

# 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](http://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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*Geometry Smarts!*

## **Teacher's Guide for Geometry 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 imagine that the world was cubed-shaped instead of round. Ask them to imagine what gravity may be like and whether there would be a stronger pull around the edges of the cube. Then ask them to think about what it would be like to step or travel over the cube's edges to get to an adjacent face. Have the students write a description of what this type of world may be like.

### **Money and Finance Activity**

Ask the students if they have heard of the business phrase "pyramid scheme" and have them discuss what they think it may mean. Draw a pyramid on the board and show the students how a 15-person pyramid would come about, with a "host" at the top and rows of 2, 4, and 8 people. Have the students research and tell why such arrangements are banned in the United States and other countries and how they are only lucrative to those who begin them.

### **Measurement Activity**

Tell the students that one way to estimate an angle's measure with just a ruler is to first continue the angle's sides so that they stretch a little more than three inches in length. Demonstrate this on the board with a 90-degree angle. Then, starting at the vertex, measure three inches on each of the two angle sides and mark the two points. Connect them with a straight line and measure the line. Multiply the line's measure by 20 to find a close approximation of the angle's measure. Have the students experiment with angles of different measures, checking the accuracy of their estimated measure with a protractor.

### **Science Activity**

Discuss with the students how humans and other mammals seem to operate under what is called the circadian rhythm, a cycle of being awake at about the same time every day and sleeping for about the same amount of time during the 24-hour cycle. Invite the students to research to find out why it is important to keep to that natural rhythm and then have the students draw a circle and chart their wake, sleep, and activity pattern for a typical day.

### **Music Activity**

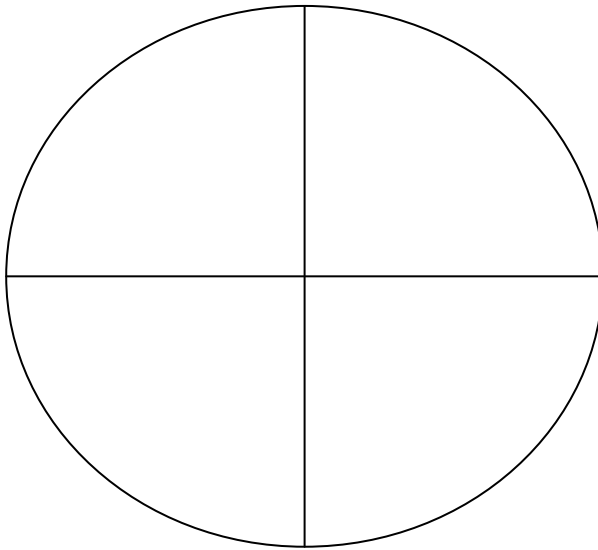
Discuss with the students how the shape of a drum determines what it sounds like. Invite the students to research the shapes of these drums and others they may know of: frame drum, bongo drum, dampfu drum, goblet drum, tenor drum, and conga drum. Have them create illustrations to show what each looks like and find samples of their unique sound online. Discuss together the different sounds produced by the assortment of shapes.

## Handout

Name: \_\_\_\_\_

### An Inscribed Hexagon

How many sides does a hexagon have? A hexagon can be inscribed – drawn – inside a circle by just using a ruler or compass, and by knowing where the circle's exact middle is located. Look at the circle below, devise a plan and mark off points on the circle, and draw a hexagon inside the circle.



*Answer: If students mark a point on the circle, then measure the radius length and mark off that length to the next point on the circle, they will end up with six points on the circle. When these are joined, a hexagon is formed.*

**Think and Write About It:** Would it be possible to inscribe other shapes within a circle? What shapes could be inscribed and how do you think it could be done?

## Assessment

1. (T/F) A line is named by any two points that fall on it.
2. In what way are angles classified?
  - A. According to their size
  - B. According to the length of their longest side
  - C. According to the length of their shortest side
  - D. According to whether it is a right angle
3. What does NOT have to be true for a figure to be a polygon?
  - A. The figure must be closed.
  - B. The figure must have at least four angles.
  - C. The figure must be bounded by line segments.
  - D. The figure must lie in one plane.
4. What is the name for lines that are not in the same plane and do not intersect?
  - A. Skewed lines
  - B. Perpendicular lines
  - C. Parallel lines
  - D. Rays
5. (T/F) Supplementary angles' measures add up to  $180^\circ$ .
6. What is the name for a polygon with eight sides?
  - A. Pentagon
  - B. Hexagon
  - C. Octagon
  - D. Decagon
7. What is the name for a line segment that connects any two points on a circle?
  - A. A ray
  - B. A chord
  - C. A radius
  - D. A diameter
8. Which statement is true about point on a line?
  - A. There are two points plus the center point on a line.
  - B. There are two points on a line: the beginning and the end point.
  - C. They are an infinite number of points on a line.
  - D. They are an even number of points on a line.
9. Which statement is NOT true of a line segment?
  - A. It has two endpoints.
  - B. It is the shortest distance between two points.
  - C. It is part of a line.
  - D. It has an infinite number of points.
10. (T/F) A line of symmetry can be drawn through any figure.

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

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