Name & Surname: _____ Class: _____ Date: _____

Nets and Surface Area



Unfold 3D shapes to find outside area

About 50 minutes Level ★★★☆☆

Nets and surface area

A **net** is a flat pattern that folds into a 3D shape. **Surface area** is the total area of all its **faces**.

- Area of rectangle: length × width
- Area of triangle: $\frac{1}{2}$ × base × height
- Surface area: add the areas of all faces in the net. Opposite faces of a prism are equal
- Worked example: prism 5 in × 3 in × 2 in gives 2 × (5 × 3) = 30, 2 × (5 × 2) = 20, 2 × (3 × 2) = 12, total = 62 in²

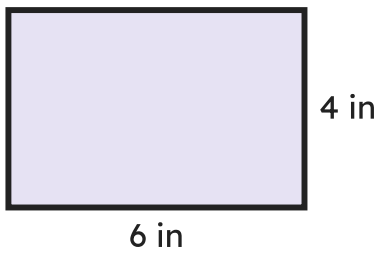


Task A

/4

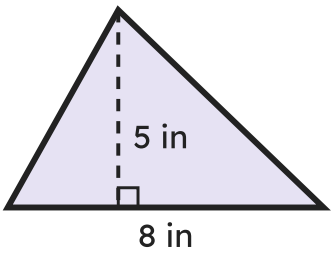
Find the area of each shape. Show each multiply step.

1



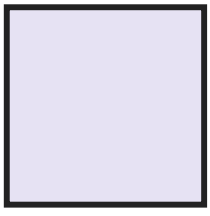
Area: _____ **in²**

2



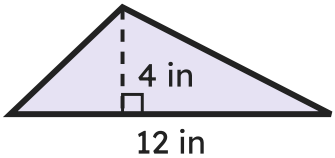
Area: _____ **in²**

3



Area: _____ **in²**

4



Area: _____ **in²**

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Prism Practice

Practice cubes and rectangular prisms from nets.

Key words

net: flat pattern that folds into a 3D shape

base: face a prism or pyramid is named for

prism: shape with two same bases and rectangles

face: flat side of a 3D shape

surface area: total area of all faces

pyramid: shape with one base and triangles

Task B

/12

Practice rectangular prisms and cubes using their nets. Add all faces to find surface area.

WARM UP

1. Find the **area** of a rectangle 5 in by 4 in.

Answer: _____

2. Find the **area** of a triangle with base 6 in and height 4 in.

Answer: _____

3. A cube has edge 2 in. Find the area of one **face**.

Answer: _____

4. Find the **surface area** of that cube.

Answer: _____

PRACTICE

5. A rectangular prism **net** shows three pairs: 6 in × 4 in, 6 in × 2 in, and 4 in × 2 in. Find the **surface area**.

Answer: _____

6. A rectangular prism **net** shows three pairs: 9 in × 5 in, 9 in × 2 in, and 5 in × 2 in. Find the **surface area**.

Answer: _____

7. A rectangular prism **net** shows three pairs: 7 in × 3 in, 7 in × 2 in, and 3 in × 2 in. Find the **surface area**.

Answer: _____

8. A box is 12 in long, 3 in wide, and 3 in high. Find its **surface area**.

Answer: _____

PROBLEM SOLVING

9. A gift box is 12 in long, 8 in wide, and 4 in high. How much wrapping paper is needed to cover the whole outside? Give **units**.

Answer: _____

10. A cube storage box has edge 7 in. Find its **surface area**.

Answer: _____

11. A student says finding **surface area** is the same as finding volume. Explain how you know they are different.

Answer: _____

12. A **net** has six squares but two squares would overlap when folded. Explain how you know it will not make a cube.

Answer: _____

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Spot the Mistake

Find the wrong step and fix the surface area.

Task C

/4

Find the wrong step in each solution. Explain the mistake and give the correct surface area.



Student A

Find the surface area of a rectangular prism 5 in × 3 in × 2 in.

1. Front and back: 5 × 3 = 15 in² each
2. Top and bottom: 5 × 2 = 10 in² each
3. Two sides: 3 × 2 = 6 in² each
4. Surface area = 5 × 3 × 2 = 30 in²

The mistake is in step: _____

What went wrong?

.....

Correct answer: _____



Student B

Find the surface area of a triangular prism with triangle base 6 in and height 4 in and rectangles 6 in × 8 in, 5 in × 8 in, 5 in × 8 in.

1. Rectangles: 6 × 8 = 48 in², 5 × 8 = 40 in², 5 × 8 = 40 in²
2. Triangles: 6 × 4 = 24 in² each
3. Total = 48 + 40 + 40 + 24 + 24 = 176 in²

The mistake is in step: _____

What went wrong?

.....

Correct answer: _____

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Triangles and Pyramids

Work with triangular prisms and square pyramids.

Task D

/12

Practice prisms with triangles and square pyramids. Use the net to add faces.

WARM UP

1. Find the **area** of a triangle with base 10 in and height 6 in.

Answer: _____

2. Find the **area** of a rectangle 7 in by 4 in.

Answer: _____

3. Find the **area** of a triangle with base 8 in and height 3 in.

Answer: _____

4. Find the **area** of a rectangle 9 in by 6 in.

Answer: _____

PRACTICE

5. Triangular prism **net**: two triangles with base 3 in and height 4 in, and rectangles 3 in × 7 in, 4 in × 7 in, 5 in × 7 in. Find the **surface area**.

Answer: _____

6. Triangular prism **net**: two triangles with base 6 in and height 8 in, and rectangles 6 in × 5 in, 8 in × 5 in, 10 in × 5 in. Find the **surface area**.

Answer: _____

7. Square pyramid **net**: base 5 in × 5 in and four triangles with base 5 in and height 6 in. Find the **surface area**.

Answer: _____

8. Square pyramid **net**: base 4 in × 4 in and four triangles with base 4 in and height 7 in. Find the **surface area**.

Answer: _____

PROBLEM SOLVING

9. A jewelry box shaped like a square **pyramid** has base 6 in × 6 in and four triangular faces with base 6 in and height 9 in. How much cardboard is needed to make it?

Answer: _____

10. A wooden block is a triangular **prism**. The triangles have base 6 in and height 8 in. The three rectangles are 6 in × 9 in, 8 in × 9 in, and 10 in × 9 in. Find the **surface area** to paint.

Answer: _____

11. A **net** shows 2 triangles and 3 rectangles. Explain how you know it folds into a triangular prism.

Answer: _____

12. Explain how finding **surface area** with a **net** is different from finding volume.

Answer: _____

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Show Your Work

Mark a sample answer like an examiner.

Task E

Mark the answer like a teacher. Give a mark and one improvement.

A box is a rectangular prism 10 in long, 6 in wide, and 4 in high. Use a net to explain how to find the surface area, and find it. Give correct units. **(6)**

A student's answer:

I unfolded the box into 6 rectangles. I did 10 × 6 = 60, 10 × 4 = 40, 6 × 4 = 24. I added 60 + 40 + 24 = 124. So the surface area is 124.

Marks	What the answer does
5–6	Full net explanation with three pairs, all areas doubled, correct total 248 in² with square inches
3–4	Some correct face areas and idea of net, but missing doubling, units, or full explanation
1–2	One area only or confused with volume or perimeter, little use of net

A good answer includes:

- ☐ Net has three pairs of equal opposite faces
- ☐ Face areas 60 in², 40 in², 24 in²
- ☐ Double each pair: 120 + 80 + 48
- ☐ Total 248 in² with square inches

My mark

____ / 6

One way to improve this answer

.....

.....

How did I do?

Circle a face for each line.

I can name nets made of rectangles and triangles ☹ 😐 ☺

I can add face areas to find surface area ☹ 😐 ☺

I can solve real-world surface area problems ☹ 😐 ☺

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Answer sheet: Nets and Surface Area

Task A

1. area = 24 in²
2. area = 20 in²
3. area = 25 in²
4. area = 24 in²

Task B

1. 20 in²
2. 12 in²
3. 4 in²
4. 24 in²
5. 88 in²
6. 146 in²
7. 82 in²
8. 162 in²
9. 352 in²
10. 294 in²
11. Surface area adds the areas of all faces in square inches to cover the outside, while volume multiplies length × width × height in cubic inches to measure inside space.
12. Overlapping squares would land on the same face, so one face would be missing and the shape would not close.

Task C

1. Step 4 is wrong: They multiplied the three edge lengths, which finds volume. Surface area must add all six faces. Correct answer: 62 in²
2. Step 2 is wrong: They forgot to divide by 2 for the triangle. Triangle area is $\frac{1}{2}$ × base × height = 12 in² each. Correct answer: 152 in²

Task D

1. 30 in²
2. 28 in²
3. 12 in²
4. 54 in²
5. 96 in²
6. 168 in²
7. 85 in²
8. 72 in²
9. 144 in²
10. 264 in²
11. The two triangles are the two same bases and the three rectangles join matching sides to connect them.
12. A net shows every face, so surface area adds all face areas in square inches. Volume measures inside space with length × width × height in cubic inches.

Task E

3 out of 6 - three face areas are correct and there is some net idea, but the three pairs were not doubled and units and explanation are missing. To improve, show 2 × each area and add to 248 in².

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