Factor Pair Detectives

Use factor pairs to sort prime and composite numbers.

4.PAR.3.4 "Identify composite numbers and prime numbers and explain the relationship with the factor pairs."

NAME _____ DATE _____

PRIME NUMBER

A prime number has exactly two factors, 1 and itself. It has only one factor pair.

13 is prime because its only factor pair is 1 × 13.

COMPOSITE NUMBER

A composite number has more than two factors. It has more than one factor pair.

18 is composite because its factor pairs are 1 × 18, 2 × 9, and 3 × 6.

1 SORT

8 items

In Part 1, circle PRIME or COMPOSITE for each number, then in Part 2 choose two numbers and explain each choice with its factor pairs.

1.	15	PRIME COMPOSITE
2.	17	PRIME COMPOSITE
3.	24	PRIME COMPOSITE
4.	25	PRIME COMPOSITE
5.	29	PRIME COMPOSITE
6.	33	PRIME COMPOSITE
7.	37	PRIME COMPOSITE
8.	39	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. Show the factor pairs for each.

PRIME _____

COMPOSITE _____

CHALLENGE

Write a composite number with exactly three factor pairs. List all three pairs.

ANSWER KEY

Factor Pair Detectives

GRADE 4 · 4.PAR.3.4

PART 1 · SORT

#	ITEM	CATEGORY	WHY
1	15	**COMPOSITE**	15 has factor pairs 1 × 15 and 3 × 5.
2	17	**PRIME**	17 has only the factor pair 1 × 17.
3	24	**COMPOSITE**	24 has several factor pairs, including 1 × 24 and 2 × 12.
4	25	**COMPOSITE**	25 has factor pairs 1 × 25 and 5 × 5.
5	29	**PRIME**	29 has only the factor pair 1 × 29.
6	33	**COMPOSITE**	33 has factor pairs 1 × 33 and 3 × 11.
7	37	**PRIME**	37 has only the factor pair 1 × 37.
8	39	**COMPOSITE**	39 has factor pairs 1 × 39 and 3 × 13.

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**: 23, factor pair: 1 × 23.
- **COMPOSITE**: 21, factor pairs: 1 × 21 and 3 × 7.

Challenge: 16: 1 × 16, 2 × 8, and 4 × 4.

Accept any correct new examples that are not 1. Reversing a factor pair, such as 3 × 7 and 7 × 3, does not make a new factor pair.