Factor Detectives

Sort numbers, prove two choices, and make your own.

4.OA.B.4.b "Determine whether a whole number in the range 1 to 100 is prime or composite."

NAME _____ DATE _____

PRIME

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

13 has only 1 and 13 as factors.

COMPOSITE

A composite number has more than two factors.

18 is composite because 3 × 6 = 18.

1 SORT

8 items

For each number, circle Prime or Composite, then choose two numbers and explain how you know where they belong.

1.	17	PRIME COMPOSITE
2.	21	PRIME COMPOSITE
3.	36	PRIME COMPOSITE
4.	29	PRIME COMPOSITE
5.	43	PRIME COMPOSITE
6.	53	PRIME COMPOSITE
7.	49	PRIME COMPOSITE
8.	64	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 1 to 100 that are not already on this page.

PRIME _____

COMPOSITE _____

CHALLENGE

Find an odd composite number from 1 to 100 that is not already on this page, and write a multiplication fact that proves it is composite.

ANSWER KEY # Factor Detectives

PART 1 · SORT

#	ITEM	CATEGORY	WHY
1	17	**PRIME**	Its only factors are 1 and 17.
2	21	**COMPOSITE**	3 × 7 = 21.
3	36	**COMPOSITE**	4 × 9 = 36.
4	29	**PRIME**	Its only factors are 1 and 29.
5	43	**PRIME**	Its only factors are 1 and 43.
6	53	**PRIME**	Its only factors are 1 and 53.
7	49	**COMPOSITE**	7 × 7 = 49.
8	64	**COMPOSITE**	8 × 8 = 64.

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**: 19
- **COMPOSITE**: 20

Challenge: 45 is composite because 5 × 9 = 45.

Part 2 explanations should name the only two factors of a prime number or give another factor pair for a composite number. The number 1 is neither prime nor composite, so it is not a valid Part 3 example.