FOR THE SURFACE AREA OF CUBOID

- 3) Given that the dimensions of a cuboid are x , $2x$, and $x + 1$, what is its surface area?



$$\text{S.A.} = 2(\text{LH} + \text{LW} + \text{HW})$$

$$\text{L} = 2x \quad \text{H} = x+1 \quad \text{W} = x$$

$$\text{S.A.} = 2(\text{LH} + \text{LW} + \text{HW})$$

$$= 2 [(2x)(x+1) + (2x)(x) + (x+1)(x)]$$

$$= 2 (2x^2 + 2x + 2x^2 + x^2 + x)$$

$$= 2 (5x^2 + 3x)$$

$$\text{SA} = 10x^2 + 6x$$

- 4) If the surface area of a cuboid is defined by the equation $S = 15x^2 + 3x$. What is its surface area if $x = 2$?

$$S = 15x^2 + 3x$$

If $x = 2$, then:

$$S = 15(2)^2 + 3(2)$$

$$S = 15(4) + 6$$

$$S = 60 + 6$$

$$\mathbf{S = 66 \text{ sq. units}}$$

- 5) In relation to item number 4, if $x = 5$, what would be its new surface area?



TABLE OF ACTIVITIES

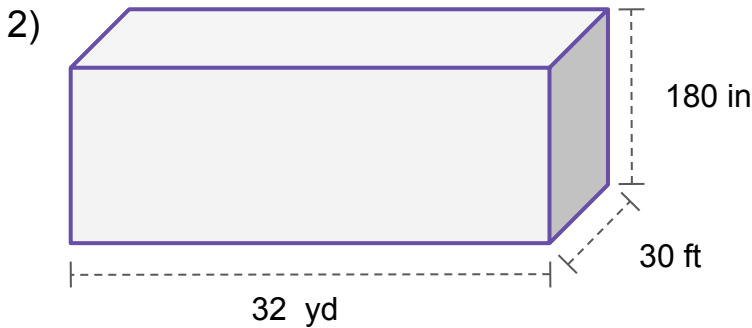
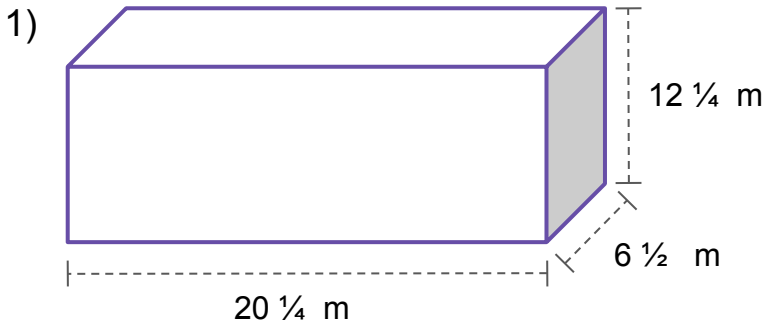
Ages 10-11 (Basic)		6th Grade
1	Celebrating Presidents' Day	
2	The Boy Scouts of America	
3	A Perennial Day of Remembrance	
4	Happy Birthday, Pres. George Washington!	
5	Thank You, Presidents!	
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6	The President's Day	
7	Celebrating in NYC	
8	Cuboid Task in President's Day	
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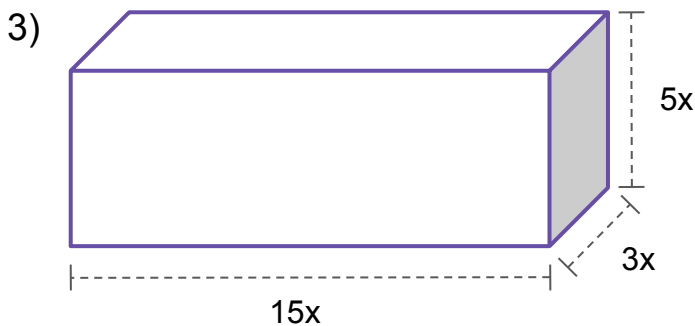
CELEBRATING PRESIDENTS' DAY

G6
Basic

One of the ways that Americans do to celebrate Presidents' Day is by organizing public ceremonies. Today, a stage presentation will be held. The event organizer is creating a cuboid-like outline of the stage. Can you help him solve the problem by calculating its surface area?



Express the final answer in yards



THE BOY SCOUTS OF AMERICA

G6
Basic

During the 1930s, the Boy Scouts of America, together with other Patriotic groups, participated in some engagements to celebrate the birthday of President George Washington. Meet these boy scouts and help them with their school work.

Ralph and James are members of the Boy Scouts of America. In celebration of President's Day, they are tasked to wrap birthday boxes that will serve as freebies. The surface area of the box is defined by an equation: $S = 180x + 36$, where S is the surface area of the box while x refers to the unknown value of its dimension.

- 1) If $x = 6$, what is the surface area of the box?
- 2) If $x = 8.5$, what is its surface area?



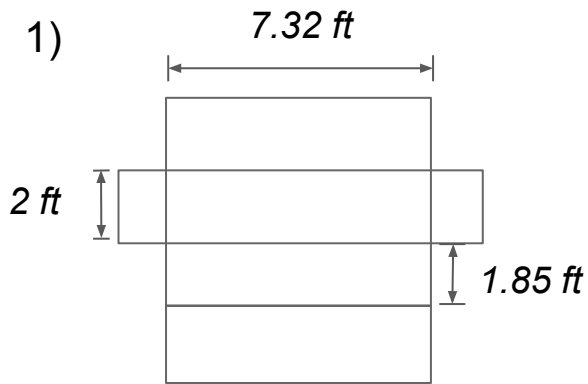
- 3) If $x = 8$, what is the surface area of the box?
- 4) If $x = 9 \frac{1}{2}$, what is its surface area?



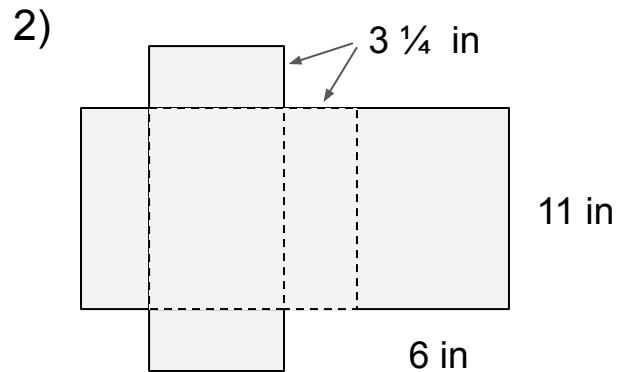
A PERENNIAL DAY OF REMEMBRANCE

G6
Basic

President's Day is a federal holiday dedicated to commemorating the contributions of the former and current presidents of America. Kendrick and his friends would like to host a patriotic show this day. They need wooden blocks for their props. Help them to figure out the answer to the following problems below.



Compute for its surface area.



Compute for its surface area.

3) What is the equivalent of your answer in item no. 1 in yards?

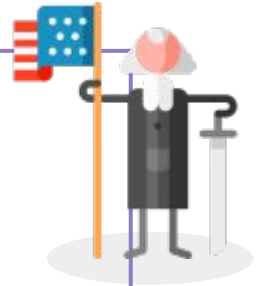
4) Convert your answer in item no. 2 to cm.



HAPPY BIRTHDAY, PRES. GEORGE WASHINGTON!

G6
Basic

On his birthday, show President Washington that you can now solve the surface area of a cuboid. Refer to the given below.



1) $L = 18 \text{ in}$ $W = 15 \text{ in}$ $H = 8 \text{ in}$

2) $L = 6.25$ $W = 1.2$ $H = 2.1$

3) $L = 9.75$ $W = 4.8$ $H = 7.7$

4) $L = 12x$ $W = 10$ $H = 5.2$

5) $L = 10 \frac{1}{2}$ $W = 4 \frac{1}{2}$ $H = 3 \frac{1}{4}$



THANK YOU, PRESIDENTS!

G6
Basic

Mr. McGregor and his 6th grade class discussed the accomplishments of different US presidents in celebration of President's Day. Refer to the word problems below and use your knowledge about the surface area of a cuboid to answer them.

- 1) The students created their gratitude message to their favorite US president. After doing so, they need to store the letter in a cuboid-like box full of lovely designs. If the surface area of the box is 700 sq. cm and its height and width are 8 cm and 10 in respectively, what is its length?



- 2) A smaller box will be used for the famous quotes of the US presidents. The surface area of the box is 115 sq cm. Find its height if the length is 6.5 cm while the width is 3 cm.



THIS PRESIDENT'S DAY

G7
Advanced

As we celebrate President's Day, give honor and respect to our leaders by answering the task below. Complete the table of values.

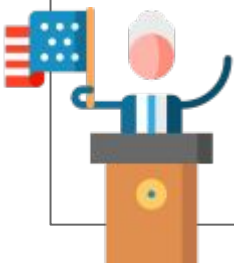
x	6	7	8	9	10
y					

Let y be the surface area of the cuboid. The cuboid's dimensions:

$$L = 2.5x$$

$$W = x + 3$$

$$H = x$$



CELEBRATING IN NYC

G7
Advanced

New York City is one of the perfect places to commemorate the contributions of the US presidents. Would you like to answer this math task while looking at the Statue of Liberty?

$$\text{S.A.} = 2(\text{LH} + \text{LW} + \text{HW})$$

$$L = 22 \text{ m} \quad H = 16 \text{ m} \quad W = 12 \text{ m}$$

$$\text{S.A.} = 2(\text{LH} + \text{LW} + \text{HW})$$

$$= [(22 \text{ m})(16 \text{ m}) + (22 \text{ m})(12 \text{ m}) + (16 \text{ m})(12 \text{ m})]$$

$$= (352 + 264 + 192) \text{ sq.m}$$

$$= 808 \text{ sq. m}$$



- 1) Is there an error in the solution? What is it? Explain your answer below.

- 2) Correct the solution.



CUBOID TASK IN PRESIDENT'S DAY

G7
Advanced

Help Mario to figure out this math task this President's Day. Use your understanding of cuboid to answer the following questions.

- 1) Mario is making a simple storage box whose dimensions are: $L = 45$ in, $W = 40$ in, and $H = 32$ in. He would like to wrap it in a special paper that costs \$ 0.32 per square inch. How much will Mario spend on the wrapper of the box?

A. Sketch the box.

B. Show your solution and answer.

- 2) If the dimensions of the box were increased by two, what would be the new surface area? How much will be the new cost?

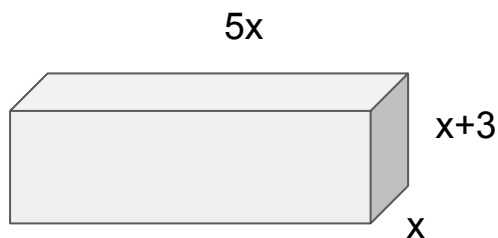


PRESIDENT'S DAY SALE!

G7
Advanced

Make sure to buy these cuboid-like items this President's Day. But before doing so, solve these problems, and you will avail them for free!

- 1) Given that the dimensions of a cuboid are x , $5x$, and $x + 3$, what is its surface area?



$$\text{S.A.} = 2(\text{LH} + \text{LW} + \text{HW})$$



- 2) If the surface area of a cuboid is defined by the equation $S = 25x^2 + 8x$. What is its surface area if $x = 2$?

- 3) In relation to item number 2, if $x = 3.5$, what would be its new surface area?



FOR OUR PRESIDENTS

G7
Advanced

This President's Day, make the US chief executives proud by applying your learning of Surface Area of Cuboid. Refer to the instruction below to complete the task.

Look for three cuboid-like objects at your house. Take their measurements and list them below. Compute for their surface and arrange them in increasing order of surface area.



ANSWER GUIDE

Activity 1

- 1) 918.625 sq. m. 2) 1060 sq. yd 3) $270x^2$ units

Activity 2

- 1) 1116 2) 1566 3) 1478 4) 1746

Activity 3

- 1) 63.76 sq. ft.
2) 242.4 sq. in
3) 21.25 sq. yd
4) 615.696 sq cm

Activity 4

- 1) 1068 sq in 2) 46.29 sq units 3) 317.67 sq units
4) $364.8x + 108$ 5) 192 sq units

Activity 5

- 1) 15 in 2) 4 cm

Activity 6

x	6	7	8	9	10
y	558	735	936	1161	1410

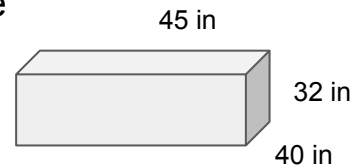
Activity 7

- 1) The final answer must be multiplied by
2) The correct answer is 1616 sq. m.

Activity 8

B) The surface area of the storage box is 9040 sq in. The total cost of the wrapper is \$ 2892.8.

2) The new surface area will be 10,000 sq in and the new cost of the wrapper will be \$3000.



Activity 9

- 1) $22x^2 + 36x$ sq units
2) 116 3) 334.25

Activity 10: Answers may vary.



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