

Math Live – Multiples, Factors, Primes and Composites: Assessment Task

Grade: 6 Strand: Number Outcome: 3

SPECIFIC LEARNER OUTCOME – Number

N3	Demonstrate an understanding of factors and multiples by: <ul style="list-style-type: none">• determining multiples and factors of numbers less than 100• identifying prime and composite numbers• solving problems using multiples and factors.
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PROCESSES

Communication (C), Connections (CN), Mental Mathematics and Estimation (ME), Problem Solving (PS), Reasoning (R), Technology (T), Visualization (V)

CN, PS, R, V

EVIDENCE the student has achieved the outcomes

Each student will:

- Identify multiples and factors of a given number.
- Draw a variety of models to represent the factors/multiples of a given number.
- Explain how to distinguish between a composite number and a prime number using words and pictures.

TEACHER NOTE

- In this assessment task, students will be asked to demonstrate their understanding of multiples, factors, primes and composites. They will use manipulatives to create models of multiples and factors and then draw representations (pictorial and symbolic) of these multiples and factors. Students then provide examples of both a prime and a composite number and explain how to distinguish between the two.
- Students should have easy access to manipulatives and grid paper.
- Students may show multiples and factors in a variety of ways:
 - Tree diagrams (Grade 4)
 - Rectangular area models
 - 100-Chart patterns
 - Number lines
 - Blocks
 - Skip counting (including with a calculator)

- Early finishers can investigate patterns produced by the multiples of numbers from 2 to 9 by generating skip-pattern chains:

2	4	6	8	10	12	14	16	18
3	6	9	12	15	18	21	24	27

Students can also investigate patterns creating by circling all the prime numbers on a number chart divided into multiples of 6:

1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48
49	50	51	52	53	54
55	56	57	58	59	60

The primes are all either one more or one less than a multiple of 6, except for 2.¹

¹ *Diagnostic Mathematics Program Elementary: Numerations Division II*

Math Live – *Multiples, Factors, Primes and Composites*: Assessment Task

1. Show how 12 is both a multiple of 4 and a factor of 48. Use words, drawings and symbols to explain your answer.

2. Use this information to explain why 48 must also be a multiple of 4.

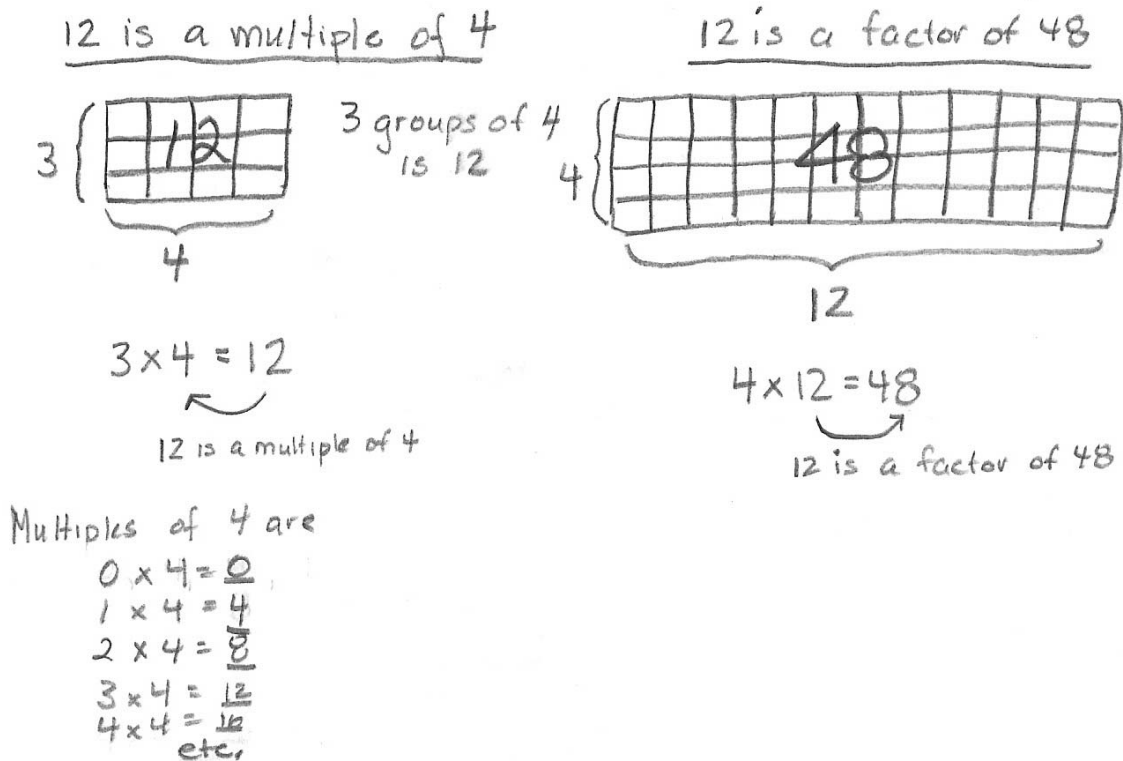
3. Give an example of a prime number and an example of a composite number. Use words and drawings to explain how to tell the difference between a prime number and a composite number.

Math Live – Multiples, Factors, Primes and Composites: Scoring Guide

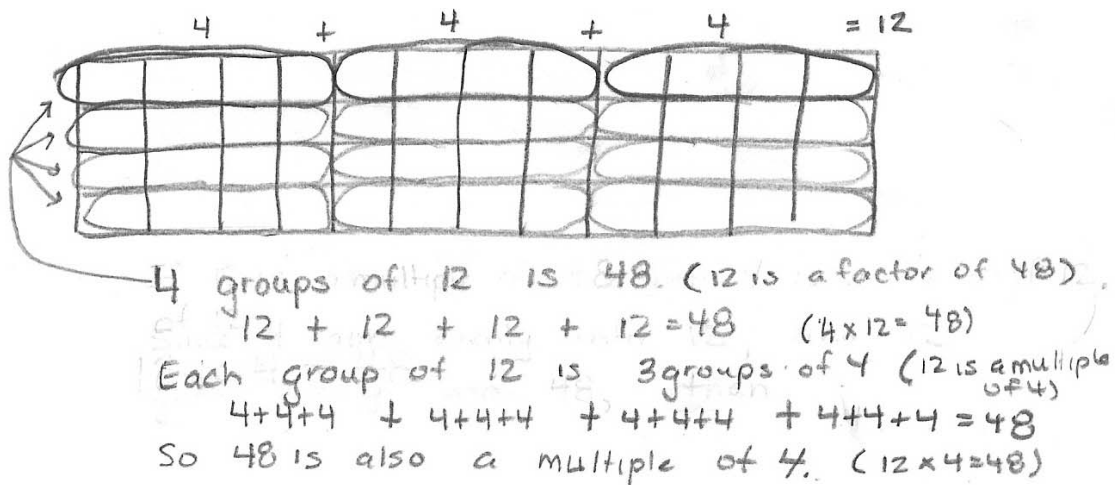
Level Criteria	Identifies and models multiples and factors Questions#1 and #2	Distinguishes between a composite number and a prime number Question #3
Wow!	Correctly identifies and models factors and multiples using a sophisticated representation such as a rectangular array, a tree diagram, or a 100-chart accompanied by a mathematically precise explanation	Provides an insightful explanation by using meaningful examples to distinguish between a composite and a prime number
Yes	Correctly identifies and models factors and multiples using relevant models such as blocks or skip counting accompanied by a logical explanation	Provides a correct explanation supported by examples to distinguish between a composite and a prime number
Yes, but...	Correctly identifies, models, and factors using a limited representation such as a number sentence accompanied by a simplistic explanation	Provides an explanation with partial support to distinguish between a composite and a prime number
No, but...	Identifies factors and models with an inaccurate representation accompanied by little or no explanation	Provides an explanation that is inaccurate or unsupported to distinguish between a composite and a prime number
Insufficient / Blank	No score awarded due to insufficient evidence of student learning based on the requirements of the assessment task	No score awarded due to insufficient evidence of student learning based on the requirements of the assessment task

Math Live – Multiples, Factors, Primes and Composites: Assessment Task

4. Show how 12 is both a multiple of 4 and a factor of 48. Use words, drawing and symbols to explain your answer.



5. Use this information to explain why 48 must also be a multiple of 4.



Math Live – Multiples, Factors, Primes and Composites: Assessment Task

6. Give an example of a prime number and an example of a composite number. Use words and drawing to explain how to tell the difference between a prime number and a composite number.

A prime number has exactly 2 factors, one and itself.

$$11 = 11 \times 1$$



$$2 = 2 \times 1$$

$$2 = 2 \times 1$$



(You can't divide a prime number evenly by another whole number beside 1 and itself:

$$11 \div 2 = 5.5$$

A composite number has more than 2 factors

example:

9

$$9 \times 1$$

$$3 \times 3$$

} 3 factors



12

$$1 \times 12$$

$$2 \times 6$$

$$3 \times 4$$

} 6 factors



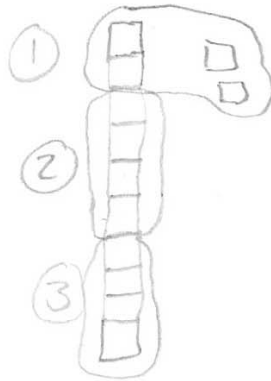
1 isn't prime or composite because it has only 1 factor

$$1 \times 1 = 1$$

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1. Show how 12 is both a multiple of 4 and a factor of 48. Use words, drawing and symbols to explain your answer.

$1 \times 4 = 4$
 $2 \times 4 = 8$
 $3 \times 4 = 12$
 you can
 multiply
 4 three
 times
 to get
 12.



$0 \times 12 = 0$
 $1 \times 12 = 12$
 $2 \times 12 = 24$
 $3 \times 12 = 36$
 $4 \times 12 = 48$

0, 12, 24, 36, 48, 60

you say "48"
 When you skip
 count by 12.

2. Use this information to explain why 48 must also be a multiple of 4.

It must as if 12 can go into 48 and 12 can be divided by 4 it could go into 48.

$$4 \times 3 = \underline{12} \longrightarrow \underline{12} \times 4 = 48$$

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3. Give an example of a prime number and an example of a composite number. Use words and drawing to explain how to tell the difference between a prime number and a composite number.

Prime Number

e.g. 11

- only 2 factors
 - one factor is always one (1)
 - The other factor is always the number giving (11) $1 \times 11 = 11$
- one factor other factor

Composite Number

e.g. 12

- always more than 2 factors:
- $12 \rightarrow 1 \times 12 = 12$ $3 \times 4 = 12$ - all factors of 12
 $2 \times 6 = 12$ - 12

Math Live – Multiples, Factors, Primes and Composites: Assessment Task

1. Show how 12 is both a multiple of 4 and a factor of 48. Use words, drawing and symbols to explain your answer.

12 can go into 48 4 times
12 can be divided by 4 3 times

$$12 \div 4 = 3$$

$$\begin{array}{r} 4 \\ 12 \overline{) 48} \end{array}$$

2. Use this information to explain why 48 must also be a multiple of 4.

That is because 4 can go into 12 and 12 can go into 48 so it is like a chain.

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3. Give an example of a prime number and an example of a composite number. Use words and drawing to explain how to tell the difference between a prime number and a composite number.

1, 3, 5, 7, 9

2, 4, 6, 8, 10

Note: 2 is not a composite number. It is prime. This student seems to show a misconception that primes are odd numbers and composites are even

A prime number that only has 2 factors 1 and itself, A composite is a number with more than two factors.

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1. Show how 12 is both a multiple of 4 and a factor of 48. Use words, drawing and symbols to explain your answer.

2 ④ 6 8 10 ⑫ 14 16 18 20 22
24 26 28 30 32 34 36 38 40 42
44 46 ④⑧

2. Use this information to explain why 48 must also be a multiple of 4.

Because its an even and 4 is an even number.

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3. Give an example of a prime number and an example of a composite number. Use words and drawing to explain how to tell the difference between a prime number and a composite number.

4 (composite) as it can be multiplied by not just itself. It has more. Such as 4×2 , 2×4 , 4×1 , 1×4 .

17 (prime) as it could only be multiplied by itself or 1. 17×1 , 1×17 , 17×17 .