

Factor Detectives

Sort numbers by their factors.

NY-4.OA.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.

24 is composite because it has factors besides 1 and 24.

1 SORT _____ 8 items

Circle PRIME or COMPOSITE for each number, then pick two numbers and explain how you knew.

1. 29

PRIME

COMPOSITE

2. 16

PRIME

COMPOSITE

3. 27

PRIME

COMPOSITE

4. 41

PRIME

COMPOSITE

5. 43

PRIME

COMPOSITE

6. 49

PRIME

COMPOSITE

7. 53

PRIME

COMPOSITE

8. 77

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, show a factor pair that proves your choice.

PRIME

COMPOSITE

CHALLENGE

Write all the factor pairs for 60. Then tell whether 60 is prime or composite.

PART 1 • SORT

#	ITEM	CATEGORY	WHY
1	29	PRIME	29 has exactly two factors, 1 and 29.
2	16	COMPOSITE	16 has factor pairs 1×16 , 2×8 , and 4×4 .
3	27	COMPOSITE	27 has factor pairs 1×27 and 3×9 .
4	41	PRIME	41 has exactly two factors, 1 and 41.
5	43	PRIME	43 has exactly two factors, 1 and 43.
6	49	COMPOSITE	49 has factor pairs 1×49 and 7×7 .
7	53	PRIME	53 has exactly two factors, 1 and 53.
8	77	COMPOSITE	77 has factor pairs 1×77 and 7×11 .

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. Its only factor pair is 1×19 .
- **COMPOSITE:** 36. One factor pair is 4×9 .

Challenge: 1×60 , 2×30 , 3×20 , 4×15 , 5×12 , and 6×10 . 60 is composite.

For Part 2, students should name factors or factor pairs to support each choice. A prime number has only the factor pair $1 \times$ itself, while a composite number has at least one other factor pair.