

Luna's Space Adventure

Grade 5 • Prime factorization • 5.NS.2

Name _____

Date _____



Astronaut Luna is exploring a far-off corner of space. Solve each problem to help Luna's mission go smoothly!

Prime or composite? A prime has only two factors: 1 and itself.

29	prime	composite	78	prime	composite
99	prime	composite	13	prime	composite
89	prime	composite	44	prime	composite

Break it into primes Write each as primes multiplied, smallest first.

$36 = \square \times \square \times \square \times \square$

$12 = \square \times \square \times \square$

$50 = \square \times \square \times \square$

$100 = \square \times \square \times \square \times \square$

$60 = \square \times \square \times \square \times \square$

$78 = \square \times \square \times \square$

Multiply the primes What number has these prime factors?

$2 \times 2 \times 5 \times 13 = \square$

$2 \times 11 \times 13 = \square$

$2 \times 2 \times 5 \times 7 = \square$

$2 \times 2 \times 3 \times 13 = \square$

$2 \times 2 \times 5 \times 11 = \square$

$3 \times 5 \times 11 = \square$

Which is the prime factorization? Every factor must be prime.

36	$2 \times 2 \times 3 \times 3$	$4 \times 3 \times 3$	$2 \times 2 \times 3 \times 2$
90	$2 \times 3 \times 3 \times 5$	$6 \times 3 \times 5$	$2 \times 3 \times 3 \times 2$



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ANSWER KEY



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Prime or composite? A prime has only two factors: 1 and itself.

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Break it into primes Write each as primes multiplied, smallest first.

$$36 = 2 \times 2 \times 3 \times 3$$

$$12 = 2 \times 2 \times 3$$

$$50 = 2 \times 5 \times 5$$

$$100 = 2 \times 2 \times 5 \times 5$$

$$60 = 2 \times 2 \times 3 \times 5$$

$$78 = 2 \times 3 \times 13$$

Multiply the primes What number has these prime factors?

$$2 \times 2 \times 5 \times 13 = 260$$

$$2 \times 11 \times 13 = 286$$

$$2 \times 2 \times 5 \times 7 = 140$$

$$2 \times 2 \times 3 \times 13 = 156$$

$$2 \times 2 \times 5 \times 11 = 220$$

$$3 \times 5 \times 11 = 165$$

Which is the prime factorization? Every factor must be prime.

36	$2 \times 2 \times 3 \times 3$	$4 \times 3 \times 3$	$2 \times 2 \times 3 \times 2$
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GUIDE

① What this sheet practises

Telling prime numbers from composite ones up to 100, and writing a number as a product of primes.

② A problem from the sheet, worked out

Break it into primes Write each as primes multiplied, smallest first.

$$36 = 2 \times 2 \times 3 \times 3$$

$$12 = 2 \times 2 \times 3$$

$$50 = 2 \times 5 \times 5$$

$$100 = 2 \times 2 \times 5 \times 5$$

$$60 = 2 \times 2 \times 3 \times 5$$

$$78 = 2 \times 3 \times 13$$

How: Split the number into any two factors, then split each again until every factor is prime. Write them smallest first and check by multiplying.

③ Words to know

prime a number with exactly two factors: 1 and itself

composite a number with more than two factors

factor a number that divides evenly into another

prime factorization a number written as primes multiplied

④ Watch for

- Calling 1 prime (it has only one factor).
- Stopping at a composite factor: $60 = 4 \times 3 \times 5$.
- Calling 51 or 91 prime because they're odd.

⑤ Where it fits

BEFORE

4.OA.B.4

Find factor pairs and multiples, and tell prime from composite numbers.

THIS SHEET

5.NS.2

Tell prime from composite numbers up to 100 and find a number's prime factorization.

NEXT

5.OA.A.1

Evaluate expressions with parentheses and brackets.

⑥ Helping at home

Pick a number like 36 and draw a factor tree together. Try a different first split and see that the primes come out the same.

