

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: P

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Data, Graphing, and Statistics Smarts!

Teacher's Guide for Data, Graphing, and Statistics 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 what a census is and discuss how, why, and when it is taken in the United States. Invite the students to research reasons our government needs to count how many people live here. Discuss other important measures (e.g., consumer price index, unemployment figures, rate of inflation). Then have the students choose one of these important pieces of data and write an essay telling how often it is reported, who is most interested in knowing the information, and what it means to the typical person.

Money and Finance Activity

Have the students brainstorm five popular American cars and write these on the board. Ask students to research each model's expected miles per gallon of gas. Create a bar graph to record this information. Have the students find the average price per gallon of gas in your area and calculate how much it would cost to drive 75 miles per week for each car.

Measurement Activity

Review with the students how a histogram is used to show the distribution of data. Create a histogram with the students showing the distribution of students' birthday months. Ask the students to brainstorm additional survey ideas to be used to create histograms and challenge them to make one of their own.

Science Activity

Discuss with the students the concept that our weight on Earth is not the same as our weight on other planets. Ask why that may be and discuss together how the further away we are from the center of a planet, the lower our weight will be as compared with our weight on Earth. Ask the students to name the planets in order of their size and create a three-column chart on the board with the names of the planets in the first column. Encourage the students to estimate the weight of a 100-pound person on each planet and note this in the second column. In the third column, ask the students to use a planet weight calculator (there are many of these online) to find out what a person weighing 100 pounds on Earth would weigh on each planet. Ask the students to use the data to create a line graph to show the difference in weights on each of the planets. Challenge the students to find out why weight is different depending on the size of the planet.

Music Activity

Discuss with the students the increase in consumers who download music from Internet sites rather than buying a CD. Have them provide ideas to explain why this is so, then ask them to research the number of CDs sold in 2000 versus 2010, and the number of music downloads at those times. Create a chart to show the figures. Ask the students to predict what the figures may trend toward in 2020, and why.

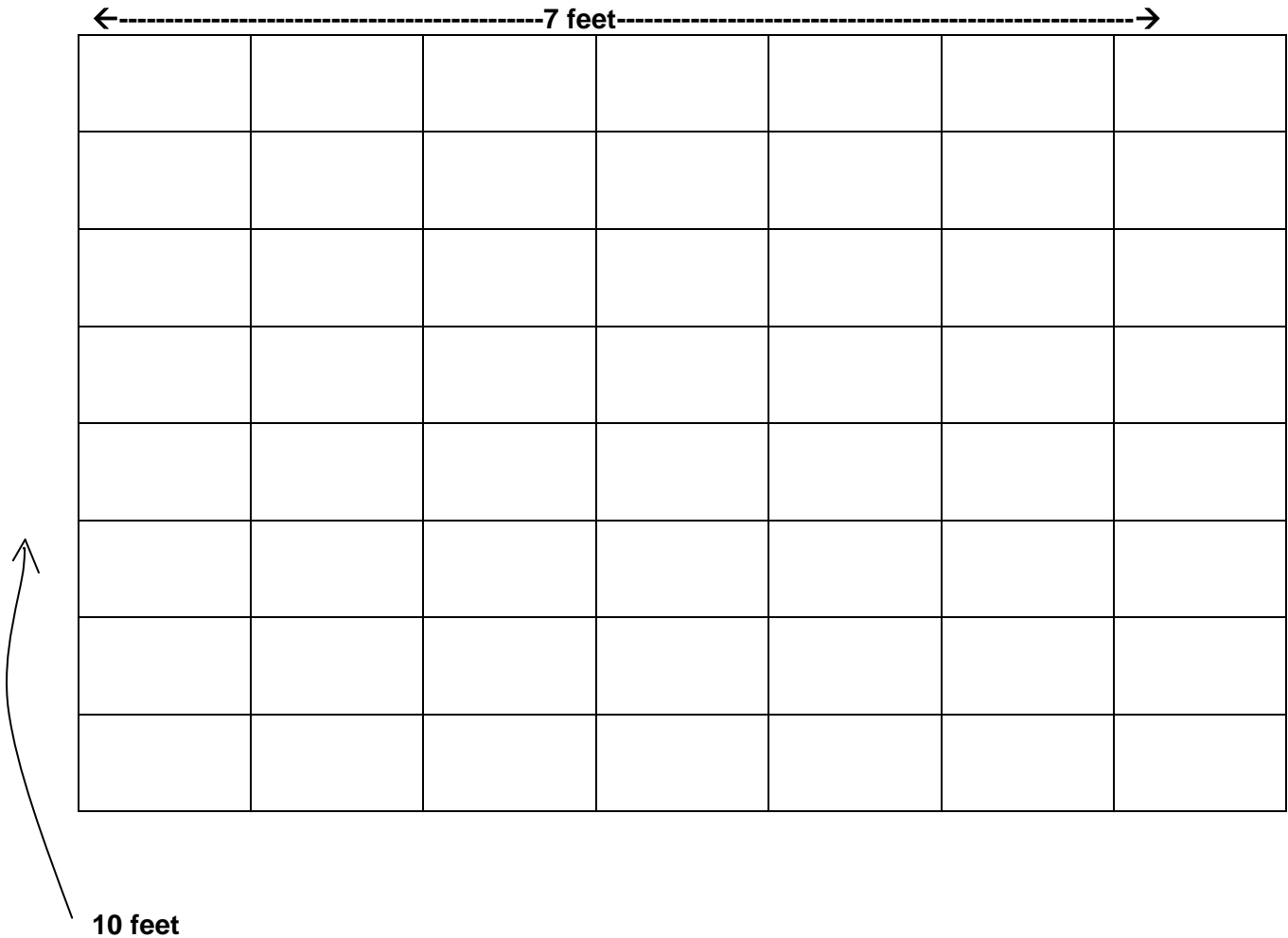
Handout

Name: _____

Using Space Wisely

Imagine that you have a room in your house that you are able to make into your own office/computer room. The room has dimensions of 10 feet by 7 feet and is shown below. Draw a plan for your room to include a desk, a small table for your printer, an office chair and a separate chair, and a book case.

First find measurements for each of these pieces of furniture, then draw them onto the plan. If you have space left over and you want other important equipment in your office, add those too.



Think and Write About It: Does a room of this dimension offer enough space for the type of room you may want to plan? What are the most vital pieces of equipment or furniture that you have included in your room? What makes each of them so important?

Assessment

1. Data was entered onto a histogram. If the graph was folded down the center, the two sides would have been close to the same shape. What is true of the histogram?
 - A. It is symmetrical.
 - B. It is uniform.
 - C. It is skewed.
 - D. It is bimodal.
2. (T/F) Data from the real world usually has a perfectly shaped distribution.
3. When is a trend formed on a line graph?
 - A. When the line segments show a clear direction
 - B. When the line segments do not show a clear direction
 - C. When the points have not been connected yet
 - D. When there are two identical pieces of data
4. What is the best way to describe data?
 - A. Numbers in an equation
 - B. A list of unorganized numbers
 - C. A table or graph
 - D. Any type of information and facts
5. Which is an example of qualitative data?
 - A. Age
 - B. Height
 - C. Shape
 - D. Income
6. (T/F) A frequency table is used to organize data.

7. What is a proportion?
- A. A comparison of two related numbers
 - B. A set of equal ratios
 - C. A statistic
 - D. A type of graph
8. The relative frequency in a relative frequency table can be written in a few ways. Which is not a way to write it?
- A. In words
 - B. As a fraction
 - C. In decimal form
 - D. As a percent
9. Which is not a type of graph?
- A. Histogram
 - B. Bar graph
 - C. Double bar graph
 - D. Ratio graph
10. What type of graph would be the least effective way to chart daily plant growth data?
- A. Circle graph
 - B. Frequency polygon graph
 - C. Line graph
 - D. Scatter plot graph

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

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