Name _____ Date _____

Extension
Lesson 1

Number Puzzles

1 Complete the puzzles.

A $(0 \times 3) \div 2 =$ ☐

B $(1 \times 4) \div 2 =$ ☐

C $(2 \times 5) \div 2 =$ ☐

D $(3 \times 6) \div 2 =$ ☐

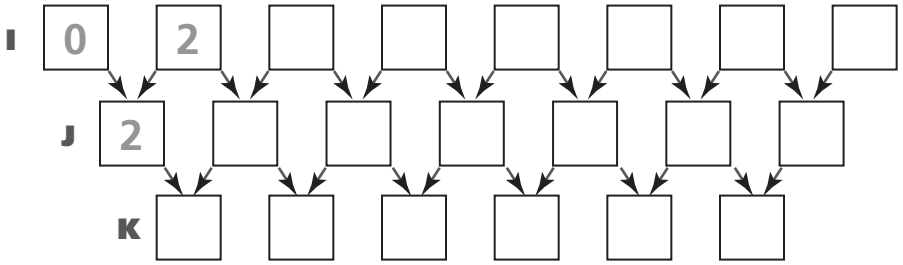
E $(4 \times 7) \div 2 =$ ☐

F $(5 \times 8) \div 2 =$ ☐

G $(6 \times 9) \div 2 =$ ☐

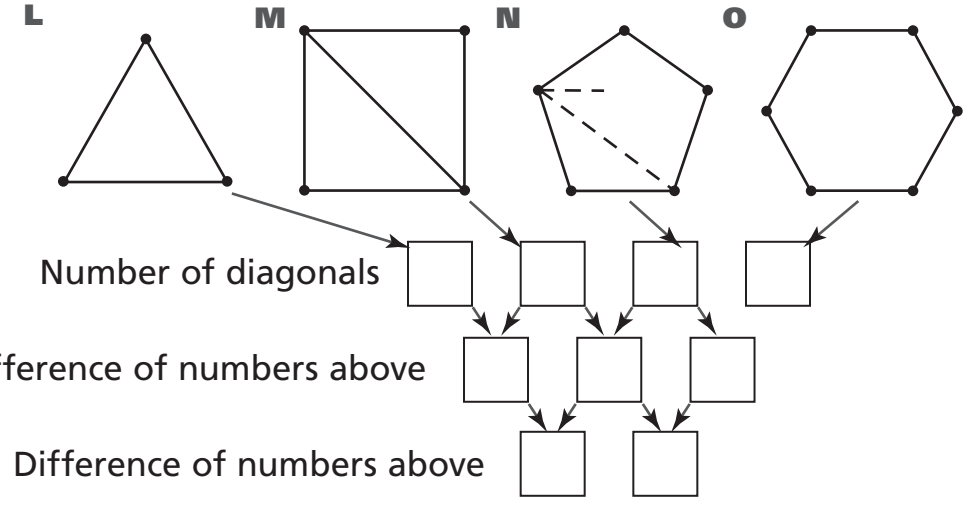
H $(7 \times 10) \div 2 =$ ☐

2 Fill in your answers to A through H in Row I.



In Row J, record the differences of the numbers in Row I.
In Row K, record the differences of the numbers in Row J.

Draw all possible diagonals connecting the dots in each of the figures below. Record the numbers of diagonals in the boxes.



Have you seen similar results before? _____

Name _____ Date _____

Extension
Lesson 2

Introducing Variables

Write words that match the letter pattern.

1. **abbc** (The middle 2 letters are the same.)

2. **rstr** (The first and last letters are the same.)

3. **abcc**

4. **abcdd**

5. **grsst**

Name _____ Date _____

Extension
Lesson 3

Introducing a Shorthand Notation

1. Record each word from the list beneath the pattern where it fits. Some words are already recorded.

   Words: meet, tree, miss, that, sits, boat, gong, lull, noon, deed, room, muff, Anna

ABBC	RSTR	ABCC	XYXX	ZMMZ
meet				deed

2. Create your own pattern. Record two words that fit your pattern.

   Pattern: _____

   Words: _____

   _____

Name _____ Date _____

Extension
Lesson 4

Using Shorthand Notation to Complete Number Puzzles

Complete the puzzle.

Words	Shorthand	A	B	C	D
Think of a number.	x				
Add 9.	$x + 9$				
	$2x + 18$		26		150
Add the number you thought of first.					
Divide by 3.				20	
Add 10.		26			82
Double.					
Subtract the number you thought of first.					
Subtract 25.					
	7				

Name _____ Date _____

Extension
Lesson 5

Using Square Numbers to Remember Other Multiplication Facts

Complete the related number sentences.

1. 50 × 50 = ☐
   49 × 51 = ◯

2. 40 × 40 = ☐
   39 × 41 = ◯

3. 51 × 51 = ☐
   50 × 52 = ◯

4. 39 × 39 = ☐
   38 × 40 = ◯

5. 100 × 100 = ☐
   99 × 101 = ◯

6. ☐ × ☐ = 784
   27 × 29 = ◯

7. ☐ × ☐ = 361
   ◯ × 20 = 360

8. ☐ × ☐ = 225
   14 × ◯ = 224

9. ☐ × ☐ = 484
   ◯ × ◯ = 483

10. ☐ × ☐ = 961
    ◯ × ◯ = 960

Name _____ Date _____

Extension
Lesson 6

Generalizing a Multiplication Pattern

Complete the puzzles.

1

Words	Shorthand	Ben	Al	Mary	Jane
Think of a number.	n	4	3	2	5
Multiply your number by itself.	$n \bullet n$	16			
Subtract 4 from the product.	$(n \bullet n) - 4$				
Add 2 to your number.	$n + 2$	6			
Subtract 2 from your number.	$n - 2$	2			
Multiply your results together.	$(n - 2) \bullet (n - 2)$				

2

Words	Shorthand	Ben	Al	Mary	Jane
Think of a number.	n	7	4	3	5
Multiply your number by itself.	$n \bullet n$				
Subtract 9 from the product.	$(n \bullet n) - 9$				
Add 3 to your number.	$n + 3$				
Subtract 3 from your number.	$n - 3$				
Multiply your results together.	$(n + 3) \bullet (n - 3)$				