

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 one factor pair: 1 and itself. For example, 13 has the factor pair 1 × 13. 13	COMPOSITE NUMBER A composite number has more than one factor pair. For example, 14 has the factor pairs 1 × 14 and 2 × 7. 14
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1 SORT _____ 8 items

Circle PRIME or COMPOSITE for each number, then choose two numbers and use factor pairs to explain how you sorted them.

1. 17	PRIME	COMPOSITE
2. 12	PRIME	COMPOSITE
3. 9	PRIME	COMPOSITE
4. 19	PRIME	COMPOSITE
5. 21	PRIME	COMPOSITE
6. 2	PRIME	COMPOSITE
7. 23	PRIME	COMPOSITE
8. 29	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 pair or pairs that prove each choice.

PRIME _____

COMPOSITE _____

CHALLENGE

Write a composite number less than 30 that has exactly two factor pairs. Show both factor pairs.

PART 1 • SORT

#	ITEM	CATEGORY	WHY
1	17	PRIME	Its only factor pair is 1×17 .
2	12	COMPOSITE	It has factor pairs 1×12 , 2×6 , and 3×4 .
3	9	COMPOSITE	It has factor pairs 1×9 and 3×3 .
4	19	PRIME	Its only factor pair is 1×19 .
5	21	COMPOSITE	It has factor pairs 1×21 and 3×7 .
6	2	PRIME	Its only factor pair is 1×2 .
7	23	PRIME	Its only factor pair is 1×23 .
8	29	PRIME	Its only factor pair is 1×29 .

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:** 11. Its only factor pair is 1×11 .
- **COMPOSITE:** 16. Its factor pairs are 1×16 , 2×8 , and 4×4 .

Challenge: 15 has exactly two factor pairs: 1×15 and 3×5 .

A prime number has exactly one factor pair, while a composite number has more than one factor pair. Accept different correct student examples in Part 3 and the challenge if the factor pairs are accurate.