

# DMT INSTITUTE

Developing Mathematical Thinking Institute (DMTI)



Professional  
Development



Curricular  
Resources



Assessment

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# Measurement

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## SURFACE AREA OF CUBES AND RECTANGULAR PRISMS

# DMTI Varied Practice Worksheets

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This PowerPoint or PDF displays the worksheets that have varied situations (context, visual, equations, and other mathematical models) for children to work on. By completing these worksheets, children increase their foundational skills in the topic, which will help them with these standards and future mathematical topics.

1. If using a journal, have children present the worksheet and complete all the problems.
2. Or print the 'Varied Practice Worksheet Slides' for them to work on. Then, you can return to the PowerPoint or PDF to look at the keys to check their work.

# Grade 6-8: Surface Area

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## Materials Needed

Printed copies of the Surface Area Worksheets

Scissors and ruler

# Measurement: Surface Area

A 'net' is a two-dimensional or flat outline of the faces of a three-dimensional solid. (Net of the cube to the right.)

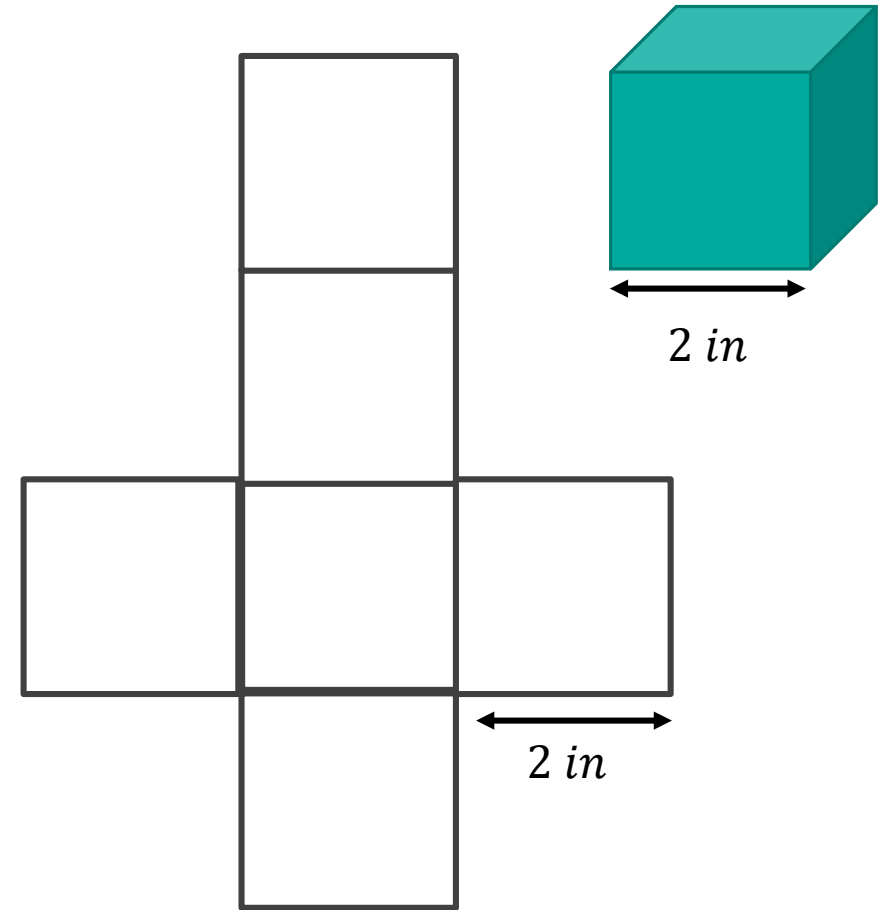
We can use a net to help us determine the surface area of a figure. Surface area is the total area on the outside surfaces of an object, so a net allows us to see all of these surfaces at once.

Determining surface area of the cube:

Because all the dimensions (edges) of a cube are the same length we can find the area of one face and then multiply by 6.

For the cube to the right this would be  $6(2 \times 2)$  or  $6(2^2)$  which is  $24 \text{ in}^2$ . (4 square units cover each face.)

*Note: In many resources the side length of a cube is labeled as length 'a' so the formula is  $6a^2$ .*

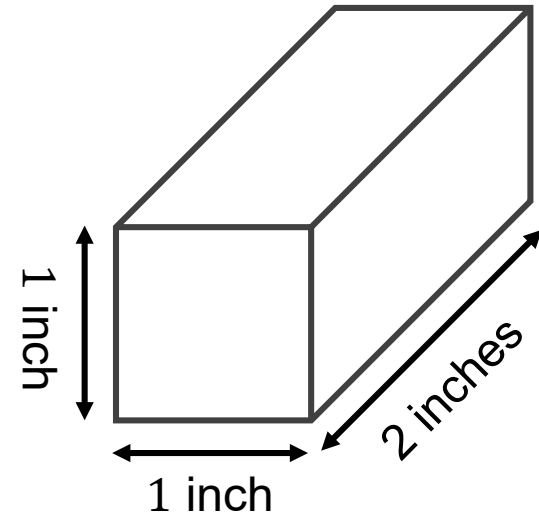


# Measurement: Surface Area

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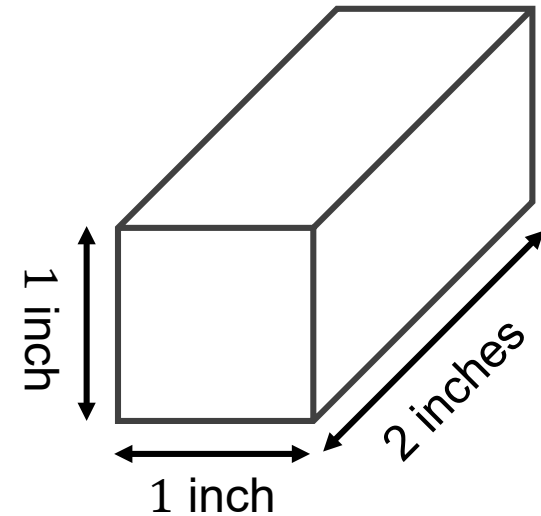
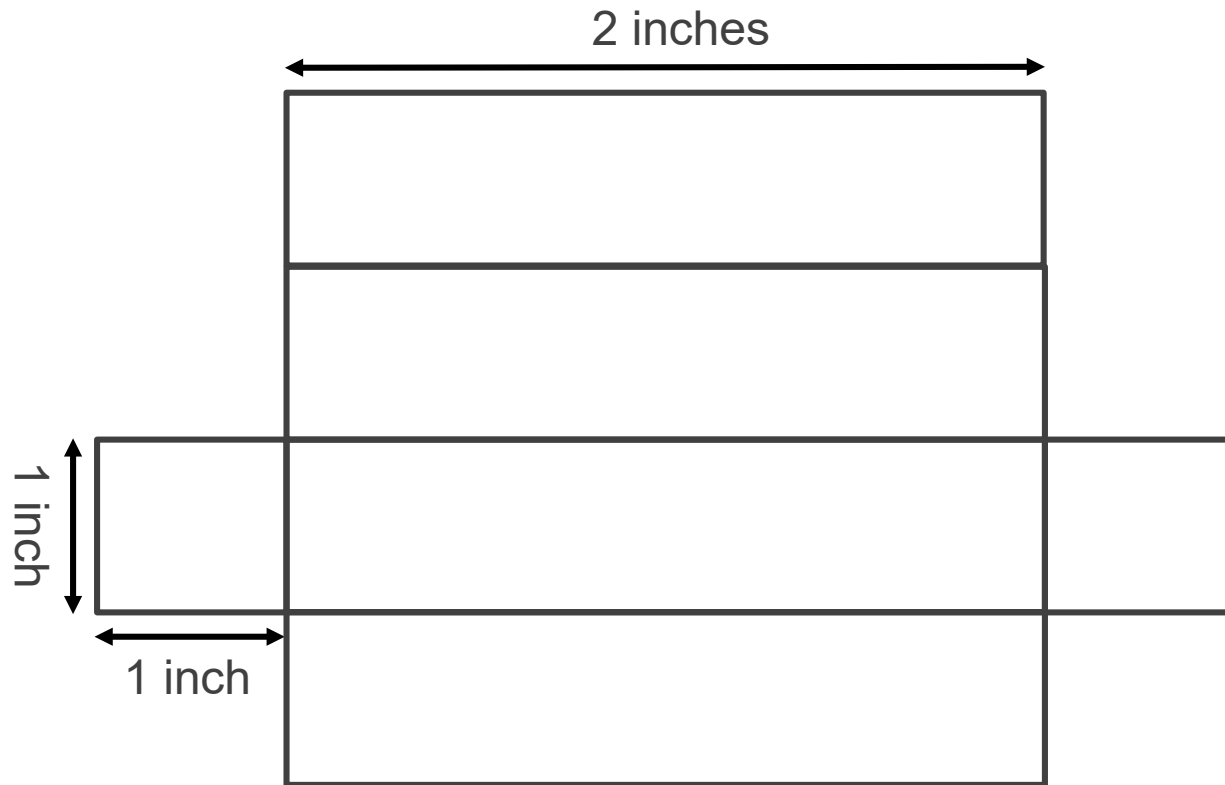
We can also use a net to determine the surface area of a rectangular prism.

Consider the rectangular prism to the right. What would the net look like? Draw it.



# Measurement: Surface Area

Here is one net for the rectangular prism. To determine the surface area we need to find the sum of the area of all the faces. Four of the faces have an area of  $2\text{ in} \times 1\text{ in}$  and two faces have an area of  $1\text{ in} \times 1\text{ in}$ , so our formula could be  $4(2 \times 1) + 2(1 \times 1) = 10\text{ in}^2$



*Note: a variety of nets can be used, but all polygons meet at an edge.*

# Measurement: Surface Area

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Notes for surface area of rectangular prisms:

- There is no real order of length, width and height, but convention does put them in this order (length · width · height).
- In the examples above, the length or width are given as options with the preferred dimension listed first. However, students are likely to see this order presented differently in many resources so flexible thinking is expected.
- Regardless of what label is given to the dimension, it is conventional to consider the “front” horizontal length first OR to consider the longest base length first as noted above.
- Students can find the surface area of the faces in any order, but conventionally we see the formula:  $A = 2(wl \cdot hl \cdot hw)$ . This formula will be used for the practice pages and answer keys, but solutions should not be considered incorrect if they are in a different order.
- In middle school, finding surface area is a great context to review/reinforces decimal and fraction operations.



# Grade 6-8: Surface Area

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## Instructions

### Worksheet 1 & 2

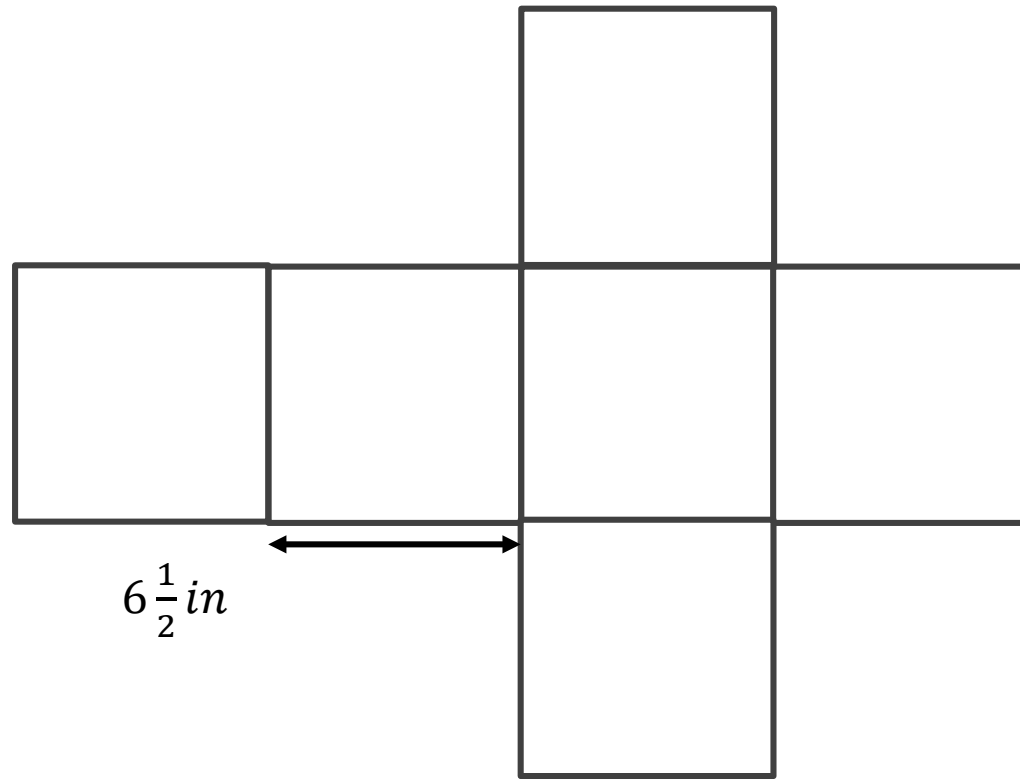
A) Use the provided net and dimensions to write and solve an equation for finding the surface area of the figure.

B) Draw a net with the given dimensions and use it to write and solve an equation for finding the surface area of the figure.

### Worksheet 3

Cut out the net and measure the side lengths in inches. Use your measurements to determine the surface area.

# Worksheet 1.1 – Surface Area of Cubes



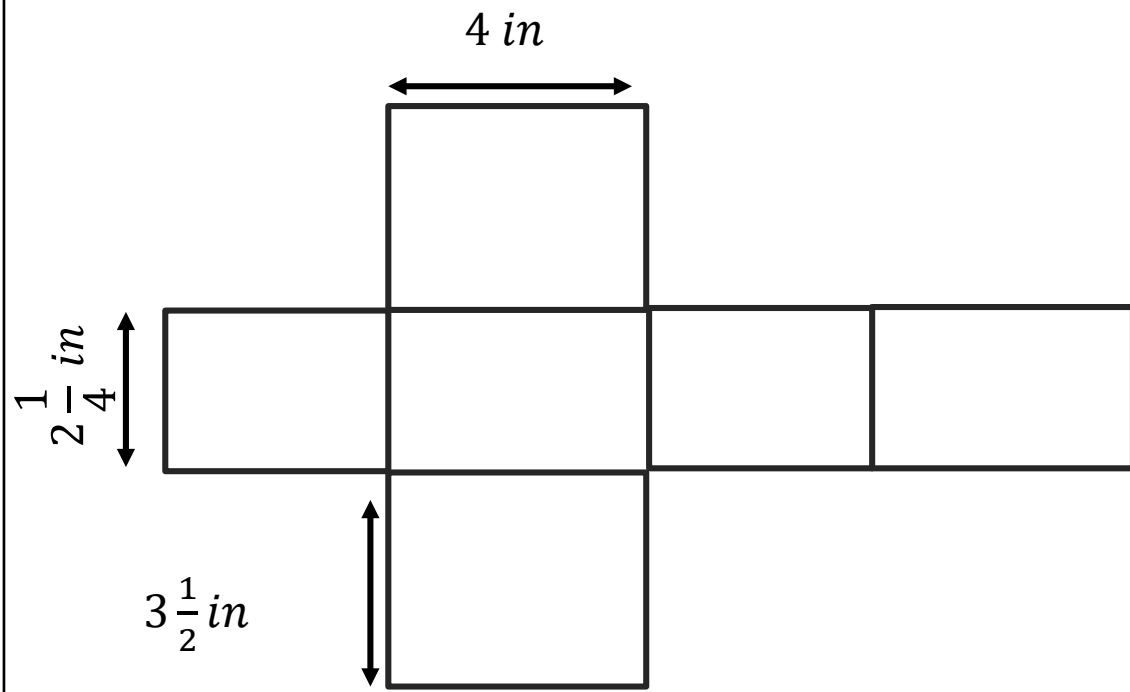
Draw a net of a cube with the following dimensions:

$$4in \times 4in \times 4in$$

Write and solve an equation for finding the surface area:

Write and solve an equation for finding the surface area:

# Worksheet 1.2 – Surface Area of Rectangular Prisms



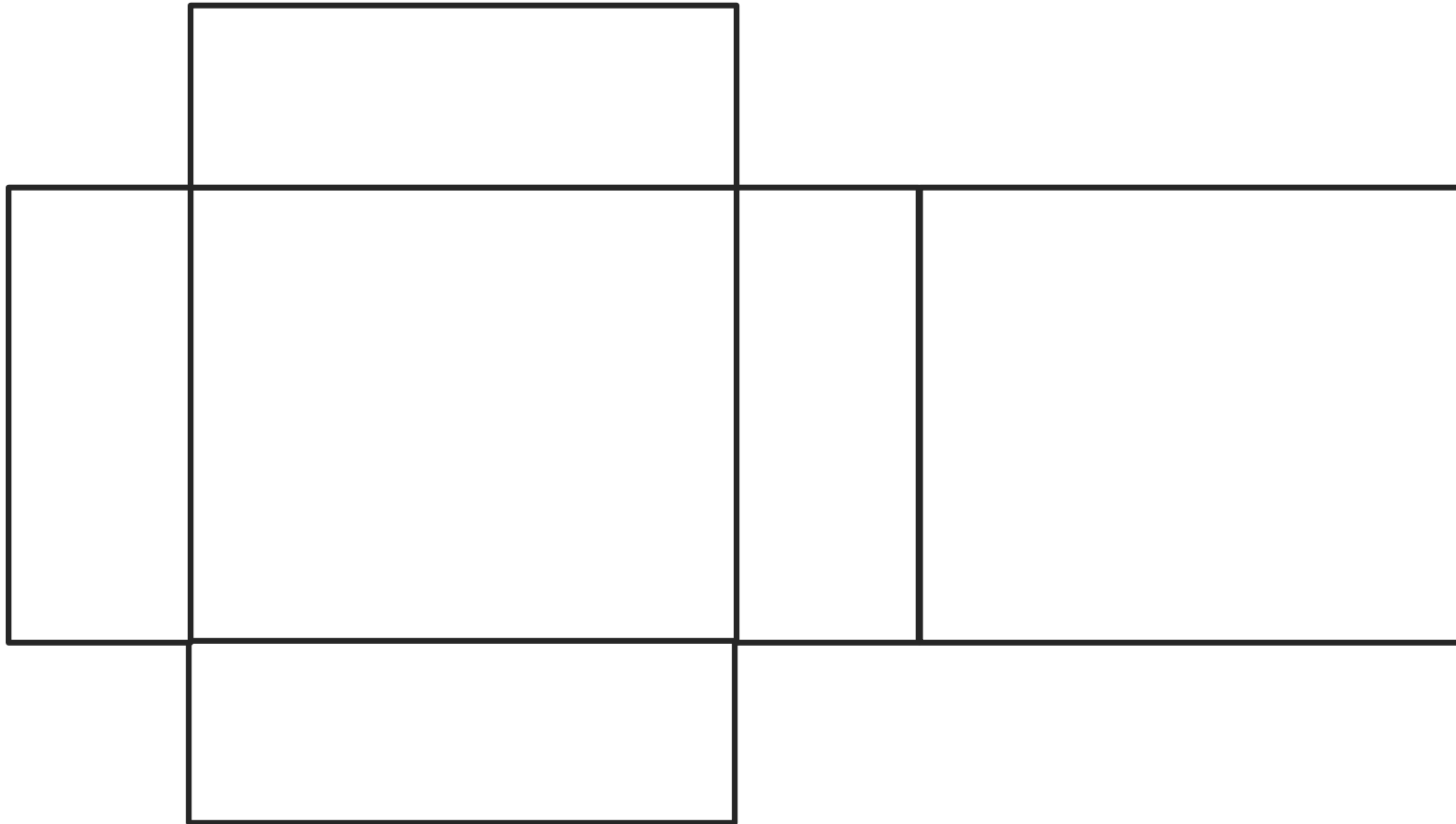
Draw a net of a rectangular prism with the following dimensions:  $5\text{ in} \times 4\text{ in} \times 1\text{ in}$

Write and solve an equation for finding the surface area:

Write and solve an equation for finding the surface area:

## Worksheet 1.3 – Surface Area of Rectangular Prisms: Measuring a Net

Directions: Cut out the net below and measure the side lengths in inches. Use your measurements to determine the surface area.

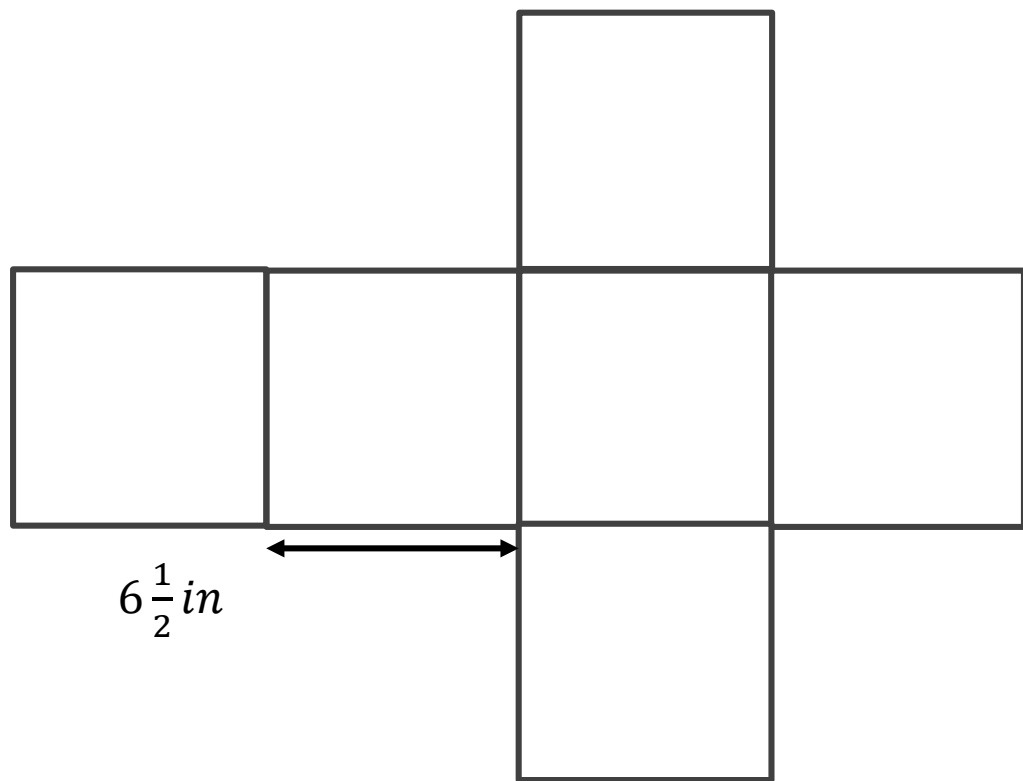




“The Developing Mathematical Thinking Institute (DMTI) is dedicated to enhancing students’ learning of mathematics by supporting educators in the implementation of research-based instructional strategies through high-quality professional development, curricular resources and assessments.”

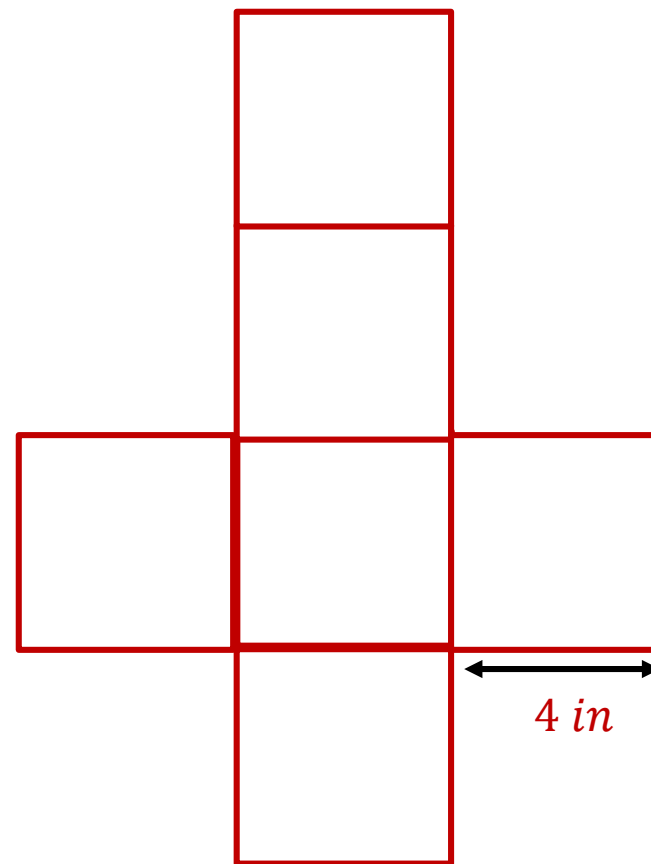
For more information contact  
Dr. Brendefur at [jonathan@dmtinstitute.com](mailto:jonathan@dmtinstitute.com)





Draw a net of a cube with the following dimensions:

$$4in \times 4in \times 4in$$

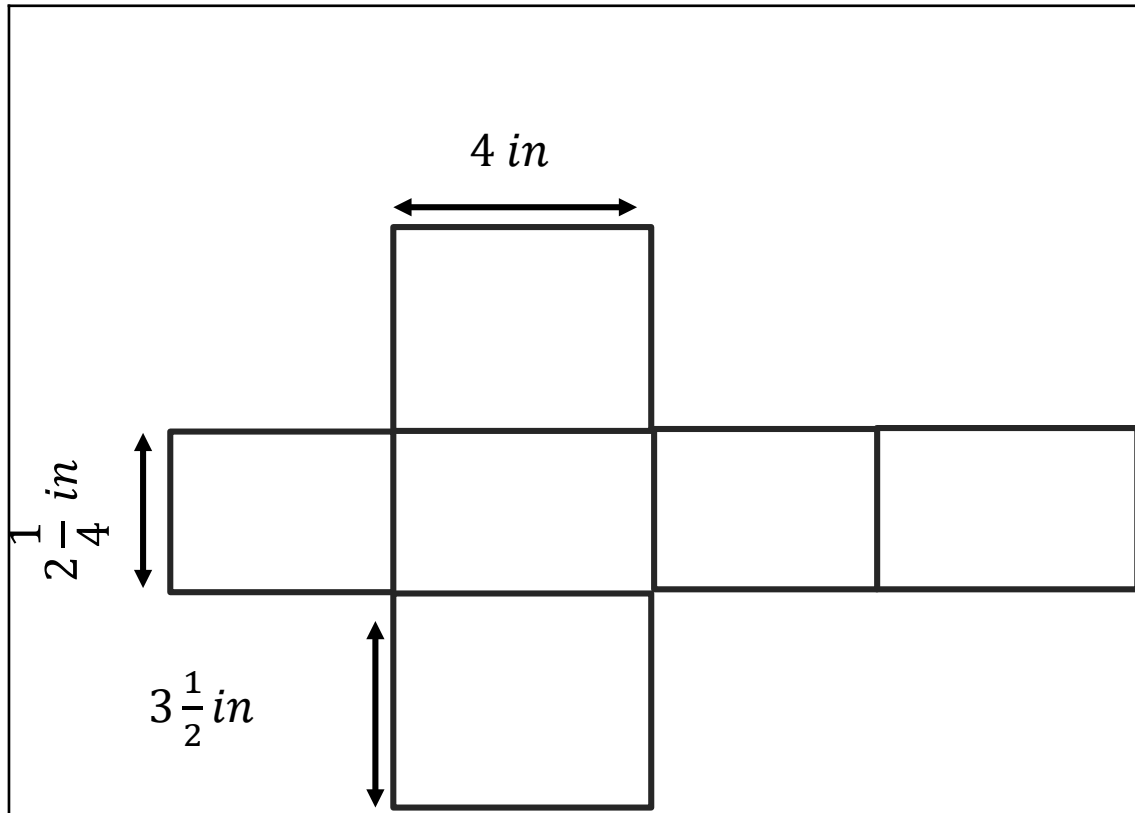


Write and solve an equation for finding the surface area:

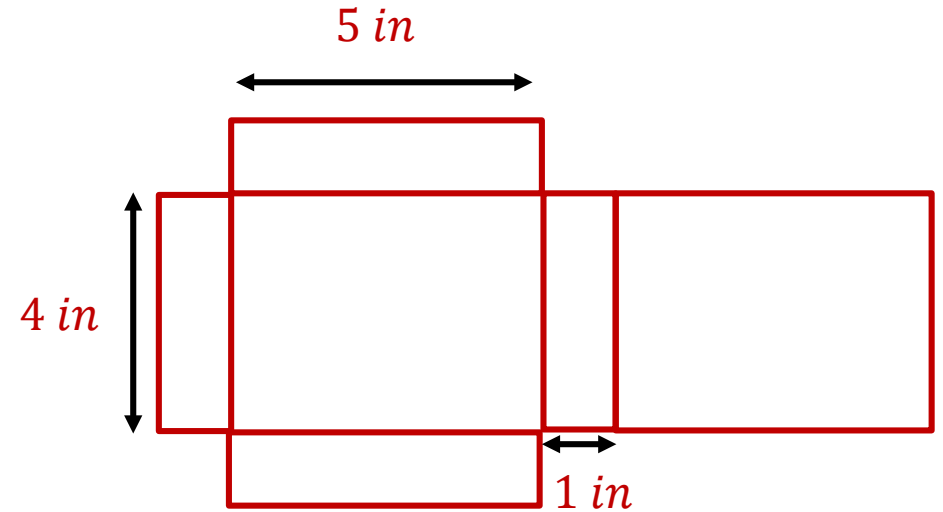
$$6 \cdot (6\frac{1}{2})^2 = 6 \left( 6\frac{1}{2} \cdot 6\frac{1}{2} \right) = 6 \left( 42\frac{1}{4} \right) = 253\frac{1}{2} in^2$$

Write and solve an equation for finding the surface area:

$$6 \cdot 4^2 = 6(4 \cdot 4) = 6(16) = 96in^2$$



Draw a net of a rectangular prism with the following dimensions:  $5in \times 4in \times 1in$



Write and solve an equation for finding the surface area:

$$A = 2 \left( 4 \cdot 2\frac{1}{4} + 3\frac{1}{2} \cdot 4 + 3\frac{1}{2} \cdot 2\frac{1}{4} \right) =$$

$$2 \left( 9 + 14 + 7\frac{7}{8} \right) = 2 \left( 30\frac{7}{8} \right) = 61\frac{3}{4} in^2$$

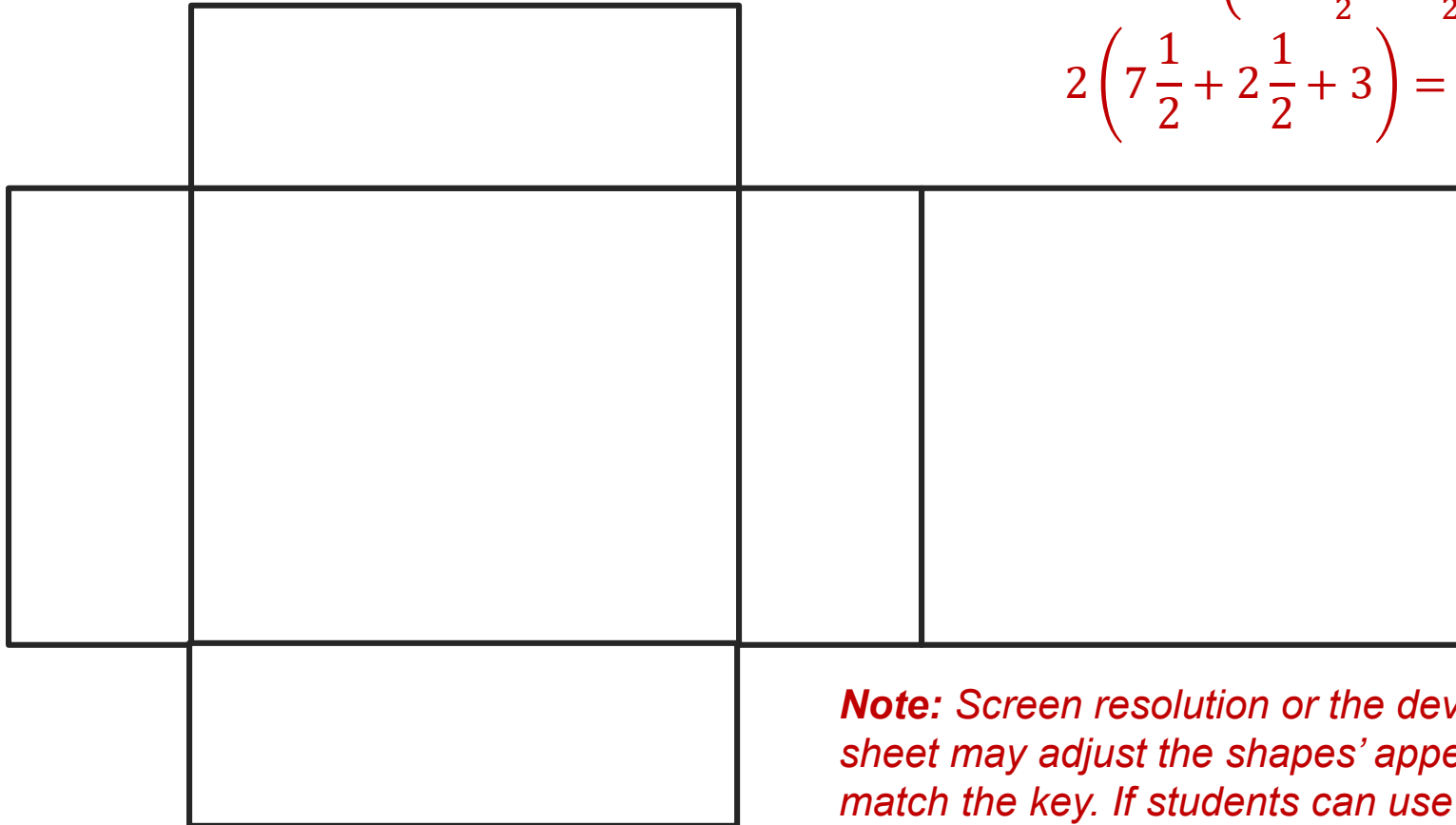
Write and solve an equation for finding the surface area:

$$A = 2(5 \cdot 4 + 4 \cdot 1 + 5 \cdot 1) =$$

$$2(20 + 4 + 5) = 2(29) = 58in^2$$

## Worksheet 1.3 – Surface Area of Rectangular Prisms: Measuring a Net **KEY**

Directions: Cut out the net below and measure the side lengths in inches. Use your measurements to determine the surface area.



$$A = 2 \left( 3 \cdot 2\frac{1}{2} + 2\frac{1}{2} \cdot 1 + 3 \cdot 1 \right) =$$
$$2 \left( 7\frac{1}{2} + 2\frac{1}{2} + 3 \right) = 2(13) = 26in^2$$

**Note:** Screen resolution or the device used to print the practice sheet may adjust the shapes' appearances in ways that do not match the key. If students can use measurements to justify their answers, the answers should be considered correct even if the key says otherwise.