SECTION EIGHT
NUMBER CONCEPTS

General Overview

This section on Number Concepts focuses on the properties of numbers. This strand of mathematics offers a wide range of opportunities for problem solving. Additionally, it is a means of assisting students in:

§   developing a fascination with numbers and number patterns.

§   discovering mathematical ideas

§   extending their understanding of topics in other content strands.

§   realizing the recreational possibilities of mathematics.

In teaching number concepts, it is important to note that the emphasis is on investigating mathematical ideas. The process of arriving at the definitions and rules related to number concepts is as important as the knowledge that students develop.

At the Grade 5 level the study of number concepts focuses on consolidating several procedures that were developed at the Grade 4 level, extending students' knowledge of whole numbers and fractions, and introducing decimals and percentages. The emphasis on the use of appropriate strategies for investigating number concepts forms a basis for the outcomes. By the end of Grade 5, the students should have extended their understanding of place value to numbers up to 99 999. They should also have developed an understanding of various types of numbers e.g. odd, even, prime, composite etc., and the interrelationships among these numbers. Their work on fractions would have exposed them to the various concepts and procedures, for example equivalent fractions, that are necessary for carrying out computations on fractions. In Grade 5, the students are also given the opportunity to explore the use of roman numerals in real life.

At the Grade 6 level, the study of whole number concepts focuses on numbers beyond 99 999. The students consolidate their work on types of whole numbers and fractions. As well they continue their exploration of decimals and percents and apply these to a variety of related topics. Students would also be introduced to ratio concept, how ratios are expressed and the relationships between ratios, fractions, decimals and percentages. Concepts in roman numerals will then be reviewed and reinforced

In teaching number concepts, the emphasis should be on promoting inquiry skills and making the activities interesting for the students. They should be encouraged to use pattern searching to explore a variety of ways of representing numbers and the interrelationships among these representations.

Specific Activities –Grade 5

Outcome 8 ,9

Students should be able to:

> Classify numbers using several number concepts e.g. prime, odd, prime and even, prime and odd, composite and odd etc.
> Explain how the various type of numbers (prime, composite, odd etc) are related

Activities: Set up a large chart on the board or give small similar charts to groups of students.

Example of a chart.
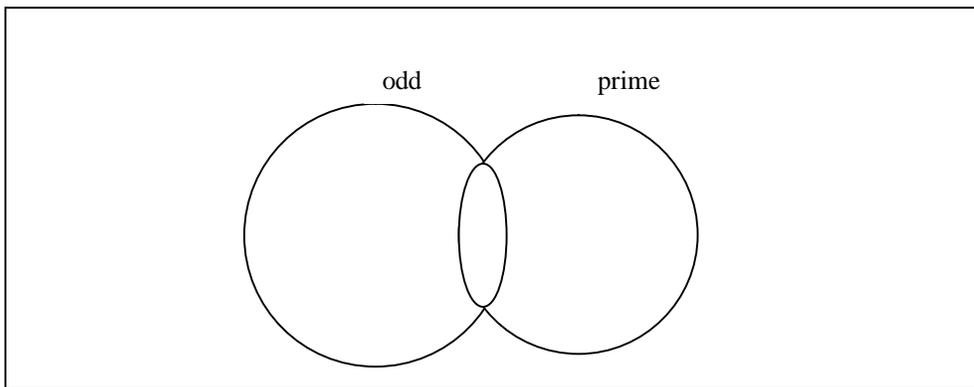
Various pairs of number classifications can be used.

The students choose a number from a pack at random place these numbers on the diagram in the appropriate places. Students evaluate each other's work.

Distribute number cards to the class. Ask the students to study their number to determine into which group of numbers that number might fit. Put up a chart with the following grid on the board.

	odd	even	square	prime	multiple of 5	multiple of 9
even						
over 20						
in the 30's						
composite						
less then 10						
divisible by 3						

Students try to fit their number in the appropriate sections of the grid.

Activities can be used followed by discussion or why certain cells are empty and why certain numbers fit into more than one cell.

Specific Activities – Grade Six

Outcomes 1, 2, 3

Students should be able to:

Create and solve problems involving number concepts
Use appropriate strategies to investigate number concepts and solve problems
Explain strategies and procedures used in solving problems and carrying out investigations.

Activities: Let the students can work in small groups of three or four to create problems based on number concepts mastered in Grades K through 6.

Let them exchange problems with other groups.

The students solve problems working as small groups and present their solutions to the whole class.

Encourage the students seek alternative solutions to problems presented.

Give the students an assignment to investigate number patterns on the calendar, a hundred squares grid etc.

Again the students must share their strategies and approaches with the whole class after carrying out their investigations in small groups.

Outcome 18

Students should be able to:

Calculate the highest common factor of two or three numbers.

Activities:

Give the students problems such as:
There are 72 eggs in a box and 60 eggs in a basket. What is the capacity of the largest size egg tray which can be filled an exact number of times from either the box or the basket without having any eggs left over.

In small groups, the students can solve this problem by making models, drawing diagrams, using concrete objects etc. working in small groups.

The whole class can then look for a solution using a number sentence and calculating the HCF.

Factor of 72 = 2 x 2 x 2 x 3 x 3
60 = 2 x 2 x 3 x 5

Common factors: 2 x 2 x 3
HCF   = 2 x 2 x 3
= 12

<u>Outcome 20</u>

Students should be able to:

Calculate the lowest common multiple of two or three numbers using listing of multiples or prime factorization.

Activities:

Present students with a problem which they solve working in small groups.
E.g. What is the smallest number of pencils that can be shared equally among groups of 5 or 4 or 3 children without there being over. [No pencil is to be broken.]

Students would be given opportunities to grapple with the problem in small groups. They would then present their solutions to the whole class. Teacher would stimulate discussion of the problem situation and the proposed solutions.

Teacher would then guide pupils through finding L. C. M. of 2 numbers by listing common multiples. This would then be extended to 3 numbers.

When learners have mastered the listing approach; Teacher introduces the prime factor approach.

Students would then work on other similar word problems.

Outcomes 39

Students should be able to:

Use appropriate vocabulary in descriptions of situation involving ratios, e.g. per, for each for every, etc.

Activities: Present the students with charts depicting activities which involve ratios. Lead a class discussion on the situations related to the ratio concept. Use vocabulary related to ratio.

Engage the students in sharing two different types of fruits. Guide the class to discuss this situation, making reference to: how many fruits per child; how many mangoes for every plum etc.

Individual students in the class can then lead a discussion of other situations that involve the use of ratios.

Outcome 42

Students should be able to:

Explain the relationship that exists among ratio, percent, fractions and decimals.

Activities:

In small groups students can analyse advertisements with percent reductions or down payments on items. Let them convert the percent to decimals and fractions and record their results.

Students can be asked to sit in mixed groups (boys and girls). The ratio of boys to girls is given. The students are then asked to calculate the fraction which is boys, (and girls), the percentage of girls or boys. Students can also convert these to decimals. Students engage in discussion about the forms of writing the same relationship.