Click Here

In order to continue enjoying our site, we ask that you confirm your identity as a human. Thank you very much for your cooperation. Table of Contents January 13, 2021 Reading Time: 6 minutes Introduction Mathematics is a subject that is quite different from others, both in terms of difficulty and in terms of usage. Every parent desires that their child succeeds in mathematics. But, teaching a child the concepts of mathematics is difficult. This is the reason why most of the parents are confused regarding how to teach maths in an interesting way to their children. The ultimate goal of mathematics is understanding the material presented, applying the skills, and recalling the concepts in the future. There is a list of concepts revolving around multiple formulas that help to solve different problem sets and make different decisions. Therefore, it is imperative to understand the material rather than memorizing the procedures of mathematics. Mathematics is a subject that requires constant practice and revision. If this is not done, students tend to forget the concepts. Some students find it interesting while others find it difficult. This is because of the strategies applied by the teacher regarding how to teach maths. As it is such a different subject, the teachers have to apply a whole different set of strategies while teaching mathematics. In this article, we will be listing down some of the approaches and strategies of teaching mathematics. These mathematical teaching strategies will help them understand how to teach maths in an interesting way to students. Hence, moving forward to some of these mathematical teaching strategies. 15 Strategies on how to teach Math-PDF Math is a subject that requires constant practice and revision. Explore some of the effective approaches and strategies to teach students mathematics through this article. Here is a downloadable PDF to explore more. 15 Strategies on how to teach Math-PDF Download Approaches and strategies in teaching mathematics Create an effective environment that is open for discussion Teachers should start by laying down the agenda of the class and must keep an open platform wherein each and every student must be encouraged to raise questions. Teachers should understand that students will take time in understanding the concepts of mathematics. Therefore provide them with due feedback, practice assignments, doubt clearing sessions, and revision papers. Explain to them the purpose behind learning a particular topic. Introduce the topics using multiple examples Mathematics is a subject which could actually be visualized and compared to practical life. Therefore, teachers can come up with creative ways like images or videos to teach maths in an interesting way to students. They can illustrate the problem sets by making a child visualize the practical side of what is mentioned in the problem. Show the students the different ways The problem sets given in maths can be solved in multiple ways. Therefore as a teacher, you should teach the students all the possible ways of solving a problem. Not every student will grasp and understand the same method of coming to a solution. Therefore, it must be an open platform wherein the students are given an option to understand the most relevant approach towards coming to a solution. Encourage students for reasoning when solving problems In order to determine that every student has actually learned the objective of a class, it is necessary that every student communicate both orally and in writing with the proper reason. Reasoning gives a proper idea about the understanding of the student about the concept. This will promote their engagement and learning. Finish the class by giving a summary and homework As stressed upon before, mathematics is the subject where you require constant practice. Therefore, we encourage every teacher to provide students with some practice assignments for their home. Make sure that these assignments are not very tough and help the student to understand the concept in a better way. These assignments are given in order to boost the morale of the students and make them get a relevant hold of the subject. Raise the difficulty level slowly Before starting to teach any particular topic in mathematics, it is very important to segregate the problem sets based on that level of difficulty. Start with a few easier problems. Teachers must keep raising the bar for all the students slowly and steadily. Many students fear mathematics As teachers, you must be enthusiastic and encouraging. You must try to prevent students from getting these negative attitudes. Try to comfort and console the students who are struggling. This will help them build their confidence and their ability to solve the problem. Create a proper and standardized testing pathway As a guide, it becomes very important to know about the progress of the child. Therefore it is imperative to conduct proper examinations. These examinations can take various forms like quizzes, classroom discussions, detailed assignments, etc. This will help the teachers to take proper actions for individual students. In mathematics, there can be a number of interesting projects which could be given This project assignment helps the students to do proper research and understand a particular topic in a much more detailed manner. Provide them with the guidance to do a particular project but let them do the research on their own. This will bring out their creativity and brings the best out of them. Observe, modify, and re-evaluate Many teachers become very rigid in the pace of completing a particular topic. They often forget to evaluate the homework given by them. Well, we say this is not a problem. But a teacher must walk through the classroom and observe the dynamics of the students. The teacher must talk to every student individually and ask them questions. This will give them a fair idea about how much a student is understanding. Encourage maths talk and games This will help the students to develop their mental abilities and skills. This will also give them a whole new learning and thinking process. They will be able to describe and solve a problem in their own certain way. Games will also encourage active engagement and participation. There are many math games available on phones and computers. It will promote their strategic mathematical thinking, computational fluency, and understanding of operations. Emphasize on hands-on learning In mathematics, there are a number of concepts that are abstract. Hands-on learning will help the students make their concepts concrete. Consider incorporating the manipulatives of mathematics wherever possible. For example, you can use building blocks to teach a variety of mathematical skills. Make a child understand a particular concept Every kid has their own way of learning math. Don't make them grasp and memorize the formulas or procedures. Memorization does not foster understanding. Therefore, build a stronger conceptual understanding and mental connection. This will build a strong foundation. To know more about learning styles click here. Build excitement and reward the progress of the child Build a proper growth mindset among the students. This keeps them motivated and boosted. Provide them with certificates, stickers, badges, or trophies as they progress. Teachers can have weekly announcements of the best students of the week. Such recognition will help them repeat the good work. To know more about the growth mindset click here. We all know how difficult maths could be. We all have been there. Therefore, it becomes very important to be patient with the child and to teach them in a step-by-step sequential manner. This will prevent them from getting afraid of mathematics. Effective strategies for teaching students with difficulties in mathematics 5-10% of the students suffer from this problem Understanding the concepts becomes difficult Similar numbers tend to confuse the kid Inability to make quick calculations Inability to judge time, speed, and distance Inability to grasp and hold numbers for calculations in the brain for a long time Well, there is nothing to be worried about. It is a common issue with a lot of children. With a proper step by step approach of learning and understanding, dyscalculia is easily solvable. It is important to consult a specialist but it is equally important for parents to show care and support at every stage of the development process. Some of the steps which parents can take are: Active participation with the child Applying maths to small household works and using them as examples for the child Making them play games which are maths oriented Abacus classes can be a great source of learning Teaching through a step by step approach of getting an answer Clearing the doubts that a child asks in the learning process Understanding his/her abilities and setting the difficulties on those parameters Conclusion We hope some of these approaches and strategies of teaching mathematics will effectively improve the dynamics of a classroom. Teachers and parents must not worry about how to teach maths. Rather they must focus on how to teach maths in an interesting way. Making things fun makes everything easier. In the entire process, it becomes very essential to understand the mindset of the child. This will help elders to develop and connect better relations with the child. Cuemath, a student-friendly mathematics and coding platform, conducts regular Online Classes for academics and skill-development, and their Mental Math App, on both iOS and Android, is a one-stop solution for kids to develop multiple skills.Understand the Cuemath Fee structure and sign up for a free trial. Start With Counting Teaching math begins with your child knowing numbers. You can help them learn to count with the same strategies you'll be using to teach them math. Children may respond better to memorizing numbers you repeat or may pick up numbers by seeing you count objects from one to ten. Mathematics teaching and learning have been a top priority in education. Several commissions and committees have underlined the importance of improving mathematics techniques of teaching. The National Education Policy (1986) emphasises the importance of mathematics as a tool for promoting creativity. As a result, traditional methods of mathematics instruction that depended mainly on rote learning and drill have been replaced by methods that rely on exploration and problem-solving approaches. Mathematics Pedagogy is a significant topic in the Mathematics portion of CTET, UPTET, REET, HTET, and other TET examinations, which is worth 30 marks per paper. In this article, we have described the numerous approaches and techniques for teaching mathematics according to the syllabus, which will assist the teacher in most successfully planning instruction in the classroom. Different Methods of Teaching Mathematics Mathematics is experimental and inductive in nature. Induction is a type of reasoning in which a general law is formed from studying specific objects or processes. The child can utilise measurement, manipulative or constructive activities, patterns, and so on to find a relationship they will later symbolically represent as a law or rule. The law, the norm or definition devised by the child, is the sum of all specific or individual cases. The evolved generalisation is viewed as a tentative conclusion in every induction.   Analytic & Synthetic Methods Analysis and synthesis are methods of discovering relationships between entities that use thinking and arguments. Synthetic Euclidean geometry is a good example of a framework that works by deduction. It helps people learn to think clearly and reason well. In every proposition, there is a hypothesis and a conclusion. The hypothesis can be the information in the statement or a set of axioms, definitions, principles, or relationships that have already been proven. The conclusion is the result to be proved or arrived at. Heuristic or Discovery Method   The modern way of teaching maths focuses on meaning, understanding, and how it can be used. The “traditional” or “drill” idea is different from this. Children should understand and care about what they are learning. Under the “drill” idea, they are told the facts, which they remember by doing them over and over again. In “meaningful” learning, the child helps find the answer. He thinks about it. He discovers how things are connected by doing, experimenting, and participating in events. All discovery methods are closely tied to real work or problem situations that show the child how inadequate his or her current schemas are. Second, teachers who use the discovery method should help the child have a good attitude and learn how to use controlled settings to test their ideas and find new connections. Different Techniques in Teaching Mathematics Mathematically, the drill is one of the most important ways to learn. All tasks used to teach have one main goal: to make learning a habit. Getting good at something takes making it a habit, so drill practice is an important part of getting good at something. Most practice lessons fall into three categories. The first type of lessons for success is those that teach basic skills, such as multiplication tables, addition combinations, fractional equivalents of decimals and percentages, factorization, construction in geometry, etc. These include the subject matter, which must be learned well in order to learn quickly and correctly in the future. For a drill lesson to be effective, the following things should be taken into account: Drills should come after students learn and understand the basics. It shouldn’t make people think that they should memorise things without understanding them. Drills should be different. Some boring and regular tasks can make learning uninteresting. Each student should be able to do drills in a way that is useful to them. Every child should understand why and how it works. There should be short practice sessions, and the learner’s progress should be checked often. Drills shouldn’t be set up just to keep students “busy.” It should be based on events that make you think, so that you don’t just do the same thing over and over. Drill can also help teachers figure out what’s wrong with a student. Oral work helps each child work at the best speed for him so that he can be as accurate as possible. Work should be done orally and in writing in any lesson, especially if modern practice or worksheets are used. Oral work is a quick drill that helps you get used to a basic process, way of thinking, or set of facts. It helps get more work done in the same amount of time. But written work is needed when a teacher needs to check each child’s work or when she wants the kids to practise working on their own. Throughout written work, accuracy in computation, legibility of figures and symbols, speed, the right algorithm, which is the logical and sequential order of steps in the answer, neatness of work, and correctness of results should be kept in mind. Written work can also be saved as a group record, which can be used to see how far a student has come over time. The Play Way method, also called teaching through games, is the most modern way to teach maths. A game is a planned action that the students do under the teacher’s supervision. Even though games can only teach certain math ideas, the most important thing that games like quizzes, puzzles, guessing games, etc. are good for is drilling or practising different math ideas out loud.   Planned assignments, which are based on each child’s growth and encourage each one to learn independently, have replaced the idea of homework in recent years. One of the most important parts of teaching is planning the task. It is part of a learning activity that involves setting up a task and finding the best way to do it. Teachers think that the best way for students to learn is to do things on their own. Here are a few aspects of a good assignment: The task should be clear and unambiguous. It should be short but clear enough for each child to understand what they are supposed to do. It should predict problems with the work that needs to be done and offer ways to solve them. It should compare the new lesson to things you’ve learned in the past and link the topic to everything else related to it. It should be interesting, let the student want to do something and let them think as well.   Unit Planning & Lesson Planning A unit is a chapter segment that helps guide the lesson plan. A unit ensures that the subject matter makes sense and that the learner’s wants, interests, and ability to learn are considered. The way information is grouped into units has many benefits: a) The teacher is in charge of the lesson plan, and the students carry it out with the help of teachers and other students. b) Units cover more than one subject, which makes it easier to see how different parts of maths and other subjects are related. So, learning is more integrated and less scattered. c) Different tasks and experiences are offered to meet the different ways people learn. The child is not forced to learn. d) Practice is more useful, and problem-solving skills are better when they are learned in real-world settings. So, this encourages students to think critically. A unit usually has three parts: (1) the goals or objectives, (2) learning situations to help meet these goals, and (3) tests to see how well the goals have been met. Planning a lesson means setting up a forty-minute time period for teaching. Since maths is a topic that builds on itself, each day’s lesson is needed to understand the next lesson. A well-planned lesson gives the teacher a sense of comfort, keeps them on track, stops time from being wasted, and makes it easy to move from one part of the topic to the next. It is best for the teacher to plan the lessons they want to teach beforehand, ideally at the start of each week. The lesson plan should have the six parts below: (1) Goals or goals, (2) background information or what you already know, (3) introductory or motivational activities, (4) growth activities, (5) a summary, and (6) a way to use what you’ve learned. Materials & Teaching aids The textbook has been the main source of explanations, directions for processes and procedures, solved model examples, diagrams of quantitative relationships, practice tasks and sample test papers. A good textbook saves teachers time and effort. It also eliminates the need for the teacher to write down tasks and problems. The value of a textbook goes up if it has good pictures and diagrams. Today, teachers use many learning tools to help students understand ideas and how they can be used. These include a) Materials made of concrete or semi-concrete, such as measurement tools. Some of these things are easy to find in the community, and others, can be bought. b) Field trips and displays. Through tours and trips, students can see how maths is used in the real world. Children find collecting pictures, newspaper articles, posters, and charts fun and useful. c) Construction work. Activities related to building can be a significant example to see how maths is used in it d) Moving pictures, film strips, and slides are all types of multisensory tools. Audiovisual aids help both the teacher and the learner interact in an interesting, quick, fun, and useful way. Laboratory approach to teaching mathematics We know that a lab is mostly used to teach science. Recently, this idea has been used to teach maths for the first time. People think it’s hard to learn maths it’s verbally taught. Students learn by doing things in a classroom. They do projects, play with materials and models, and use different tools, which helps them understand what this math terminology means. In a lab, a child can see how much of what they learn in maths comes to life. The lab is a place where problems can be solved in settings that are like real life. In the lab, there should be wall charts, models, math tools, film slides and video tapes, and many things that can be touched and moved. In a lab situation: a) Learning is child-centred, not teacher-dominated. The practice is done by the students. The teacher guides or helps the students. b) The work is relevant to the learner’s life and important to them. c) The students are more interested because they work with real problems instead of just ideas. d) Many community resources are utilized as the subject matter is organized into functional activities.   CTET Mathematics Preparation Tips Follow these CTET Preparation tips if you want to be ready for the basic questions that are asked in the CTET exam, Paper 1 and Paper 2. Sample Papers: Before the test, the CBSE will give out sample papers that you should work on to fully understand the type of exam, how it is set up, and how the questions are asked. Pedagogical Concerns: Students should be well-versed in these topics because the mathematics exam will include pedagogy-related questions. It is critical to understand practical methods and their potential for teaching. You should learn about both formative and non-formative evaluation here. Examine NCERT Books: Depending on the paper code, students taking paper I or paper II need to review NCERT math books from classes I through 5 or 6 through 8. Practise Mock Tests: To do well on the CTET exam, you must know the previous year’s questions. There are mock tests on several websites. Sign up online for a CTET course or coaching. How to crack CTET without Coaching? Is it possible to pass CTET without support? This is a question that all CTET candidates have in mind. Candidates can prepare for the CTET Exam without attending any coaching sessions by developing an effective Preparation Strategy. CTET Preparation Tips might help candidates who desire to excel their exams. Students can appropriately prepare for their exams by following these study strategies. Students can use the following preparation techniques. Check the CTET Exam Pattern to see how many marks are awarded to each section and how many questions are covered in each area. Candidates can prepare successfully for the CTET Exam by understanding the exam format. Knowing the CTET Syllabus makes it simpler to prepare for the exam. The syllabus may include information on the most significant subjects of each subject covered in the exam. Identifying your strengths and shortcomings is vital when preparing for the CTET. This helps you determine which topics demand more attention. Incorporating essential books in your CTET Exam Preparation is crucial to comprehend each exam topic properly. Only the CTET Books recommended by subject experts for each subject should be used for optimum preparation. Short notes and one-liners can help with CTET exam preparation. Always take short notes on each topic so that revising is simple throughout the exam. Collect appropriate study materials from past years, such as textbooks, reference books, and exam papers. Make sure you have reliable and up-to-date study materials. Make a study schedule and schedule time for each course and topic. Set attainable objectives and prioritise your study method accordingly. Take regular pauses to avoid burnout. Strong foundation: Depending on your exam, focus on creating a strong foundation in CTET essential topics such as Child Development and Pedagogy, Mathematics, Environmental Studies, Language (English/Hindi), and Science/Social Science. Books for CTET exam preparation The important mathematics books for CTET exam preparation are Mathematics & Pedagogy for Class I-V – Arihant Publication A Complete Resources for CTET: Mathematics and Pedagogy – Haneet Gandhi, Pearson Publication CTET & TETs for Class VI-VIII Mathematics & Pedagogy – Arihant Publication Mathematics and Science for CTET 2021 Paper II – Hankeet Gandhi and Yukti Sharma, Pearson Publication Mathematics Exam Goalpost (Class 1 to 5) – Wiley Publication Mathematics & Pedagogy (Class 6 to 8) – Disha Publication Candidates can check the syllabus for other competitive exams at the links given below: Some of the benefits of the problem-solving approach are: The problem’s consideration of a real-life situation motivates the student to learn. It improves the ability to think and produce new ideas. As a result, concepts are better understood. The two reasons that favour the discovery method compared to other methods are: a) It is more focused towards children. It gives the child additional possibilities to ponder and draw conclusions. b) The sense of discovery increases the desire for continued learning, aids in the consolidation of concepts learned, and helps retain them for longer.The two advantages of drill and practice are: i) It helps memorise and retain the concept for longer. ii) It provides analytical information about student’s learning pace. In order to continue enjoying our site, we ask that you confirm your identity as a human. Thank you very much for your cooperation. Interact with students while they engage in the experiences, encourage students to interact with each other, including asking and answering questions, and specifically plan to support students who need it and challenge those who are ready (Sullivan, 2011). What are the essential strategies for good, effective math teaching? Everyone wants kids to succeed in math, but how best to do that? In most districts, standardized tests are a high-stakes way to measure students’ understanding, yet few want to teach to the test. Over-reliance on test prep materials and “drill and kill” worksheets can make math repetitive, boring, and devoid of true understanding for kids. The reality is that motivating, effective instruction and good test scores aren’t mutually exclusive. Being intentional and using creative approaches to your teaching can get students excited about math and successful in their understanding. Here are some essential strategies and attitudes in teaching mathematics that can help make this your class’s best math year ever! Noted math educator Marilyn Burns wrote a classic book entitled Math: Facing an American Phobia (Math Solutions, 1998). The title kind of says it all. In America we have a cultural belief that you have to be born good at math because as Barbie once said, “Math is hard.” On the other hand, we have a generally held belief that everyone can and should learn to read. If you were to tell a room of adults you hate math, you would get plenty of affirmation. Try telling them you hate reading. You’ll see a different reaction. As teachers of young children, we need to help our students understand and believe that we are all mathematicians, just like we are all readers. We can do this by giving kids positive and successful experiences with math from an early age and pointing out to them how we all are constantly doing math on a daily basis. Try this with your students. Ask them to write down every bit of math they did at home the day before. Did they look at a clock and check the time? Math. Did they use any words reflecting spatial sense like next to, under, over, right, left? Math. Did they hear anything about weather like the temperature for the day? Math. And it goes on. Make clear to them that they are already daily mathematicians and that in school you are going to help them in becoming even more expert in the field! Use targeted feedback to support this. Rather than general statements like “That was good,” it’s better to say, “You put those two numbers together perfectly. That is the exact right answer and perfect mathematics!” Now the student knows what was good and can reflect on that. The reality is everyone can do math and do it well, but as the teacher, you have to believe that to be true and help your students truly experience it and believe it too. We Are Teachers Becoming expert at anything is usually not easy. There is work involved, but there’s a great feeling of satisfaction and accomplishment when we work hard and see results. Rather than success being a function of how much math talent we’re born with, kids need to hear from teachers that anyone who works hard can succeed. Practice and persistence make you good at math or anything else. Ask students about experiences they have had with sports. How long did it take to learn to throw a ball? Kick a goal? Make a basket? No one is born with these skills. They take lots of practice. Well, so does math. But just like sports, practice in math can be fun because the results are visible. With this in mind, one simple thing you can do at the beginning of the year is to give everyone a math assessment of all the concepts they will be expected to master in the year. Start it off with some skills from the previous year, but put in everything else. Tell students first that this assessment is to help you know what you have to teach this year. If they all know how to count to 10 already, you won’t spend a lot of time on that, maybe just a little practice. Tell them to circle anything they don’t know how to do yet and want to learn. They are helping you find out what to teach. Explain that these assessments (some teachers call them inventories) don’t get graded, they are only to help you as the teacher to plan. Because that is what it’s really for. At the end of the year, give students the same assessment again. Score it and hand it back along with the original so they can compare. When they see how much they have learned, they will feel like they received a gold medal in mathematics! Try it: Free Printable Growth Mindset Posters Assessment is not something separate from your instruction. In fact, assessment, like that first math assessment of the year mentioned above, drives instruction. It should be integrated into your planning. Exit tickets or questions, quizzes, open-ended questions, and meaningful homework assignments confirm what students have mastered or not mastered and let you know what needs to happen next. Additionally, asking students to explain their thinking orally or in writing is a great way to determine their level of understanding. A capable digital resource, designed to monitor your students in real time, can also be an invaluable tool, providing actionable data to inform your instruction along the way if you have access. Remember, it’s not about generating grades. It’s about learning what needs to be taught. Try it: Free Printable Exit Ticket Templates Sometimes we get stuck in a mindset of “a lesson a day” in order to get through the content. However, we should keep our pacing flexible, or kids can fall behind. Walk through your classroom as students work on problems and observe the dynamics. Talk with them individually and ask questions to gauge understanding. In response, make decisions to go faster or slower or put students in flexible groups as needed. Flexible groups could be together for the lesson, the week, the concept, or however long it makes sense. It can help you individualize instruction more easily. Generally, students will become excited about a subject if their teacher is excited about it. However, it’s hard to be excited about teaching math if your understanding hasn’t changed since you learned it in elementary school. When you have confidence in your own mathematical expertise, then you can teach math confidently and joyfully. How to do this? Consider attending a conference on math teaching. Don’t be intimidated. It’s not all math geniuses trading formulas. It’s teachers sharing best practices. Most every state has a branch of NCTM (National Council of Teachers of Mathematics) that provides programs from preschool through high school. It’s very motivating. Or read a book on math-teaching ideas by folks like John Van de Walle, Marilyn Burns, Susan O’Connell, or other leading math educators. Get together with a couple of colleagues and start a book group. These books are full of ideas, lessons, and motivation. We need it just like the kids do. Try it: Best Education Conferences in 2024-2025 When the Common Core State Standards were first released, most people focused on the content standards. At the beginning of the document, however, there were eight math-practice standards. These are qualities and attitudes of young mathematicians that are desirable to develop in all kids. They are: While the document is written for adults, here’s the kid-language version. It makes a great poster and discussion starter: I can solve problems without giving up. I can think about numbers in many ways. I can explain my thinking and try to understand others. I can show my work in many ways. I can use math tools and explain why I chose them. I can work carefully and check my work. I can use what I know to solve problems. I can solve problems by looking for rules and patterns. For good lesson ideas and teaching tips for each standard, check out Putting the Practices Into Action by Susan O’Connell and John SanGiovanni (Heinemann, 2013). We Are Teachers Communicating about math helps students process new learning and build on their thinking. Engage students during conversations and have them describe why they solved a problem in a certain way. “My goal is to get information about what students are thinking and use that to guide my instruction, as opposed to just telling them information and asking them to parrot things back,” says Delise Andrews, who taught math (K–8) and is now a grade 3–5 math coordinator in the Lincoln Public Schools in Nebraska. Instead of seeking a specific answer, Andrews wants to have deeper discussions to figure out what a student knows and understands. “True learning happens a lot around talking and doing math—not just drilling,” she says. Of course, this math strategy not only requires students to feel comfortable expressing their mathematical thinking, but also assumes that they have been trained to listen respectfully to the reasoning of their classmates. Learn more: Free Let’s Talk Math Poster Sometimes as teachers we get so caught up in meeting the demands of the curriculum and the pressure to “get it all done” that we don’t give students the time to reflect on their learning. Students can be asked to reflect in writing at the end of an assignment or lesson, via class or small-group discussion, or in interviews with the teacher. It’s important to give them the time to think about and articulate the meaning of what they’ve learned, what they still don’t understand, and what they want to learn more about. This provides useful information for the teacher and helps the student monitor their own progress and think strategically about how they approach mathematics. To keep it simple and build a routine, you can give students an index card at the end of a lesson and ask them to write a thought about each of those three things: What I learned. What I still don’t understand. What I want to learn more about. Not only will this give you invaluable feedback, but it gives students the clear message that you care about what’s happening with them and their learning. Don’t spoon-feed kids answers and strategies. Pose the question and allow time and attitude for some “bumping around.” That’s what real life is like. We don’t always know how to solve a problem, like buying enough fertilizer for the lawn, but we can figure it out. We might make some mistakes, but we can get there. Generally, provide as little information as possible but enough so students can be productive. Effective math teaching supports students as they grapple with mathematical ideas and relationships. Allow them to discover what works and experience setbacks along the way as they adopt a growth mindset about mathematics. This also involves wait time. How much time do you allow kids before you expect an answer? We feel time-pressured in our teaching, so we tend to want to “move it along.” Resist this. If no on answers, just wait. Someone will eventually venture a guess. You can work from there, but give them time to think and process. We Are Teachers; Alchemancer via Amazon; Oryx Learning Developmentally, the first stage for almost any math learning should be physical. Then pictorial, then symbolic. From counting to algebraic equations, the physical comes first. To do that, you need “stuff” to get physical with. You can use almost anything to model concepts like counting, operations, measurement, data, money. Dried beans work. Cubes work. Tiles work. Buttons work. Almost any set of small objects works. There are also place value models, geometric shapes, number tiles, and so on. Bring out the math tools too! Calculators, scales, rulers, measuring tapes, balances, measuring cups, all of it. Experiencing math ideas in a hands-on way always leads to deeper understanding. Try it: Best Math Manipulatives for the Classroom Whatever you get involved in with math and kids, give them time to explore first. This is particularly true for math tools and materials. If you’re introducing calculators or scales or rulers or number cards, first make an agreement with the class. Something along the lines of, “You have 10 minutes to play with this, explore it, learn what you can about it, and then we’ll share back what you notice. After that, I’ll be giving you some directions on what I’d like to do with it today.” They’re going to play with it anyway, so you might as well use that inclination to your advantage, and it will also open up their thinking at the beginning and value it. As you plan your lessons, try to allow time for individual work, partner work, and small-group work. Kids need time in all three contexts. Everyone needs that individual time to work things out for themselves, work at their own pace, and to be properly assessed. Partner groups give students a chance to support one another and learn how to cooperate with others on a small scale in an easily managed environment. Small groups allow for diverse thinking, learning from others, and developing mutual cooperation and listening skills. Kids get excited about math when they get to solve real-life problems. For instance, when teaching 4th graders how to determine area, do this Haunted Mansion project. Kids get a letter from the fictitious owners of the Haunted Mansion Fun House. The owners want a plan for designing their new fun house. It has to include a certain perimeter, area, and volume. Kids can’t wait to learn how to do it and are incredibly proud when they use math to make a model of the fun house. Amazon reviews When you play a game, the number of repetitions of certain tasks is surprisingly large. Just consider how many times you roll two dice together and add them in a board game like Monopoly. That’s practice, practice, practice, but it doesn’t feel like it. No one complains or even realizes how many times it’s happening. You can find a game or make one for every math concept you will teach. And kids will thank you for it! Games are an excellent way to make the learning more fun while simultaneously promoting strategic mathematical thinking, computational fluency, and understanding of operations. Games are especially good for kinesthetic learners and foster a home-school connection when they’re sent home for extra practice. Try it: First Grade Math Games Students generally feel confident and competent in the classroom when they know what to do and why they’re doing it. Establishing routines in your math class and training kids to use them can make math class efficient, effective, and fun! For example, consider starting your class with a number sense routine and finishing with reflection on the day’s learning. Rich, productive small-group math discussions don’t happen by themselves, so make sure your students know the “rules of the road” for contributing their ideas and respectfully critiquing the ideas of others. We Are Teachers Students—especially those who haven’t experienced success—can have negative attitudes about math. While good instruction and success are the best intrinsic motivators, consider rewarding achievements with certificates, stickers, badges, or rewards as they progress. Remember: They are kids and kids like this stuff. Make the rewards all math-oriented though. If you give out stickers, you’ll find even stickers that just have numbers on them are motivating. Collect them all, 1 to 100! Or have a Mathematician Certificate of Achievement with Einstein’s picture on it. This helps build a culture that says math is fun, math is cool, and learning math is valued. Try it: Classroom Rewards and Incentives That Really Work Think about ways to assign meaningful homework. Ask deeper, more open-ended questions, not just practice pages. Yes, practice is important, and you should help kids understand that. There is a need for practice pages, but also have kids engage with people in their homes at least once a week on an interesting question. Ask questions like: What do you think the best way to multiply two numbers is? What is the best way to multiply three numbers? How would you measure the wall if you had to paint it? How do you know if something you buy is a good price? Make parents aware at the beginning of the year that you are going to be asking one of these questions every week, and make clear that there is no one right answer you are looking for. Explain this process is just so your students will understand that people in their home use math, that it’s valuable, that it’s done in different ways, and that you care about it. Those are huge pluses for making math relevant for kids. Help kids understand and value math by building their awareness of the math all around them. With every math concept you teach, a routine math assignment should be to have students go home and find out where this concept (measurement, money, multiplication, fractions, etc.) is in their home or neighborhood. For example, learning about patterns? Any in your house? On your clothes? Learning about addition? Does anyone in your house add anything? Ask your parents. Learning geometry? Any shapes in your house? In your neighborhood? Have students report back with written notes about what they found out. Pretty soon, no matter what you teach, they’ll automatically be on the lookout for it and they’ll see how math is very relevant. We Are Teachers; Stephanie Sanders Although we don’t often think of reading as a math strategy, there’s almost nothing better to get students ready to learn a new concept than a great read-aloud. It’s fun, it’s engaging, and it can teach us a lot. Kids love to be read to, and the more we show students how math is connected to the world around us, the more invested they become. It also connects imagination to math and makes for a more creative context. Reading books with math connections helps children see how abstract concepts connect to their lives. Try it: Amazing Math Picture Books for Young Mathematicians A number of students learn math by rote. They’ve attended special programs or learned online or from family members. They have memorized procedures, but have no real understanding of why they are doing what they are doing. This is OK for a while, but eventually if something in the procedure changes or problems become more complex, or the idea must be applied, it all breaks down. One way to help with this is when a student tells you something like, “I know 9 x 9 = 81.” Reply, “Ah, so you say. But can you prove it?” If they don’t know what to do next, take some time with your class to model ways to provide proof. For example, you could draw a picture of 9 groups of 9 dots in each. Or you could use tally marks. Or you might say, “I know 10 x 9 = 90 and 9 less is 81,” and show a multiplication chart. You could use buttons to build arrays. There are a ton of ways for students to show what they know, and yes, it is slower, but unless someone can prove that what they say is true, it makes real conceptual understanding suspect. Almost all kids love art, and visual learners need a math strategy that works for them too, so consider integrating art and math instruction for one of the easiest strategies in teaching mathematics. Many concepts in geometry, such as shapes, symmetry, and transformations (slides, flips, and turns), can be applied in a fun art project. Also consider using art projects to teach concepts like patterns, measurement, ratios, arrays, and really anything. Try it: Geometric Art Project The majority of math we do on a daily basis involves estimation. It’s an important but often neglected skill. Many kids grow up thinking that in math they must have the exact answer or they can’t move forward with whatever they are doing. When you shop for food, you estimate how much you need of a certain item. You don’t know exactly how many slices of bread your family will eat this week or how much milk they will drink down to the ounce, but you have some idea based on your experience, so you estimate, and you buy about how much you think you will need. That’s what an estimate is. A guess based on experience and what you can see. Before you do any math with kids, ask them for an estimate before they give you an answer or begin calculations. It will build understanding and number sense, two qualities that will help them throughout their lives. Try it: Estimation Activities That Take the Guesswork Out of Teaching Math Consider starting some projects in school with your kids where they use math to make things happen. For example, you could start a class store. Think of all the math involved: counting, adding, subtracting, multiplication, money, data collection … the list goes on. Or how about making a classroom lunch once a week for all to share. Kids will not only see how real, useful, and relevant these skills are, but they will also feel like “Wow. I really did that. I made it happen. No me, no math = no lunch.” It’s that sense of real accomplishment and empowerment we want for all our young mathematicians. A school garden is another great real-life way to apply math concepts in a fun way while instilling a sense of purpose. Measurement, geometry, and data analysis are obvious topics that can be addressed through garden activities, but also consider using the garden to teach operations, fractions, and decimals. Additionally, garden activities can help promote character education goals like cooperation, respect for the earth, and, if the crops are donated to organizations that serve those in need, the value of giving to others. Try it: How To Start a School Store Teaching is a hard job. It’s even harder if you go it completely alone. Collaborate with other teachers to improve your math instruction skills. Consider meeting with a teacher partner to share and discuss a unit you are both starting. Begin by discussing the goals and what it will look like for kids to achieve them. Work backward from there. Share strategies that have worked and maybe research a little together. Try things out and then share with each other what worked and what didn’t work. We Are Teachers Kids are built to get up and move. Use that desire to make your math lessons even more fun and motivating. Asking kids to get out of their seats can increase their energy and interest. For example, you could ask students to: Make angles with their arms Create a snap/clap sequence that demonstrates different types of patterns Complete a shape scavenger hunt in the classroom Run or complete other exercises periodically, count them, time them, and graph the results Jump on a given number from the ones you chalk on the playground The possibilities of these strategies in teaching mathematics are limited only by your imagination and the math concepts you need to cover. Try it: Active Math Games and Activities for Kids Who Love To Move We need to be open-minded when it comes to math strategies. There are many viable strategies to solving any problem, including many math problems. Promote open-ended discussions about how different concepts in math can be done. For example, when adding two two-digit numbers together, you could stack one above the other, do column addition, regroup if you need to, and check the answer by reversing the operation. Is there another way? Could you add the tens first and then the ones and then put them together? Is it easier for you to do it vertically or horizontally? Do pictures or drawings help you? When you come to a concept, brainstorm with your class about different ways to solve problems in this area. This sharing of ideas promotes flexible thinking and also validates different approaches that are appropriate to different learning styles and levels. A good way to start any lesson is with a question. A question that gets people thinking. Instead of saying, “Today we are going to learn about multiplication,” what if instead you put a pile of books out on the floor and asked, “What’s the best way to find out how many books there are here?” You might get questions back like, “Can we move them?” That’s a good sign. It shows you’ve already engaged students’ thinking. Questions do that—they provoke thinking. In this example, some kids will estimate, some will want to count by ones, some will want to skip-count, some will want to group them and do repeated addition, while others will group them and multiply. You can then ask, “What does efficient mean?” Field answers and work toward the idea that efficient means quick and accurate. That’s what multiplication is—it’s a quick and accurate way of finding out how many. Another good opening question is, “What do you know about ________ ?” Fill in the math topic you are about to start. Have the class brainstorm on this, and write everything they say down on a chart. This will help you assess previous knowledge, give kids a chance to share, expose them to new ideas, validate their thinking, and open the door to exploration. Think about whatever you’re teaching and consider: What is the main idea here, and what’s a question that gets at it? Lead with that and the rest will follow. We all want our kids to succeed in math. In most districts, standardized tests measure students’ understanding, yet nobody wants to teach to the test. Over-reliance on test prep materials and “drill and kill” worksheets steal instructional time while also harming learning and motivation. But sound instruction and good test scores aren’t mutually exclusive. Being intentional and using creative approaches to your instruction can get students excited about math. These essential strategies in teaching mathematics can make this your class’s best math year ever! Try it: Ways To Pose Better Math Questions in Class 1. “Some people talk in their sleep Lecturers talk while other people sleep” - Albert Camus. V. Suresh Kumar Assistant Professor Of Mathematics Rajalakshmi College Of Education Thoothukudi 2. What is method ? The word “Method” has been derived from Latin which word means, “Mode” or “Way”. What is Method of Teaching? “The process of interpreting the world of knowledge to pupils mind is called the method of teaching” 3. World of Method of World of the Knowledge Teaching Student’s Knowledge 4. Method of Teaching should be Simple Complex. Known Unknown. Definite Indefinite. Concrete Abstract. Direct Indirect. Empirical Rational 5. Principal of learning by doing. Principal of individual differences. Principal of motivation. Principal of correlation. Principal of linking with previous knowledge. Principle of distribution. Principle of repetition. Principle of certain objectives. Principle of evaluation. 7. The child occupies a central position. Teaching – learning process is geared to the needs, interests, capabilities & requirements of the child. based on psychological principles. To develop abilities, skills & discovery attitude amongst the students. Teacher is passive. Includes, project, laboratory, problem – solving, heuristic, discussion method etc 8. Teacher occupies the central position. Focus on telling, memorization & recalling information. The children are passive. Include lecture, historical & lecture cum – demonstration method 10. The world analytic is derived from the world “analysis” which means “breaking up” or “separate things that are together” Analysis starts with “what we have to find out & traces the connection between it & data”. Proceed from “unknown to known”. From conclusion to hypothesis. In this method we start from “what is to be determined” or “what is to be proved”. It is also called “method of discovery” 11. To prove any theorem. When construction work is to be done in the geometry. To find the solution for arithmetic problem. 12. Example : If $a/b = c/d$, then P.T $ac + 4b^2 / bc = c^2 + 4bd/dc$. Solution To prove this using analytic method, begin from the unknown The unknown is $ac + 4b^2/bc = c^2+4bd/dc$. => $ac + 4b^2/b = c^2+4bd/d$. => $d(ac + 4b^2) = b(c^2+4bd)$. => $dac + 4db^2 = bc^2+4b^2d$. => $dac = bc^2$. => $da = bc$. => $a/b = c/d$. This type of the solution of the problem can be easily obtained by analysis. 13. Based on psychological principles. Explanatory procedure. Creates creativity & originality in the child. Develops analytic & reasoning power. Develops scientific attitude. Analysis is the process of thinking. Develops self – confidence & logical abilities in the child. Knowledge gained by this method is more solid & durable. The child is always curious for attaining new knowledge. Formative method & based on inductive reasoning. 14. This is a lengthy method. It is not possible to acquire speed & efficiency. Every teacher cannot use this method successfully. Whole syllabus cannot completed in certain period. Analytic method is possible only when we have knowledge of known facts & unknown conclusion 15. Reverse of the analytic method. Synthesis means “ to join separate parts”. We proceed “from known to unknown” or “start with hypothesis & end with conclusion”. Method of formulation, recording & presenting concisely the discovered solution omitting the trial & errors. Synthesis leads to rote memory & doing by mere. Synthesis without analysis is dogmatic, but synthesis is offer analysis has a place in the class - room 17. Example : If $a/b = c/d$, then P.T $ac + 4b^2 / bc = c^2 + 4bd/dc$. Solution We known that $a/b = c/d$. In this method we start from known & proceed to unknown. Adding $4b/c$ on both sides. $a/b + 4b/c = c/d + 4b/c$. => $ac + 4b^2 / bc = c^2 + 4bd/dc$. Which was to be proved. 18. No logic or reason is gives here for why $4b/c$ is added on both sides. Analysis is the process of discovering the solution & synthesis is the method of setting out the solution in a concise from so as to convince yourself & others. 19. It is a short & quick method. It glorifies the memory of the child. It formulates, records & presents concisely the discovered facts. It omits the trials & errors like in analysis. The solution in a concise form. It is informative method. It takes less time. 20. No scope of discovery. It leads to rote memory. It create many doubts in the mind of the child. It does not give full satisfaction to the child. No opportunity for developing thinking, reasoning & other mental abilities. 21. S.N Analytic Synthetic 1. Unknown to known Known to unknown conclusion to hypothesis Hypothesis to conclusion 2. Based on inductive Based on deductive reasoning reasoning. 3. Based upon heuristic Not based on heuristic approach approach. 4. It is laborious & very It is short & quick lengthily method method. 5. Development of No development of self-confidence & self-confidence & Self reliance. Self reliance. 22. S.N Analytic Synthetic 6. Development of Not developments of intellectual abilities intellectual abilities. 7. Psychological in nature Unpsychological in nature. 8. Approach is scientific Approach is unscientific in nature. in nature. 9. It is a formative method It is an informative method. 10. Develops originality & More stress on memory creativity with reasoning of the child without reasoning. 11. Leads to discovery of Not leads to discovery of something new something new. 12. Proof can be easily Once forgotten proof cannot recollected if forgotten be recollected. 23. To make mathematics more interesting & meaningful. Laboratory method is used in teaching of mathematics. Students get the opportunity to acquaint themselves with the facts through direct experiences individually. 24. Pupils carryout the experiment themselves in the laboratory & gain knowledge through direct experiences. Teacher observes the students working from time to time & guide them by giving instructions whenever needed. Develops creative & heuristic attitude amongst them. This method is more useful & scientific. The success & effectiveness of experiments in laboratory depend upon the ability, capacity & intelligence of both teacher & student. 25. “Sum of three angles of a triangle is 180” Solution: how we can prove the problem by laboratory. Objective : To prove that Sum of three angles of a triangle is equal to two right angles or 180. Apparatus: cardboard, sheet, pencil, scale, triangle & other necessary equipments. 26. Procedure: In the laboratory pupils will be given one cardboard sheet each & then they are told how to draw (make) triangles of different size on it. After drawing the triangles they cut this separately with the help of scissors. Observation: Students will measure the angles of the triangles drawn & write these in a tabular form. 27. Fig No Measure of Different Angles Total A B C A + B + C 1. 90 60 30 180 2. 120 30 30 180 3. 60 60 60 180 28. After measuring the angles of different triangles in the form of cardboard sheet. We calculate their sum. A C C 30 60 30 B 90 60 C A 120 30 B 60 60 Fig – 1 Fig – 2 Fig – 3 29. 1. In fig – 1 A = 90 , B = 60, C = 30 A + B + C = 90 + 60 + 30 = 180. 2. In fig – 2 A = 120, B = 30, C = 30 A + B+ C = 120 + 30 + 30 = 180. 3. In fig – 3 A = 60, B = 60, C = 60 A + B+ C = 60 + 60 + 60 = 180. In this way the students generalize the result & understand that the measure of two angles is given, the third angle can be measured. 30. Based on psychological principle “learning by doing”. Acquired knowledge is more solid& durable. Mathematics as a practical subject. Developing the habit of discovery & self – study. Develops scientific attitude. Develop positive attitude towards mathematics. Developing problem – solving. Developing self – confidence. Learn the use of different equipments. 32. Financial constraints – for many school. Used for a small class only. Takes more time to teach. Requires laboratory equipped with different apparatus. Not fit for lower classes. Particular topic can be taught by using laboratory method. Slow method. 33. Experiments related to weight & measurement. Experiments related to speed, time & distance, etc. To prepare a table of square roots & cube roots of numbers. To calculate area, volume & surface area of different geometrical figures or shapes. To represent different mathematical number in figure. 34. The word heuristic is believed to be originated from Greek word “Heurisco” which means “I find out”. The profounder was Prof. Hennery Edward Armstrong. Students work like a researcher & solve the problems. Developed the scientific & Mathematical attitude. 35. The population of a city is 50,000 per year then find out the population of the city after 2 years. Solution: Teacher will tell the students to repeat this question many times and will tell them to find the solution with the help of suitable research, questions and he will encourage them for finding correct solution. The question asked by the teacher & expected answers given by the students are listed in the following table. 36. Question asked by Expected answer given Teacher by Students. 1. What has to be calculated Population of city after in the given question 2 year. 2. How can we find out this? First we find population after one year. 3. What is percentage increase 4% increase per year. in population every year. 4. How can we find population Students can find at the end of first year that increase in population at the end of first year = 50000 4/100. = 2000 37. 5. In this way what Students can tell after will be the total solving that population at population at the end of first year end of first year 50000 + 2000 = 52000. 6. Population increase Students tell that population for second year can increase for second year be calculated on can be calculated on which figure? 52000. 7. How can we calculate Students can solve by their this increase. efforts. Population increase at the end of second year 52000 4/100 = 2080 38. 8. Now how to calculate students will be able to the population at the understand that end of second year? population of the two years will be 52000 + 2080 = 54080. The books should be written on heuristic lines. 39. Psychological method. Develops self – confidence , self – reliance & scientific attitude. Develops ability of observation & spirit of enquiry to solve the problems. Contemplation & awakening increase in the children. The knowledge obtained by this method is more stable. Based on the principle of activity. Develop the mental & thinking powers. 40. It is not suitable for lower classes. It is a very slow method. It is very expensive method. It is very lengthy method. Lack of textbooks written on heuristic approach. Formational method rather than informational. 41. Advocated by Kilpatrick, an American educationist. Based on pragmatic philosophy. It involves a variety of activities. Students work co – operatively. This method consist chiefly of building a comprehensive unit around an activity which may be carried on in the school or outside. 44. Based on various psychological laws & principles. The children remain active throughout the execution of the project. Based on principle of activity, reality, effect & learning by doing etc. Develops co-operative feeling & group – interaction. The gained knowledge becomes solid & durable. It is democratic & scientific in nature. Develops discovery attitude. 45. It takes more time. It is very difficult to complete the whole syllabus by project – method. It is not economical. Textbooks & written learning material are not available. There is no provision for drill & practice for skills required in mathematics. 47. Teacher should provide democratic atmosphere in the classroom. Teacher should be active & careful all the time to observe the progress of the project. Teacher should work as a friend, guide & working partner. Teacher should have thorough knowledge & experience. 48. Execution of school bank. Study of school budget. Running of book – bank. Execution of hostel mess. Collection & study of the currency of different countries etc. 49. The child is curious by nature. Teacher teach the pupils how to think these techniques to a vast number of varied problematic situation. Life is full of problem, successful man equipped with adequate knowledge & reasoning power to tackle these

problem. It may be a purely mental difficulty or it may be physical & involve the manipulation of data. 50. “Problem solving is a set of events in which human being was rules to achieve some goals”. - Gagne. “Problem solving involves concept formation & discovery learning” - Ausubel. 51. Meaningful, interesting & practical. It should be well defined. It should have some educational value. Problem related with the daily life of the child. It should be challengeable. Related with previous knowledge. Develop mathematical skill. Develop scientific attitude amongst the children 52. Selection & formation of problem. Presentation of the problem. Formulation of hypothesis. Collection of relevant data & information. Analysis & organization of data. Drawing conclusions. Testing of conclusions. 53. Define union of two sets. If A ={2,3,5}, B ={ 3,5,6}, C = {4,6,8,9} P.T AU(BUC) = (AUB)C. Solution: Step :1 After selecting & understanding the problem the child will be to defined the Problem. The union of two sets A & B is the set which contains all the members of set A & all the members of set B. AUB ={X: X € A or X € B}. The common elements are taken only once in the union of two sets. 54. Step : 2 Analyze the given problem that how the problem can be solved? Step : 3 Able to make hypothesis. 1. BUC. 2. AU (BUC). Similarly (AUB)UC. 55. Step :4 On the basis of given data, the child able to solve the problem. A = { 2,3,5} B = { 3,5,6} & C = {4,6,8,9} BUC = {3,5,6} U{4,6,8,9}. = {3,4,5,6,8,9} AU(BUC) = {2,3,5} U{3,4,5,6,8,9}. = {2,3,4,5,6,8,9}. Similarly A U B = {2,3,5} U {3, 5, 6}. (A U B) U C = {2,3,5,6} U { 4,6,8,9}. = {2,3,4,5,6,8,9}. 56. Step : 5 Analyze the result on the basis of given data & verify the hypothesis whether (A U B) U C is equal to A U(B U C) or not. Step : 6 After verifying the hypothesis, the child will be able to conclude that (A U B) U C = A U (B U C). Thus the child generalizes the results & apply his knowledge in new situation. 57. This method is psychological & scientific in nature. Helps in developing good study habits & reasoning powers. Helps to improve & apply knowledge &experiences. Stimulates thinking of the child. Learns how to act in new situation. Helps in maintaining discipline in the class. Teachers becomes familiar with his pupils 58. Not suitable for lower classes. Lack of suitable books & references. It is not economical. Wastage of time & energy. Teacher find it difficult to cover the prescribed syllabus. Talented teachers are required. 59. Based on induction. Induction means “proving a universal truth or theorem by showing that if it is true in any particular case”. The rules & formula are established after extensive study of experiences , experiments & examples. Particular to general. 61. Problem: Establishing a formula for solving simple interest problem First steps: The teacher will present many examples related to simple interest before the students & will solve them using unitary method with the help of which the formula for calculating simple interest can be established. 62. Find out S.I of Rs 700 at 8% per annum for 3 years. Solution: Unitary Method: S.I of Rs 100 for 1 year = Rs 8. S.I of Rs 1 for 1 year = Rs 8/100. S.I of Rs 700 for 1 year = Rs (8/100 700). S.I of Rs 700 for 3 year = Rs (8/100 700 3). = Rs (8 7 3). = Rs 168. Similarly ,A number of examples of this type can be presented in classroom. 63. Step : 2 Students will observe examples with the help of the teacher. Teacher: What is S.I for 3 year in Example. S.I = Rs (8/100 700 3). = Rs 168. Similarly by solving other more problem & by observing the process of finding out the interest, the students can arrive at a law or formula. 64. After through observation of examples, children will be able to establish the formula of S.I. Teacher make the following discussion. Q1 : What is 8 in the given examples?. Ans : 8 is the rate of interest. Q2 : What is 700 in the given examples? Ans : 700 is the principal. Q3 : what is 3 in the given examples? Ans : 3 is years or time. 65. S.I = rate/100 principle time. or S.I = rate principle time/100. S.I = PRT/100. Fourth step : Verify the derived formula by solving other problems based on S.I 67. It is a scientific method. Developed critical observation & logical power of children. It is a psychological method. Guide the child to do the work himself. Helps to establish many laws, relations, formulae & New principles of mathematics. Suitable for lower classes. 68. Very slow process. It needs sharp mind, proper planning & enough. Only an experienced & able teacher can use this method. Ability, capacity of problem solving cannot be developed. Results drawn by this method are not always true. 69. Opposite to inductive method. Deductive logic is used. Used in algebra, geometry & trigonometry. Impossible to verify each law & formula practically. Help is taken from assumptions, postulates & axioms of mathematics. Based on deduction. “Abstract to Concrete”. “General to Particular”. “From General rule to Example” 70. If length & breadth of a rectangle is 6m & 4m respectively, then find out the area of rectangle. Solution: Children can solve the problem by using the formula to find out the area of the rectangle. Area of rectangle = length breadth. = 6m 4m. = 24m2 71. Mathematics becomes very easy & comfortable. The speed of gaining knowledge increases. Used in the storage of time. No difficult for both teacher & students. More knowledge in less time. Laws, principles & formulas can easily be checked. Do the exercise quickly & easily. Short as well as practical. 72. Not in psychological principles. Students work like machine. Knowledge gained is unstable. Not scope of developing powers like logical, thinking & investigation. Not suitable for lower classes. Teaching – learning process become uninteresting & dull. 73. S.No Inductive Method Deductive Method 1. Particular to General General to particular. 2. A habit of discovery A habit of discovery is developed. is not developed. 3. Best method of Best method of teaching learning. 4. Suitable for lower Suitable for higher classes. classes. 5. Develop self – confidence Not Develop self – confidence & self – reliance. & self – reliance. 6. Discovery of new Use the knowledge gained knowledge by others. 74. 7. Scientific method. Not scientific method. 8. Develop scientific Not develop scientific attitude. attitude. 9. Emphasis on original Emphasis on problem - Solving. & creative work. 10. Teaching – learning Teaching – learning Process process become become dull. interested. 11. Slow method. Fast method. 12. Psychological method Unpsychological method. 13. Understanding Centered Memory – Centered