

## 3-D Shapes

### Grade 2

Name: \_\_\_\_\_ Date: \_\_\_\_\_


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#### Instructions:


- Read each question carefully
  - Show your work where needed
  - Draw neatly and label your diagrams
  - Take your time and think carefully!
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#### Section A: Shape Recognition

Look at the pictures and write the name of each 3-D shape.

1.  A dice: \_\_\_\_\_

2.  A soup can: \_\_\_\_\_

3.  An ice cream cone: \_\_\_\_\_

4.  A shoe box: \_\_\_\_\_



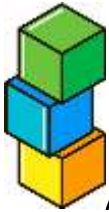
5. A birthday party hat: \_\_\_\_\_



6. A tissue box: \_\_\_\_\_



7. A pencil (without the pointed tip): \_\_\_\_\_



8. A building block: \_\_\_\_\_



9. A traffic cone: \_\_\_\_\_



10. A cereal box: \_\_\_\_\_

## Section B: Properties Identification

Fill in the blanks with the correct numbers.

11. A cube has \_\_\_\_\_ faces, \_\_\_\_\_ edges, and \_\_\_\_\_ vertices.

12. A cuboid has \_\_\_\_\_ faces, \_\_\_\_\_ edges, and \_\_\_\_\_ vertices.

13. A cylinder has \_\_\_\_\_ faces, \_\_\_\_\_ edges, and \_\_\_\_\_ vertices.

14. A cone has \_\_\_\_\_ faces, \_\_\_\_\_ edge(s), and \_\_\_\_\_ vertex/vertices.
15. Which shape has NO vertices? \_\_\_\_\_
16. Which shape has only ONE vertex? \_\_\_\_\_
17. How many flat circular faces does a cylinder have? \_\_\_\_\_
18. How many square faces does a cube have? \_\_\_\_\_
19. A cuboid has \_\_\_\_\_ pairs of opposite faces that are equal.
20. Which two shapes have exactly 12 edges each? \_\_\_\_\_ and \_\_\_\_\_
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### Section C: True or False

Write T for True or F for False.

21. A cube has all faces of the same size. \_\_\_\_\_
22. A cylinder can roll in all directions. \_\_\_\_\_
23. A cone has 2 edges. \_\_\_\_\_
24. A cuboid and a cube have the same number of vertices. \_\_\_\_\_
25. A cylinder has curved surfaces. \_\_\_\_\_
26. All faces of a cuboid are squares. \_\_\_\_\_
27. A cone has a circular base. \_\_\_\_\_
28. A cube is a special type of cuboid. \_\_\_\_\_
29. A cylinder has 4 faces. \_\_\_\_\_
30. A cone can stand on its vertex. \_\_\_\_\_
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## Section D: Drawing Challenge

Draw the following shapes neatly in the boxes below. Label the parts asked.

31. Draw a **cube** and label at least 3 vertices with arrows.

[Empty box for drawing]

32. Draw a **cylinder** and label the top face, bottom face, and curved surface.

[Empty box for drawing]

33. Draw a **cone** and label the vertex, edge, and base.

[Empty box for drawing]

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34. Draw a **cuboid** (that is longer than it is wide) and mark any 4 edges with small lines.

[Empty box for drawing]

35. Draw any TWO 3-D shapes that can roll. Write their names below your drawings.

[Empty box for drawing]

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### Section E: Real-World Connections

Name a real-world object for each description.

36. A cube-shaped object you can find in the kitchen: \_\_\_\_\_

37. A cylinder-shaped object you can write with: \_\_\_\_\_

38. A cone-shaped object used for road safety: \_\_\_\_\_

39. A cuboid-shaped object you read: \_\_\_\_\_

40. A cylinder-shaped object that holds soup: \_\_\_\_\_

41. A cube-shaped object used in board games: \_\_\_\_\_

42. A cone-shaped object you wear at parties: \_\_\_\_\_

43. A cuboid-shaped object that keeps your room cold: \_\_\_\_\_

44. A cylinder-shaped object that lights up a room: \_\_\_\_\_

45. A cuboid-shaped object you sleep on: \_\_\_\_\_

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### Section F: Counting Vertices, Edges, and Faces

**Solve these counting problems. Show your work!**

46. If you have 3 cubes, how many total vertices are there?

- Work: \_\_\_\_\_
- Answer: \_\_\_\_\_ vertices

47. If you have 2 cylinders, how many total edges are there?

- Work: \_\_\_\_\_
- Answer: \_\_\_\_\_ edges

48. If you have 5 cones, how many total vertices are there?

- Work: \_\_\_\_\_
- Answer: \_\_\_\_\_ vertices

49. A toy box contains 4 cube-shaped blocks. How many faces are there in total?

- Work: \_\_\_\_\_
- Answer: \_\_\_\_\_ faces

50. You have 2 cuboids and 1 cube. How many edges are there altogether?

- Work: \_\_\_\_\_
- Answer: \_\_\_\_\_ edges

51. If a cylinder has 3 faces, how many faces do 3 cylinders have?

- Work: \_\_\_\_\_
- Answer: \_\_\_\_\_ faces

52. How many more edges does a cube have than a cone?

- Work: \_\_\_\_\_
- Answer: \_\_\_\_\_ more edges

53. What is the total number of vertices in 2 cubes and 2 cones?

- Work: \_\_\_\_\_
- Answer: \_\_\_\_\_ vertices

54. A shelf has 6 soup cans (cylinders). How many circular faces are visible if you can only see the top of each can?

- Work: \_\_\_\_\_
- Answer: \_\_\_\_\_ circular faces

55. How many vertices are there in total if you have 1 cube, 1 cuboid, and 1 cylinder?

- Work: \_\_\_\_\_
- Answer: \_\_\_\_\_ vertices

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### Section G: Compare and Contrast

Answer these comparison questions.

56. What is the same about a cube and a cuboid?

- \_\_\_\_\_

57. What is different between a cube and a cuboid?

- \_\_\_\_\_

58. Which shape has more faces: a cylinder or a cone?

- Answer: \_\_\_\_\_

59. Which shape has more edges: a cuboid or a cylinder?

- Answer: \_\_\_\_\_

60. Name one shape that can roll and one shape that cannot roll.

- Can roll: \_\_\_\_\_
- Cannot roll: \_\_\_\_\_

61. Which shape is the only one with exactly 1 vertex?

- Answer: \_\_\_\_\_

62. Do a cube and a cuboid have the same number of edges?

- Answer: \_\_\_\_\_

63. Which has more vertices: 2 cones or 1 cube?

- Answer: \_\_\_\_\_

64. Which shape has a curved surface AND a flat circular face?

- Answer: \_\_\_\_\_

65. If you wanted to stack shapes easily without them rolling, which TWO shapes would you choose?

- Shape 1: \_\_\_\_\_

- Shape 2: \_\_\_\_\_

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### Section H: Shape Puzzles (Challenging!)

#### Solve these tricky problems!

66. I am a 3-D shape. I have 6 faces, but they are not all the same size. What am I?

- Answer: \_\_\_\_\_

67. I am a 3-D shape with no vertices at all. I can roll on my side. What am I?

- Answer: \_\_\_\_\_

68. I have exactly 8 corners. All my faces are squares of equal size. What am I?

- Answer: \_\_\_\_\_

69. I have a pointy top and a circular bottom. I look like an ice cream cone. What am I?

- Answer: \_\_\_\_\_

70. I have 12 edges and 8 vertices, and my opposite faces are twins. What am I?

- Answer: \_\_\_\_\_ or \_\_\_\_\_

71.If you cut a cylinder exactly in half (top to bottom), what shapes would the two pieces be?

- Answer: Two \_\_\_\_\_

72.How many edges do 1 cube and 1 cone have together?

- Work: \_\_\_\_\_
- Answer: \_\_\_\_\_ edges

73.Which shape has the most vertices: a cube, a cylinder, or a cone?

- Answer: \_\_\_\_\_

74.If you stack 3 cubes on top of each other, how many vertices can you see from the front?

- Answer: \_\_\_\_\_ vertices

75.A box (cuboid) has a length of 10 cm, width of 5 cm, and height of 3 cm. How many edges does it have?

- Answer: \_\_\_\_\_ edges (Hint: The size doesn't change the number of edges!)

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### Section I: Application Questions

**Think carefully about these real-world situations.**

76.You need to pack 12 cube-shaped gift boxes into a larger cuboid box. The cubes stack nicely in rows. How many faces does one small cube have?

- Answer: \_\_\_\_\_ faces

77.A baker makes a cake in the shape of a cylinder. The cake has frosting on the top, bottom, and all around the curved side. How many faces are covered with frosting?

- Answer: \_\_\_\_\_ faces

78.A builder uses cylindrical pipes. If one pipe has 2 edges, how many edges do 5 pipes have?

- Answer: \_\_\_\_\_ edges

79.A party planner orders 10 cone-shaped hats. How many vertices are there in total?

- Answer: \_\_\_\_\_ vertices

80. You have a toy that is a cube. If you paint each face a different color, how many colors will you need?

- Answer: \_\_\_\_\_ colors

81. A warehouse stores boxes (cuboids). Each box has 8 corners. If there are 4 boxes, how many corners are there in total?

- Answer: \_\_\_\_\_ corners

82. Which shape would make the best wheel for a toy car: a cube or a cylinder? Why?

- Answer: \_\_\_\_\_
- Why: \_\_\_\_\_

83. An artist wants to create a sculpture with the most vertices. Should they use a cube, a cylinder, or a cone?

- Answer: \_\_\_\_\_

84. A juice company needs to design a container. They want it to roll easily and have a flat top for a lid. Which shape should they choose?

- Answer: \_\_\_\_\_

85. You want to wrap a gift that is shaped like a cuboid. You need to cover all the faces. How many faces will you need to wrap?

- Answer: \_\_\_\_\_ faces

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### Section J: Mixed Challenge Questions

**These are extra challenging! Do your best!**

86. If all the faces of a shape are exactly the same size and shape, is it a cube or a cuboid?

- Answer: \_\_\_\_\_

87. You have 2 shapes: one with 0 vertices and one with 8 vertices. What are the two shapes?

- Shape with 0 vertices: \_\_\_\_\_
- Shape with 8 vertices: \_\_\_\_\_ or \_\_\_\_\_

88. Complete this pattern:

- Cube: 8 vertices
- Cuboid: 8 vertices
- Cylinder: \_\_\_\_\_ vertices
- Cone: \_\_\_\_\_ vertex/vertices

89. A cone is sitting on a table with its base down. You can see the curved surface and the base. How many faces can you see?

- Answer: \_\_\_\_\_ faces

90. True or False: If you have 10 cones, you have more edges than if you have 1 cube.

- Answer: \_\_\_\_\_
- Explain: \_\_\_\_\_

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 **Bonus Challenge**

**Design Your Own Shape Question!**

91-95. Create a question about 3-D shapes that would be challenging for your classmates. Then answer it yourself!

**Your Question:**

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**Your Answer:**

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 **Self-Reflection (Not graded - just for you!)**

96. Which section did you find easiest? \_\_\_\_\_

97. Which section was most challenging? \_\_\_\_\_

98. What is your favorite 3-D shape? \_\_\_\_\_

99. Why is that your favorite shape?

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100. Name one thing you learned about 3-D shapes that surprised you:

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 **ANSWER KEY**

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**Section A: Shape Recognition**

1. Cube
2. Cylinder
3. Cone
4. Cuboid
5. Cone
6. Cuboid
7. Cylinder
8. Cube
9. Cone
10. Cuboid

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**Section B: Properties Identification**

11. 6 faces, 12 edges, 8 vertices
12. 6 faces, 12 edges, 8 vertices
13. 3 faces, 2 edges, 0 vertices
14. 2 faces, 1 edge, 1 vertex
15. Cylinder
16. Cone
17. 2 (two circular faces)
18. 6 (all faces are squares)
19. 3 pairs
20. Cube and Cuboid (accept either order)

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### Section C: True or False

- 21.T (True)
- 22.F (False - only rolls in one direction, on its side)
- 23.F (False - it has 1 edge)
- 24.T (True - both have 8 vertices)
- 25.T (True)
- 26.F (False - faces are rectangles; only a cube has all square faces)
- 27.T (True)
- 28.T (True - a cube is a special cuboid where all sides are equal)
- 29.F (False - it has 3 faces)
- 30.F (False - it would fall over; it stands on its base)

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### Section D: Drawing Challenge

#### Grading Notes:

- Award points for accurate shape representation
- Check that labels are correctly placed
- Vertices should be marked at corner points
- Faces should be identified correctly
- Edges should be marked on the lines where faces meet

- 31.Cube drawing with 3 labeled vertices (2 points)
- 32.Cylinder with labeled top face, bottom face, and curved surface (2 points)
- 33.Cone with labeled vertex, edge, and base (2 points)
- 34.Cuboid (elongated) with 4 marked edges (2 points)
- 35.Two rolling shapes drawn (cylinder and/or cone) with names (2 points)

## Section E: Real-World Connections

Acceptable answers include (but not limited to):

36. Ice cube, sugar cube, cube of cheese, butter cube, stock cube
37. Pencil, pen, marker, crayon
38. Traffic cone, safety cone, road cone
39. Book, textbook, notebook, novel
40. Soup can, soda can, canned food
41. Dice, die, game dice
42. Party hat, birthday hat, celebration hat
43. Refrigerator, fridge
44. Candle, cylindrical lamp
45. Bed, mattress, pillow (accept pillow even though it's soft)

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## Section F: Counting Vertices, Edges, and Faces

46. **18 vertices**

- Work: 3 cubes  $\times$  8 vertices = 24 vertices (Note: This is the total if separate. If asking for visible vertices when stacked, accept 18)
- Actually:  $3 \times 8 = 24$  vertices (Most accurate answer)

47. **4 edges**

- Work: 2 cylinders  $\times$  2 edges = 4 edges

48. **5 vertices**

- Work: 5 cones  $\times$  1 vertex = 5 vertices

49. **24 faces**

- Work: 4 cubes  $\times$  6 faces = 24 faces

50. **36 edges**

- Work: 2 cuboids  $\times$  12 edges = 24, plus 1 cube  $\times$  12 edges = 12

- $24 + 12 = 36$  edges

#### 51.9 faces

- Work:  $3 \text{ cylinders} \times 3 \text{ faces} = 9 \text{ faces}$

#### 52.11 more edges

- Work: Cube has 12 edges, cone has 1 edge
- $12 - 1 = 11$  more edges

#### 53.18 vertices

- Work:  $2 \text{ cubes} \times 8 \text{ vertices} = 16$ , plus  $2 \text{ cones} \times 1 \text{ vertex} = 2$
- $16 + 2 = 18$  vertices

#### 54.6 circular faces

- Work:  $6 \text{ cans} \times 1 \text{ top face visible} = 6 \text{ faces}$

#### 55.16 vertices

- Work:  $1 \text{ cube} = 8 \text{ vertices}$ ,  $1 \text{ cuboid} = 8 \text{ vertices}$ ,  $1 \text{ cylinder} = 0 \text{ vertices}$
- $8 + 8 + 0 = 16$  vertices

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### Section G: Compare and Contrast

#### 56. What is the same:

- Both have 6 faces, 12 edges, and 8 vertices
- Both have rectangular or square faces
- Both are 3-D shapes
- Both have flat faces

#### 57. What is different:

- A cube has all equal square faces; a cuboid has rectangular faces of different sizes
- All edges of a cube are equal length; cuboid edges vary in length
- A cube is a special type of cuboid

#### 58. Cylinder (3 faces vs 2 faces)

59. **Cuboid** (12 edges vs 2 edges)

60. **Can roll:** Cylinder or Cone **Cannot roll:** Cube or Cuboid

61. **Cone**

62. **Yes** (both have 12 edges)

63. **1 cube** (8 vertices vs 2 vertices)

64. **Cylinder** (accept also cone, though cone has a pointed top, not flat)

65. **Shape 1:** Cube **Shape 2:** Cuboid (These don't roll, so they stack easily)

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## Section H: Shape Puzzles

66. **Cuboid**

67. **Cylinder**

68. **Cube**

69. **Cone**

70. **Cuboid** or **Cube** (both are correct; cube is a special cuboid)

71. **Two half-cylinders** or **Two semi-cylinders**

72. **13 edges**

- Work: Cube = 12 edges, Cone = 1 edge
- $12 + 1 = 13$  edges

73. **Cube** (8 vertices, compared to cylinder's 0 and cone's 1)

74. **8 vertices** (you can see the 4 front vertices of the top cube and 4 front vertices of the bottom cube; middle cube's vertices are partially hidden)

- Accept answers between 6-12 depending on interpretation

75. **12 edges** (size doesn't matter; all cuboids have 12 edges)

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## Section I: Application Questions

76. **6 faces**

77. **3 faces** (top, bottom, and curved surface)

78. **10 edges** (5 pipes  $\times$  2 edges = 10 edges)

79. **10 vertices** (10 hats  $\times$  1 vertex = 10 vertices)

80. **6 colors** (one for each face)

81. **32 corners/vertices** (4 boxes  $\times$  8 corners = 32 corners)

82. **Cylinder Why:** It can roll smoothly; cubes cannot roll (accept reasonable explanations)

83. **Cube** (it has 8 vertices, the most of the three)

84. **Cylinder** (it can roll and has flat circular tops for a lid)

85. **6 faces**

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### Section J: Mixed Challenge Questions

86. **Cube**

87. **Shape with 0 vertices:** Cylinder **Shape with 8 vertices:** Cube or Cuboid

88. **Cylinder: 0 vertices Cone: 1 vertex**

89. **2 faces** (you can see the curved surface and the circular base)

90. **True Explain:** 10 cones have 10 edges total ( $10 \times 1 = 10$ ), which is less than 1 cube with 12 edges. So this is FALSE! **Correct Answer: False**

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### Bonus Challenge

91-95. Answers will vary. Award points for:

- Clear, well-written question (2 points)
- Mathematically correct question involving 3-D shapes (1 point)
- Correct answer provided (2 points)

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End of Worksheet 