



Answer Key

## **GRADE 3 • MODULE 4**

Multiplication and Area

## Lesson 1

### Problem Set

1. Lines drawn to show 6 triangles each inside Shapes A and B
2. Lines drawn to show 3 rhombuses each inside Shapes A and B
3. Lines drawn to show 2 trapezoids each inside Shapes A and B
4. As pattern blocks get bigger, the number of block it takes gets smaller
5. Lines drawn to show 6 squares inside rectangle
6. No, because you can't have gaps when measuring area

### Exit Ticket

1. Yes, both rectangles have an area of 12 square units

### Homework

1.
  - a. 12
  - b. 6
  - c. 4; because  $12 \div 3 = 4$
2.
  - a. 12
  - b. 12; because 12 squares fit inside of it
3. A, because it has an area of 18 square units

## Lesson 2

### Pattern Sheet

4	8	12	16
20	24	28	32
36	40	24	28
24	32	24	36
24	40	24	28
24	28	32	28
36	28	40	28
32	24	32	28
32	36	32	40
32	36	24	36
28	36	32	36
40	36	40	24
40	28	40	32
40	36	40	32
32	40	28	36

### Problem Set

- Rectangle A: 2 rows of 6 square inches; 12 sq in  
Rectangle B: 3 rows of 4 square inches; 12 sq in  
Rectangle C: 4 rows of 3 square inches; 12 sq in
- Rectangle A: 2 rows of 6 square centimeters; 12 sq cm  
Rectangle B: 3 rows of 4 square centimeters; 12 sq cm  
Rectangle C: 4 rows of 3 square centimeters; 12 sq cm
- Answers will vary.
- Yes, 6 square units inside of each rectangle
- 8 square units; rectangle with an area of 8 square units drawn

**Exit Ticket**

- 16 square units; rectangle with an area of 16 square units drawn
- No, square inches are larger than square centimeters

**Homework**

- 12; rectangle circled
  - 9
  - 12; rectangle circled
  - 12; rectangle circled
  - 5
  - 8
- No, rectangle with 8 square units; rectangle with 6 square units
- 16 square units; a different rectangle with an area of 16 square units drawn

## Lesson 3

### Problem Set

- 6
  - 12 square units
  - 12 square units
  - 20 square units
- 6 square units
  - 9 square units
  - 16 square units
  - 12 square units
- Answers will vary.
  - Answers will vary.
- Answers will vary.

### Exit Ticket

- 12 square units; rectangle with an area of 12 square units drawn
- No, this rectangle's area is 16 square units.

### Homework

- 5
  - 15 square units
  - 12 square units
  - 20 square units
- 9 square units
  - 24 square units
  - 8 square units
  - 18 square units
- 10; rectangle with an area of 10 square units drawn
  - 9 square units; rectangle with an area of 9 square units drawn
  - 12 square units; rectangle with an area of 12 square units drawn

## Lesson 4

### Problem Set

1. 2 cm by 7 cm marked and connected; 14 sq cm
2. 3 in by 2 in marked and connected; 6 sq in
3. 3 cm by 4 cm labeled; 12 sq cm
4. Both are correct; explanations will vary.
5. Square-inch tiles, explanations will vary.
6. Explanations will vary.

### Exit Ticket

- a. 2 cm by 3 cm; 6 sq cm
- b. 2 cm by 6 cm; 12 sq cm
- c. 1 in by 5 in; 5 sq in

### Homework

1. 8 sq cm
2. 4 cm by 5 cm labeled; 20 sq cm
3. 2 in by 7 in labeled; 14 sq in
4. Both are correct; explanations will vary.
5. 2 in; 4 in; 8 in; explanations will vary.

## Lesson 5

### Problem Set

- 6
  - 20; tiles drawn; 4, 5, 20
  - 3 cm; tiles drawn; 6, 3, 18
  - 8 cm; tiles drawn; 3, 8, 24
  - 4 cm; tiles drawn; 5, 4, 20
  - 9; tiles drawn; 3, 3, 9
- 5 in, 7 in; answers will vary.
- Two rectangular arrays drawn, multiplication sentences written for each
- 8; answers will vary.
  - No; answers will vary.

### Exit Ticket

Rectangle with 7 rows of 4 tiles drawn; labeled 7 cm and 4 cm; multiplication sentence written

### Homework

- 6
  - 4 cm; tiles drawn; 6, 4, 24
  - 3 cm; tiles drawn; 5, 3, 15
  - 5 cm; tiles drawn; 3, 5, 15
- 9; answers will vary.
- 9; answers will vary.
  - Yes; answers will vary.
  - Yes; explanations will vary.

## Lesson 6

### Problem Set

- Lines drawn to find 5 cm by 6 cm; matched to fifth completed array;  $5 \times 6 = 30$
  - Lines drawn to find 3 cm by 7 cm; matched to sixth completed array;  $3 \times 7 = 21$
  - Lines drawn to find 5 cm by 3 cm; matched to first completed array;  $5 \times 3 = 15$
  - Lines drawn to find 4 cm by 5 cm; matched to second completed array;  $4 \times 5 = 20$ .
  - Lines drawn to find 2 cm by 6 cm; matched to third completed array;  $2 \times 6 = 12$
  - Lines drawn to find 4 cm by 3 cm; matched to fourth completed array;  $4 \times 3 = 12$
- No; explanations may vary.
- 90
- 30; explanations may vary.

### Exit Ticket

80

### Homework

- Lines drawn to find 6 cm by 6 cm; matched to fifth completed array;  $6 \times 6 = 36$
  - Lines drawn to find 3 cm by 8 cm; matched to sixth completed array;  $3 \times 8 = 24$
  - Lines drawn to find 3 cm by 6 cm; matched to first completed array;  $3 \times 6 = 18$
  - Lines drawn to find 5 cm by 5 cm; matched to second completed array;  $5 \times 5 = 25$
  - Lines drawn to find 2 cm by 8 cm; matched to third completed array;  $2 \times 8 = 16$
  - Lines drawn to find 4 cm by 3 cm; matched to fourth completed array;  $4 \times 3 = 12$
- Yes; explanations may vary.
- 90
- 36; explanations may vary.



## Lesson 7

### Problem Set

- Grid lines drawn inside rectangle; side lengths labeled;  $3 \times 4 = 12$
  - Grid lines drawn inside rectangle; side lengths labeled;  $5 \times 4 = 20$
  - Grid lines drawn inside rectangle; side lengths labeled;  $2 \times 7 = 14$
  - Grid lines drawn inside rectangle; side lengths labeled;  $7 \times 4 = 28$
  - Grid lines drawn inside rectangle; side lengths labeled;  $1 \times 3 = 3$
  - Grid lines drawn inside rectangle; side lengths labeled;  $4 \times 2 = 8$
- Side lengths labeled as 9 and 11
  - Grid lines drawn inside rectangle
  - 99
- No, explanations will vary.
- Answers will vary.
  - 24

### Exit Ticket

- Grid lines drawn inside rectangle; 42
- Gia, square inches are larger than square centimeters

### Homework

- 6; answer provided;  $3 \times 2 = 6$
  - 10; side lengths labeled;  $2 \times 5 = 10$
  - 12; side lengths labeled;  $3 \times 4 = 12$
  - 16; side lengths labeled;  $4 \times 4 = 16$
- 7 by 4 rectangle drawn on grid; 28 square units
  - Side lengths labeled;  $7 \times 4 = 28$
- Gregory, square inches are larger than square centimeters

## Lesson 8

### Pattern Sheet

6	12	18	24
30	36	42	48
54	60	30	36
30	42	30	48
30	54	30	60
36	30	36	42
36	48	36	54
36	42	36	42
48	42	54	42
48	36	48	42
48	54	54	36
54	42	54	48
54	48	36	54
42	54	36	48
54	42	36	48

### Problem Set

- $28; 4 \times 7 = 28$
  - $56; 8 \times 7 = 56$
  - $36; 6 \times 6 = 36$
- $8; 9 \times 8 = 72; 72 \div 9 = 8$
  - $5; 3 \times 5 = 15; 15 \div 3 = 5$
  - $7; 7 \times 4 = 28; 28 \div 4 = 7$
- Answers will vary.
- 54 sq cm; explanations will vary.
- No; explanations will vary.
- 4 in; explanations will vary.

### Exit Ticket

- $27; 3 \times 9 = 27$
- $9; 6 \times 9 = 54; 54 \div 6 = 9$

**Homework**

1.
  - a.  $24; 3 \times 8 = 24$
  - b.  $48; 6 \times 8 = 48$
  - c.  $16; 4 \times 4 = 16$
  - d.  $28; 4 \times 7 = 28$
2.
  - a.  $8; 3 \times 8 = 24; 24 \div 3 = 8$
  - b.  $4; 4 \times 9 = 36; 36 \div 9 = 4$
3. Answers will vary.
4. 36 sq cm; explanations will vary.
5. 3 in; explanations will vary.

## Lesson 9

### Problem Set

- 2 rectangles drawn; 5 cm, 10 cm labeled
  - $5 \text{ cm} \times 10 \text{ cm} = 50 \text{ sq cm}$
  - $50 \text{ sq cm} + 50 \text{ sq cm} = 100 \text{ sq cm}$
- Rectangle drawn; 5 cm, 20 cm labeled
  - 100 sq cm
- 4, 6; 4, 7; 24 sq units; 28 sq units
  - Rectangle drawn; 4, 13
  - Rahema is right; explanations will vary.
- No; explanations will vary.

### Exit Ticket

- 6, 6; 6, 3
- $6 \times 6 = 36$ , 36 sq units;  $6 \times 3 = 18$ , 18 sq units
- 54 sq units; answers will vary.

### Homework

- Line drawn to show two 4 by 8 rectangles or two 8 by 4 rectangles; 1 rectangle shaded
  - 4, 8; 4, 8 or 8, 4; 8, 4
  - $4 \times 8 + 4 \times 8 = 64 \text{ sq units}$   
or  $8 \times 4 + 8 \times 4 = 64 \text{ sq units}$
- Rectangle drawn; 4, 16
  - 64 sq units
  - Yes; answers will vary.

## Lesson 10

### Problem Set

- 35, 21; 56
  - 10; 10; 10; 40; 48
  - 10, 3; 10; 10; 60, 18; 78
  - 8, 10, 2; 10, 2; 10, 2; 80, 16; 96
- Answers will vary.
- 75 sq units; answers will vary.

### Exit Ticket

- 8, 5, 2; 5, 2; 5, 2; 40, 16; 56
- 9, 10, 3; 10, 3; 9, 10, 9, 3; 90, 27; 117

### Homework

- 40, 32; 72
  - 10; 10; 10; 50; 60
  - 10, 3; 10; 10; 70, 21; 91
  - 9, 10, 2; 10, 2; 10, 2; 90, 18; 108
- Answers will vary.
- Rectangle shaded; 64 sq units; answers will vary.

## Lesson 11

### Problem Set

- 6, 48
  - 48, 48
  - 24; 2, 24; 48
  - 12; 4, 12; 48
  - 16, 3; 16, 3; 48
- Yes; answers will vary.
- Answers will vary
- 72 sq cm
  - 8, 9; 72; yes; answers will vary.
  - Answers will vary.

### Exit Ticket

- 64 sq cm
- 4, 16; 4, 16; 64

### Homework

- 9, 36
  - 36
  - 18; 2, 18; 36
  - 12, 3; 12, 3; 36
  - 6, 6; 6, 6; 36
- Yes, answers will vary.
- 48 sq cm
  - 8, 6; 48; yes; answers will vary.
  - Answers will vary.

## Lesson 12

### Pattern Sheet

7	14	21	28
35	42	49	56
63	70	35	42
35	49	35	56
35	63	35	70
42	35	42	49
42	56	42	63
42	49	42	49
56	49	63	49
56	42	56	49
56	63	63	42
63	49	63	56
63	56	42	63
49	63	42	56
63	49	42	56

### Problem Set

- 81 sq cm
- 12 sq units; answers will vary.
  - Yes; answers will vary.
- 64 sq ft
- 4 sq units, 9 sq units, 16 sq units; explanations will vary.
  - 5 by 5 and 6 by 6 rectangles drawn; 25 sq units, 36 sq units
- 3 cm; 54 sq cm

### Exit Ticket

- 7 in
- 64 sq in

**Homework**

1. 81 sq in
2. Yes; answers will vary.
3. 3 ft
4. 2 rectangles drawn; answers will vary.
5. 5 by 2 rectangle drawn; explanations will vary.



## Lesson 13

### Problem Set

- 9, 27; 18, 15, 33; 9, 21, 30; answers will vary, 55
- 90, 12, 78
- 5, 4
  - 7, 9, 63
  - 4, 5, 20
  - 43 sq cm

### Exit Ticket

32, 20, 52

### Homework

- 15, 9, 24; 24, 20, 44; 12, 32, 44; 15, 25, 40
- 56, 9, 47
- 4, 3
  - 9, 8, 72
  - 4, 3, 12
  - 60 sq cm

## Lesson 14

### Pattern Sheet

8	16	24	32
40	48	56	64
72	80	40	48
40	56	40	64
40	72	40	80
48	40	48	56
48	64	48	72
48	56	48	56
64	56	72	56
64	48	64	56
64	72	72	48
72	56	72	64
72	64	48	72
56	72	48	64
72	56	48	64

### Problem Set

- 19 sq cm
  - 10 sq m
- 24 sq m
- 39 sq in
- Evan; explanations will vary.

### Exit Ticket

32 sq cm

### Homework

- 75 sq ft
  - 58 sq in
- 3 ft, 5 ft
  - 55 sq ft

## Lesson 15

### Pattern Sheet

9	18	27	36
45	9	18	9
27	9	36	9
45	9	18	27
18	36	18	45
18	9	18	27
9	27	18	27
36	27	45	27
36	9	36	18
36	27	36	45
36	45	9	45
18	45	27	45
36	18	36	27
45	27	18	36
27	45	18	36

### Problem Set

1. Answers will vary.
2. 60; 56; 42; 24; 25; 28; 88; strategies will vary.
3. Living room; yes or no; answers will vary.
4. 19, 17; answers will vary.
5. 323; answers will vary.

**Exit Ticket**

Missing side lengths labeled

- a. Equations will vary, 300
- b. Equations will vary, 60
- c. Equations will vary, 9
- d. Equations will vary, 24
- e. Equations will vary, 21

**Homework**

1. 4, 6; bathroom; 24 sq cm
2. 5, 9; kitchen; 45 sq cm
3. 8, 7; bedroom; 56 sq cm
4. 12, 1; hallway; 12 sq cm
5. 7, 9; living room; 63 sq cm
6. 2, 17; porch; 34 sq cm

## Lesson 16

### Pattern Sheet

9	18	27	36
45	54	63	72
81	90	45	54
45	63	45	72
45	81	45	90
54	45	54	63
54	72	54	81
54	63	54	63
72	63	81	63
72	54	72	63
72	81	81	54
81	63	81	72
81	72	54	81
63	81	54	72
81	63	54	72

### Problem Set

Answers will vary.

### Exit Ticket

40 sq cm; rectangle drawn, side lengths labeled

### Homework

Drawings will vary.