Name: _____ **Buddy:** _____

Learning Outcomes: N.1 a, N.1 d and U.1 to U.13. **Date:** September 26, 2023

Learning Intentions: I will learn to calculate and interpret multiples and **least common multiples,**abbreviated as **LCM** and use prime numbers and my calculator to make calculating them easier. I will also learn to apply least common multiples to solve real world problems like the tilers riddle.

Assessment: Guided practice and collaborative exercises followed by written, reading and online activities

4 8

3 7

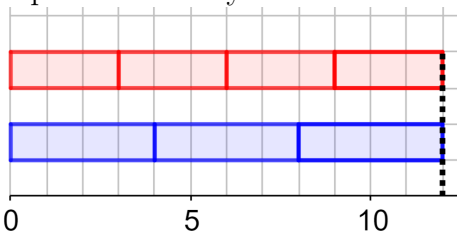
Numeracy Challenge: Make the number 24 by using the four numbers shown to the left once each. You can add, subtract, multiply, divide and use brackets.

1. Least common Multiple LCM by Skip Counting

(a) **Step-by-step example: LCM(3,4)**

Step 1: Skip count the **multiples** and identify and circle the lowest common multiple.

Step 2: Represent visually if needed



3, 6, 9, (12), 15 . . .

4, 8, (12), 16 . . .

Step 3: Always write solution as an equation.

LCM(3,4) = 12

(b) **Worked example: LCM(4,6,10)**

4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, (60) . . .

6, 12, 18, 24, 30, 36, 42, 48, 54, (60) . . .

10, 20, 30, 40, 50, (60) . . .

LCM(4,6,10)= 60

(c) **Guided Practice: LCM(2,4,6)**

2, 4, 6, 8, 10, 12 . . .

4, 8, 12, 16 . . .

6, 12, 18, 24 . . .

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(d) **Shared Practice** LCM(5,6)

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(e) LCM(6,8)

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(f) LCM(1,5)

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Essential homework (Do into copy)

(g) i. LCM(2,3)

ii. LCM(4,5)

iii. LCM(4,6)

Challenge homework (Do into copy)

(h) i. LCM(4,24)

ii. LCM(1,2345)

iii. LCM(51,153)

iv. 1123 is prime. Find the L.C.M(3,1123)

v. What is the least positive number that can be added to 173 so that the result is a multiple of 20?

vi. 7879 is prime. Write downthe LCM(7879,7879) Hint: **Write down** is code for "No calculation needed!"

Extension homework

(i) i. LCM(9009,6006)

ii. How many integers between 2 and 1004 are multiples of 5?

iii. How many two-digit multiples of 7 have a digit sum of 10?

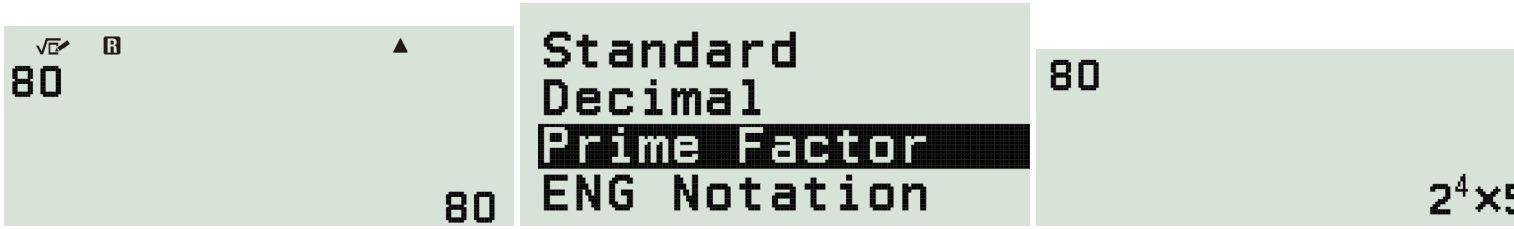
iv. What are they?

v. What is the sum of all positive integers less than 100 that are multiples of 13?

vi. What is the greatest four-digit multiple of 18? Hint: An even multiple of 9. The digits of multiples of 9 sum to a multiple of 9!

vii. How many integers between 150 and 300 are multiples of 9?

2. Prime Factorization Method



(a) **Step-by-step example: LCM(42,135)**

Step 1: Write down the expanded prime factors of each number.

$42 = 2 \cdot 3 \cdot 7$

$135 = (3 \cdot 3 \cdot 3) \cdot 5$

Step 2: use each prime factors at least once and more often if it **repeats.**

$$\text{LCM}(42,135) = 2 \cdot (3 \cdot 3 \cdot 3) \cdot 5 \cdot 7 = 1260$$

From now on we will use **prime factors in power notation form.**

(b) **Worked example : LCM(54,150,420)**

$54 = 2 \cdot (3^3)$

$150 = 2 \cdot 3 \cdot (5^2)$

$420 = (2^2) \cdot 3 \cdot 5 \cdot 7$

(c) use each prime factors and repeat based on most appearances

$$\text{LCM} = (2^2) \cdot (3^3) \cdot (5^2) \cdot 7 = 18900$$

(d) **Guided Practice: LCM(60,42)**

Write the prime factorization of each number:

$60 =$

$42 = 2 \cdot 3 \cdot 7$

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(e) **Shared Practice** LCM(24, 36)

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(f) LCM(18, 27)

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(g) LCM(75, 100)

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(h) LCM(18, 24, 36)

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(i) You lap the school in 5 minutes and your maths buddy does it in 6 minutes. Show that if you start out together in the GPA at 13.10 *pm* you will meet again for the first time at the end of lunch. Explain any assumption ?

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Essential homework (Do into copy)

(j) Use prime factors to find:

i. LCM(2,3)

ii. LCM(6,10)

iii. LCM (21, 10)

iv. LCM(70,80)

Challenge homework (Do into copy)

(k)

i. LCM(90, 120, 150)

ii. LCM(96, 128, 192)

iii. LCM(120,63,81 and check your answer online by searching LCM calculator

Extension homework

(l)

i. 6 is a perfect number because the sum of its proper factors $1+2+3=6$. Is 28 a perfect number?

ii. What is the sum of all the prime numbers between 80 and 90?

iii. How many pairs of primes are there such that sum of the pair is 40?

iv. The product of all prime numbers between 1 and 80 is divided by 10. What is the remainder?