FACTORS, MULTIPLES AND PRIMES

BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

KEY IDEA

Factors multiply to make a number.

Multiples are in a number's times table.

3 and 4 are factors of 12. 12 is a multiple of 3 and of 4.



$3 \times 4 = 12$

1 Write the multiplication each array shows.



a) ☐ × ☐ = ☐



b) ☐ × ☐ = ☐



c) ☐ × ☐ = ☐

2 a) Count on in 6s. Fill in the boxes.

+6, +6, +6, +6, +6, +6

0, 6, 12, ☐, ☐, ☐, ☐

b) Is 40 a multiple of 6? Circle: YES NO

3 Find all the factor pairs of 20.

$1 \times \square = 20$

$2 \times \square = 20$

$4 \times \square = 20$

Factors of 20 in order:

1 2 4 ☐ ☐ ☐

4 Complete the table.

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

NUMBER	ALL ITS FACTORS	PRIME? (YES/NO)
7		
9		
11		
15		

FACTORS, MULTIPLES AND PRIMES

SUPPORT

NAME _____ CLASS _____ DATE _____

KEY IDEA

Factors of 12: 1, 2, 3, 4, 6, 12

Multiples of 12: 12, 24, 36, 48, ...

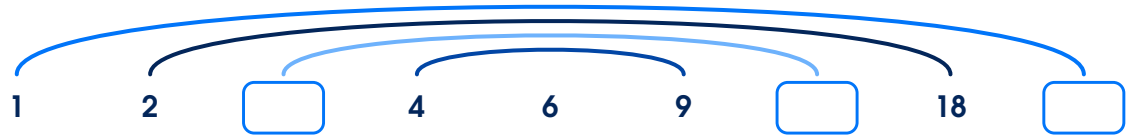
A prime number has exactly two factors: 1 and itself.

1 is not prime. 2 is the only even prime.



1 a) Find the factor pairs of 36. Then fill in the factors of 36 in order.

1 × ☐ = 36 2 × ☐ = 36 3 × ☐ = 36 4 × ☐ = 36 6 × ☐ = 36



b) How many factors does 36 have? ☐

Why is 6 only written once?

2 Write the first five multiples of each number.

a) Multiples of 8: ☐, ☐, ☐, ☐, ☐

b) Multiples of 15: ☐, ☐, ☐, ☐, ☐

3 Circle TRUE or FALSE.

a) 5 is a factor of 35. TRUE FALSE

b) 24 is a factor of 8. TRUE FALSE

c) 45 is a multiple of 9. TRUE FALSE

d) 1 is a prime number. TRUE FALSE

4 Complete the table.

NUMBER	FACTORS	HOW MANY?	PRIME?
13			
16			
21			

FACTORS, MULTIPLES AND PRIMES

CORE

NAME _____ CLASS _____ DATE _____

KEY IDEA

List factors in pairs, working up from 1 until the pairs meet. A prime number has exactly two factors. A square number has an odd number of factors, because one pair repeats ($5 \times 5 = 25$).

FLUENCY

1 List all the factors of each number.

a) **48** .....

b) **60** .....

c) **81** .....

2 Use the numbers on the cards. A number can be used more than once.

1	2	9	15	23	27	36	41	51	57	64

a) Prime numbers: .....

b) Multiples of 3: .....

c) Factors of 72: .....

d) Square numbers: .....

REASONING

3 Circle TRUE or FALSE. Give a reason or an example.

a) All odd numbers are prime. TRUE FALSE

Because .....

b) A number is always a factor of itself. TRUE FALSE

Because .....

c) Every multiple of 4 is a multiple of 2. TRUE FALSE

Because .....

4 Amir says, "91 is prime because it is odd and is not in the 3, 5 or 9 times tables." Is Amir right? Explain.

.....

.....

FACTORS, MULTIPLES AND PRIMES

GREATER DEPTH

NAME _____ CLASS _____ DATE _____

REASONING

1 Is each statement always, sometimes or never true? Circle your answer.

If it is sometimes true, give an example of when it is true and when it is not.

a) A multiple of 6 is also a multiple of 3. ALWAYS SOMETIMES NEVER

b) A factor of 20 is also a factor of 40. ALWAYS SOMETIMES NEVER

c) The sum of two prime numbers is even. ALWAYS SOMETIMES NEVER

d) A number has more factors than multiples. ALWAYS SOMETIMES NEVER

PROBLEM SOLVING

2 I am a two-digit odd multiple of 7. My digits add up to 10.

a) What number am I? ☐

b) Am I prime? Explain.

3 Think about how factors come in pairs.

a) Find the smallest number that has exactly 6 factors. ☐

b) Explain why no number between 50 and 100 has exactly 3 factors.

★ CHALLENGE FOR ALL

4 Twin primes are two prime numbers with a difference of 2, like 5 and 7.

a) List all the pairs of twin primes less than 50.

b) Write 40 as the sum of two primes in three different ways.

40 = ☐ + ☐ 40 = ☐ + ☐ 40 = ☐ + ☐

FACTORS, MULTIPLES AND PRIMES

ANSWERS

BUILDING BLOCKS

1 a) 2 × 7 = 14 · b) 3 × 5 = 15 · c) 4 × 6 = 24 (either order)

2 a) 18, 24, 30, 36 · b) NO

3 1 × 20, 2 × 10, 4 × 5 · factors: 1, 2, 4, 5, 10, 20 (boxes: 5, 10, 20)

4 7: 1, 7 – YES · 9: 1, 3, 9 – NO · 11: 1, 11 – YES · 15: 1, 3, 5, 15 – NO

SUPPORT

1 a) 36, 18, 12, 9, 6 · boxes: 3, 12, 36 · b) 9 (6 × 6 is one pair, so 6 is listed once)

2 a) 8, 16, 24, 32, 40 · b) 15, 30, 45, 60, 75

3 a) TRUE · b) FALSE · c) TRUE · d) FALSE

4 13: 1, 13; 2; prime · 16: 1, 2, 4, 8, 16; 5; not prime · 21: 1, 3, 7, 21; 4; not prime

CORE

1 a) 1, 2, 3, 4, 6, 8, 12, 16, 24, 48 · b) 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60 · c) 1, 3, 9, 27, 81

2 a) 2, 23, 41 · b) 9, 15, 27, 36, 51, 57 · c) 1, 2, 9, 36 · d) 1, 9, 36, 64

3 a) FALSE, e.g. 9 = 3 × 3 · b) TRUE, n × 1 = n · c) TRUE, 4 = 2 × 2 so a multiple of 4 is also 2 × something

4 No. 91 = 7 × 13, so it has four factors: 1, 7, 13, 91.

GREATER DEPTH

1 a) always · b) always · c) sometimes: 3 + 5 = 8 is even but 2 + 3 = 5 is odd · d) never (multiples go on forever)

2 a) 91 · b) No: 91 = 7 × 13

3 a) 12 (1, 2, 3, 4, 6, 12) · b) Only squares of primes have exactly 3 factors; $7^2 = 49$ and $11^2 = 121$, so none lie between 50 and 100.

4 a) 3 & 5, 5 & 7, 11 & 13, 17 & 19, 29 & 31, 41 & 43 · b) 3 + 37, 11 + 29, 17 + 23