Factor Detectives

Sort numbers by their factors.

4.OA.B.4 "For whole numbers in the range 1 to 100, find all factor pairs, identifying a number as a multiple of each of its factors. a. Determine whether a whole number in the range 1 to 100 is a multiple of a given one-digit number. b..."

NAME _____ DATE _____

PRIME

A prime number has exactly two factors: 1 and itself.

13 is prime because its only factors are 1 and 13.

COMPOSITE

A composite number has more than two factors. You can make it by multiplying two whole numbers greater than 1.

18 is composite because 3 × 6 = 18.

1 SORT

8 items

For Part 1, circle PRIME or COMPOSITE for each number; for Part 2, choose two numbers and explain how you know where each belongs.

1.	2	PRIME COMPOSITE
2.	9	PRIME COMPOSITE
3.	25	PRIME COMPOSITE
4.	37	PRIME COMPOSITE
5.	49	PRIME COMPOSITE
6.	31	PRIME COMPOSITE
7.	17	PRIME COMPOSITE
8.	28	PRIME COMPOSITE

2 PROVE IT

Explain your thinking

Pick two items from Part 1. For each one, tell how you knew where it belonged.

ITEM # _____ **HOW I KNEW** _____

ITEM # _____ **HOW I KNEW** _____

3 MAKE YOUR OWN

One of each

Write one new prime number and one new composite number from 2 to 100 that are not in the sort.

PRIME _____

COMPOSITE _____

CHALLENGE

Choose one composite number from the sort and write all its factor pairs.

ANSWER KEY # Factor Detectives

PART 1 · SORT

#	ITEM	CATEGORY	WHY
1	2	**PRIME**	Its only factors are 1 and 2.
2	9	**COMPOSITE**	3 × 3 = 9.
3	25	**COMPOSITE**	5 × 5 = 25.
4	37	**PRIME**	Its only factors are 1 and 37.
5	49	**COMPOSITE**	7 × 7 = 49.
6	31	**PRIME**	Its only factors are 1 and 31.
7	17	**PRIME**	Its only factors are 1 and 17.
8	28	**COMPOSITE**	4 × 7 = 28.

PART 2 · PROVE IT

Accept any explanation that names the deciding feature from the rule box for the chosen item.

PART 3 · MAKE YOUR OWN (SAMPLE ANSWERS)

- **PRIME**: 41
- **COMPOSITE**: 54

Challenge: 28: 1 × 28, 2 × 14, 4 × 7

For Part 2, a sample explanation is: 9 is composite because 3 × 3 = 9; 2 is prime because its only factors are 1 and 2. Other correct explanations and Part 3 examples may vary.