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 ÷ 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

1. 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
2. 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
3. Answers will vary.
4. Yes, 6 square units inside of each rectangle
5. 8 square units; rectangle with an area of 8 square units drawn

Exit Ticket

1. 16 square units; rectangle with an area of 16 square units drawn
2. No, square inches are larger than square centimeters

Homework

1. a. 12; rectangle circled
   b. 9
   c. 12; rectangle circled
   d. 12; rectangle circled
   e. 5
   f. 8
2. No, rectangle with 8 square units; rectangle with 6 square units
3. 16 square units; a different rectangle with an area of 16 square units drawn

Lesson 3

Problem Set

1. a. 6
   b. 12 square units
   c. 12 square units
   d. 20 square units
2. a. 6 square units
   b. 9 square units
   c. 16 square units
   d. 12 square units
3. a. Answers will vary.
   b. Answers will vary.
4. Answers will vary.

Exit Ticket

1. 12 square units; rectangle with an area of 12 square units drawn
2. No, this rectangle's area is 16 square units.

Homework

1. a. 5
   b. 15 square units
   c. 12 square units
   c. 20 square units
2. a. 9 square units
   b. 24 square units
   c. 8 square units
   d. 18 square units
3. a. 10; rectangle with an area of 10 square units drawn
   b. 9 square units; rectangle with an area of 9 square units drawn
   c. 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

1. a. 6
   b. 20; tiles drawn; 4, 5, 20
   c. 3 cm; tiles drawn; 6, 3, 18
   d. 8 cm; tiles drawn; 3, 8, 24
   e. 4 cm; tiles drawn; 5, 4, 20
   f. 9; tiles drawn; 3, 3, 9
2. 5 in, 7 in; answers will vary.
3. Two rectangular arrays drawn, multiplication sentences written for each
4. a. 8; answers will vary.
   b. No; answers will vary.

Exit Ticket

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

Homework

1. a. 6
   b. 4 cm; tiles drawn; 6, 4, 24
   c. 3 cm; tiles drawn; 5, 3, 15
   d. 5 cm; tiles drawn; 3, 5, 15
2. 9; answers will vary.
3. a. 9; answers will vary.
   b. Yes; answers will vary.
   c. Yes; explanations will vary.

Lesson 6

Problem Set

1. a. Lines drawn to find 5 cm by 6 cm; matched to fifth completed array; 5 × 6 = 30
   b. Lines drawn to find 3 cm by 7 cm; matched to sixth completed array; 3 × 7 = 21
   c. Lines drawn to find 5 cm by 3 cm; matched to first completed array; 5 × 3 =15
   d. Lines drawn to find 4 cm by 5 cm; matched to second completed array; 4 × 5 = 20.
   e. Lines drawn to find 2 cm by 6 cm; matched to third completed array; 2 × 6 = 12
   f. Lines drawn to find 4 cm by 3 cm; matched to fourth completed array; 4 × 3 = 12
2. No; explanations may vary.
3. 90
4. 30; explanations may vary.

Exit Ticket

80

Homework

1. a. Lines drawn to find 6 cm by 6 cm; matched to fifth completed array; 6 × 6 = 36
   b. Lines drawn to find 3 cm by 8 cm; matched to sixth completed array; 3 × 8 = 24
   c. Lines drawn to find 3 cm by 6 cm; matched to first completed array; 3 × 6 =18
   d. Lines drawn to find 5 cm by 5 cm; matched to second completed array; 5 × 5 = 25
   e. Lines drawn to find 2 cm by 8 cm; matched to third completed array; 2 × 8 = 16
   f. Lines drawn to find 4 cm by 3 cm; matched to fourth completed array; 4 × 3 = 12
2. Yes; explanations may vary.
3. 90
4. 36; explanations may vary.

Lesson 7

Problem Set

1. a. Grid lines drawn inside rectangle; side lengths labeled; 3 × 4 = 12
   b. Grid lines drawn inside rectangle; side lengths labeled; 5 × 4 = 20
   c. Grid lines drawn inside rectangle; side lengths labeled; 2 × 7 = 14
   d. Grid lines drawn inside rectangle; side lengths labeled; 7 × 4 = 28
   e. Grid lines drawn inside rectangle; side lengths labeled; 1 × 3 = 3
   f. Grid lines drawn inside rectangle; side lengths labeled; 4 × 2 = 8
2. a. Side lengths labeled as 9 and 11
   b. Grid lines drawn inside rectangle
   c. 99
3. No, explanations will vary.
4. a. Answers will vary.
   b. 24

Exit Ticket

1. Grid lines drawn inside rectangle; 42
2. Gia, square inches are larger than square centimeters

Homework

1. a. 6; answer provided; 3 × 2 = 6
   b. 10; side lengths labeled; 2 × 5 = 10
   c. 12; side lengths labeled; 3 × 4 = 12
   d. 16; side lengths labeled; 4 × 4 = 16
2. a. 7 by 4 rectangle drawn on grid; 28 square units
   b. Side lengths labeled; 7 × 4 = 28
3. 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

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

Exit Ticket

1. 27; $3 \times 9 = 27$
2. 9; $6 \times 9 = 54$; $54 \div 6 = 9$

Homework

1. a. 24; 3 × 8 = 24
   b. 48; 6 × 8 = 48
   c. 16; 4 × 4 = 16
   d. 28; 4 × 7 = 28

2. a. 8; 3 × 8 = 24; 24 ÷ 3 = 8
   b. 4; 4 × 9 = 36; 36 ÷ 9 = 4
3. Answers will vary.
4. 36 sq cm; explanations will vary.
5. 3 in; explanations will vary.

Lesson 9

Problem Set

1. a. 2 rectangles drawn; 5 cm, 10 cm labeled
   b. 5 cm × 10 cm = 50 sq cm
   c. 50 sq cm + 50 sq cm = 100 sq cm
2. a. Rectangle drawn; 5 cm, 20 cm labeled
   b. 100 sq cm
3. a. 4, 6; 4, 7; 24 sq units; 28 sq units
   b. Rectangle drawn; 4, 13
   c. Rahema is right; explanations will vary.
4. No; explanations will vary.

Exit Ticket

1. 6, 6; 6, 3
2. 6 × 6 = 36, 36 sq units; 6 × 3 = 18, 18 sq units
3. 54 sq units; answers will vary.

Homework

1. a. Line drawn to show two 4 by 8 rectangles or two 8 by 4 rectangles; 1 rectangle shaded
   b. 4, 8; 4, 8 or 8, 4; 8, 4
   c. 4 × 8 + 4 × 8 = 64 sq units
   or 8 × 4 + 8 × 4 = 64 sq units
2. a. Rectangle drawn; 4, 16
   b. 64 sq units
   c. Yes; answers will vary.

Lesson 10

Problem Set

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

Exit Ticket

1. 8, 5, 2; 5, 2; 5, 2; 40, 16; 56
2. 9, 10, 3; 10, 3; 9, 10, 9, 3; 90, 27; 117

Homework

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

Lesson 11

Problem Set

1. a. 6, 48
   b. 48, 48
   c. 24; 2, 24; 48
   d. 12; 4, 12; 48
   e. 16, 3; 16, 3; 48
2. Yes; answers will vary.
3. Answers will vary
4. a. 72 sq cm
   b. 8, 9; 72; yes; answers will vary.
   c. Answers will vary.

Exit Ticket

1. 64 sq cm
2. 4, 16; 4, 16; 64

Homework

1. a. 9, 36
   b. 36
   c. 18; 2, 18; 36
   d. 12, 3; 12, 3; 36
   e. 6, 6; 6, 6; 36
2. Yes, answers will vary.
3. a. 48 sq cm
   b. 8, 6; 48; yes; answers will vary.
   c. 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

1. 81 sq cm
2. a. 12 sq units; answers will vary.
   b. Yes; answers will vary.
3. 64 sq ft
4. a. 4 sq units, 9 sq units, 16 sq units; explanations will vary.
   b. 5 by 5 and 6 by 6 rectangles drawn; 25 sq units, 36 sq units
5. 3 cm; 54 sq cm

Exit Ticket

1. 7 in
2. 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

1. 9, 27; 18, 15, 33; 9, 21, 30; answers will vary, 55
2. 90, 12, 78
3. a. 5, 4
   b. 7, 9, 63
   c. 4, 5, 20
   d. 43 sq cm

Exit Ticket

32, 20, 52

Homework

1. 15, 9, 24; 24, 20, 44; 12, 32, 44; 15, 25, 40
2. 56, 9, 47
3. a. 4, 3
   b. 9, 8, 72
   c. 4, 3, 12
   d. 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

1. a. 19 sq cm
   b. 10 sq m
2. 24 sq m
3. 39 sq in
4. Evan; explanations will vary.

Exit Ticket

32 sq cm

Homework

1. a. 75 sq ft
   b. 58 sq in
2. a. 3 ft, 5 ft
   b. 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.