

LESSON PLAN 6

CLASS : 8 TEACHER'S NAME :

NAME OF THE UNIT	SUB-TOPICS	NO OF PERIODS REQUIRED			Time line for teaching	
		Teaching	Practice	TOTAL	From	To
CUBES AND CUBE ROOTS	6.1 INTRODUCTION	2	3	5		
	6.2 CUBES					
	6.2.1 SOME INTERESTING PATTERNS					
	6.2.2 SMALLEST MULTIPLE THAT IS A PERFECT CUBE	2	3	5		
6.3 CUBE ROOTS						
TOTAL	4	6	10			
	KEY CONCEPTS	KEY VOCABULARY				
PRE-REQUISITES	Every Pupil is expected to have basic knowledge in # finding squares and square roots of a number # different patterns and their implications # writing factors of different numbers # performing four fundamental operations like +,-,X,÷	# Ramanujan # cubes # cuboids # cube roots # Perfect cube # Patterns # Consecutive			# 1729- Ramanujan's number # Hardy # factorisation # Prime Factorisation # Estimation	

Learning Outcomes

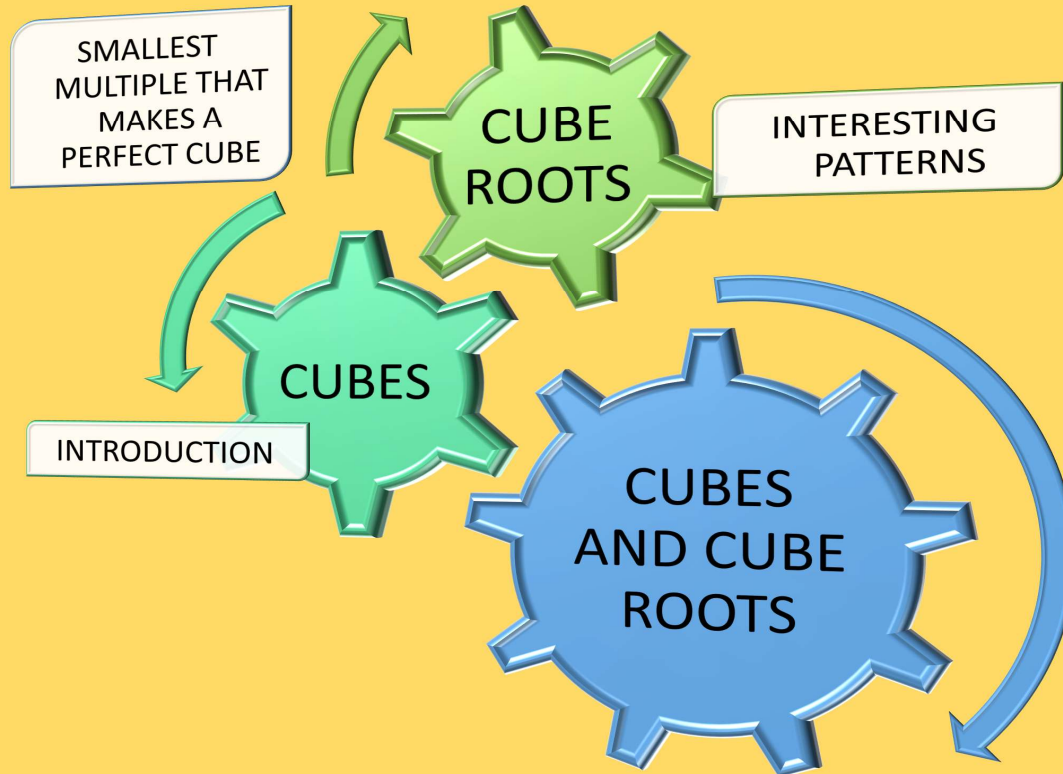
After Completion of this lesson every student will be able to

- # recognize different patterns among numbers
- # find the cube of any given number
- # distinguish between perfect cubes and not perfect cubes
- # find the cube root of given perfect cube number by Prime factorisation
- # find the smallest multiple as well as divisor required to make a given number a perfect cube.
- # recognize the significance and appreciate the importance of the concept of cubes and cube roots in real life situations.

Teaching Learning Process

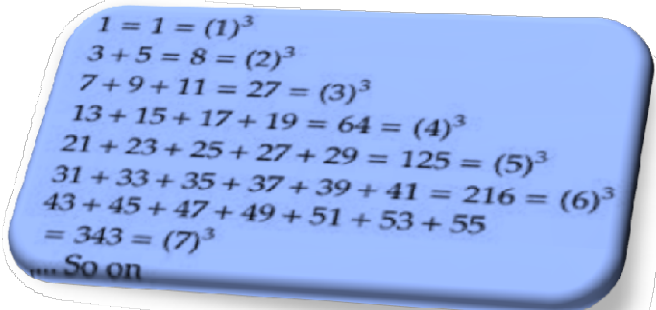
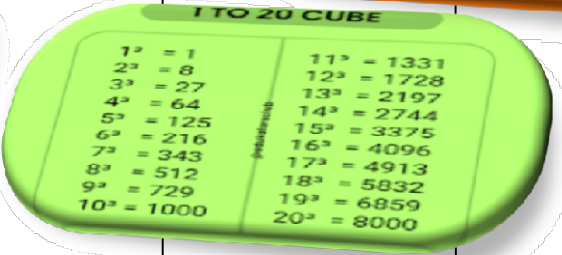

MIND MAPPING

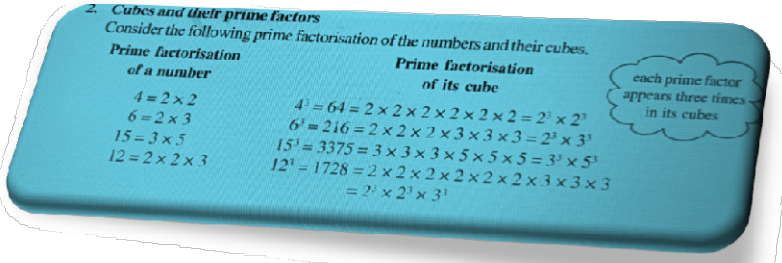
Experience & Reflection

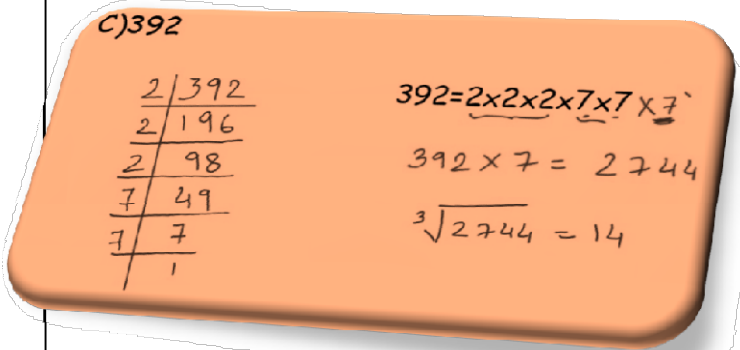
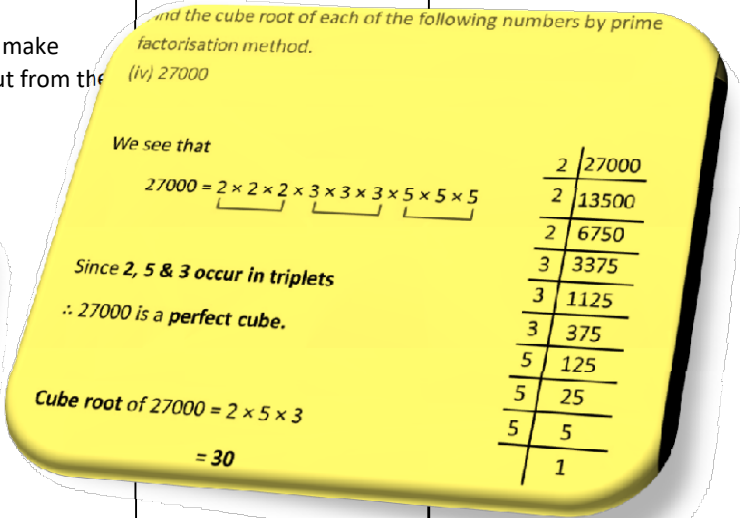


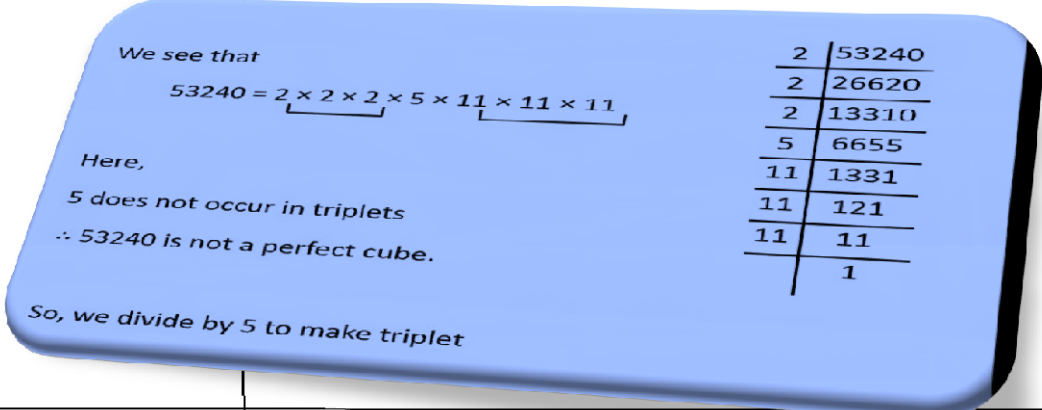
Pupils will recollect their knowledge in finding squares and squares roots of given numbers and will utilize that knowledge here in doing the similar exercise with cubes and cube roots

Students will experience the knowledge on Cubes and Cube roots in real life situations.

TEACHING PERIOD : 1,2		INTRODUCTION, CUBES, SOME INTERESTING PATTERNS	
CONCEPTS/STEPS	TEACHER ACTIVITY (I DO)	GROUP ACTIVITY (WE DO)	INDIVIDUAL ACTIVITY (YOU DO)
KEY WORDS & PRE REQUISITES	Brain storming session involving children with pre-requisites vocabulary and concepts related to previous knowledge. Introduction of new vocabulary and key words associated with the concept # CUBE # Hardy # Ramanujan # 1729 - Ramanujan's Number # perfect cubes # cube numbers # patterns # consecutive numbers	* Students read the pre-requisites and answer the questions to the teacher (whole class activity)	Every Pupil will read and write the key words in their note books
MIND MAPPING	Teacher writes the key word "CUBES AND CUBE ROOTS" on the black board and will elicit its other related words through questioning and will draw pupils' attention towards key concepts in the lesson	Heterogeneous groups are created. One group will read the words and other will explain the meaning	Pupils individually read the keywords associated with Integers
CONCEPTUAL UNDERSTANDING	Teacher narrates the story behind Ramanujan's Number 1729 interestingly to the children and creates inspiration in them by describing the stories of great mathematicians of India and abroad like Ramanujan and Hardy respectively. Later teacher conducts an activity involving heterogeneous groups where each group will be provided different single digit and double digit numbers and are instructed to find their cubes through multiplication. The group that gives the answers first will be the winner. Later teacher illustrates some interesting patterns of cube numbers and draws the attention of children towards those patterns which involve arriving to cubes by some simple addition of consecutive odds.	Heterogeneous groups are formed and are engaged in different activities to ascertain learning of the concept	Each student in the group participates in the activity and learns the concept
LEARNING ACTIVITY	  		
SUMMARY	Teacher writes the summary of the concept of cubes and different patterns associated with cubes and asks children to note, read and adopt	pupils will note down and read the summary in groups	every individual reads the summary and notes it down
ASSESSMENT	Teacher asks children to solve the sums of try these sections and some sums of exercise 6.1	every group will do the sums by discussion among each other	every individual solves the sums on their own

PRACTICE PERIOD: 1,2,3		INTRODUCTION, CUBES, SOME INTERESTING PATTERNS											
CONCEPTS/STEPS	TEACHER ACTIVITY (I DO)	GROUP ACTIVITY (WE DO)	INDIVIDUAL ACTIVITY (YOU DO)										
KEY WORDS READING	Teacher writes the key words from previous class's teaching period and asks children to read and write them in note books # Cube # Hardy # Ramanujan # 1729 - Ramanujan's Number # perfect cubes # cube numbers # patterns # consecutive numbers	Whole class activity : one child comes to the board and reads the key words loudly and the remaining class follows.	Every child comes to the board and reads the key words and notes them down in their note books										
SIMILAR LINES READING	Teacher writes some interesting patterns involving cube numbers and asks children to write some more by watching similar lines  <p>2. Cubes and their prime factors Consider the following prime factorisation of the numbers and their cubes.</p> <table border="0"> <tr> <td>Prime factorisation of a number</td> <td>Prime factorisation of its cube</td> </tr> <tr> <td>$4 = 2 \times 2$</td> <td>$4^3 = 64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 2^3 \times 2^3$</td> </tr> <tr> <td>$6 = 2 \times 3$</td> <td>$6^3 = 216 = 2 \times 2 \times 2 \times 3 \times 3 \times 3 = 2^3 \times 3^3$</td> </tr> <tr> <td>$15 = 3 \times 5$</td> <td>$15^3 = 3375 = 3 \times 3 \times 3 \times 5 \times 5 \times 5 = 3^3 \times 5^3$</td> </tr> <tr> <td>$12 = 2 \times 2 \times 3$</td> <td>$12^3 = 1728 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 = 2^3 \times 2^3 \times 3^3$</td> </tr> </table> <p>each prime factor appears three times in its cubes</p>	Prime factorisation of a number	Prime factorisation of its cube	$4 = 2 \times 2$	$4^3 = 64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 2^3 \times 2^3$	$6 = 2 \times 3$	$6^3 = 216 = 2 \times 2 \times 2 \times 3 \times 3 \times 3 = 2^3 \times 3^3$	$15 = 3 \times 5$	$15^3 = 3375 = 3 \times 3 \times 3 \times 5 \times 5 \times 5 = 3^3 \times 5^3$	$12 = 2 \times 2 \times 3$	$12^3 = 1728 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 = 2^3 \times 2^3 \times 3^3$	Each group will read the similar lines and will frame some more by discussion	Every Individual prepares their own similar lines using the lines prepared by the teacher
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SUMMARY/ SYNOPSIS	Teacher once again writes important key words and procedure adopted in writing patterns and asks children to read, note down and practice.	pupils will note down and read the summary in groups	every individual spells and reads the summary and notes it down										
WRITING/ EDITING	Teacher guides children in doing sums of try these section as well as examples and exercise sums of 6.1 on their own and checks their writings	One group will check the writings of the other and vice versa	Slow learners are focused and teacher will ascertain that every individual learns the concept in successive upcoming practice sessions										

TEACHING PERIODS : 3,4	SMALLEST MULTIPLE THAT IS A PERFECT CUBE, CUBE ROOTS		
CONCEPTS/STEPS	TEACHER ACTIVITY (I DO)	GROUP ACTIVITY (WE DO)	INDIVIDUAL ACTIVITY (YOU DO)
KEY WORDS	Brain storming session involving children with key words # Cube roots # Factorisation # Prime Factorisation # Estimation	* Students read the keywords answer the questions to the teacher (whole class activity)	Every Pupil will read and write the key words in their note books
CONCEPTUAL UNDERSTANDING	<p>Teacher introduces the concept of finding cube roots by prime factorisation method through an activity involving children. Teacher randomizes a box consisting of cards having some perfect cube numbers and non cube numbers . Now teacher divides children into heterogeneous groups and asks to pick one card by each group and instructs them to prime factorise the number and tell whether it is a perfect cube or not along with the cube root if it is a perfect cube. As children are already familiar with prime factorisation while finding square roots in previous chapter, they enjoy in participating in this activity and will learn finding cube root through prime factorisation.</p> <p>Later teacher asks them to guess the smallest multiples which can make perfect cubes in the case of non cube numbers that were picked out from the box.</p>	<p>pupils are divided into heterogeneous groups and are engaged in the activity</p>	<p>Each student in the group participates in the activity and learns the concept</p>
			
SUMMARY	Teacher once again writes important key words and summary of the concept discussed and asks children to note down and adopt.	Pupils will note down and read the summary in	Every individual reads the summary and notes it down
ASSESSMENT	Teacher gives some questions from Try These sections, example sums, exercise sums of 6.2 and asks children to solve those sums	Every group will do the sums by discussion among	Every individual solves the sums on their own

KEY WORDS READING	children to read and write them in note books # Cube roots # Factorisation # Prime Factorisation # Estimation	child comes to the board and reads the key words	and reads the key words and notes them down in their note
SIMILAR LINES READING	<p>Teacher finds the cube roots of some numbers as wells as smallest multiples that make a perfect cube through some illustrative examples and asks children to find some more by watching similar lines.</p> 	Each group watches the similar lines and writes some more	Every individual solves some more statements by watching the similar lines
SUMMARY/ SYNOPSIS	Teacher once again writes important key words and summary and asks children to note down and adopt.	Pupil groups will read and adopt the procedure	Teacher focuses on every individual so that each one learns the concept in successive upcoming practice sessions
WRITING/ EDITING	Teacher gives some questions from Try These sections and exercise sums of 6.2 and asks children to solve those sums and teacher checks the writings of children	One group will check the writings of the other and vice versa	