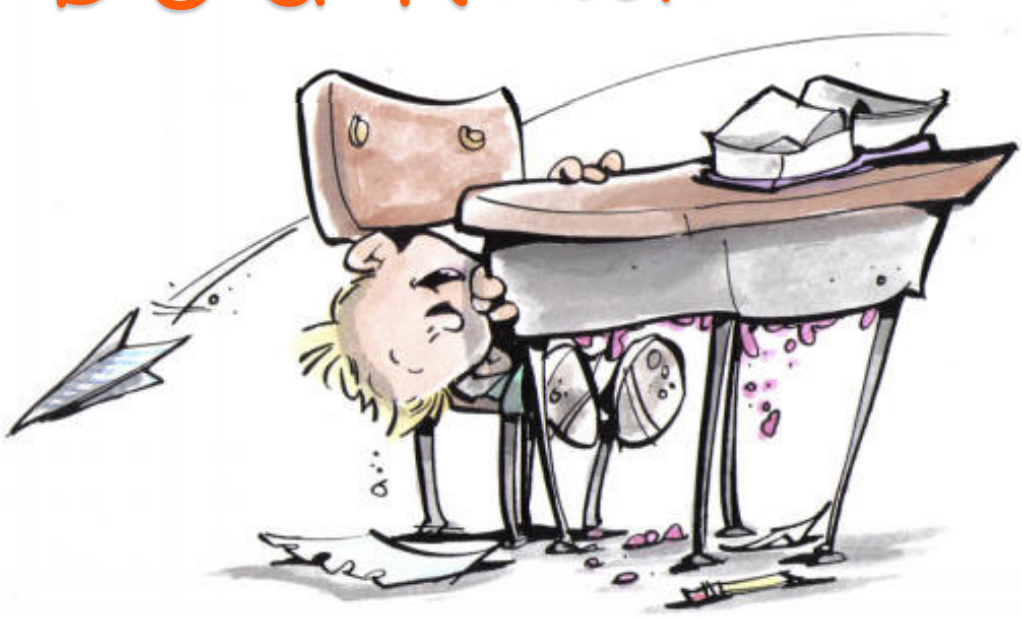
B.U.G. Newsletter



August 2014

THIS NEWSLETTER IS A SERVICE THAT WAS FUNDED BY "NO CHILD LEFT BEHIND" TITLE II PART A HIGHER EDUCATION IMPROVING TEACHER QUALITY HIGHER EDUCATION GRANT ADMINISTERED THROUGH THE UNIVERSITY OF GEORGIA.

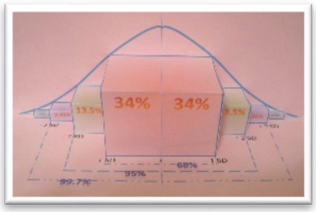
IN THIS ISSUE

Welcome Back!

by Jennifer L. Brown

Welcome back to school! I hope that you are thrilled about the upcoming year. When I was in the classroom, I was always filled with excitement this time of the year. I am sure that you all are busy preparing your classrooms and learning activities for the first days of school. Even at the college level, it is exciting to plan for the upcoming semester's classes. To provide on-going support, I will be emailing you monthly newsletters throughout the academic year. Along with the newsletter, I will include at least one activity for each of the three CCGPS courses: Coordinate Algebra, Analytic Geometry, and Advanced Algebra. For this month, I am focusing on Unit 1 within each of those courses. Unit 1 in Coordinate Algebra examines the relationships between quantities. From my experience working with freshmen, they do not always come to high school with all of the necessary perquisites to be successful in secondary mathematics. For each course, it is important to take some time at the beginning of each lesson to activate that prior knowledge. You may need to reteach more than review a concept. I utilized bellringer time for that purpose. Remember, the test creators expect the students to know the content whether it is listed for 9th or not. Math is a spiral curriculum by its very nature. For these reasons, I have included the prior knowledge needed for Unit 1 on page 2. I have created an order of operations foldable. In the classroom, I used order of operations forward for simplifying and backwards for solving.

Instead of **P**lease **E**xcuse **M**y Dear **A**unt **S**ally, this foldable uses GEMS. GEMS stands for Grouping Symbols, Exponents, Multiply or Divide, Subtract or Add. The G helps students to remember that you are not just looking for parentheses, and the S reminds students that you can subtract before adding, as with multiplying and dividing, but move left to right. For Analytic Geometry, Unit 1 covers similarity, congruence, and proofs. The activity that I have included focuses on differentiated instruction with parallel lines. There are a variety of activities for parallel lines cut by a transversal. I would use different colored electrical tape to create stations on the classroom floor. Once you have created the stations, you can develop other activities to assist the students with "proofing". Lastly, Unit 1 in Advanced Algebra focuses on inferences and conclusions from data. I will admit . . . statistics are my very favorite thing to teach. I have included my graphic organizer for teaching standard deviation. In addition, I have included my normal distribution pop-up foldable, and the accompanying PowerPoint is on my website. I found that it helped the students visualize the curve, and, with all foldables, it makes the abstract concept more concrete and hands-on for the students. Feel free to contact me if you have any questions or if you need activities for specific topics.



Dr. Brown ☺

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Prior Knowledge

Units 1 & 2 in Coordinate Algebra

- Using the Pythagorean Theorem
- Understanding slope as a rate of change of one quantity in relation to another quantity
- Interpreting a graph
- Creating a table of values
- Working with functions
- Writing a linear equation
- Using inverse operations to isolate variables and solve equations
- Maintaining order of operations
- Understanding notation for inequalities
- Being able to read and write inequality symbols
- Graphing equations and inequalities on the coordinate plane
- Understanding and using properties of exponents
- Graphing points
- Choosing appropriate scales and labeling a graph

Unit 1 in Analytic Geometry

- Understand and use reflections, translations, and rotations.
- Define the following terms: circle, bisector, perpendicular and parallel.
- Solve multi-step equations.
- Understand angle sum and exterior angle of triangles.
- Know angles created when parallel lines are cut by a transversal.
- Know facts about supplementary, complementary, vertical, and adjacent angles.
- Solve problems involving scale drawings of geometric figures.
- Draw geometric shapes with given conditions.
- Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations.
- Draw polygons in the coordinate plane given coordinates for the vertices.

Unit 1 in Advanced Algebra

- Determine whether data is categorical or quantitative (univariate or bivariate).
- Know how to compute the mean, median, interquartile range, and mean absolute deviation by hand in simple cases and using technology with larger data sets.
- Determine whether a set of data contains outliers.
- Create a graphical representation of a data set.
- Be able to use graphing technology.
- Describe center and spread of a data set.
- Describe various ways of collecting data.

FOR MORE IDEAS AND ACTIVITIES

www.bugforteachers.com/crmc.html

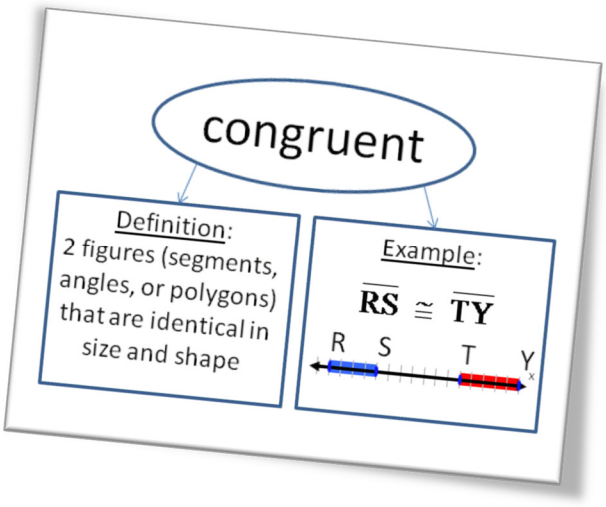
Common Student Misconceptions

by Jennifer L. Brown

Statistics. Students often look for the easiest way to complete a task. Easiest is not always the best when it comes to statistics. During one lesson, I had my students write two survey questions and target a sample of 10 people. Many of them asked the 10 people sitting around their desk in the classroom. Then, I could show the difference between random and convenient samples. Of course, their "easy" procedure makes it difficult to draw any conclusions from the data. Another difficult concept that students often confuse is causality whether it is when they are studying correlations or when they are conducting a survey. Causality derives from an experiment only. Try to use these misconceptions as teachable moments.

Geometry. One popular misconception in geometry is the existence of SSA and AAA when studying triangle congruence. I would always remind them there are no donkeys or car insurance in geometry. Another misconception is the difference between similarity and congruence. Similar objects has the same shape. Congruence objects have the same shape and size.

Algebra. The biggest issues that I had in math class was showing students that math exists everywhere. I often heard, as I am sure that you have heard it too, "When will we ever use this?". We have to overcome this misconception by showing them the usefulness of math in the real world. For example, I had a student who wanted to open a beauty salon, but she hated math. Every chance I got I showed her how math could help her with the future business. I do not know if you would categorize this one as a misconception or just a plain difficult concept. Students struggle with translating words into equations. It is too abstract for them – unfortunately. I found teaching vocabulary helped them. I even gave vocabulary quizzes to assess the students' knowledge.



Cut along the dotted lines and discard.

$$\frac{6(2x + x)^2}{(3)} - 5x + 2$$

Cut along the dotted lines and discard.

( ) { } [ ]

G

Grouping

E

Exponents

Cut along the dotted lines and discard.

/

D

to Right

-

S

to Right

Cut along the dotted lines and discard.

*

M

from LEFT

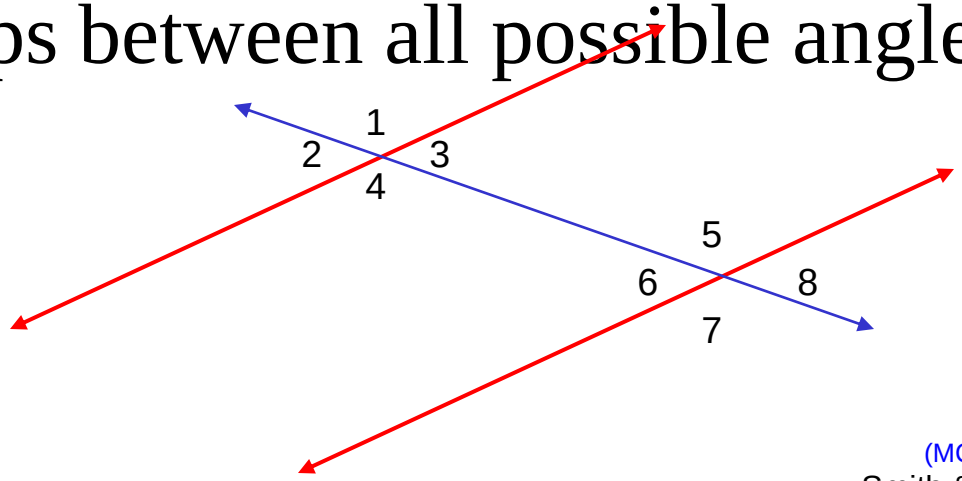
+

A

from LEFT

Parallel Lines Cut by a Transversal

- Visual: Make posters showing all the angle relations formed by a pair of parallel lines cut by a transversal. Be sure to color code definitions and angles, and state the relationships between all possible angles.

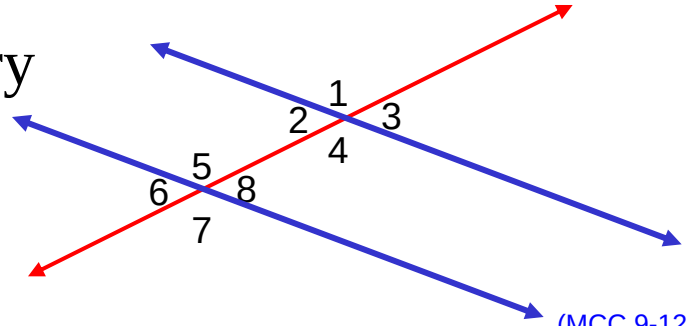


(MCC.9-12.G.CO.9)

Smith & Smarr (2005)

Parallel Lines Cut by a Transversal

- Auditory: Play "Shout Out!!" Given the diagram below and commands on strips of paper (with correct answers provided), players take turns being the leader to read a command. The first player to shout out a correct answer to the command, receives a point. The next player becomes the next leader. Possible commands:
  - Name an angle supplementary supplementary to angle 1.
  - Name an angle congruent to angle 2.

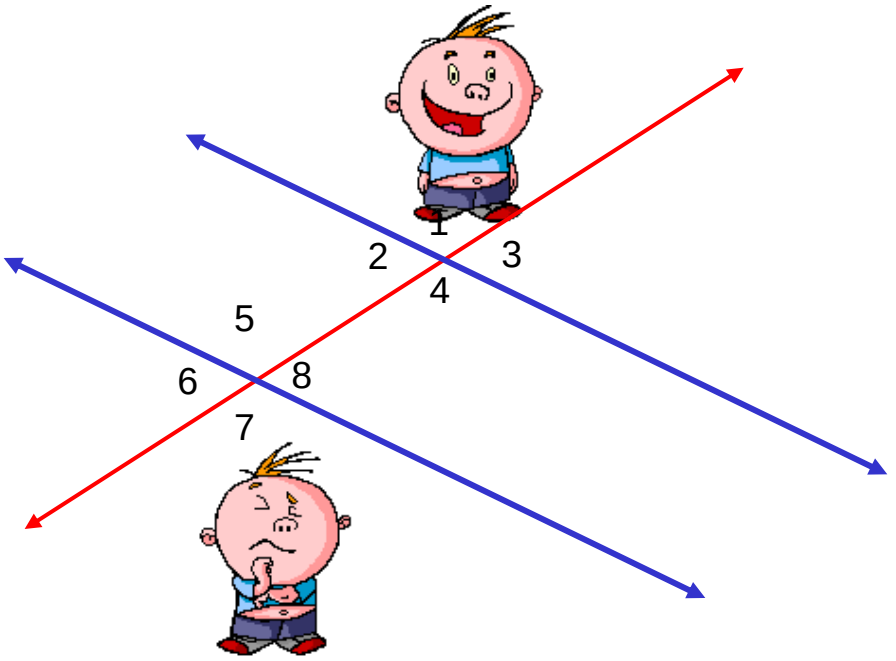


(MCC.9-12.G.CO.9)

Smith & Smarr (2005)

Parallel Lines Cut by a Transversal

- Kinesthetic: Walk It
  Tape the diagram below on the floor with masking tape. Two players stand in assigned angles. As a team, they have to tell what they are called (ie: vertical angles) and their relationships (ie: congruent). Use all angle combinations, even if there is not a name or relationship. (ie: 2 and 7)

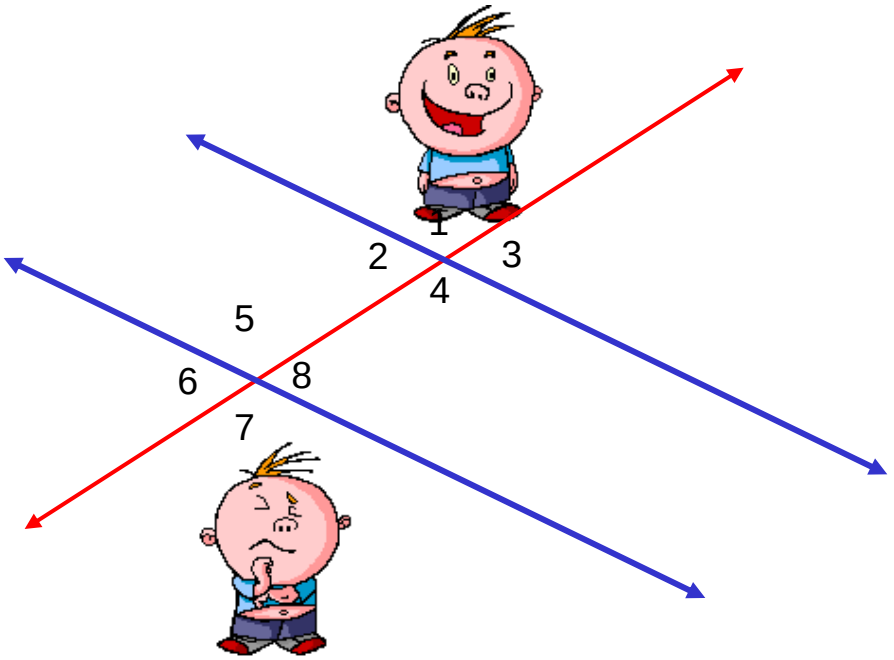


(MCC.9-12.G.CO.9)
Smith & Smarr (2005)

Parallel Lines Cut by a Transversal

Kinesthetic: Walk It

I modified this idea. My students created parallel lines on the floor using electrical tape and a ruler to ensure the lines were the same distance apart. Then, the students created a transversal with the electrical tape. The students measured the angles with a protractor to discover the angle relationships. You can use strips of paper and brass brads, too (Bell, J. L., 2009).



(MCC.9-12.G.CO.9)

x	$\bar{x}$	$x - \bar{x}$	$(x-\bar{x})^2$
		SUM (Σ)	
		÷ N	
		√