

FREE NOTES BY HIMANSHI SINGH

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MATHS PEDAGOGY



गणित शिक्षण-शास्त्र

REVISED AND UPDATED

FOR ALL TEACHING EXAMS :
(CTET, UPTET, KVS, DSSSB, NVS, REET ETC.)



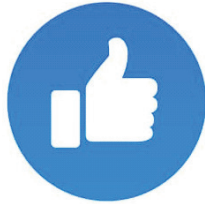
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CTET 5 Marathon Free Classes by Himanshi Singh:

<https://bit.ly/3skQ6wq>

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MATHS PEDAGOGY

English Medium

Objectives of Teaching Mathematics

- Mathematization of the child's thought process.
- Children learn to enjoy mathematics.
- Making mathematics a part of children's life experience.
- To develop logical thinking among the children.
- Children understand the basic structure of mathematics i.e. arithmetic, algebra, geometry and trigonometry.

David wheeler: says "more useful to know how to mathematise than to know a lot of mathematics".

According to George Polya there are two aims of teaching mathematics in schools.

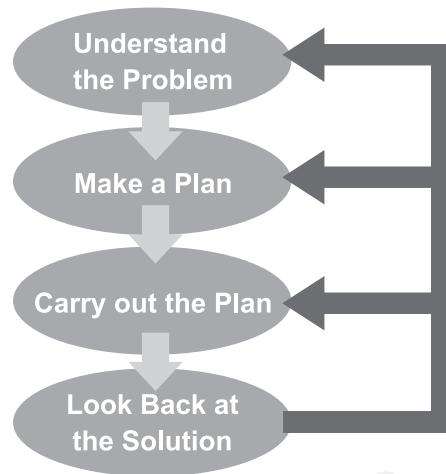
Narrow Aims

- These aims emphasize on turning out employable adults who can contribute to social and economic development.
- This is related to numerical operations i.e. measurement, fraction, percentage etc.
- Thus the limited aim of mathematics is to develop "useful" abilities.

Broad Aims/Higher Aims

- Think mathematically.
- Have logical discussion.
- Find logical conclusions to beliefs.
- Understand abstractness.
- Find solution to a problem.
- To develop child resources.





Polya's Problem Solving Model

According to the NCF-2005

At primary level

6-11 years

- Ensuring numeracy in all children is an important aspect of universalization of elementary education. (UEE)
- At this level progression should be from *concrete* to *abstract*.
- Encourage non-number areas like shapes, spatial understanding, patterns, measurement and data handling.
- 'Mathematics puzzles' help in problem solving skills.
- Children learn to enjoy mathematics rather than fear it.
- Children learn importance of mathematics: Mathematics is more than formulas and mechanical procedures.
- Children see mathematics as something to talk about, to communicate through, to discuss among themselves, to work together on.
- Children pose and solve meaningful problems.
- Children use abstractions to perceive relationships, to see structures, to reason out things, to argue the truth or falsity of statements.
- Children understand the basic structure of Mathematics Arithmetic, algebra, geometry and trigonometry, the basic content areas of school Mathematics, all offer a methodology for abstraction, structuration and generalization.
- Teachers engage every child in class with the conviction that everyone can learn mathematics.



- Visualisation and representation are skills that Mathematics can help to develop.
- All learning occurs through play rather than through dialectic communication.
- Rather than the rote learning of the number sequence, children need to learn and understand in the context of small sets, the connection between word games and counting quantity.
- Mathematical games, puzzles and stories help in developing a positive attitude and in making connections between mathematics and everyday thinking.
- Students are introduced to algebraic notation and use it in solving problems and in generalization to the systematic study of space and shapes and for consolidating their knowledge of measurement.
- The learning at this stage also offers an opportunity to enrich Students spatial reasoning and visualization skills.
- NCF 2005 emphasises on Constructivist approach of learning as it focuses on active participation of learner through engaging activities.

Concept Mapping

- It is a schematic drawing which shows relationship between the concepts.
- It is a hierarchical structure.
- It can be built either by the teacher or learner.
- It connects the new concept with the previous knowledge.
- It is a method which makes learning successful.

Q. Which one of the following statements is not true about 'concept maps'?

- Concept maps represent a collection and links connecting them.
- Concept maps should be constructed by teachers only.
- Concept maps are hierarchical in nature.
- Concept maps help in thinking prior knowledge to new instruction.

Ans. B



The Van Hiele Theory of Geometric Thought

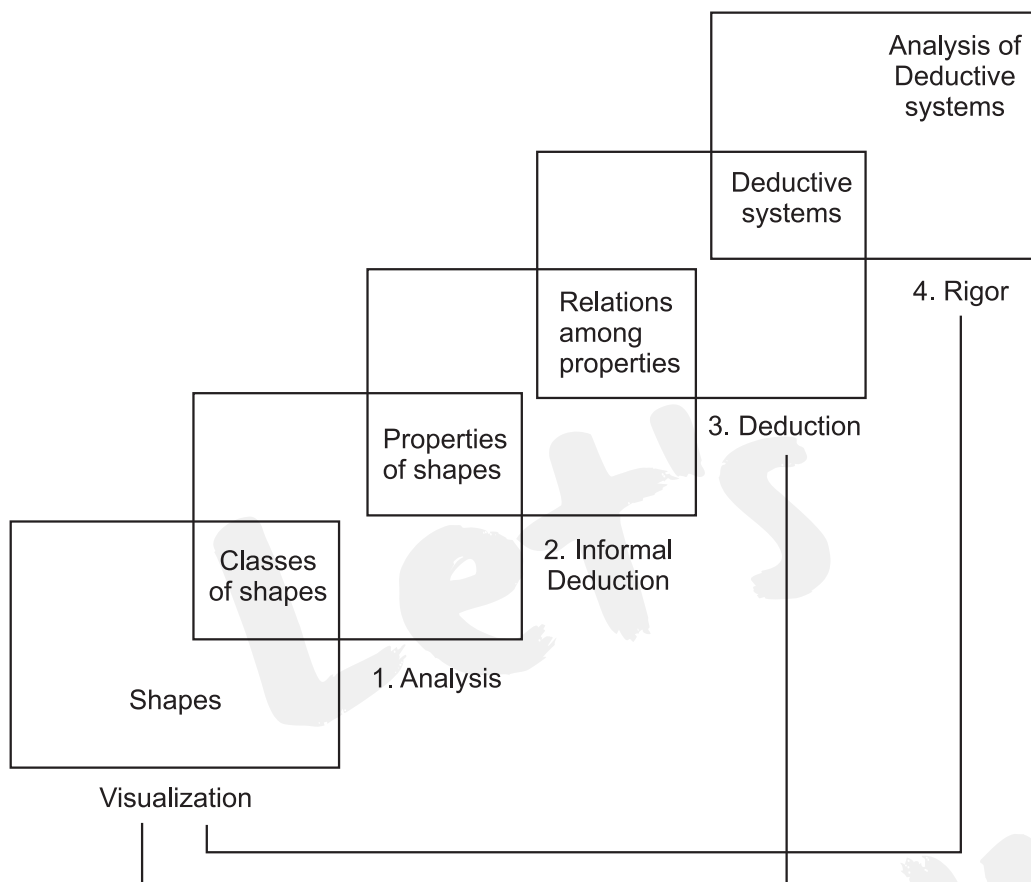


Table 1. The Van Hiele theory of geometric thought describes the different levels of understanding which students progress when learning geometry.

Van Hiele theory of geometric thought

Level	Description	Ability of Student
0	Visual	Describes shapes on the basis of their appearance.
1	Analysis	Describes shapes on the basis of their properties.
2	Abstraction	Recognizes the importance of properties and the relationships among them, which assist students in logically, ordering the properties of the shapes.
3	Deduction	Attains logical reasoning ability and proves theorems deductively.
4	Rigor	Establishes and analyzes theorems in different postulation systems.



Q. According to the Van Hiele, at which level of geometric thinking can children assess the properties of a collection of shapes together?

- A. Level 4 : Rigor
- B. Level 2 : Informal deduction
- C. Level 0 : Visualization
- D. Level 1 : Analysis

Ans. D

Q. Identify a desirable practice for teaching Geometry at primary level?

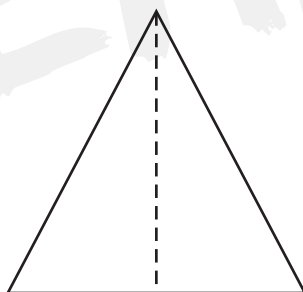
- 1. Geometry at primary level should be limited to recognition of simple basic shape.
- 2. The teacher should begin by giving clear definitions of simple shapes and showing examples.
- 3. Children should be given ample opportunities to develop an intuitive understanding of space.
- 4. Developing extensive geometric vocabulary need not be an objective at primary level.

Ans. C

Symmetry

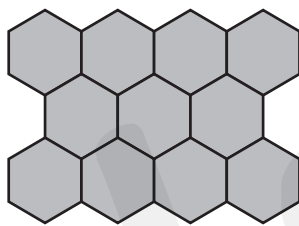
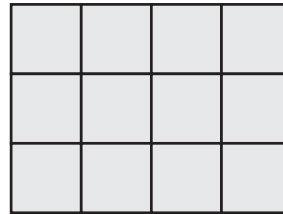
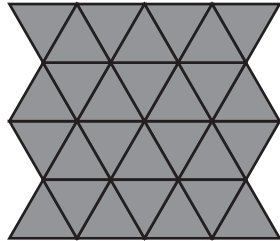
- The quality of being made up of exactly similar parts facing each other or around on axis.

e.g.



Tessellation (Tiling)

Tessellation is created when a shape is repeated over and over again covering a plane without any gaps or overlaps.



Regular Tessellations (Composed of Triangles, Squares and Hexagons)

Q. Which of the following topics are not part of primary school mathematics curriculum as per NCF-2005?

1. Tessellation
2. Symmetry
3. Patterns
4. Ratio

Ans. D

Inductive and Deductive Reasoning

- Deductive reasoning is the process of reading conclusions based on previously known facts.
- Inductive reasoning is the process of arriving at a conclusion based on a set of observations.

Inductive Method

- In this method first examples are given and then a conclusion is drawn.
- It follows the maxims of particular to general, concrete to abstract and known to unknown.



Steps in Inductive Method

- Cite examples.
- Draw conclusions observing examples.
- Build concept.
- Attestation of concepts on the basis of examples.

Deductive Method

- In this method first rules are given and then they are attested by examples.
- It follows the maxims of general to particular, abstract to concrete and concept to examples.

Steps of Deductive Method

- Provide knowledge of concept.
- Use of concept in different examples.
- Test the truth of concepts.
- Attestation of the truth of concept by citing other examples.
- Rule to Example.

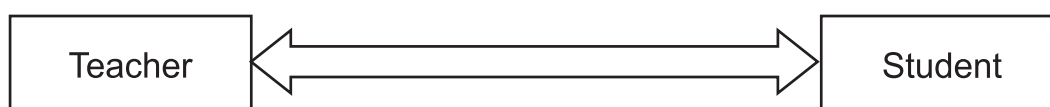
Q. To teach the Pythagoras theorem, a teacher has distributed a sheet on which four right-angled triangles were drawn and asks the child to find the relationship between the sides of a triangle. In the above situation, the teacher used:

- A. Inductive method
- B. Deductive method
- C. Lecture method
- D. Laboratory method.

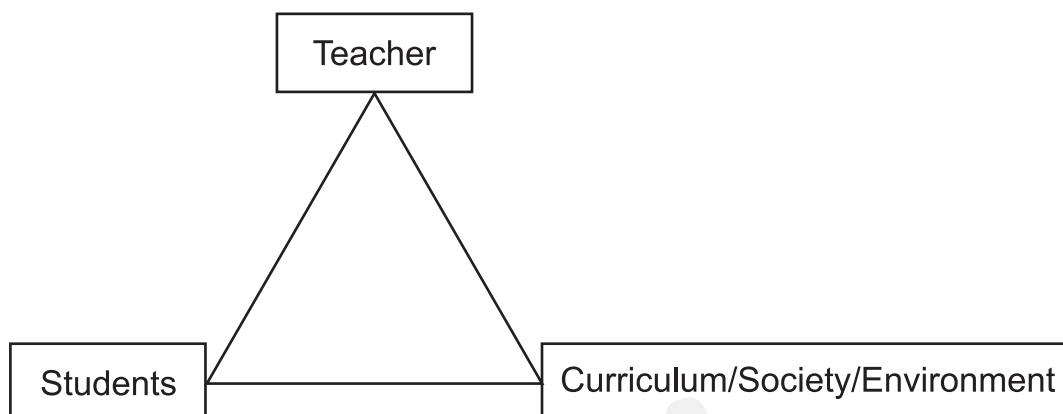
Ans. A

Meaning of Teaching-Learning

- Teaching derived from : to teach which means to instruct.
- Process in which one individual makes something known to another individual.
- Teaching is a bipolar process-John Adam (Narrow Meaning).



- Teaching is a tripolar process (Broad Meaning)

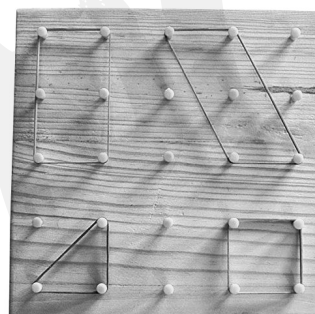


Teaching Learning Materials

- Indigenous
- Effective
- Connect with real life
- Interesting
- Long-lasting
- Helpful in learning

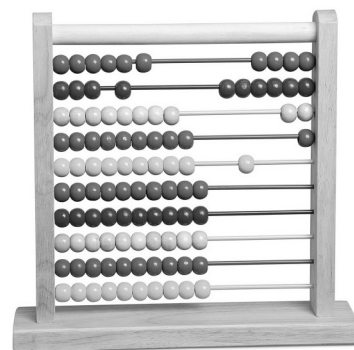
Geo Board

- It is a square board in which nails are embedded.
- With the use of rubber band initial geometrical, measurement and numerical concepts can be made to understand.



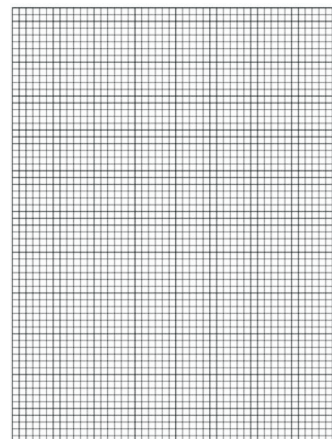
Abacus

- It is an ancient mathematical instrument.
- It is a frame generally of wood or plastic that holds rods with freely sliding beads mounted on them.
- The concepts of addition, subtraction, multiplication, division, fractions, square root, place value etc. can be made to understand very easily.



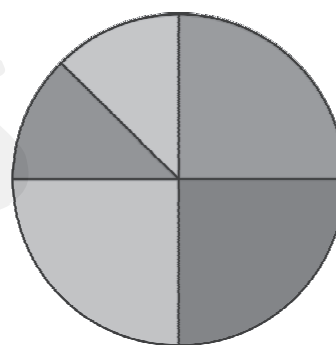
Graph Paper

- Graph paper is the best teaching learning resource to explain the concept of decimal numbers.



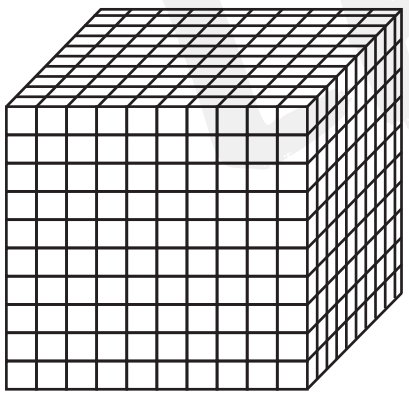
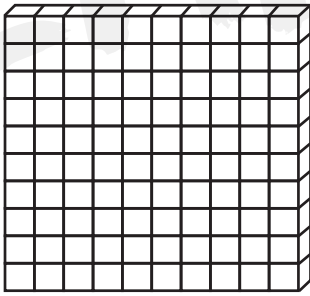
Pie-chart

- A geometric representation, showing the relationship between a whole and its parts is pie chart.



Dienes Block

- These are manipulative tools used to teach basic addition, subtraction, counting, place value and multiplication.
- These are of four types : units, rods, flats and cubes.
- The unit cubes represent units, rods tens, flats hundreds and cube thousands.

Thousands	Hundreds	Tens	Units / Ones
 Cube	 Flat	 Rod	 Unit



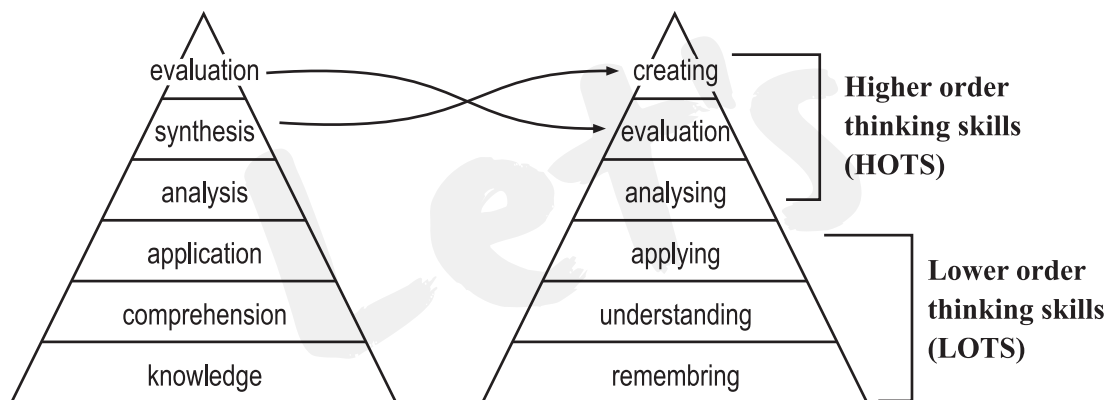
Three Dimensional Teaching Aids

- These aids provide understanding of real things.
- These are-real objects, specimens, models, puppets.

Tall Shape of Mathematics

The 'tall shape' of mathematics is where mastery of one topic is a prerequisite for the next.

Bloom's Taxonomy



Q. The assessment of what children learn in mathematics in primary classes should not focus on:

- A. Understanding of the mathematical concepts.
- B. Development of mathematical language.
- C. Preciseness in answering mathematics problems.
- D. Development of reasoning skills.

Ans. C

Q. The mathematics used by illiterate shopkeeper:

- A. is not useful in the mathematics classroom.
- B. is very useful in solving all mathematical problems.
- C. has ambiguity and very low level of correctness in it.
- D. Should be discussed by the teaches in classrooms as an alternate strategy in solving related problems. (Community Resources)

Ans.D



Q. The learning outcomes in mathematics are developed:

- A. such that children may be told small steps for calculations.
- B. to increase the achievement of children in various educational surveys.
- C. to define classwise competencies and skills to be achieved by children.
- D. to prepare children for year-end examinations.

Ans. C

Q. Which one of the following happenings in the classroom is an activity?

- A. Teacher explaining how to do sums.
- B. Children reciting counting in form of rhymes.
- C. Children copying from blackboard.
- D. Children engaged in exploration.

Ans. D

Note : Written language, written symbols, manipulative models, static pictures, spoken and real-world situations or contexts are five ways to represent mathematical thinking and ideas.

- Learner having problem with numbers and calculation she/he is having disability known as : Dyscalculia.
- A good mathematics textbook at primary level :
 - ❖ It should not be too dense and large.
 - ❖ Concepts should be introduced through contexts because it gives a clear idea of the subject and causes less confusion in students.
 - ❖ Book should include shapes, drawing, along with problems solved.

□□□



EXERCISE

1. Which of the following is the correct order according to Polya's problem solving model?
- A. Understand the problem, devise a plan, look back, carryout the plan.
 - B. Understand the problem, devise a plan, carryout the plan, look back
 - C. Devise a plan, understand the problem, carryout the plan, look back
 - D. Devise a plan, understand the problem, look back, carryout the plan

Ans. B

2. Which one of the following is NOT true about the 'nature of concepts' in mathematics?
- A. Abstract in nature
 - B. Hierarchical in nature
 - C. Logical in nature
 - D. Concrete in nature

Ans. D

3. After teaching 'Place value of numbers', a teacher gave the following question to solve- "Take two digits, say 3 and 5. Make four digit numbers using both the digits equal number of times. Is your answer unique?"

Which of the following statements is correct for the above context?

- A. It is an open ended question and gives opportunities to students to analyse and critique each other's responses.
- B. It is an example of closed ended question.
- C. Multiple responses to a question should be discouraged in mathematics.
- D. It is an example of contextual question.

Ans. A

4. Ms Sonali, a class I mathematics teacher gives the following activities to her learners-
- (i) Sorting shells, stones, tokens of different size and colour
 - (ii) Arranging different sticks in a bundle according to their lengths
 - (iii) Collecting sticks, feathers, leaves from their surroundings and tie them in groups
 - (iv) Threading the beads to form a garland for counting

These type of activities are-

- A. done in primary classes for leisure
- B. a waste of time as teacher should focus on solving problems given in textbook



- C. only done in pre-primary hence an irrelevant activity in class I.
- D. useful for assessing children's readiness to introduce important concepts like numbers, counting in arithmetic.

Ans. D

5. According to 'National Curriculum Framework' 2005, which of the following processes are indicative of 'Mathematization of child's thinking'?

- A. Mathematical communication only through a formula
- B. Solving the problem using formal procedures and checking the answers from an answer key
- C. Estimating the weights of different objects in surroundings and discussing the answers with peers and teachers
- D. Doing an activity on addition following the strict prescribed instructions given by the teacher

Ans. C

6. According to 'National Curriculum Framework' (2005), 'The Shape of mathematics education has become taller and more spindly, rather than broad and rounded. This means

- A. There is no communication between primary school and high school teachers
- B. Topics have been introduced in hierarchical level of difficulty in mathematics curriculum
- C. Over the years, the mathematics curriculum has increased in volume by inclusion of many new topics.
- A. A curriculum acceleration has led to pruning of some basic topics to include new topics which are of significance in higher mathematics education

Ans. D

7. Concept maps are commonly used in mathematics teaching.

Which of the given statements are true about concept maps?

- (a) It is a complex network depicting the relationship between all the subconcepts of the concept.
- (b) It is a linear arrangement of all the subconcepts of the concept.
- (c) They can be used as diagnostic tools to identify difficulties in learning that students are facing.
- (d) They help a teacher to gain new insights into the nature of mathematics.



A. (b) and (c)
B. (b) and (d)
C. (b), (c) and (d)
D. (a), (c) and (d)

Q8. Which of the following represents the correct matching pairs?

- | | |
|-------------------------------|--|
| (a) Formative Assessment | (i) Children memorising the facts and are assessed through written tests. |
| (b) Teacher centred classroom | (ii) Children work both individually and in groups and are assessed while doing activities. |
| (c) Child centred classroom | (iii) Helps to assess social skills and cooperative learning processes. |
| (d) Group Assessment | (iv) Finds out what learning, changes and progress has taken place in the child over a period of time in different subjects and other dimensions of personality. |

- Ans. A

- A. A test based on recalling of facts and formulae
- B. A subjective test according to the learning levels of children
- C. Using ICT based tools for assessment
- D. Using concept maps

10. A primary class teacher is using a variety of concrete material to teach place value to his students. These include:

- (a) Dienes Blocks
(b) Bundles of matchsticks (unburnt)
(c) Fake currency notes (money)
(d) An abacus

Which of the following represents appropriate classification of the concrete material?

- A. (a) and (d) are proportional material
- B. (a) and (b) are proportional material
- C. (b) and (d) are proportional material
- D. (a) and (c) are non-proportional material

Ans. B

11. Assessing children's previous knowledge of mathematical concepts is important because,

- A. it helps in memorising mathematical facts
- B. mathematics is integrated with other subjects
- C. it is helpful in summative assessment
- D. mathematical concepts are hierarchical in nature

Ans. D

12. Sum of 6 and 7 is 13. It is an example of

- A. Definition
- B. Proposition
- C. Open sentence
- D. Conjunction

Ans. B

13. Which of the following levels of cognitive domain are responsible for divergent thinking processes?

- A. Knowledge, Comprehension, and Application
- B. Analysis, Synthesis and Evaluation
- C. Knowledge, Analysis, and Evaluation
- D. Comprehension, Analysis, and Evaluation

Ans. B

14. To solve 76×32 , a student uses the following methods:

$$\begin{aligned} &76 \times 32 \\ &= (70+6) \times (30+2) \\ &= (70 \times 30) + (6 \times 30) + (70 \times 2) + (6 \times 2) \\ &= 2100 + 180 + 140 + 12 \\ &= 2432 \end{aligned}$$



For the above method which of the following statements is true?

- A. Informal techniques of problem solving should be discouraged among learners
- B. Student does not have conceptual knowledge of multiplication
- C. The method used by student reflects her understanding of the properties of multiplication.
- D. Student will get zero marks in written test for using this method.

Ans. C

15. The most appropriate reason for introducing Geo-board based activities could be-

- A. to teach lines and angles to learners.
- B. to teach different types of triangles to learners.
- C. to teach volume to learners.
- D. to provide concrete representations for many investigations in geometrical concepts.

Ans. D

16. To teach the concept of place value the teacher brings in a variety of material into her classroom like abacus, Dienes blocks, and currency notes of ₹ 1, ₹ 10, and ₹ 100. Which principle of Dienes theory is the teacher referring to in the above scenario?

- A. Dynamic Principle
- B. Mathematical Variability Principle
- C. Perceptual Variability Principle
- D. Constructivity Principle

Ans. C

17. Errors play an important role in mathematics. This statement is :-

- A. False, as errors indicate careless attitude towards mathematics
- B. True, they help teacher understand how children construct mathematical concepts
- C. False, as mathematics is considered free from errors
- D. True, as error are indicative of low IQ

Ans. B

18. A common error that we often encounter when children are asked to add two fractions is: they add the numerator with the numerator and denominator with the denominator. What could be the possible reason for such a misconception?

- A. Lack of conceptual understanding of the teacher
- B. Lack of attention of students in the class
- C. Generalization of facts learned in addition being applied to fractions
- D. Non-availability of teaching - learning material

Ans. C



19. The most appropriate formative task to assess the students' understanding of data collection is

- A. Classroom Discussion
- B. Crossword
- C. Survey Based project
- D. Role play

Ans. C

20. Engaging students in mathematical activities at primary level can help in many ways like :

- (a) Providing opportunities to children to explore many abstract concepts and learn computational strategies
- (b) Help to utilize free periods given in time - table
- (c) Help students deepen their mathematical understanding and reasoning
- (d) Serve as a tool for summative assessment

Choose the correct option

- A. (a) and (d)
- B. (b) and (c)
- C. (b) and (d)
- D. (a) and (c)

Ans. D

21. Geometry has been identified as one of the important areas of mathematics and should be an integral part of primary mathematics. This is because :

- A. All students get good marks in geometry as it is easy to understand
- B. Geometry is activity oriented and hence provides play time
- C. Many famous mathematicians have contributed towards development of geometry
- D. Experiences in geometry help in learning and visualising mathematical ideas and concepts that are useful in daily life

Ans. D

22. Ms. Shreya, a primary class mathematics teacher uses various methods to teach addition of 2-digit numbers to her learners, like,

(i)	$\begin{array}{r} 23 \\ + 46 \\ \hline 69 \end{array}$	(ii)	$\begin{array}{r} 20 + 3 \\ + 40 + 6 \\ \hline 60 + 9 = 69 \end{array}$	(iii)	$\begin{aligned} (23 + 46) &= (20 + 3) + (40 + 6) \\ &= (20 + 40) + (3 + 6) \\ &= 60 + 9 = 69 \end{aligned}$
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Which of the following statements is most appropriate for her Pedagogy

- A. She is focusing only on mathematical communication
- B. She is offering her students a multiplicity of approaches in solving problems in mathematics
- C. She is confusing the students with so many methods
- D. She is wasting a lot of time in solving one problem

Ans. B

23. In a game of marbles, Renu lost 4 marbles. She is left with 7 marbles. With how many marbles did she start the game ? The above question is an example of

- A. Contextual question on addition
- B. Open-ended question
- C. Multiple choice question
- D. Contextual question on subtraction

Ans. A

24. Where do we use sexagesimal system?

- A. In quantification of data
- B. In measuring angles
- C. In measuring distances in foot and yards
- D. In writing Hindi - Arabic numerals

Ans. B

25. Which one of the following is true about teaching and learning of mathematics in classes I and II as per the vision of National Curriculum Framework (2005) ?

- A. Focus on algorithms and rote learning.
- B. Only oral Mathematics Problems should be done in classes I and II
- C. Mathematics should be integrated with other subjects like language, arts, EVS etc.
- D. Mathematics should not be taught in classes I and II

Ans. C

26. In a constructivist classroom, for introducing the multiplication of decimals, which among the following is most appropriate?

- A. Using grids to represent decimals and then introduce multiplication of decimals
- B. Convert decimals to fractions and then multiply.
- C. Convert decimals to whole numbers and then multiply.
- D. Use formal algorithm to solve the questions followed by a practice worksheet.

Ans. A



27. A classroom discussion was initiated on the topic of 'Sale and Discount in festival season' while teaching the concept of 'Percentage'. This type of discussion in classroom

- A. helps the students to enhance their debating skills.
- B. helps the students to listen to each other's opinion and encourage them to present their argument thus improving their speaking skills.
- C. must be avoided as it raises the noise level of class and disturb others.
- D. helps the students to connect classroom mathematics with the real world thus improving conceptual clarity.

Ans. D

28. Which of the following questions would be the most appropriate to assess the mathematical thinking of children?

- A. Solve 4.25×0.5
- B. If a fruit costs Rs.4.25 per kilogram, how much would you pay for 0.5 kg ?
- C. If 4.25 is multiplied by a number between 0 and 1, is the product less than or greater than 4.25? Explain.
- D. Explain the standard algorithm of multiplying 4.25 with 0.5

Ans. C

29. Which of the following activity teacher can use for class II children to teach about subtraction of one digit numbers.

- A. Draws 6 dots and encircles 2 among them and asks children to count the remaining dots. Repeats the some process with similar examples.
- B. Writes $6 - 2 = 4$ on black board and asks children to write it 10 times in their note book
- C. Teacher asks children to read aloud all the problems written on the black board
- D. Teacher gives a lot of numerical problems like 17-8, 14-12 etc. to practice

Ans. A

30. Rihana wants to become a good mathematics teacher. To be a good mathematics teacher, she must have

- A. the skills to prepare students for math Olympiads.
- B. Conceptual understanding and ability to relate the content of mathematics with real life
- C. The ability to recall all formulae & theorems
- D. Ability to solve mental math problems

Ans. B



31. Following three statements have been given in the context of teaching numbers to students of early primary classes:

- A. Encouraging students to think about the number of objects and their quantities when they are meaningful to them.**
- B. To encourage students to learn counting by remembering the names of numbers.**
- C. Encouraging students to make aggregates out of movable objects.**

Which of the above statements is correct?

- A. A and C
- B. Only B
- C. B and C
- D. A and B

Ans. A

32. Which of the following represents the correct sequence of geometrical reasoning levels according to Van Hiele's theory?

- A. visualization-relationship recognition - incorporation- analysis-axiom
- B. Relation-recognition-visualization-analysis-axiom
- C. Visualization-Analyzing-Relationship Recognition-Deduction-Axioms
- D. Visualization-analysis-relationship recognition-incorporation-axiom

Ans. C

33. Which of the following statements is NOT appropriate for mathematical tasks?

- A. The probability that students become self confident in their ability to tackle difficult problems when they are challenged with the above mathematical tasks.
- B. If the mathematical work is difficult then it cannot keep the students engaged.
- C. Mathematical tasks should encourage students to become autonomous learners.
- D. Mathematical operations should provide flexibility to explore alternative ways to solve the problem.

Ans. B

34. Which skill is expressed in the following statement which will help the child to understand the quantization of objects?

"The child mentally includes one in two, two in three, three in four, four in five so on and so forth".

- A. Equality
- B. Hierarchical Inclusion
- C. Inverse Inverse Protection
- D. Normalization

Ans. B



35. Which of the following is the most appropriate strategy to introduce the concept of fractions in primary mathematics class?

- A. Posing a word problem on fractions.
- B. Showing a picture chart representing $\frac{1}{2}$ and $\frac{1}{4}$.
- C. Representing a fraction on a number line.
- D. Doing paper folding activities with symmetrical rectangular strips and circular cut-outs

Ans. D

36. Given below, are two statements marked as Assertion (A) and Reason (R)

(A): Mathematics curriculum in primary school must progress from concrete to abstract.

(R): Primary class students start doing mathematics without thinking.

Choose the correct option.

- A. Both (A) and (R) are true and (R) is the correct explanation of (A).
- B. Both (A) and (R) are true but (R) is not the correct explanation of (A).
- C. (A) is true but (R) is false.
- D. Both (A) and (R) are false.

Ans. C

37. According to national Curriculum Framework 2005, which is the most appropriate statement about classroom based assessment in mathematics?

- A. It should not merely be done for evaluating the students, rather should be done for providing feedback and improving teaching learning process.
- B. It must be done to rank the students in classroom which will help the students to progress
- C. It should not be part of mathematical instructions but should be done separately
- D. Self-assessment is not possible in primary classes

Ans. A

38. Which of the following statements is/are true about mathematics learning among primary grade learners?

- A. Children come to school with some ideas/opinions about maths.
- B. Children's views/opinions about mathematics before coming to school are inconsistent with school mathematics.
- C. The understanding of space in children develops only during the study of geometry.
- D. Children in primary classes are able to recognize shapes in their surroundings.



Select the correct option.

- A. A and D
- B. Only B
- C. B and C
- D. A, C and D

Ans. A

39. According to National Curriculum Framework 2005, important feature/features of mathematics curriculum is/ are:

- A. It should be ambitious and coherent.
- B. It should be activity-oriented
- C. it should include more number of summative assessments
- D. It should emphasise on procedures and knowledge of formulae over understanding.

- A. A and C
- B. Only B
- C. A and B
- D. C and D

Ans. C

40. The most appropriate example of a student-centred classroom in mathematics is:

- A. Providing multiple questions to every student in the class for practice.
- B. Teacher is asking every student to solve the problem on blackboard.
- C. Teacher is engaging with students in the classroom to build their mathematical understanding from their personal experiences.
- D. Teacher is solving the problem on the blackboard and explaining the algorithm to the Students.

Ans. C

41. Which of the following is/are most appropriate about the mathematics textbook of primary classes?

- A. The problems given in textbook should reduce solutions to knowledge of specific tricks.
- B. The language used in textbook must not be far removed from everyday speech of the students.
- C. The books should not include stories and other narratives rather should include a lot of questions to practice

- A. A and B
- B. B and C
- C. Only B
- D. Only C

Ans. C



42. Which of the following is NOT related with process of mathematics teaching and learning?

- A. Abstraction
- B. Investigation
- C. Optimization
- D. Rote Memorization

Ans. D

43. Which of the following is NOT a step of Polya's problem-solving model?

- A. Understanding the problem
- B. Memorizing the algorithm
- C. Devising a plan
- D. Look back

Ans. B

44. While adding three numbers given as $73+35+27$, a student calculates in the following manner.'

$$(73 + 35) + 27 = (35 + 73) + 27 = 35 + (73 + 27) = 35 + 100 = 135$$

Which of the following properties of addition of numbers the student has used?

- A. Commutative and associative
- B. Commutative and distributive rules
- C. Distribution-laws and analogies
- D. Identities and associatives

Ans. A

45. A student solves the problem on multiplication in the following way.

35

23

75

What could be the most probable reason for the error made by the student?

- (a) The student is unable to recall the multiplication tables upto 10.
- (b) The student has extended the algorithm of addition to multiplication
- (c) The student does not know the algorithm of addition
- (d) The students is unable to do regrouping of numbers while multiplying the numbers.

Ans. B



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