

Playground Blueprint

Teacher Guide & Answer Keys

Grade 4 · All levels

Overview

Students design a playground. They use the area and perimeter formulas for rectangles, find an unknown side length, convert larger units to smaller units, and solve problems about time, distance and money for the building project.

Time: 3 class periods · **Product:** Playground Blueprint · **Standards:** 4.MD.A.1, 4.MD.A.2, 4.MD.A.3

Suggested pacing

- Day 1: Introduce the challenge, read the scenario together, and work Parts 1–2 in pairs.
- Day 2: Finish the remaining parts and create the final product.
- Day 3: Share products in a gallery walk and reflect.

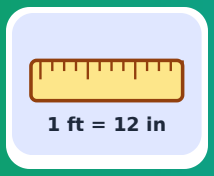
Levels

- **Remedial:** smaller numbers, fewer steps, more structure.
- **Standard:** grade-level numbers and the full set of tasks.
- **Advanced:** harder numbers, extra reasoning and multi-step questions.

All three levels practice the same learning goals, so the class can share and compare work.

Rubric

Category	4 Excellent	3 Good	2 Developing	1 Beginning
Math accuracy	All answers correct	Most answers correct	Some answers correct	Few answers correct
Shows work	Clear work for every step	Work for most steps	Some work shown	Little work shown
Explains thinking	Clear, complete explanations	Mostly clear explanations	Some explanation	Little explanation
Final product	Complete, neat and creative	Complete and neat	Partly complete	Not complete



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Answer key · Remedial KEY

Part 1: The Play Area

1. What is the area? Write the formula you used.

A = l × w = 12 × 8 = 96 square meters

2. What is the perimeter?

P = 2 × 12 + 2 × 8 = 40 meters

3. Which measurement tells how much rubber matting to buy: area or perimeter? Why?

Area, because matting covers the surface inside the rectangle.

Part 2: The Sandbox

4. How long is the other side? Write an equation with a letter.

9 × w = 36, so w = 4 meters

5. What is the perimeter of the sandbox?

2 × 9 + 2 × 4 = 26 meters

Part 3: Fence and Units

6. How much does the fence cost?

40 × $5 = $200

7. How many centimeters long is the fence? (1 meter = 100 centimeters)

40 × 100 = 4,000 centimeters

8. Complete the conversion table.

1 m = 100 cm; 2 m = 200 cm; 5 m = 500 cm; 10 m = 1000 cm

Part 4: Building Day

9. How many minutes does the job take?

2 × 60 + 15 = 135 minutes

10. What time do the workers finish?

11:15 AM

11. The workers drink 4 liters of water. How many milliliters is that?

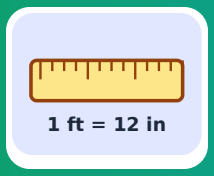
4 × 1,000 = 4,000 milliliters

12. Draw your blueprint on grid paper. Label every length, the area and the perimeter.

Check that labeled areas and perimeters match the drawn dimensions.

Extension

Examples: 1 × 24 (P = 50), 2 × 12 (P = 28), 3 × 8 (P = 22), 4 × 6 (P = 20). The 4 × 6 rectangle needs the least fence.



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Answer key · Standard KEY

Part 1: The Play Area

1. What is the area? Write the formula you used.

A = l × w = 24 × 15 = 360 square meters

2. What is the perimeter?

P = 2 × 24 + 2 × 15 = 78 meters

3. Which measurement tells how much rubber matting to buy: area or perimeter? Why?

Area, because matting covers the surface inside the rectangle.

Part 2: The Sandbox

4. How long is the other side? Write an equation with a letter.

12 × w = 96, so w = 8 meters

5. What is the perimeter of the sandbox?

2 × 12 + 2 × 8 = 40 meters

Part 3: Fence and Units

6. How much does the fence cost?

78 × $8 = $624

7. How many centimeters long is the fence? (1 meter = 100 centimeters)

78 × 100 = 7,800 centimeters

8. Complete the conversion table.

1 m = 100 cm; 2 m = 200 cm; 5 m = 500 cm; 10 m = 1000 cm

Part 4: Building Day

9. How many minutes does the job take?

3 × 60 + 45 = 225 minutes

10. What time do the workers finish?

12:15 PM

11. The workers drink 6 liters of water. How many milliliters is that?

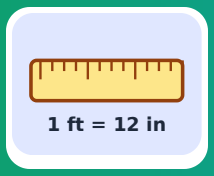
6 × 1,000 = 6,000 milliliters

12. Draw your blueprint on grid paper. Label every length, the area and the perimeter.

Check that labeled areas and perimeters match the drawn dimensions.

Extension

1 × 36 (P = 74), 2 × 18 (P = 40), 3 × 12 (P = 30), 4 × 9 (P = 26), 6 × 6 (P = 24). The 6 × 6 square needs the least: 24 meters.



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Answer key · Advanced KEY

Part 1: The Play Area

1. What is the area? Write the formula you used.

A = l × w = 36 × 28 = 1008 square meters

2. What is the perimeter?

P = 2 × 36 + 2 × 28 = 128 meters

3. Which measurement tells how much rubber matting to buy: area or perimeter? Why?

Area, because matting covers the surface inside the rectangle.

Part 2: The Sandbox

4. How long is the other side? Write an equation with a letter.

14 × w = 182, so w = 13 meters

5. What is the perimeter of the sandbox?

2 × 14 + 2 × 13 = 54 meters

Part 3: Fence and Units

6. How much does the fence cost?

128 × $12 = $1,536

7. How many centimeters long is the fence? (1 meter = 100 centimeters)

128 × 100 = 12,800 centimeters

8. Complete the conversion table.

1 m = 100 cm; 2 m = 200 cm; 5 m = 500 cm; 10 m = 1000 cm

Part 4: Building Day

9. How many minutes does the job take?

5 × 60 + 50 = 350 minutes

10. What time do the workers finish?

1:35 PM

11. The workers drink 15 liters of water. How many milliliters is that?

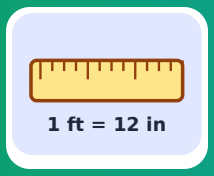
15 × 1,000 = 15,000 milliliters

12. Draw your blueprint on grid paper. Label every length, the area and the perimeter.

Check that labeled areas and perimeters match the drawn dimensions.

Extension

10 × 10 gives 100 square meters. As the sides get closer to equal (1 × 19 = 19, 5 × 15 = 75, 9 × 11 = 99), the area grows.



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Worked teacher example (Standard, Part 1)

What is the area? Write the formula you used.

A = l × w = 24 × 15 = 360 square meters

What is the perimeter?

P = 2 × 24 + 2 × 15 = 78 meters

Which measurement tells how much rubber matting to buy: area or perimeter? Why?

Area, because matting covers the surface inside the rectangle.

Model the first part aloud: read the situation, name the operation, estimate, solve, and check. Then let partners try Part 2.

Look for

- Students use correct notation and units in every answer.
- Students explain why an answer is reasonable (estimates, benchmarks, pictures).
- Final products show the math clearly, not just the answers.