

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 range 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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Algebra I and Algebra II Smarts!

Teacher's Guide for Algebra I and Algebra II Smarts!

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 order of operations and explain in essay form to someone who is not familiar with the importance of this order why it is crucial to use it. Have the students provide scenarios demonstrating what can happen if a random order is used in solving these types of equations.

Money and Finance Activity

Ask the students to research the U. S. Postal Service's Forever stamp and tell why it may be a wise purchase. Discuss how and when the price of the stamp may fluctuate. Ask the students to think about whether it is smarter to buy a supply of these stamps and not use them right away or whether it makes more sense to purchase and use them as regular stamps. Have students create an equation to show what 100 regular stamps would cost at today's prices. Then have them research when the Forever stamp first came out and their value at that time. Discuss whether it would have been wise to stockpile those stamps and how much money could have been saved per 100 stamps.

Measurement Activity

Ask the students to discuss why it is difficult to define 0^0 . Ask a sample of students what 0^0 is equal to and why. Guide the students to recall that any number to the zero power = 1, so it may be logical to think that $0^0 = 1$. Zero to any power = zero, so $0^0 = 0$ or 1. Invite the students to discuss whether there are any other numbers that may be undefined in this way.

Science Activity

As the students may know, mercury is an element that occurs in the environment and a once-common use was for dental fillings. Invite the students to find out why this practice was eventually stopped and why many people have had mercury fillings replaced with safer compounds. Have the students find out the *half-life* of mercury, and discuss with them what this term means. Then have the students determine how long it would take for mercury to leave a person's body when a filling is removed (the half-life ranges from 35 to 90 days).

Music Activity

Discuss with the students how sound volume is measured in decibels (dB). A sound that can hardly be heard is measured at a decibel of 0, whereas someone standing close to a train would experience sounds in the decibel range of about 110, considered to be dangerous to the ears. Have the students create a chart showing the acceptable highest (*h*) range of sound volume for human ears (about 50-60 dB), the decibels of common sounds to include music concerts, and each of the sounds' relationships to acceptable range (+ or - *h*). As time permits, discuss why it is important to stay away from sounds with a high decibel rating.

Handout

Name: _____

Calculate and Find

You will need a partner for this, but not until you complete the first three steps.

- 1) Fill in the grid below with consecutive numbers beginning with any number you want and going across in order until the grid is full (don't use numbers larger than 3-digits).

- 2) Cross out any four of the numbers on the grid, making sure they are four consecutive numbers and that you have not skipped any.
- 3) Add the four numbers together and tell your partner the sum.

Your partner should have done the same three steps. Now, use your algebra skills to find out each other's four crossed-out numbers.

Compare your results when both of you have figured out the numbers.

To solve: the first unknown number is x , the second is $x + 1$, the third is $x + 2$, and the fourth number is $x + 3$. Students create an equation adding the four together and having them equal the total given by their partner, then solve for x .

Think and Write About It: What are some ways you may use algebra skills in your everyday life? How might algebra skills be sometimes unknowingly used, for example, when buying six-packs or cartons of soda, packages of utensils for a class party, or when calculating distance?

Assessment

1. What is another name for the horizontal axis on a coordinate plane?
 - A. x-axis
 - B. y-axis
 - C. Origin
 - D. Point
2. What point is written first when referring to a pair of coordinates?
 - A. The higher number
 - B. The lower number
 - C. x
 - D. y
3. Which direction does a positive x-value move on the coordinate plane?
 - A. Up
 - B. Down
 - C. Right
 - D. Left
4. What is another name for a flat surface that continues in all directions?
 - A. A plane
 - B. A grid
 - C. A graph
 - D. A line
5. What are coordinates?
 - A. Opposite points on a number line
 - B. Points on the x-axis
 - C. Points on the y-axis
 - D. Ordered pairs of numbers
6. What does an exponent tell?
 - A. The order of operations
 - B. The product of two factors
 - C. The number that is being multiplied
 - D. The number of times the base is multiplied
7. What are binomials?
 - A. Pairs of numbers
 - B. Two-digit numbers
 - C. Polynomials made of two terms
 - D. Multiplied factors

8. Lines AB and CD are parallel. What is a true statement about the lines?
- A. They will eventually meet at points B and D.
 - B. They will eventually meet and points A and C.
 - C. They will never meet.
 - D. They will eventually form a right angle.
9. What is the first step in solving the inequality $-3y - 4 \geq 3$?
- A. Divide both sides of the equation by 3
 - B. Divide both sides of the equation by -3
 - C. Add 4 to both sides of the equation
 - D. Subtract 4 from both sides of the equation
10. (T/F) Using the FOIL method of multiplying binomials works well, but the same answer will result if the opposite (LIOF) method is used.

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

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