MATH SMARTS

Introduction

Math is so much a part of our everyday lives that it is hard to think of how we would function without a fundamental understanding of numbers and number systems. Showing students the importance of math in all aspects of their lives is an important step toward convincing them of the relevance of learning about the rules of math, how numbers work, and how numbers are used.

This teacher's guide helps young adults learn more about using math skills. Students will have varying familiarity with the topics covered in the book and the detailed explanations will help them understand more about the basic study of mathematics. This guide provides cross-curricular ideas to reinforce their learning and their review.

National Standards

This series supports Math, Language Arts, Social Studies, Music, and Science curriculum. Go to www.enslowclassroom.com and click on the Curriculum Correlations tab. Click on your state, grade level, and curriculum standard to display how any book in this series backs up your state's specific curriculum standard.

Classroom Activities

Activities for teaching five curriculum areas: Reading/Language Arts, Money and Finance, Measurement, Science, and Music can be found in this teacher's guide. Students will appreciate how math is so closely tied to everything they do and the activities are designed to show a wide ranges of examples to show how math is not just a subject to learn in school but a tool to master and use throughout their lives.

Guided Reading Level: O

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Teacher's Guide for
Problem Solving and Word Problems

Warm Up
Have the students look at the book's cover and read the title aloud. Discuss together what they may already know about the topic or topics mentioned in the title. Then have the students review the table of contents to see how the book is organized - show the students that the book builds on each chapter and skill. Turn to some pages to show the students how important words, concepts, and ideas are highlighted and boxed on pages. Tell the students that when they see boxed text on a page, they should reread it and think about what it says.

Assess Readiness
Consider preparing and administering a short pretest prior to discussing new concepts to assess prior knowledge and to maximize class time for all students.

Introducing New Concepts
Although new math concepts are often taught in a whole-group setting, some teachers may find it useful to create three or four small groups and work with each individually when concepts and strategies are introduced. As the teacher works with one group for ten or fifteen minutes, the other students may be reviewing previous lessons or concepts, working on math fluency, or reinforcing what they have already learned.

Practice New Concepts
Provide ample time for students to review and practice each new concept as it is presented, always keeping in mind the ability levels of all students. Remember that in most cases, it is not: _Can the student learn it?_ but: _How can the student learn it?_ It is important to know and use the tools and materials students will need to practice and master concepts.

Make an assortment of tools and materials available to engage all types of learners: manipulatives, computers, conferencing with peers and/or the teacher, writing on the board or on paper, and plenty of time and unlimited practice to reinforce each new concept before moving on. Tell the students that an important part of the learning process is actually doing it. They must do multiple problems to master each concept and become proficient.

Mastering Fundamental Skills
Remind the students that basic math skills should be practiced until they are automatic and they should work toward knowing addition, subtraction, multiplication, and division facts without conscious thought. Make them aware that these facts will be used constantly in all higher-level math skills.

Provide timed practice sessions for fundamental skills as appropriate and encourage pairs of students to quiz each other as time permits. Have flash cards, practice sheets, games, and manipulatives easily accessible for students to work on mastery of basic math facts.

Encourage Discussion
Strive to keep learning and class time comfortable and fun for all students. They should be encouraged to ask questions and talk about what they do not understand and may need extra help with.

The Five Curriculum Activities
Before any activity, make sure your students do not have any allergies to items you may use. Never use anything sharp that may cut a student. Do not use anything too hot or too cold which may injure a student. Always have an adult supervise all activities to ensure the safety of your students and provide an appropriate setting, such as a gym or an outdoor space, for physical activities. Make sure the students are supervised when using the Internet.

Reading/Language Arts Activity
Ask the students to think about the variety of ways to do math calculations: mental math, paper and pencil, and the calculator, and discuss why any other ways are even used when we have calculators available that always provide accurate results. Have them write an essay discussing the strengths and weaknesses of each calculation method.

Money and Finance Activity
Distribute note cards and have the students create word problems involving money: currency, income, consumer spending, or other aspects of money and finance, with the solution on the back. Collect and redistribute the cards, and ask students to read aloud the word problem they have, and have the class work to solve it together.

Measurement Activity
Discuss with the students how a leaky faucet can cost money and waste water. Tell them to imagine that there is a faucet in the school that leaks 3 fluid ounces of water each hour. Create a graph together to show how much water would be lost each day, week, month, and year if it was not fixed. Convert ounces to cups, pints, quarts, and gallons as needed.

Science Activity
Discuss with the students how word problems may or may not be relevant in science. Ask the students to brainstorm ways scientists use problem-solving math skills in their work.

Music Activity
Ask the students why a student would lease rather than buy a musical instrument from a music store. Then discuss how the imaginary Clark's Music Store charges $25/month for students to rent a flute or a clarinet. They charge $45/month for students to rent a cello, alto sax, or a tenor sax. Invite the students to research and find out the average price for a standard flute, clarinet, cello, alto sax, and tenor sax. Then have groups of students figure out whether it is wiser to lease each instrument for three years (36 months) or buy one. Compare students' findings.

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Problem Solving and Word Problem Smarts!

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Name: _____

Word Problem Data
Each of the four problems below is missing a crucial piece of data. On the line under each problem, tell what is missing. Then make up the missing data and solve the problem.

1. Mike's test score average in biology is 78. He gets a grade of 98 on his final test. What is his test score average now?
Missing information:_____

2. Bob's parents' car gets an average of 36 miles per gallon. They drove 2890 miles on their vacation. What was the total cost of the gas used by their car?
Missing information:_____

3. Allie's dog went to the vet and was told to lose 20% of its body weight so that it could be healthy. What should the dog weigh?
Missing information: _____

4. Stella has five coins in her hand. Three of them are quarters. What are the other two coins?
Missing information:_____

Think and Write About It: *Think about strategies you use to solve word problems. What do you do first after you read a word problem? Then what do you do? Write down the way you like to approach these kinds of problems.*

Assessment

1. What is the first step in the problem-solving process?
   A. Solve the problem
   B. Make a plan
   C. Look back and check
   D. Understand the problem

2. What should you look for when reading a problem for the first time?
   A. Key facts and details
   B. The answer to the problem
   C. Ways to summarize the problem
   D. Short-cuts to solve the problem

3. What is not a main reason a table could be created when solving a problem?
   A. To see what can be deleted from the problem
   B. To identify data needed to solve the problem
   C. To spot missing data
   D. To keep track of data

4. What is a legend, as used in problem solving?
   A. The pattern to the data
   B. A way to label data sets
   C. The answer to the problem
   D. An inverse operation

5. What is a variable?
   A. An algebraic expression
   B. The formula used to solve an equation
   C. A letter representing the unknown number
   D. A way to evaluate an expression

6. What is an example of an inverse operation?
   A. Addition and multiplication
   B. Subtraction and multiplication
   C. Subtraction and division
   D. Addition and subtraction

7. (T/F) Simplifying a ratio means to put it into its lowest terms.

8. (T/F) There is usually only one strategy that will work to solve a word problem.

9. (T/F) Estimating what an answer might be will end up confusing you about the actual answer.

10. What is most often found when arranging information in a table?
    A. Mistakes in the problem
    B. A pattern to the data
    C. The answer to the problem
    D. Confusing parts of the problem

Problem Solving and Word Problem Smarts!

Answers: (1-3=supporting facts; 4-7=vocabulary; 8-10=inference)

1	D
2	A
3	A
4	B
5	C
6	D
7	T
8	F
9	F
10	B

_____
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