Multiplying Decimals and Exploring Patterns

To multiply money, we use decimal multiplication. An example would be to multiply $3.25 times 6 to get $19.50. We'll take a look at other decimals and how to multiply them.

To place the decimal point when multiplying decimals, count the decimal places in each factor and total them. The total is the number of decimal places that will be in the product. We will examine more multiplication problems.

Number patterns are everywhere. When counting by 5's, we are stating a number pattern: 5, 10, 15, 20, 25, ... We'll look at more interesting patterns with numbers. Calculators can speed up the exploration of number patterns. We'll see how a calculator can be a tool to aid in exploring patterns.

Using variables we can express a description of a pattern mathematically. We will explore using variables to describe patterns.

Note: Remember that the answer to a multiplication problem is called the product.

Multiply Decimals

More Decimal Multiplication

Patterns

Exploring Patterns with a Calculator

Patterns and Variables

Multiply Decimals

Multiplying Decimals Less Than One

To place the decimal point when multiplying decimals, count the decimal places in each factor and total them. The total is the number of decimal places that will be in the product (answer to a multiplication problem).

Multiply 0.7 × 0.9

Estimate: 1 × 1 = 1

one decimal place → **0.7**
one decimal place → **× 0.9**
total – two decimal places → **0.63**

Answer: 63 hundredths

Why two places?
Write both as fractions and multiply.

$$\frac{7}{10} \times \frac{9}{10} = \frac{63}{100} = 0.63$$

Check: The estimate, 1, is close to 0.63.

Multiply 0.12 × 0.36

Estimate: 0 × 0 = 0

two decimal places → **0.12**
two decimal places → **× 0.36**
72
36
total – four decimal places → **0.0432**

Why four places?
Write both as mixed fractions and multiply.

$$\frac{12}{100} \times \frac{36}{100} = \frac{432}{10000} = 0.0432$$

Use 0 as a placeholder before the numerals to give 4 decimal places.

Answer: 432 ten thousandths

Check: The estimate, 0, is close to 0.0432.

More Decimal Multiplication

To place the decimal point when multiplying decimals, count the decimal places in each factor and total them. The total is the number of decimal places that will be in the product (answer to a multiplication problem).

Multiply 5.23 × 7.9

Estimate: 5 × 8 = 40

two decimal places → **5.23**

one decimal place → **× 7.9**

4707

3661

total – three decimal places → **41.317**

Answer: 41 and 317 thousandths

Check: The estimate, 40, is close to 41.317.

Why three places?
Write both as mixed fractions and multiply.

$$5\frac{23}{100} \times 7\frac{9}{10} =$$

$$\frac{523}{100} \times \frac{79}{10} = \frac{41317}{1000} =$$

$$41\frac{317}{1000} = 41.317$$

Multiply 46 × 2.8

Estimate: 50 × 3 = 150

zero decimal places → **46**

one decimal place → **× 2.8**

368

92

total – one decimal place → **128.8**

Answer: 128 and 8 tenths

Check: The estimate, 150, is close to 128.8.

Why one decimal place?
Write both as mixed fractions and multiply.

$$\frac{46}{1} \times 2\frac{8}{10} =$$

$$\frac{46}{1} \times \frac{28}{10} = \frac{1288}{10} = 128.8$$

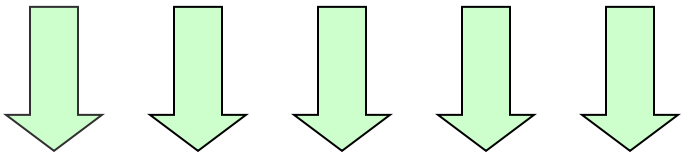
Patterns

Study the number of smiley faces that make up the pattern.

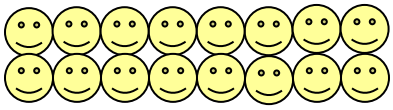
1 **2** **3** **4**

How many smiley faces will make up the next step? Draw a table to show the relationship between the step of the sequence and the number of smiley faces.

Step	Number of Faces
1	1
2	2
3	4
4	8
5	



Step 5



Each new step has twice as many faces as the step before, so step five would have **16** smiley faces.

Step	Number of Faces
1	1
2	2
3	4
4	8
5	**16**

Exploring Patterns with a Calculator

Using a calculator, fill in the missing numbers in the pattern.

28, ____, 42, 49, ____

Look at the table below. It may help you find the missing numbers.

N	N × 7
4	28
5	
6	42
7	49
8	

The rule is to **multiply N by 7**.

The missing numbers are:

5 × 7 = **35**

8 × 7 = **56**

Patterns and Variables

The 5th Grade Class is raising money for a field trip. They are selling spaghetti dinner tickets for $4.50. The table below shows the cost for up through 5 tickets.

Tickets (T)	**1**	**2**	**3**	**4**	**5**
Cost (C)	**4.50**	**9.00**	**13.50**	**18.00**	**22.50**

Megan sold 8 tickets.

Write a rule for the pattern in the ticket sales. Use **T** for a variable that represents the number of tickets. Use **C** to represent the cost of the tickets.

C = T × 4.50

Tickets (T)	**1**	**2**	**3**	**4**	**5**
Cost (C = T × 4.50)	**4.50**	**9.00**	**13.50**	**18.00**	**22.50**

Use the rule to find the amount of money Megan owes for the tickets.

C = T × $4.50
C = 8 × $4.50
C = $36.00