Factor Detectives

Sort numbers by their factors.

CCSS.Math.Content.4.OA.B.4 "Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number..."

NAME _____ DATE _____

PRIME NUMBER

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

17 is prime because its only factors are 1 and 17.

COMPOSITE NUMBER

A composite number has more than two factors.

18 is composite because 1, 2, 3, 6, 9, and 18 are factors.

1 SORT

8 items

Circle PRIME or COMPOSITE for each number, then choose two numbers and write the factor pairs that prove each choice.

1.	29	PRIME COMPOSITE
2.	24	PRIME COMPOSITE
3.	35	PRIME COMPOSITE
4.	43	PRIME COMPOSITE
5.	49	PRIME COMPOSITE
6.	53	PRIME COMPOSITE
7.	67	PRIME COMPOSITE
8.	70	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. For each number, list factor pairs that prove your choice.

PRIME _____

COMPOSITE _____

CHALLENGE

Write a composite number from 20 to 40 that has exactly three factor pairs. List all three pairs.

ANSWER KEY # Factor Detectives

GRADE 4 · 4.OA.B.4

PART 1 · SORT

#	ITEM	CATEGORY	WHY
1	29	**PRIME**	Its only factor pair is 1 × 29.
2	24	**COMPOSITE**	It has factor pairs 1 × 24, 2 × 12, 3 × 8, and 4 × 6.
3	35	**COMPOSITE**	It has factor pairs 1 × 35 and 5 × 7.
4	43	**PRIME**	Its only factor pair is 1 × 43.
5	49	**COMPOSITE**	It has factor pairs 1 × 49 and 7 × 7.
6	53	**PRIME**	Its only factor pair is 1 × 53.
7	67	**PRIME**	Its only factor pair is 1 × 67.
8	70	**COMPOSITE**	It has factor pairs 1 × 70, 2 × 35, 5 × 14, 7 × 10.

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**: 31 is PRIME. Its factor pair is 1 × 31.
- **COMPOSITE**: 27 is COMPOSITE. Its factor pairs are 1 × 27 and 3 × 9.

Challenge: 28 is composite. Its factor pairs are 1 × 28, 2 × 14, and 4 × 7.

Accept any explanation that names the deciding feature from the rule box for the chosen item. For Part 2, accept factor pairs or a complete factor list that correctly proves each chosen category. Student-created answers may vary, as long as prime numbers have exactly two factors and composite numbers have more than two factors.