

**UM Printables**

PREMIUM EDUCATIONAL RESOURCES

DISCOVERY LAB • GRADE 6 • CCSS 6.G.A.4

Surface Area Using Nets Discovery Lab

Build • Unfold • Calculate — A hands-on exploration of three-dimensional solids as they enclose.

GRADE 6

CCSS 6.G.A.4

4 ACTIVITIES + PRACTICE

01 Cereal Box Lab — real-world unfolding**03** Square Pyramid Discovery

+ 6 printable net templates (color & B&W)

+ Vocabulary foldable & anchor chart

02 Triangular Prism Discovery**04** Net Match-Up Card Sort

+ 16 word-problem task cards + quiz

+ 4 exit tickets + answer keys

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Teacher Overview & How to Use This Resource

Welcome to the Surface Area Using Nets Discovery Lab. This mega unit is a hands-on, discovery-based exploration of three-dimensional figures and their surface area, designed to align precisely with Common Core State Standard 6.G.A.4: *Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures.* Rather than handing students a formula on day one, this lab invites them to physically build, unfold, and measure — letting the surface area concept emerge from their own geometric reasoning.

The resource is built around four core activities that progress from concrete to abstract. In **Activity 1 — Cereal Box Lab**, students bring a real cereal box from home, cut it apart along its edges, label the resulting six rectangles, and sum their areas to find total surface area. In **Activity 2 — Triangular Prism Discovery**, students fold a provided paper net, identify its five faces (two triangles and three rectangles), and calculate the surface area using the net as a visual scaffold. **Activity 3 — Square Pyramid Discovery** repeats this process with a five-faced figure (one square and four triangles). **Activity 4 — Net Match-Up** consolidates learning through a card-sort where students pair twelve flat nets with their corresponding three-dimensional solids.

A complete practice set of sixteen surface-area word problems follows the activities, covering all three figure families (rectangular prism, triangular prism, square pyramid) in real-world contexts such as gift wrapping, painting, packaging, and tent design. Four exit tickets provide quick formative checks, and a twelve-question summative quiz measures end-of-unit mastery. Every practice item includes a fully worked solution so the lab can be used by a substitute teacher, a homeschool parent, or a math specialist without additional preparation.

Pacing Guide (Suggested 8-Day Unit)

Day 1: Vocabulary foldable + anchor chart + Cereal Box Lab introduction (send home the cereal-box homework).

Day 2: Cereal Box Lab — cutting, labeling, and calculating surface area.

Day 3: Triangular Prism Discovery — fold, identify, calculate.

Day 4: Square Pyramid Discovery — fold, identify, calculate.

Day 5: Net Match-Up card sort + task cards 1–8.

Day 6: Task cards 9–16 + small-group problem solving.

Day 7: Exit tickets + quiz review stations.

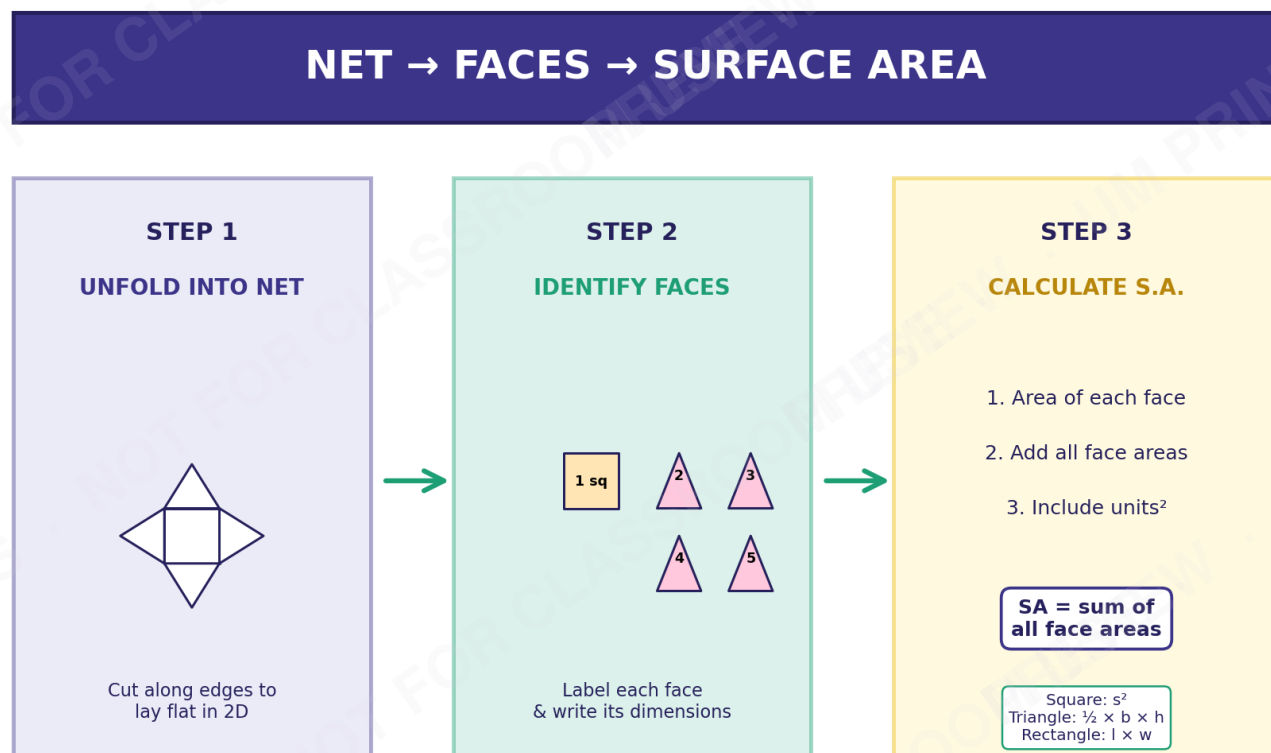
Day 8: Summative quiz + reflection.

Materials You Will Need

Per Student	Per Group of 4	Teacher Prep
Cereal box (Activity 1 homework)	Scissors (1 per student)	Print 1 packet per student

Anchor Chart — Net → Faces → Surface Area

Classroom display: Print this anchor chart on tabloid (11 × 17) paper or project it as a slide. The three-step workflow — Unfold into a Net, Identify each Face, Calculate Surface Area — gives students a memorable mental model for every problem in the lab. Refer back to it any time a student gets stuck: "Which step are you on?"



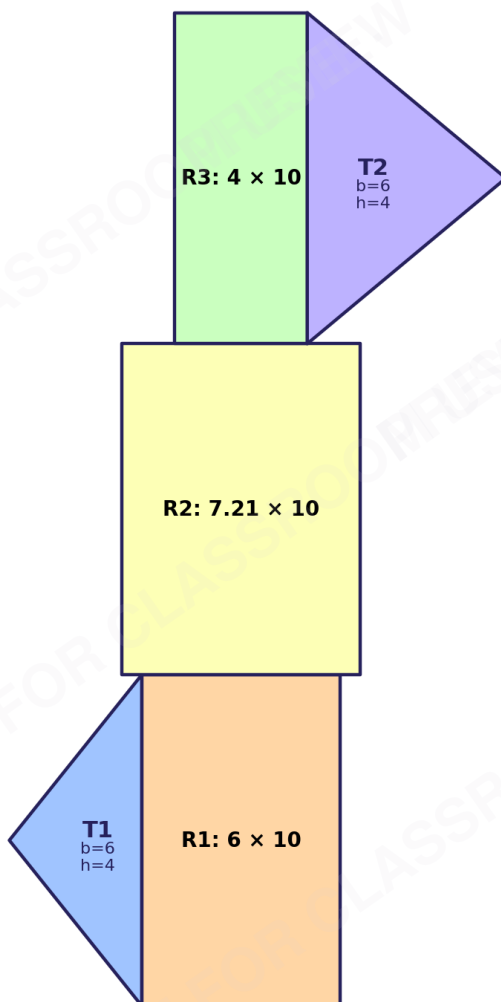
Worked example: Square pyramid ($s = 6$, slant = 5) → $SA = 6^2 + 4 \times (\frac{1}{2} \times 6 \times 5) = 36 + 60 = 96$ square units

Figure 2. The three-step workflow connects the concrete (a folded solid), the representational (the labeled net), and the abstract (the surface-area formula).

Triangular Prism Net — Color Version

Print on cardstock. Score each fold line with a ruler before folding for cleaner edges.

Triangular Prism Net

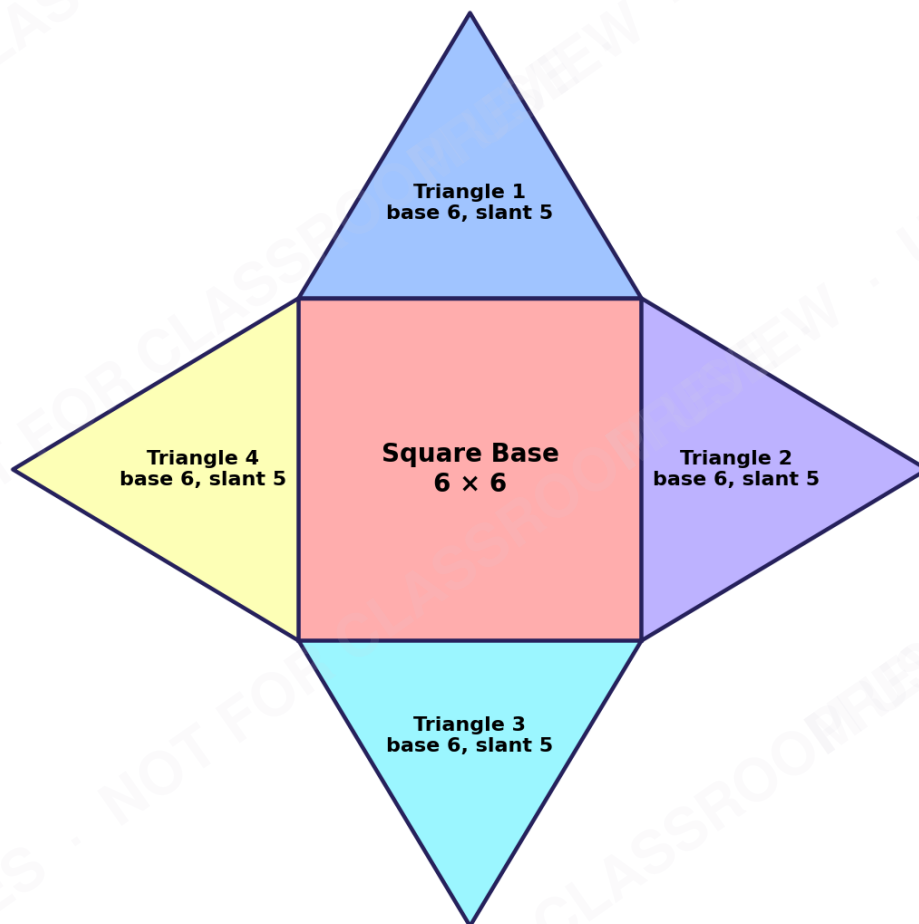


Right triangle base $\times$ height: 6×4 | Prism length: 10 | Slant height: 7.21
 5 faces: 2 triangles (T1, T2) + 3 rectangles (R1, R2, R3) | Surface Area = $2 \times (\frac{1}{2} \times b \times h) + (b + s + h) \times L$

Square Pyramid Net — Color Version

Print on cardstock. Fold the four triangular flaps up to meet at the apex.

Square Pyramid Net

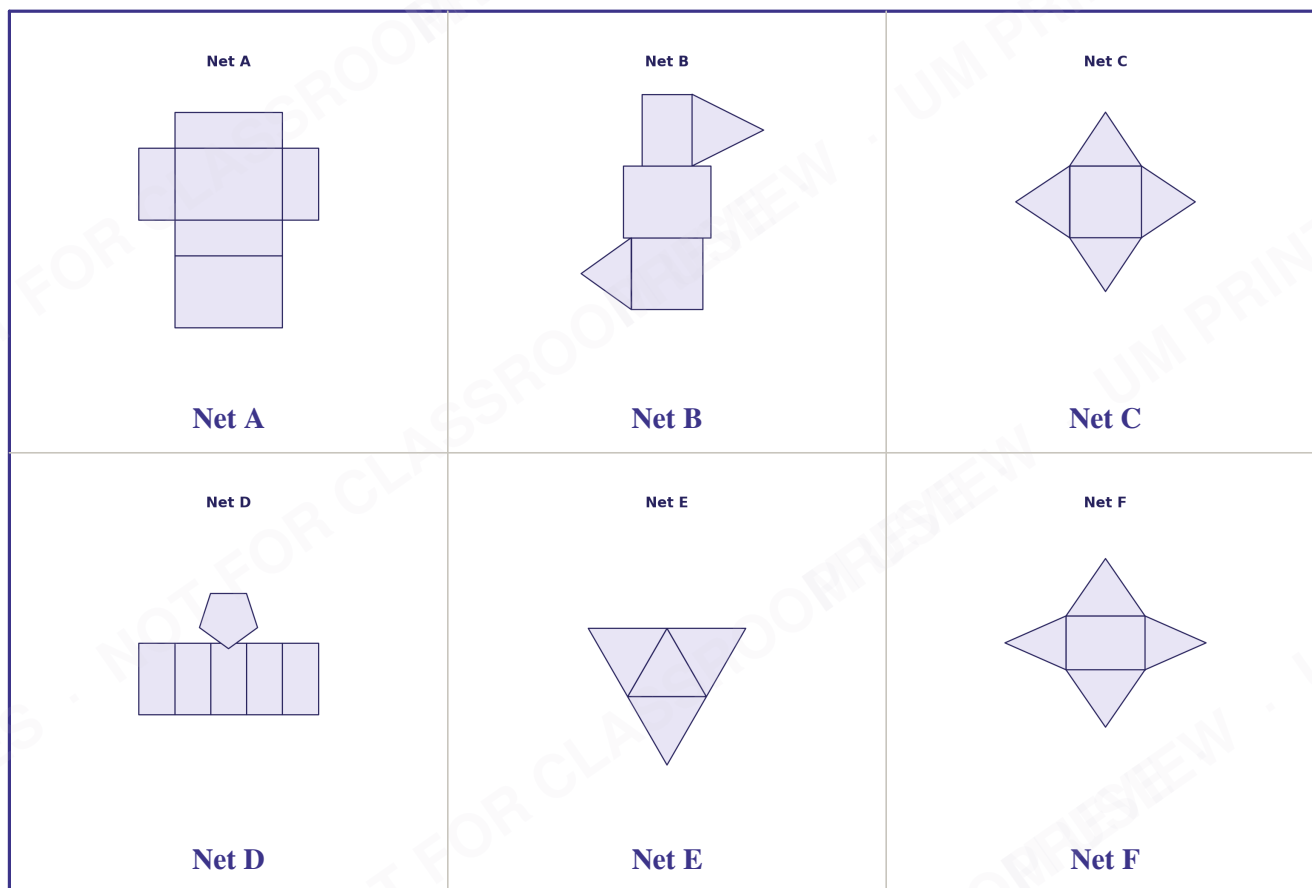


Square base 6×6 | Slant height 5 | 5 faces: 1 square + 4 triangles

$$\text{Surface Area} = s^2 + 4 \times \left(\frac{1}{2} \times s \times l\right) = s^2 + 2sl$$

Net Match-Up Cards (Set 1 of 2 — Nets)

Cut apart the six cards below. Shuffle with the figure cards on the next page.



03

Rectangular Prism

A fish tank is a rectangular prism with dimensions 30 in × 12 in × 18 in. The manufacturer wants to know the total area of glass needed to build the tank. (Assume the tank has a glass top.)

Workspace:

04

Rectangular Prism

Maya is wrapping a gift box that is 10 inches long, 7 inches wide, and 3 inches tall. She wants to know the minimum amount of wrapping paper she needs (ignoring overlap).

Workspace:

Answer Key — 16 Task Cards (Worked Solutions)

Each worked solution below shows the steps a student should take. If a student reaches a different numerical answer, ask them to walk you through their reasoning — many "wrong" answers reveal a thoughtful (if slightly off) interpretation of the problem context (for example, excluding the floor when it was supposed to be included).

Card 1. Rectangular Prism

Problem: Aiden is painting a wooden storage chest shaped like a rectangular prism. The chest measures 24 inches long, 12 inches wide, and 10 inches tall. What is the total surface area Aiden will paint?

Solution: $SA = 2(LW + LH + WH) = 2(24 \cdot 12 + 24 \cdot 10 + 12 \cdot 10) = 2(288 + 240 + 120) = 2(648) = \mathbf{1,296 \text{ sq. in.}}$

Card 2. Rectangular Prism

Problem: A jewelry box is a rectangular prism measuring 8 cm long, 5 cm wide, and 3 cm tall. The lid covers the top face only. How much velvet is needed to line the inside of the lid and all four sides (no bottom)?

Solution: Faces to line: top ($8 \cdot 5 = 40$), front ($8 \cdot 3 = 24$), back ($8 \cdot 3 = 24$), left ($5 \cdot 3 = 15$), right ($5 \cdot 3 = 15$). Total = $40 + 24 + 24 + 15 + 15 = \mathbf{118 \text{ sq. cm}}$

Card 3. Rectangular Prism

Problem: A fish tank is a rectangular prism with dimensions 30 in $\times$ 12 in $\times$ 18 in. The manufacturer wants to know the total area of glass needed to build the tank. (Assume the tank has a glass top.)

Solution: $SA = 2(LW + LH + WH) = 2(30 \cdot 12 + 30 \cdot 18 + 12 \cdot 18) = 2(360 + 540 + 216) = 2(1,116) = \mathbf{2,232 \text{ sq. in.}}$

Card 4. Rectangular Prism

Problem: Maya is wrapping a gift box that is 10 inches long, 7 inches wide, and 3 inches tall. She wants to know the minimum amount of wrapping paper she needs (ignoring overlap).

Solution: $SA = 2(LW + LH + WH) = 2(10 \cdot 7 + 10 \cdot 3 + 7 \cdot 3) = 2(70 + 30 + 21) = 2(121) = \mathbf{242 \text{ sq. in.}}$

Card 5. Triangular Prism

Problem: A canvas tent is shaped like a triangular prism. The triangular ends are right triangles with a base of 4 ft and a height of 3 ft, and the tent is 7 ft long. The tent has a fabric floor. What is the total surface area of the tent (including the floor)?

Solution: Slant $s = \sqrt{4^2 + 3^2} = 5$ ft. Two triangles: $2 \times (\frac{1}{2} \times 4 \times 3) = 12$ sq. ft. Three rectangles: $(4 + 5 + 3) \times 7 = 12 \times 7 = 84$ sq. ft. Total = $12 + 84 = \mathbf{96 \text{ sq. ft}}$

Card 6. Triangular Prism

Problem: A glass prism is a triangular prism with equilateral triangle bases of side 6 cm. The prism is 10 cm long. Find the total surface area of the prism. (Round to the nearest tenth.)

Solution: Triangle area = $(\sqrt{3}/4) \times 6^2 \approx 15.6$ sq. cm. Two triangles: 31.2 sq. cm. Three rectangles: $3 \times (6 \times 10) = 180$ sq. cm. Total = $31.2 + 180 = \mathbf{211.2 \text{ sq. cm}}$

Card 7. Triangular Prism

Problem: A wedge of cheese is shaped like a triangular prism. The triangular face is a right triangle with legs of 5 cm and 12 cm. The prism is 8 cm long. What is the total surface area?

Solution: Slant $s = \sqrt{5^2 + 12^2} = 13$ cm. Two triangles: $2 \times (\frac{1}{2} \times 5 \times 12) = 60$ sq. cm. Three rectangles: $(5 \cdot 8) + (12 \cdot 8) + (13 \cdot 8) = 40 + 96 + 104 = 240$ sq. cm. Total = $60 + 240 = \mathbf{300 \text{ sq. cm}}$

Summative Quiz — Surface Area Using Nets

Name: _____ Date: _____ Class: _____

Score: _____ / 20 Standard: 6.G.A.4

Quiz Directions

This quiz has 12 questions worth 20 points total. Multiple-choice questions (1–8) are worth 1 point each. Short-answer questions (9–12) are worth 3 points each (1 point for the correct answer, 1 point for showing work, 1 point for correct units where applicable). You may use a calculator. Show your work in the space provided. You may use the anchor chart on page 10 as a reference.

1. Which of the following best describes the net of a rectangular prism?

- A pattern of 4 rectangles
- A pattern of 6 rectangles
- A pattern of 2 squares and 4 triangles
- A pattern of 6 triangles

2. How many faces does a square pyramid have?

- 3
- 4
- 5
- 6

3. What is the area of a rectangle that is 8 inches long and 5 inches wide?

- 13 sq. in.
- 26 sq. in.
- 40 sq. in.
- 80 sq. in.

4. Find the surface area of a cube with side length 4 cm.

- 16 sq. cm
- 64 sq. cm
- 96 sq. cm
- 128 sq. cm

5. A rectangular prism has length 6 in, width 4 in, and height 3 in. What is its surface area?

- 72 sq. in.

What's Inside This Resource

Surface Area Using Nets Discovery Lab · Grade 6 · CCSS 6.G.A.4

CCSS 6.G.A.4 ALIGNED

A 55-page printable resource with four discovery activities, practice, formative checks, a summative quiz, and teacher support materials.

01 4 CORE ACTIVITIES

Cereal Box Lab; Triangular Prism Discovery; Square Pyramid Discovery; Net Match-Up card sort.

02 16 TASK CARDS

Surface-area word problems using rectangular prisms, triangular prisms, and square pyramids, with worked solutions.

03 6 NET TYPES

Printable net types with color and black-and-white versions; includes core and challenge shapes.

04 VOCABULARY + DEFINITIONS

A vocabulary foldable and companion definitions to support key geometry language.

05 ANCHOR CHART

Net -> Faces -> Surface Area three-step workflow for classroom display or projection.

06 4 EXIT TICKETS

Formative checks covering net identification and surface-area work with rectangular prisms, triangular prisms, and square pyramids.

07 12-QUESTION QUIZ

Summative quiz with 12 questions worth 20 points, plus worked answer key.

08 TEACHER SUPPORT

Teacher overview, materials list, differentiation tips, CCSS alignment, pacing guide, and answer keys.

55

TOTAL PAGES

4

DISCOVERY ACTIVITIES

16

TASK CARDS

6

NET TYPES