

TOPIC: WHOLE NUMBERS**OUTCOMES:**

- The commutative, associative, distributive properties of whole numbers.
- 0 in terms of its additive property (identify element for addition).
- 1 in terms of its multiplicative property (identify element for multiplication).
- Recognise the division property of 0, whereby any number divided by 0 is undefined.
- Determine the prime factors
- Determine the LCM(Lowest Common Multiple)
- Determine the HCF(Highest Common Factor)
- Solve problems involving whole numbers

➤ THE COMMUTATIVE PROPERTY

When you add or multiply two numbers you can change the order of the numbers, for example:

$4 + 5 =$	$5 + 4 =$
$22 + 25 =$	$25 + 22 =$
$2 \times 3 =$	$3 \times 2 =$
$6 \times 7 =$	$7 \times 6 =$

The **commutative property** of whole numbers represented by $a + b = b + a$ and $a \times b = b \times a$ is applicable for **addition** and **multiplication**.

➤ THE ASSOCIATIVE PROPERTY

The order in which you add or multiply numbers also doesn't matter. This is called the associative property of addition and multiplication.

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$(4 + 5) + 6 =$	$4 + (5 + 6) =$
$(3 + 4) + 5 =$	$3 + (4 + 5) =$
$(4 \times 2) \times 3 =$	$4 \times (2 \times 3) =$
$(3 \times 2) \times 2 =$	$3 \times (2 \times 2) =$

➤ THE DISTRIBUTIVE PROPERTY:

$2(5 + 2) =$	$(2 \times 5) + (2 \times 2) =$
$3(6 + 4) =$	$(3 \times 6) + (3 \times 4) =$
$2(5 - 2) =$	$(2 \times 5) - (2 \times 2) =$
$3(6 - 4) =$	$(3 \times 6) - (3 \times 4) =$

The **distributive property** of whole numbers represented by $a(b + c) = (a \times b) + (a \times c)$ and $a(b - c) = (a \times b) - (a \times c)$ is applicable to **addition** and **subtraction**.

➤ 0 - IN TERMS OF ITS ADDITION AND SUBTRACTION PROPERTY

$4 + 0 =$
$2\ 645 + 0 =$
$4 - 0 =$
$2\ 645 - 0 =$

➤ 1 - IN TERMS OF MULTIPLICATION AND DIVISION PROPERTY

$4 \times 1 =$
$2\ 645 \times 1 =$
$4 \div 1 =$
$2\ 645 \div 1 =$

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➤ 0 – IN TERMS OF DIVISION PROPERTY

$$\frac{4}{0} = \text{undefined}$$

$$7\,174 \div 0 = \text{undefined}$$

Any number divided by **0** is undefined.

KEY WORDS:

MULTIPLES – Use multiplication table, for example: the Multiples of 8 = 8; 16; 24

FACTORS – A factor of a whole number is a number that can divide exactly into a whole number without a remainder.

EXAMPLES:

- The factors of 6 are 1, 2, 3 and 6. You write $F_6 = \{1, 2, 3, 6\}$
- The factors of 12 are 1, 2, 3, 4, 6 and 12. You write $F_{12} = \{1, 2, 3, 4, 6, 12\}$

PRIME NUMBERS – Are natural numbers that have two different factors **ONLY**, the number **itself** and **1**. The prime numbers are:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31

PRODUCT OF PRIME FACTORS – Write a number as a product of its prime factors. Example: $24 = 2 \times 2 \times 2 \times 3$.

Show learners a systematic way of finding prime factors i.e. start with the first prime numbers and try the consecutive prime numbers 2; 3; 5; 7; ... as possible factors.

COMPOSITE NUMBERS – numbers with more than one factor i.e. numbers that are not prime numbers.

- **LOWEST COMMON MULTIPLE (LCM)** – the smallest number that is common in all the multiples of the whole numbers in the question.

- Multiples of 6: 6; 12; 18; 24.....
- Multiples of 8: 8; 16; 24.....

24 occurs in both multiples and it is the lowest; therefore it is the **Lowest Common Multiple (LCM)**

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- **HIGHEST COMMON FACTOR (HCF)** – the biggest number that can divide exactly into all the whole numbers in the question.
- Factors of 12: 1, 2, 3, 4, 6, 12
 - Factors of 30: 1, 2, 3, 5, 6, 10, 15, 30
 - Common factors are: 2, 3, 6

6 is the **Highest Common Factor (HCF)**

HCF: 6

SOLVING PROBLEMS (RATIO AND RATE)

- Comparing two or more quantities of the same kind (ratio)
- Sharing in a given ratio where the whole is given

1	Simplify the following ratios:
1.1	10: 50
1.2	15: 25
1.3	30: 45
1.4	21: 28: 56
1.5	120: 132: 144
1.6	350: 400
2	Share in a given ratio
2.1	Divide 220 in the ratio 3: 8
2.2	Divide 840 in the ratio 3: 4
2.3	Divide 144 in the ratio 5: 3
2.4	Divide 1 560 in the ratio 2: 3: 5
2.5	Nathi, Paul and Tim worked in Mr Setati's garden. Nathi worked for 5 hours, Paul for 4 hours and Tim for 3 hours. Mr Setati gave

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	the boys R600 for their work. How should they divide the R600 among the three of them?
2.6	Mulalo and Tsakani sell bread that they baked to a spaza shop. They agreed that the profit they make will be divided between them in the ratio Mulalo : Tsakani = 5 : 4. What amount must each of them get if their profit is R252,90?
2.7	Hanna, Sarah and Mthunzi buy a completion ticket for R60. Hanna contributes R15, Sarah contributes R21 and Mthunzi contributes R24. They win R4 000. Calculate the amount each of them should get?