Eureka Math

3rd Grade
Module 3
Lesson 13

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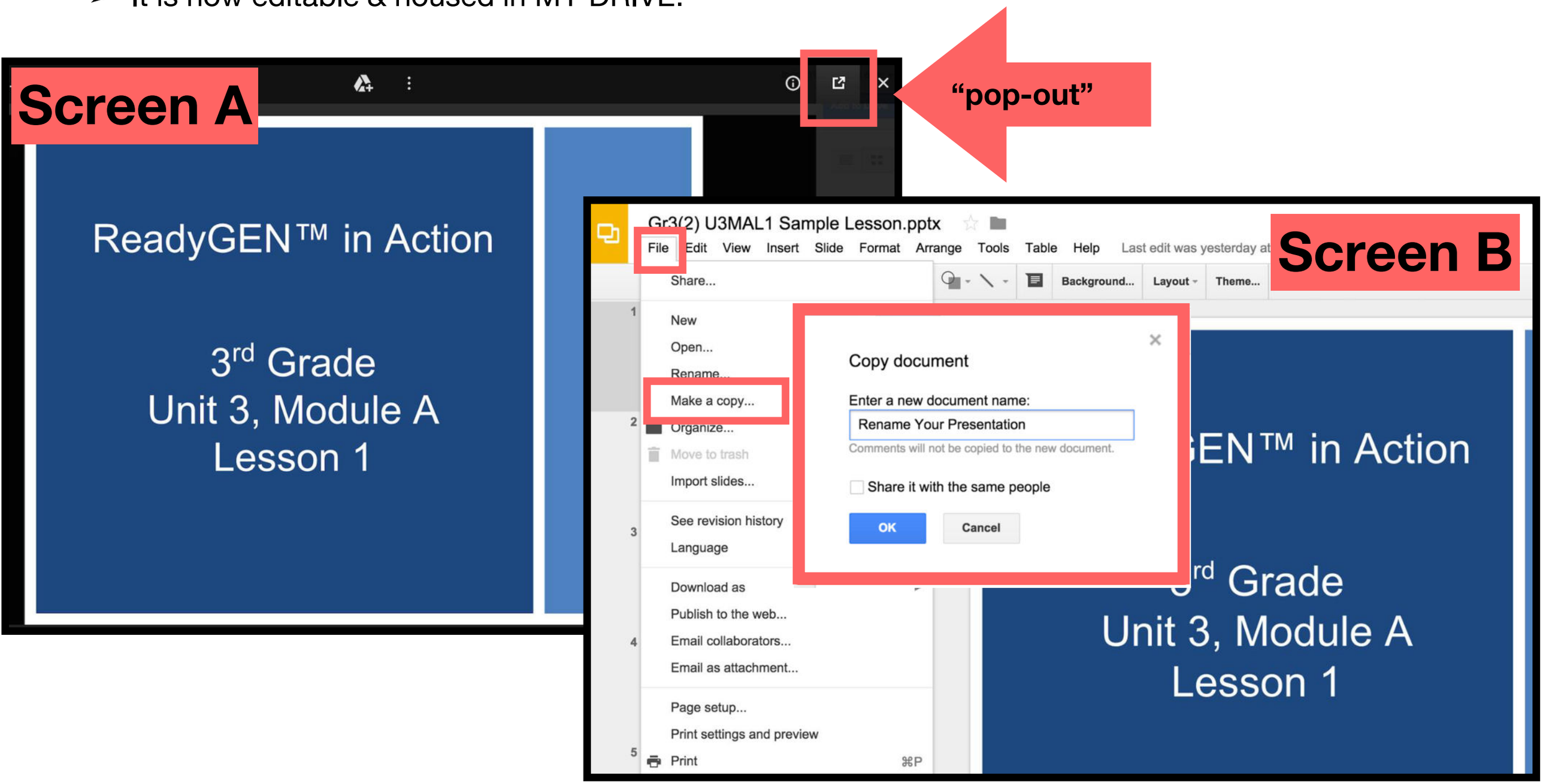
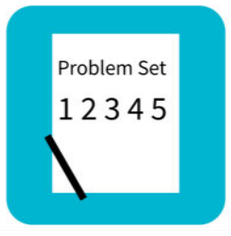


Icons

Read, Draw, Write

Learning Target

Personal White Board

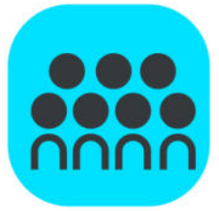


Problem Set

Manipulatives Needed

Fluency

Think Pair Share



Whole Class

Individual

Partner

Small Group

Small Group Time

Lesson 13

Objective: Identify and use arithmetic patterns to multiply.

Suggested Lesson Structure

Fluency Practice	(15 minutes)
Concept Development	(20 minutes)
Application Problem	(15 minutes)
Student Debrief	(10 minutes)
Total Time	**(60 minutes)**

NOTES ON LESSON STRUCTURE:

The Problem Set follows immediately after the Application Problem in this lesson. The 10 minutes for the Problem Set are included in the time allotted for the Application Problem rather than the Concept Development.

I can identify and use arithmetic patterns to multiply.

Fluency Practice Sprint (15 minutes)

3.OA.7

A

Number Correct: _____

Multiply or divide by 8

1.	2 × 8 =		23.	_____ × 8 = 80	
2.	3 × 8 =		24.	_____ × 8 = 32	
3.	4 × 8 =		25.	_____ × 8 = 24	
4.	5 × 8 =		26.	80 ÷ 8 =	
5.	1 × 8 =		27.	40 ÷ 8 =	
6.	16 ÷ 8 =		28.	8 ÷ 1 =	
7.	24 ÷ 8 =		29.	16 ÷ 8 =	
8.	40 ÷ 8 =		30.	24 ÷ 8 =	
9.	8 ÷ 1 =		31.	_____ × 8 = 48	
10.	32 ÷ 8 =		32.	_____ × 8 = 56	
11.	6 × 8 =		33.	_____ × 8 = 72	
12.	7 × 8 =		34.	_____ × 8 = 64	
13.	8 × 8 =		35.	56 ÷ 8 =	
14.	9 × 8 =		36.	72 ÷ 8 =	
15.	10 × 8 =		37.	48 ÷ 8 =	
16.	64 ÷ 8 =		38.	64 ÷ 8 =	
17.	56 ÷ 8 =		39.	11 × 8 =	
18.	72 ÷ 8 =		40.	88 ÷ 8 =	
19.	48 ÷ 8 =		41.	12 × 8 =	
20.	80 ÷ 8 =		42.	96 ÷ 8 =	
21.	_____ × 8 = 40		43.	14 × 8 =	
22.	_____ × 8 = 16		44.	112 ÷ 8 =	

Fluency Practice (15 minutes)

Sprint

B

Number Correct: _____

Improvement: _____

Multiply or divide by 8

1.	1 × 8 =		23.	____ × 8 = 48	
2.	2 × 8 =		24.	____ × 8 = 80	
3.	3 × 8 =		25.	____ × 8 = 24	
4.	4 × 8 =		26.	16 ÷ 8 =	
5.	5 × 8 =		27.	8 ÷ 1 =	
6.	24 ÷ 8 =		28.	80 ÷ 8 =	
7.	16 ÷ 8 =		29.	40 ÷ 8 =	
8.	32 ÷ 8 =		30.	24 ÷ 8 =	
9.	8 ÷ 1 =		31.	____ × 8 = 64	
10.	40 ÷ 8 =		32.	____ × 8 = 32	
11.	10 × 8 =		33.	____ × 8 = 72	
12.	6 × 8 =		34.	____ × 8 = 56	
13.	7 × 8 =		35.	64 ÷ 8 =	
14.	8 × 8 =		36.	72 ÷ 8 =	
15.	9 × 8 =		37.	48 ÷ 8 =	
16.	56 ÷ 8 =		38.	56 ÷ 8 =	
17.	48 ÷ 8 =		39.	11 × 8 =	
18.	64 ÷ 8 =		40.	88 ÷ 8 =	
19.	80 ÷ 8 =		41.	12 × 8 =	
20.	72 ÷ 8 =		42.	96 ÷ 8 =	
21.	____ × 8 = 16		43.	13 × 8 =	
22.	____ × 8 = 40		44.	104 ÷ 8 =	

Group Counting

3.OA.7

Multiply by 8

(4 minutes)

Sixes to 60
Sevens to 70
Eights to 80
Nines to 90

Group Counting

3.OA.5

Decompose Multiples of 9 (3 minutes)

Group Counting

3.OA.5

Decompose Multiples of 9

Continue with the following possible sequence:
whole of 90 and 27 as a part,
whole of 54 and 36 as a part,
whole of 72 and 27 as a part,
and whole of 63 and 18 as a part.

Concept Development

Part 1 (20 minutes)

Name _____ Date _____

1. a. Skip-count by nine.

   9, _____, _____, 36, _____, _____, _____, 72, _____, _____

   b. Look at the *tens* place in the count-by. What is the pattern?

   c. Look at the *ones* place in the count-by. What is the pattern?

2. Complete to make true statements.

   a. 10 more than 0 is 10,
      1 less is 9.
      1 × 9 = 9

   b. 10 more than 9 is 19,
      1 less is 18.
      2 × 9 = _____

   c. 10 more than 18 is _____,
      1 less is _____.
      3 × 9 = _____

   d. 10 more than 27 is _____,
      1 less is _____.
      4 × 9 = _____

   e. 10 more than 36 is _____,
      1 less is _____.
      5 × 9 = _____

   f. 10 more than 45 is _____,
      1 less is _____.
      6 × 9 = _____

   g. 10 more than 54 is _____,
      1 less is _____.
      7 × 9 = _____

   h. 10 more than 63 is _____,
      1 less is _____.
      8 × 9 = _____

   i. 10 more than 72 is _____,
      1 less is _____.
      9 × 9 = _____

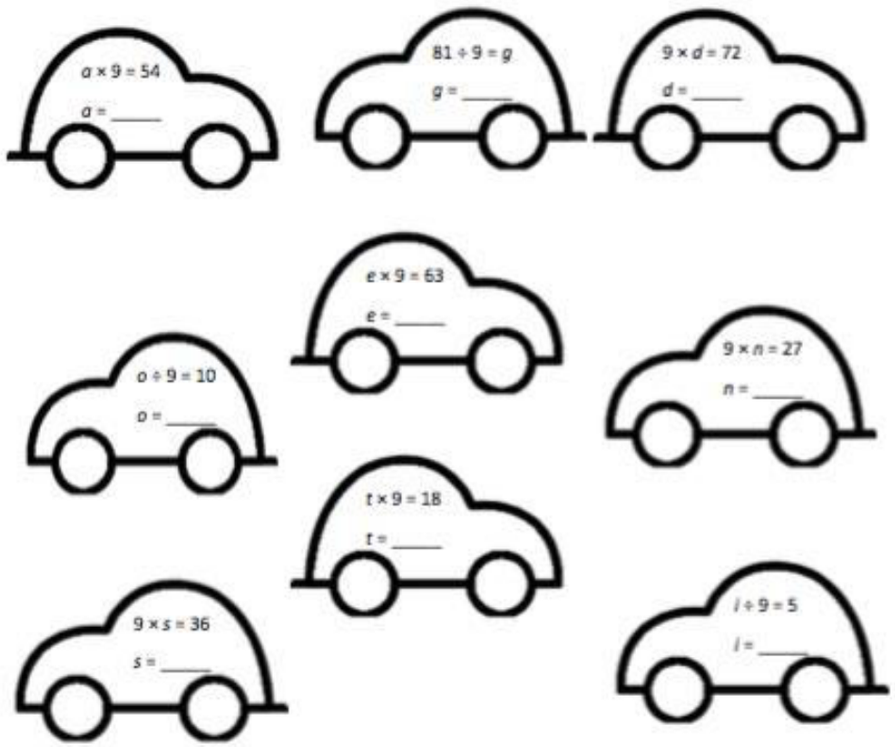
   j. 10 more than 81 is _____,
      1 less is _____.
      10 × 9 = _____

Concept Development

Part 2: Apply strategies to solve nines facts.

(20 minutes)

4. Each equation contains a letter representing the unknown. Find the value of each unknown. Then, write the letters that match the answers to solve the riddle.



How do you make one vanish?

___	___	___	___	" ___ "	___	___	___	___	___	' ___	___	___	___	___	___ !
6	8	8	6	9	6	3	8	45	2	4	9	90	3	7	

Application Problem

(15 minutes)

Michaela and Gilda read the same book. It takes Michaela about 8 minutes to read a chapter and Gilda about 10 minutes. There are 9 chapters in the book. How many fewer minutes does Michaela spend reading than Gilda?

Application Problem

(15 minutes)

Michaela and Gilda read the same book. It takes Michaela about 8 minutes to read a chapter and Gilda about 10 minutes. There are 9 chapters in the book. How many fewer minutes does Michaela spend reading than Gilda?

Michaela $8 \times 9 = 72$

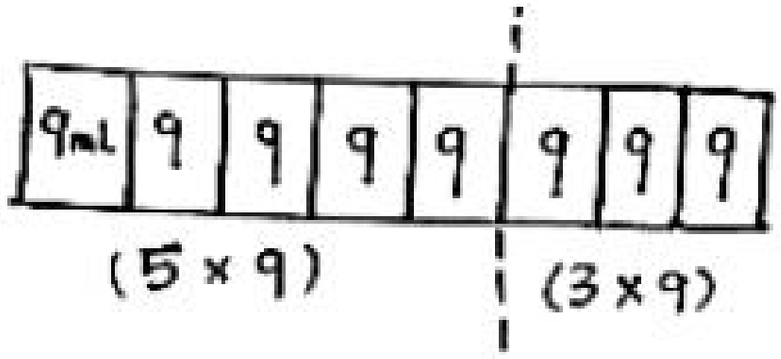
Gilda $10 \times 9 = 90$

$90 - 72 = 18$

Michaela spends 18 fewer minutes reading.

Application Problem

A scientist fills 5 test tubes with 9 milliliters of fresh water in each. She fills another 3 test tubes with 9 milliliters of salt water in each. How many milliliters of water does she use in all? Use the break apart and distribute strategy to solve.



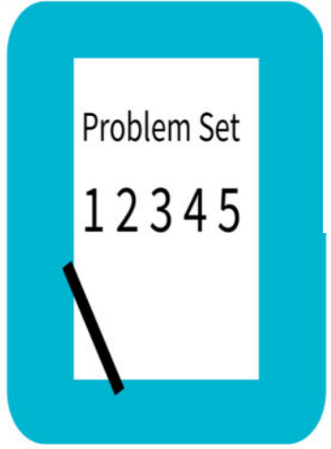
$8 \times 9 = (5+3) \times 9$

$= (5 \times 9) + (3 \times 9)$

$= 45 + 27$

$= 72$

She used 72mL of water in all.

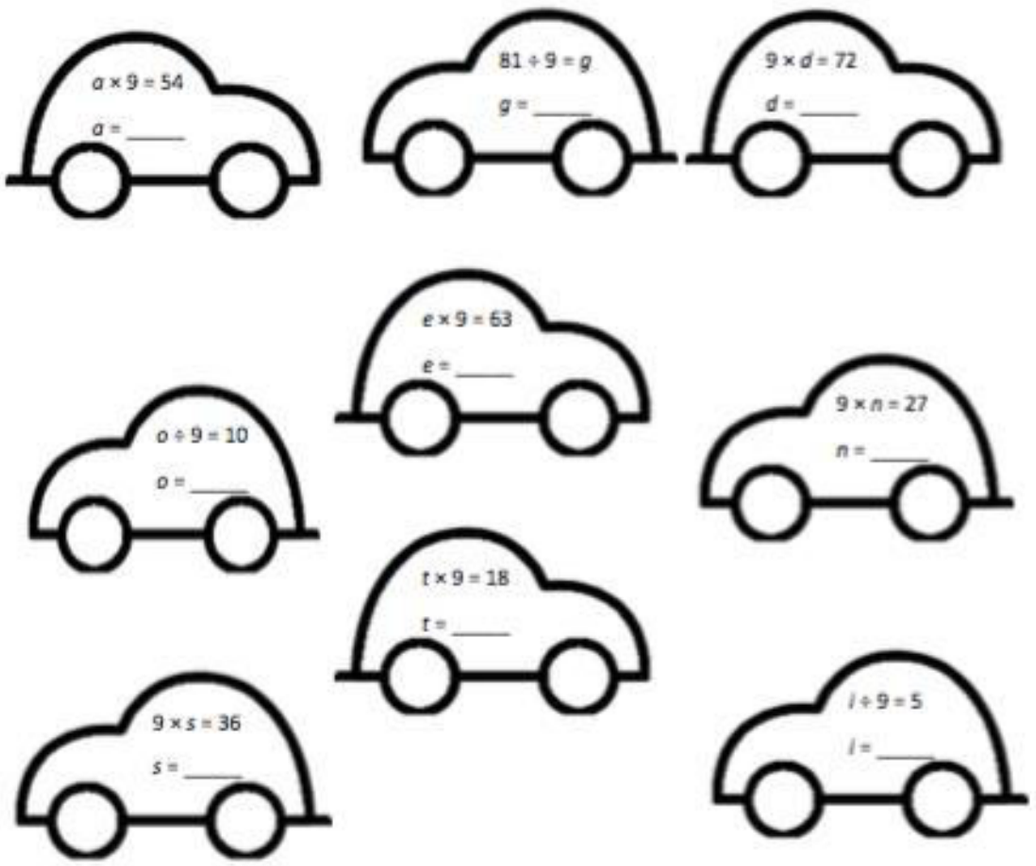


RDW

Problem Set

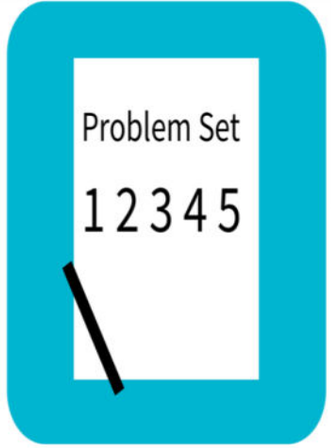
(10 minutes)

4. Each equation contains a letter representing the unknown. Find the value of each unknown. Then, write the letters that match the answers to solve the riddle.



How do you make one vanish?

___	___	___	___	" ___ "	___	___	___	___	___ '	___	___	___	___	___	!
6	8	8	6	9	6	3	8	45	2	4	9	90	3	7	



Problem Set

(10 minutes)

Name _____ Date _____

1. a. Skip-count by nine.

   ____9____, _____, _____, ____36____, _____, _____, _____, ____72____, _____, _____

   b. Look at the *tens* place in the count-by. What is the pattern?

   c. Look at the *ones* place in the count-by. What is the pattern?

2. Complete to make true statements.

   a. 10 more than 0 is ___10___,
      1 less is ___9___.
      1 × 9 = ___9___

   b. 10 more than 9 is ___19___,
      1 less is ___18___.
      2 × 9 = _____

   c. 10 more than 18 is _____,
      1 less is _____.
      3 × 9 = _____

   d. 10 more than 27 is _____,
      1 less is _____.
      4 × 9 = _____

   e. 10 more than 36 is _____,
      1 less is _____.
      5 × 9 = _____

   f. 10 more than 45 is _____,
      1 less is _____.
      6 × 9 = _____

   g. 10 more than 54 is _____,
      1 less is _____.
      7 × 9 = _____

   h. 10 more than 63 is _____,
      1 less is _____.
      8 × 9 = _____

   i. 10 more than 72 is _____,
      1 less is _____.
      9 × 9 = _____

   j. 10 more than 81 is _____,
      1 less is _____.
      10 × 9 = _____

Student Debrief

Lesson Objective: Identify and use arithmetic patterns to multiply.

Name _____ Date _____

1. Each ▭ has a value of **9**. Find the value of each row. Then, add the rows to find the total.

a. **6 × 9 =** _____

5 × 9 = 45

1 × 9 = _____

6 × 9 = (5 + 1) × 9
= (5 × 9) + (1 × 9)
= 45 + _____
= _____

b. **7 × 9 =** _____

5 × 9 = 45

_____ × 9 = _____

7 × 9 = (5 + _____) × 9
= (5 × 9) + (_____ × 9)
= 45 + _____
= _____

c. **8 × 9 =** _____

5 × 9 = _____

_____ × 9 = _____

8 × 9 = (5 + _____) × 9
= (5 × 9) + (_____ × _____)
= 45 + _____
= _____

d. **9 × 9 =** _____

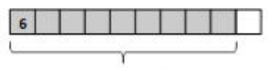
5 × 9 = _____

_____ × 9 = _____

9 × 9 = (5 + _____) × 9
= (5 × 9) + (_____ × _____)
= 45 + _____
= _____

2. Find the total value of the shaded blocks.

a. **9 × 6 =**

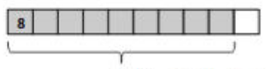


9 sixes = 10 sixes – 1 six
= _____ – 6
= _____

b. **9 × 7 =**

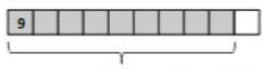
9 sevens = 10 sevens – 1 seven
= _____ – 7
= _____

c. **9 × 8 =**



9 eights = 10 eights – 1 eight
= _____ – 8
= _____

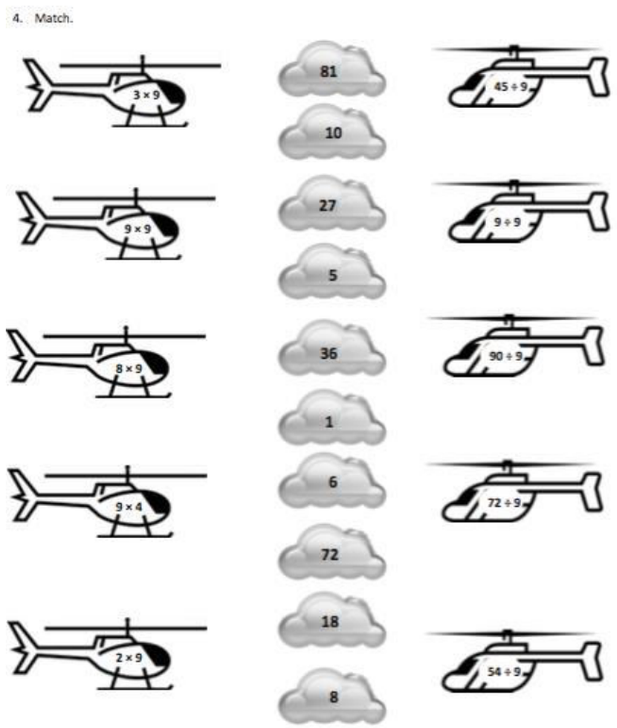
d. **9 × 9 =**



9 nines = 10 nines – 1 nine
= _____ – _____
= _____

3. Matt buys a pack of postage stamps. He counts 9 rows of 4 stamps. He thinks of 10 fours to find the total number of stamps. Show the strategy that Matt might have used to find the total number of stamps.

4. Match.



Exit Ticket

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help with assessing students' understanding of the concepts that were presented in today's lesson and planning more effectively for future lessons. The questions may be read aloud to the students.

Name _____ Date _____

1. $6 \times 9 = 54$ $8 \times 9 = 72$

   What is 10 more than 54? _____ What is 10 more than 72? _____

   What is 1 less? _____ What is 1 less? _____

   $7 \times 9 =$ _____ $9 \times 9 =$ _____

2. Explain the pattern used in Problem 1.

Multiply.

8 x 1 = _____	8 x 2 = _____	8 x 3 = _____	8 x 4 = _____
8 x 5 = _____	8 x 6 = _____	8 x 7 = _____	8 x 8 = _____
8 x 9 = _____	8 x 10 = _____	8 x 5 = _____	8 x 6 = _____
8 x 5 = _____	8 x 7 = _____	8 x 5 = _____	8 x 8 = _____
8 x 5 = _____	8 x 9 = _____	8 x 5 = _____	8 x 10 = _____
8 x 6 = _____	8 x 5 = _____	8 x 6 = _____	8 x 7 = _____
8 x 6 = _____	8 x 8 = _____	8 x 6 = _____	8 x 9 = _____
8 x 6 = _____	8 x 7 = _____	8 x 6 = _____	8 x 7 = _____
8 x 8 = _____	8 x 7 = _____	8 x 9 = _____	8 x 7 = _____
8 x 8 = _____	8 x 6 = _____	8 x 8 = _____	8 x 7 = _____
8 x 8 = _____	8 x 9 = _____	8 x 9 = _____	8 x 6 = _____
8 x 9 = _____	8 x 7 = _____	8 x 9 = _____	8 x 8 = _____
8 x 9 = _____	8 x 8 = _____	8 x 6 = _____	8 x 9 = _____
8 x 7 = _____	8 x 9 = _____	8 x 6 = _____	8 x 8 = _____
8 x 9 = _____	8 x 7 = _____	8 x 6 = _____	8 x 8 = _____

multiply by 8 (6–10)