Name _____

Extending Multiplication Patterns

Use patterns to find the products.

1. $100 \times 0.95 =$ __**95**__

$1,000 \times 0.95 =$ __**950**__

$10,000 \times 0.95 =$ __**9,500**__

$100,000 \times 0.95 =$ __**95,000**__

$1,000,000 \times 0.95 =$ __**950,000**__

2. $1 \times 2,689 =$ __**2,689**__

$0.1 \times 2,689 =$ __**268.9**__

$0.01 \times 2,689 =$ __**26.89**__

$0.001 \times 2,689 =$ __**2.689**__

$0.0001 \times 2,689 =$ __**0.2689**__

3. $2 \times 4 =$ __**8**__

$20 \times 4 =$ __**80**__

$200 \times 4 =$ __**800**__

$2,000 \times 4 =$ __**8,000**__

$20,000 \times 4 =$ __**80,000**__

4. $30 \times 8 =$ __**240**__

$3 \times 8 =$ __**24**__

$0.3 \times 8 =$ __**2.4**__

$0.03 \times 8 =$ __**0.24**__

5. __**3**__ $\times 4 = 12$

__**30**__ $\times 4 = 120$

__**300**__ $\times 4 = 1,200$

__**3,000**__ $\times 4 = 12,000$

__**30,000**__ $\times 4 = 120,000$

6. $10 \times 7 =$ __**70**__

$1.0 \times 7 =$ __**7**__

$0.1 \times 7 =$ __**0.7**__

$0.01 \times 7 =$ __**0.07**__

$0.001 \times 7 =$ __**0.007**__

7. ⬛ Write Math ▶ **Explain** how you used patterns to complete Exercise 3.

Possible answer: I know that 2 × 4 = 8 and 20 × 4 = 80.

To continue the pattern, I kept moving the decimal point

one place to the right to find the remaining products.

8. Stretch Your Thinking Suppose you continue the pattern
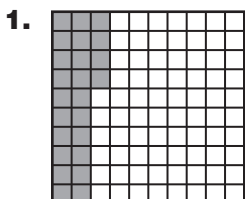in Exercise 4. What will be the next three products?

0.024; 0.0024; 0.00024

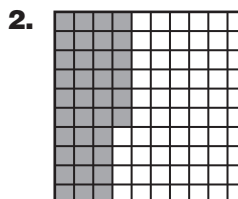# One Product, Two Multiplication Sentences

The shaded squares in each decimal model represent the product of a whole number and a decimal. For each model, write two multiplication sentences whose products correspond to the model. The first one has been done for you.
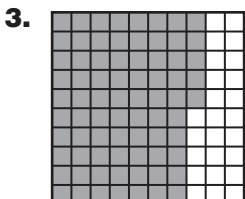
Possible answers are given.

1.

$8 \times 0.03 = 0.24$

$2 \times 0.12 = 0.24$

2.

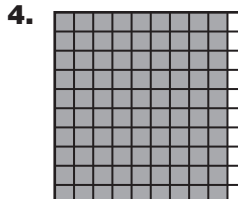$6 \times 0.06 = 0.36$

$3 \times 0.12 = 0.36$

3.

$3 \times 0.25 = 0.75$

$5 \times 0.15 = 0.75$

4.

$2 \times 0.45 = 0.90$

$10 \times 0.09 = 0.90$

5. Stretch Your Thinking Shade your own decimal model to represent the product of a whole number and a decimal. Then challenge a classmate to write two multiplication sentences for your model. **Check students' work.**

Connecting Decimal Multiplication and Division

Possible multiplication sentences are given.

Write a related multiplication sentence to find the unknown value that makes each statement true.

1. __**1.2**__ ÷ 6 = 0.2

6 × 0.2 = 1.2

2. __**3.5**__ ÷ 7 = 0.5

7 × 0.5 = 3.5

3. __**0.49**__ ÷ 7 = 0.07

7 × 0.07 = 0.49

4. __**0.25**__ ÷ 5 = 0.05

5 × 0.05 = 0.25

5. __**72.8**__ ÷ 8 = 9.1

8 × 9.1 = 72.8

6. __**133.60**__ ÷ 5 = 26.72

5 × 26.72 = 133.60

7. **Write Math** ▶ **Explain** how you can use the relationship between multiplication and division to complete Exercise 1.

Possible answer: I know that 6 × 0.2 = 1.2. Since multiplication and division are inverse operations, I can conclude that 1.2 ÷ 6 = 0.2.

8. **Stretch Your Thinking** How could you find the value that makes the statement 32.2 ÷ ▢ = 4.6 true?

Possible answer: First I can write 32.2 and 4.6 as whole numbers by multiplying both by 10. That will give me 322 ÷ ▇ = 46. Then I can divide 322 by 46, which is 7. So 32.2 ÷ 7 = 4.6.
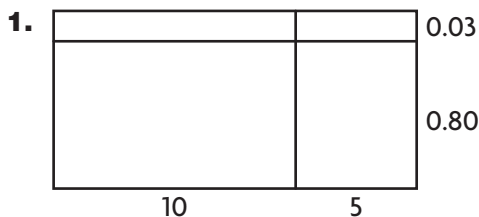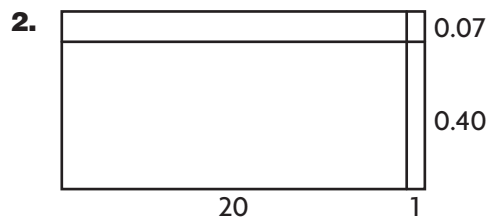
Analyzing Models and Partial Products

Write the multiplication expression represented by the model. Then find the product.

1.

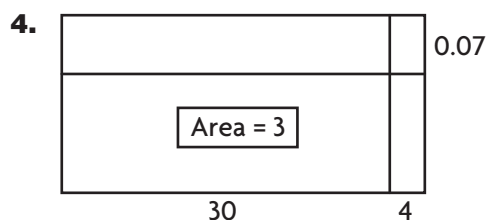| | 0.03 |
| | 0.80 |

10   5

$0.83 \times 15 = 12.45$

2.

| | 0.07 |
| | 0.40 |

20   1

$0.47 \times 21 = 9.87$

3.

| | 2 |
| Area = 400 | 10 |

0.2

$40.2 \times 12 = 482.4$

4.

| | 0.07 |
| Area = 3 | |
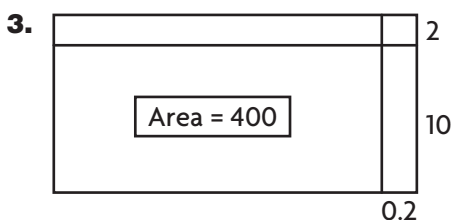
30   4

$0.17 \times 34 = 5.78$

5. **Write Math ▶** Look back at Exercise 3. **Explain** how you used the given area of the smaller rectangle to help you write the multiplication expression the model represents.

Possible answer: I know the area of the smaller rectangle is 400 and its width is 10. To find its length, divide 400 ÷ 10, which is 40. So the length of the large rectangle is 40 + 0.2, or 40.2. Its width is 2 + 10, or 12. So the multiplication expression is 40.2 × 12.

Money Multiplication Problems

**Write a problem that can be represented by the model.
Then solve the problem.** **Check students' problems.**

1. T-shirt $15.49

Sunglasses $15.49 | $3.80

_____

_____

_____

2. Lemonade $3.50

Salad $3.50 | $3.50 | $3.50 | $3.50

_____

_____

_____

3. Mia $5.25

Madison $5.25 | $5.25

Morgan $5.25 | $5.25 | $10.89

_____

_____

_____

4. June $28.50

July $28.50 | $28.50 | $28.50

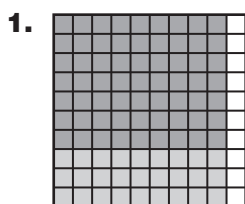**August** $28.50 | $28.50 | $28.50 | $17.75

_____

_____

_____

5. **Write Math** ▸ In Exercise 1, suppose you have $41. Would you
have enough money to buy the items in the problem and two pairs
of socks at $2.75 each? **Explain**.

**Yes; the total cost of the T-shirt and sunglasses
is $34.78. So I would have $6.22 left. The cost of
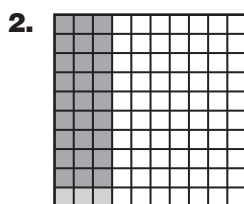the socks is 2 × $2.75, or $5.50. Since
$5.50 < $6.22, I could buy the socks, too.**
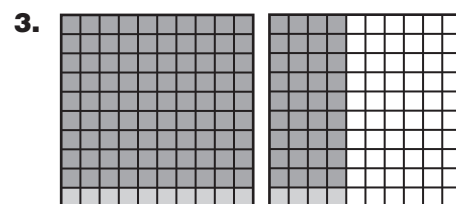
Backward Decimal Multiplication

**Write the multiplication equation that is represented by the model.
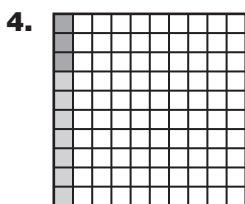Each equation should include the factors and their product.**
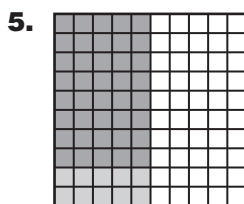
1.

$0.7 \times 0.9 = 0.63$

2.

$0.9 \times 0.3 = 0.27$

3.

$0.9 \times 1.4 = 1.26$

4.

$0.3 \times 0.1 = 0.03$

5.

$0.8 \times 0.5 = 0.40$

6.
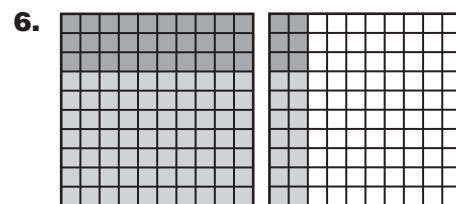
$0.3 \times 1.2 = 0.36$

7. **Write Math** In Exercise 6, explain how you found the multiplication equation that the model represents.

Possible answer: 12 columns are shaded, which represents the factor 1.2; 3 rows are shaded, which represents the factor 0.3. The shadings overlap in 36 squares, which represents the product 0.36. So the multiplication equation is 1.2 × 0.3 = 0.36.

8. **Stretch Your Thinking** How can you use decimal squares to represent the product 0 × 0.7? What is the product?

Possible answer: I would shade 7 columns to represent the factor 0.7. To represent the second factor, 0, I would shade 0 rows. There is no overlapping shading, so the product is 0.

A Chain of Products

Find the product.

1. 5.4 × 3.2

17.28

2. Multiply the product in Exercise 1 by 1.5.

25.92

3. Multiply the product in Exercise 2 by 0.5.

12.96

4. Multiply the product in Exercise 3 by 2.5.

32.4

5. Multiply the product in Exercise 4 by 9.4.

304.56

6. Multiply the product in Exercise 5 by 3.2.

974.592

7. Write Math ▶ Which exercise has a product that is less than the product in the exercise just before it? **Explain**.

The product in Exercise 3 is less than the product in Exercise 2, because I multiplied by a number less than 1.

Multiply and Compare

Write <, >, or = in the circle to make each comparison statement true.

1. 0.6×0.05 ⊜ 0.03 → $=$

2. 0.72 ⊜ 0.9×0.08 → $>$

3. 0.3×0.3 ⊜ 0.06 → $>$

4. $\$0.20$ ⊜ $0.4 \times \$0.50$ → $=$

5. 0.8×0.06 ⊜ 0.48 → $<$

6. 0.3×0.09 ⊜ 0.039 → $<$

7. 0.8×0.03 ⊜ 0.06×0.4 → $=$

8. 0.05×0.9 ⊜ 0.07×0.6 → $>$

9. 0.3×0.12 ⊜ 0.4×0.09 → $=$

10. 0.2×0.19 ⊜ 0.8×0.05 → $<$

11. **Write Math** → **Explain** how you completed Exercise 10.

Possible explanation: first I found the product 0.2 × 0.19, which is 0.038. Then I found the product 0.8 × 0.05, which is 0.040. Finally, I compared 0.038 and 0.040. Since 3 hundredths is less than 4 hundredths, I know that 0.038 < 0.040.