COLLABORATE TO EDUCATE: CREATING A PROFESSIONAL E-LEARNING COMMUNITY

NANCY J. SATTLER, PH.D.
AMERICAN MATHEMATICAL ASSOCIATION OF TWO YEAR COLLEGES, PRESIDENT
TEACHER AT WALDEN UNIVERSITY
TERRA COMMUNITY COLLEGE

COLLABORATION – WHAT IS IT?

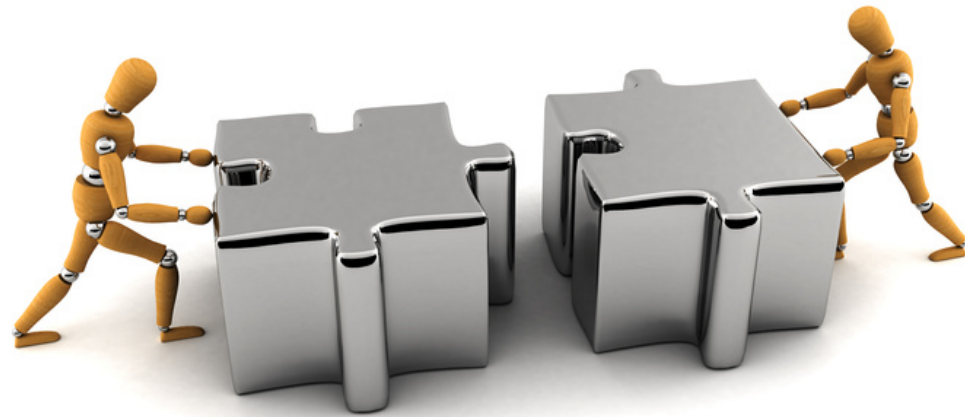**Collaboration is working with each other to do a task and to achieve shared goals**

HOW IT WORKS

CONNECT
CONTRIBUTE
COLLABORATE
COMMUNICATE

IT'S NOT ALWAYS EASY . . .

COLLABORATION – WHY DO IT?

Provide support to our peers

Build Better Understanding

Share the work

TOOLS FOR COLLABORATION

Technology makes it easy!

- **FaceTime or Skype**

- **Google Docs (www.google.com)**

- **Web-X GoToMeeting (www.webex.com/Online-Meetings)**

- **Adobe Connect (www.adobe.com/Connect)**

- **Educreation for iPads (www.educreations.com/)**

- **Internet Searches**
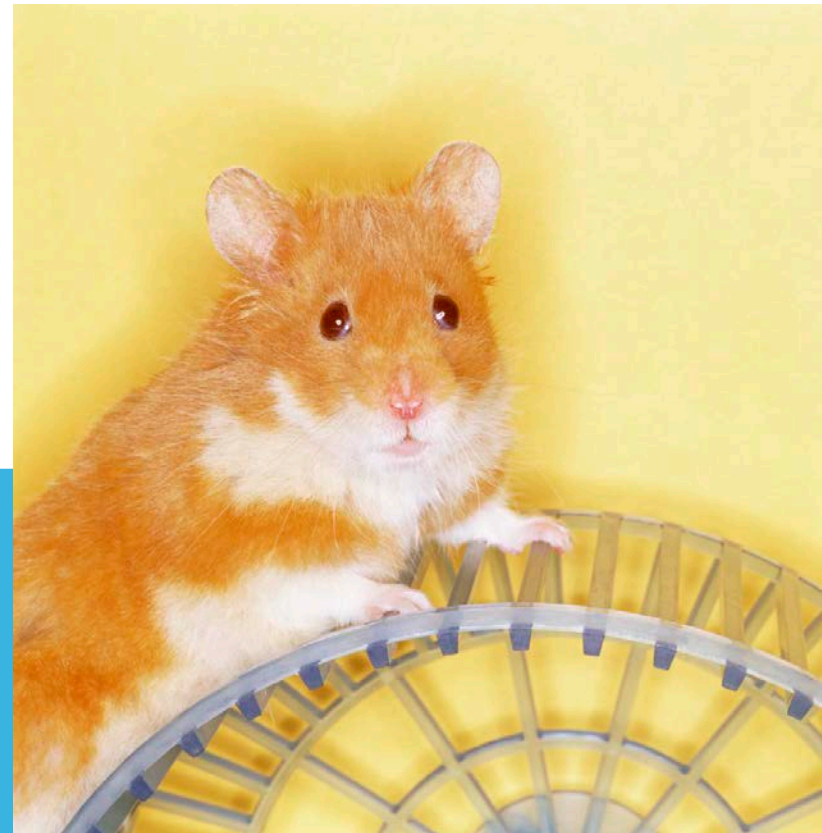 - 12 mazing tools for online collaboration
    http://www.creativebloq.com/design/online-collaboration-tools-912855

DON'T REINVENT THE WHEEL

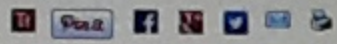**National Council of Teachers of Mathematics Illuminations**

- **http://illuminations.nctm.org/**

Ohio Resource Center

- **http://www.ohiorc.org/**

- **http://www.ohiorc.org/standards/commoncore/mathematics/**
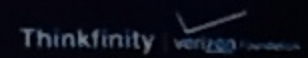
What's Next?

STANDARDS:
$X+Y=Z$

AUTHOR:
Grace M. Burton
Location: unknown

GRADE: Pre-K-2, 3-5
PERIODS: 1

In this lesson, students make patterns with objects, read patterns and find patterns in the environment. They should be encouraged to classify patterns by type (i.e. AAB, ABC). They continue learning about patterns by extending a given pattern, identifying missing elements in a pattern, and recording a pattern.

| Instructional Plan | Objectives + Standards | Materials | Assessments + Extensions | Questions + Reflection | Related Resources | Print All |

Begin the lesson by displaying a piece of fabric or wallpaper with a pattern. Ask the students to describe the pattern in words (for example, red, green, blue, red, green, blue) and then to record the pattern using crayons. Then ask the students to look around the room to see what other patterns they can find. You might want to suggest that they look at classmate's clothing. Next, ask the students what patterns they found at their house. Ask students to compare one another's patterns. Provide them with the appropriate pattern names, such as ABA and AAB).

Then put the students into pairs and distribute materials such as buttons, pretty pasta, or color tiles. Ask each student to make a pattern of at least 3 repeats. When all the students have done this, ask them to add 2 repeats to their partner's pattern. (You may wish to provide rubber stamps or stickers in addition to, or in place of, real objects.)

Next make a pattern with overhead color tiles or some other overhead manipulatives on the overhead projector.

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Theme of newest In Perspective is the writing process
Read feature articles by Penny Kittle and Robin Holland in the latest issue of ORC's online literacy journal, In Perspective. The issue, "Ohio's New... (more)

Visit ORC at the Ohio Early Care & Education Conference, April 10-12
Come by and say hi to ORC's early childhood specialist Nancy Brannon at the Greater Columbus Convention Center in downtown Columbus. ORC is sharing Booth 415 with... (more)

Watch broadcasts of the Digital Learning Day panel discussion
Be sure to watch the Digital Learning Day panel discussion "Perspectives on Digital Learning in Ohio," which was originally

Browse by Standards

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Ohio Standards (2001)
NCTM National Standards

Science

Ohio Standards (2010)
Ohio Standards (2002)
NRC National Standards

English Language Arts / Reading

Common Core Standards
Ohio Standards (2001)

Social Studies

STANDARDS FOR MATHEMATICAL PRACTICE

CCSS.MATH.PRACTICE.MP1 Make sense of problems and persevere in solving them.

CCSS.MATH.PRACTICE.MP2 Reason abstractly and quantitatively.

CCSS.MATH.PRACTICE.MP3 Construct viable arguments and critique the reasoning of others.

CCSS.MATH.PRACTICE.MP4 Model with mathematics.

CCSS.MATH.PRACTICE.MP5 Use appropriate tools strategically.

CCSS.MATH.PRACTICE.MP6 Attend to precision.

CCSS.MATH.PRACTICE.MP7 Look for and make use of structure.

CCSS.MATH.PRACTICE.MP8 Look for and express regularity in repeated reasoning.

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<< Return to Common Core Mathematics Standards

Standards for Mathematical Practice

CCSS.Math.Practice.MP1 Make sense of problems and persevere in solving them.

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches. (ORC Resources)

CCSS.Math.Practice.MP2 Reason abstractly and quantitatively.

Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects. (ORC Resources)

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Math Common Core Standards

Return to Standard

Results 1 - 10 of 266:
   CCSS.Math.Practice.MP1 Make sense of problems and persevere in solving them.

View Results: 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-110 | 111-120 |
121-130 | 131-140 | 141-150 | 151-160 | 161-170 | 171-180 | 181-190 | 191-200 | 201-210 | 211-220 | 221-230 |
231-240 | 241-250 | 251-260 | 261-266

| 1 | Supreme Court Welcome |

VIEW FULL RECORD | 📖 ADD TO MY COLLECTION   ORC# 7867

RESOURCE INFORMATION

RESOURCE URL: http://illuminations.nctm.org/LessonDetail.aspx?ID=U168

RESOURCE TYPE: Lessons

DISCIPLINE: Mathematics

GRADES: Grade 6

PROFESSIONAL COMMENTARY: This two-lesson unit allows students to investigate the
triangular numbers in an interesting, real-world context, the Supreme Court. Beginning with
the classic handshake problem, students generate geometric and algebraic representations
for the patterns they encounter and conclude with a formula for the nth triangular
number....

MORE...

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Math Common Core Standards

Results 1 - 10 of 329:   Return

   CCSS.Math.Practice.MP2 Reason abstractly and quantitatively.

View Results: 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-110 | 121-130 | 131-140 | 141-150 | 151-160 | 161-170 | 171-180 | 181-190 | 191-200 | 201-210 | 211-220 | 231-240 | 241-250 | 251-260 | 261-270 | 271-280 | 281-290 | 291-300 | 301-310 | 311-320 | 321-329

1   **Walk the Plank**

     VIEW FULL RECORD   ADD TO MY COLLECTION

     RESOURCE INFORMATION

     RESOURCE URL: http://illuminations.nctm.org/LessonDetail.aspx?id=L682

     RESOURCE TYPE: Lessons

     DISCIPLINE: Mathematics

     GRADES: Grade 8

     PROFESSIONAL COMMENTARY: When one end of a wooden board is placed on a scale and the other end is propped on a textbook, students can "walk the plan the weight measurement as their distance from the scale changes. The results unexpected— the relationship between the weight and distance is linear, and

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Math Common Core Standards

Results 1 - 10 of 168:   Return to Standard
CCSS.Math.Practice.MP3 Construct viable arguments and critique the reasoning of others.

View Results: 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-110 | 111-120 |
121-130 | 131-140 | 141-150 | 151-160 | 161-168

1   Detective Slope - An Investigation of the Slopes of Lines and Shapes

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RESOURCE INFORMATION

RESOURCE URL: http://www.nsa.gov/academia/_files/collected_learning/high_schoo...

RESOURCE TYPE: Lessons

DISCIPLINE: Mathematics

GRADES: Grades 8-12

PROFESSIONAL COMMENTARY: This learning unit is designed for students to investigate the
definition of slope and the slopes of parallel and perpendicular lines. Students are introduced
to special parallelograms by applying the concept of slope using Geometer's Sketchpad®....

MORE...

2   Circle Packing 3: Circle Packing and Curvature

VIEW FULL RECORD   ADD TO MY COLLECTION   ORC# 7611

RESOURCE INFORMATION

RESOURCE URL: http://illuminations.nctm.org/LessonDetail.aspx?ID=L692

RESOURCE TYPE: Lessons

DISCIPLINE: Mathematics

GRADES: Grades 9-12

PROFESSIONAL COMMENTARY: An important idea in advanced mathematics is curvature, the

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Math Common Core Standards

Results 1 - 10 of 119:

Return to Standard

CCSS.Math.Practice.MP4 Model with mathematics.

View Results: 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-110 | 111-119

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1   At The Circus

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RESOURCE INFORMATION

RESOURCE URL: http://www.nsa.gov/academia/_files/collected_learning/high_schoo...

RESOURCE TYPE: Lessons

DISCIPLINE: Mathematics

GRADES: Grades 9-12

PROFESSIONAL COMMENTARY: Students use algebra or geometry software to discover that the height at which guy wires supporting two vertical poles cross does not depend on how far apart the poles are. This counterintuitive result can lead to conjecturing and testing hypotheses as to what factors determine the height at which the wires cross...

MORE...

2   Power of Points

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RESOURCE INFORMATION

RESOURCE URL: http://illuminations.nctm.org/LessonDetail.aspx?id=L700

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Math Common Core Standards

Results 1 - 10 of 82:   Return to Standard

   CCSS.Math.Practice.MP5 Use appropriate tools strategically.

View Results: 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-82

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1   Walk the Plank

VIEW FULL RECORD | 🖉 ADD TO MY COLLECTION   ORC# 7882

RESOURCE INFORMATION

RESOURCE URL: http://illuminations.nctm.org/LessonDetail.aspx?id=L682

RESOURCE TYPE: Lessons

DISCIPLINE: Mathematics

GRADES: Grade 8

PROFESSIONAL COMMENTARY: When one end of a wooden board is placed on a bathroom
scale and the other end is propped on a textbook, students can "walk the plank" and record
the weight measurement as their distance from the scale changes. The results are
unexpected— the relationship between the weight and distance is linear, and all lines have...

MORE...

2   Impact of a Superstar

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RESOURCE INFORMATION

RESOURCE URL: http://illuminations.nctm.org/LessonDetail.aspx?id=L673

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Math Common Core Standards

Results 1 - 10 of 121:   Return to Standard
CCSS.Math.Practice.MP6 Attend to precision.

View Results: 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-110 | 111-120 | 121-121

1   Pinwheel

VIEW FULL RECORD | ADD TO MY COLLECTION   ORC# 7847

RESOURCE INFORMATION

RESOURCE URL: http://illuminations.nctm.org/LessonDetail.aspx?id=L608

RESOURCE TYPE: Lessons

DISCIPLINE: Mathematics

GRADES: Grades 6-12

PROFESSIONAL COMMENTARY: Students create parallelograms from square sheets of paper and connect them to form an octagon. During the construction, students analyze angle measures, segment lengths, and areas in terms of the original square.....

MORE...

2   Check That Digit

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RESOURCE INFORMATION

RESOURCE URL: http://illuminations.nctm.org/LessonDetail.aspx?id=L693

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Math Common Core Standards

Results 1 - 10 of 114:   Return to Standard
CCSS.Math.Practice.MP7 Look for and make use of structure.

View Results: 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-110 | 111-114

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1   Tweaking a Trigonometric Function -- An Exploratory Lesson

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RESOURCE INFORMATION

RESOURCE URL: http://www.nsa.gov/academia/_files/collected_learning/high_schoo...

RESOURCE TYPE: Lessons

DISCIPLINE: Mathematics

GRADES: Grades 9-12

PROFESSIONAL COMMENTARY: This lesson demonstrates the various translations of $y = A \sin B(x + C) + D$ and $y = A \cos B(x + C) + D$ based upon changes in A, B, C, and D. Graphing calculator overlay graphs make it easy for students to detect, understand, and predict the relationship between changes in parameters and...

MORE...

2   Regular Pentagons, "Star Polygons," and the Golden Ratio

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RESOURCE INFORMATION

RESOURCE URL: http://www.nsa.gov/academia/_files/collected_learning/high_schoo...

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Math Common Core Standards

Results 1 - 10 of 91:

Return to Standard

CCSS.Math.Practice.MP8 Look for and express regularity in repeated reasoning.

View Results: 1-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-91

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1   What About Medians?

[VIEW FULL RECORD] [🔎 ADD TO MY COLLECTION]   ORC# 8881

RESOURCE INFORMATION

RESOURCE URL: http://www.nsa.gov/academia/_files/collected_learning/high_schoo...

RESOURCE TYPE: Lessons

DISCIPLINE: Mathematics

GRADES: Grades 9-12

PROFESSIONAL COMMENTARY: Students draw a triangle and the three medians of the
triangle using Geometer's Sketchpad®. The students identify and measure the line segments
between the vertices of the triangle and the centroid and between the centroid and the
midpoints of the opposite sides using dynamic geometry software....

MORE...

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2   Regular Pentagons, "Star Polygons," and the Golden Ratio

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WHAT STANDARD(S) FOR MATHEMATICAL PRACTICE DO YOU SEE IN THE FOLLOWING DISCUSSION?

SOLVING MATHEMATICAL TASKS

Solve the following mathematical task in as many ways as you can. Consider other approaches students might use to solve it. Identify misconceptions that you would anticipate as students work on this task. Make note of any challenges you experience as you solve the task.

The Vegetable Garden

The students in Mr. Landon's class are designing and planting a vegetable garden as a community service project. They have 32 feet of fencing that has been donated to the class for this project. They have decided to use the fencing to make a rectangular garden.

If the students want as much space as possible to plant the vegetables, how long will each of the sides of the garden need to be?

The class receives additional fencing from a second donor. They now have 64 feet of fencing in total—double the amount of the original fencing. Determine the largest rectangle possible to allow for the maximum space to plant the vegetables. How does the area of this new garden compare to the original design?
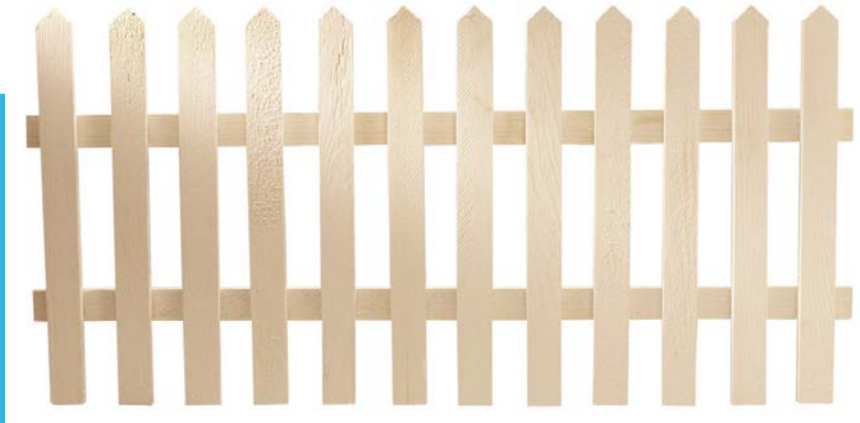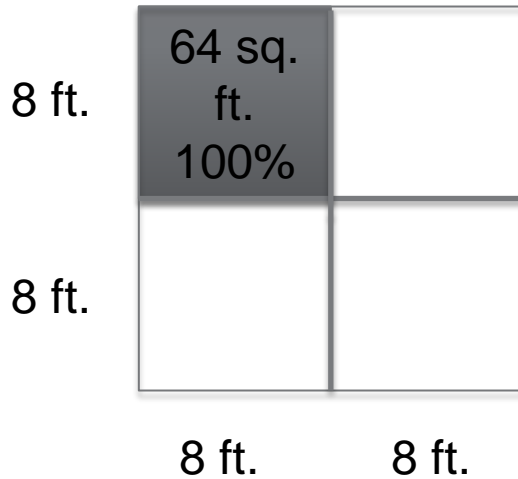
Original garden: 8ft x 8ft = perimeter 32 ft. Area 64 sq. ft.

Double dimension garden: 16ft x 16ft = Perimeter 64 ft. Area 256 sq. ft.

The diagram makes it easy to see that first garden could be copied and pasted three more times to fill the second garden. This would be 300 "more" percent than we had originally. This is a 300% increase.

If students first learn to model percent using 100 grids, it makes this easier to connect with percent. It helps them to see the original amount as 100%.

This model could also represent that the larger garden is 400% or 4 times the original garden.

Slide contribution:
Jacqueline Miller, MATH6561
Spring Semester 2014
Walden University

FROM ANOTHER STUDENT . . .

The teacher knowing what misconceptions the students may have is a good idea. I like to know in advance how the students maybe thinking so that I can address these issues while I am teaching the lesson. Most of the time when I bring the misconceptions to my students' attention they don't make the mistakes. I love doing hands on activities in the classroom, this allows the students to have something concrete to refer back too. When students are given an assignment they must know how to use critical thinking to address everything that the problem asks them. I use a method call unpacking. With unpacking the students read the question and figure out what they are asked to do and make sure the answer covers everything. For instance we were asked to: Post an explanation of at least two different strategies for solving the mathematical task. Include the mathematical thinking you used as you applied your strategies. Identify misconceptions that may occur while students work on this task. If you had difficulties in solving the task, indicate the challenges you had in solving the task. You would make a chart with two sides the first is DO and the second is What.

For instance we were asked to: Post an explanation of at least two different strategies for solving the mathematical task. Include the mathematical thinking you used as you applied your strategies. Identify misconceptions that may occur while students work on this task. If you had difficulties in solving the task, indicate the challenges you had in solving the task. You would make a chart with two sides the first is DO and the second is What.
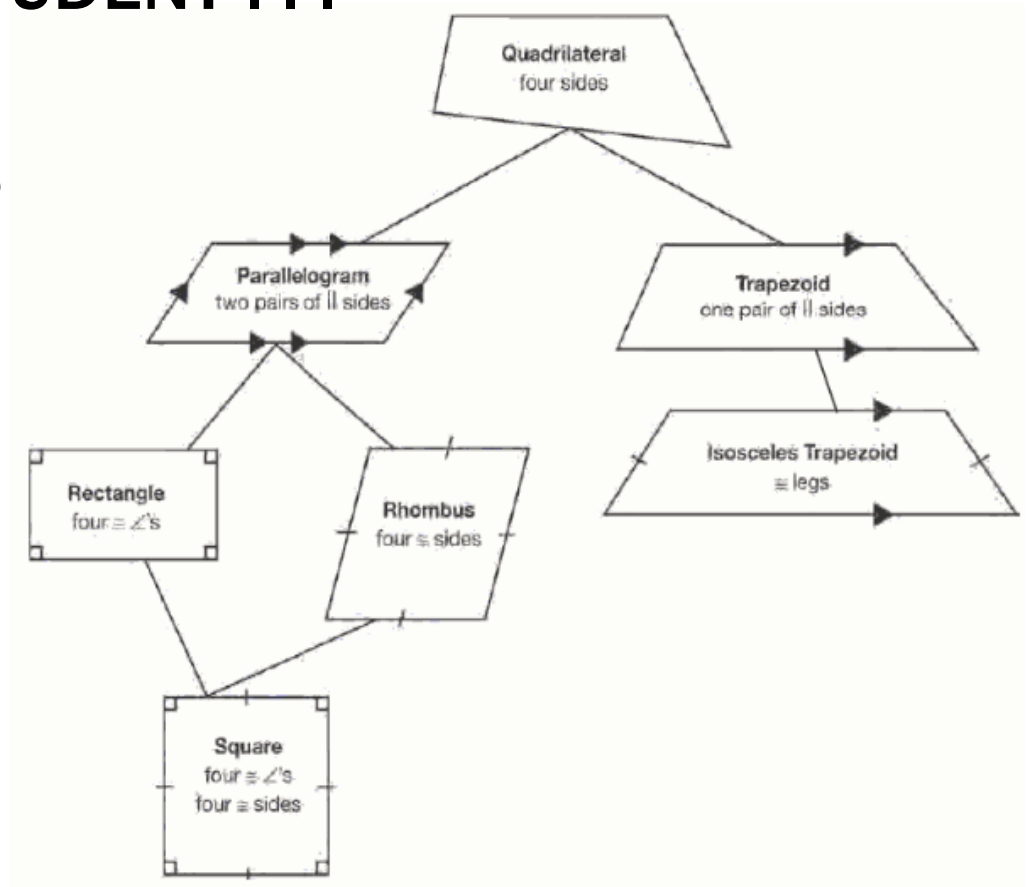
Do (Action)	What (Response)
Post	Two different strategies for solving the math task
Include	Math thinking used as u applied strategies
Identify	Misconceptions students may have
Identify	Difficulties you had
Indicate	Challenges you had

Slide Contribution
Shanona Merrell, MATH6561
Spring Semester 2014
Walden University

FROM ANOTHER STUDENT . . .

The actual definition of a rectangle is that it is a quadrilateral with two sets of parallel lines and 4 right angles. Therefore a square is a rectangle.

This is something my fifth graders always find confusing, but we draw out examples while creating definitions. Here is an example of what we draw:

Slide contribition:
Jillian Engelhardt, MATH6561
Spring Semester 2014
Walden University

DR. NAN TO STUDENT

You might wish to create a table to organize the possibilities. I have created a table for you with two sets of numbers. How many other sets of integer numbers exist that can be used to make a rectangle with a perimeter of 32 feet

Length	Width	Area (length times width)
1 foot	15 feet	1 foot x 15 feet = 32 sq. feet
2 feet	14 feet	2 feet x 14 feet = 28 sq. feet

STUDENT RESPONSES

Dr. Nan!

Thank you for this suggestion. Creating a table is an excellent way to not only organize information that is important to the task at hand, but it allows to student to hone in on what is being asked of them through the implementation of the task.

****

Dr. Nan,

Wow that is a good way to solve a problem. Creating a table does make it easier for the students to find the answer. I am going to use method with one of my lesson to see how my students like it!

Sher to Dr. Nan and Terrance,

As I was reading your post (Terrance) and Dr. Nan's question... it gave me an "Aha" moment :). Area is in square units, so of course the n times that you would multiply the perimeter, the area should be n^2 greater than the original area. Oh gosh!! :) So I did a table because I really need to visualize it... so here it is.

Thank you Terrance and Dr. Nan :)

WHAT I HAVE DONE . . .

- **Created an Environment that encourages sharing**

- **Created vehicles for sharing lesson plans and electronic resources**

- **Students share by**
  - Content
  - Grade level

$$x^2 + y^2 + 2dx + 2ey + f = 0$$

$$(x,y) = F(x',y')$$

$$a = \pi r^2$$
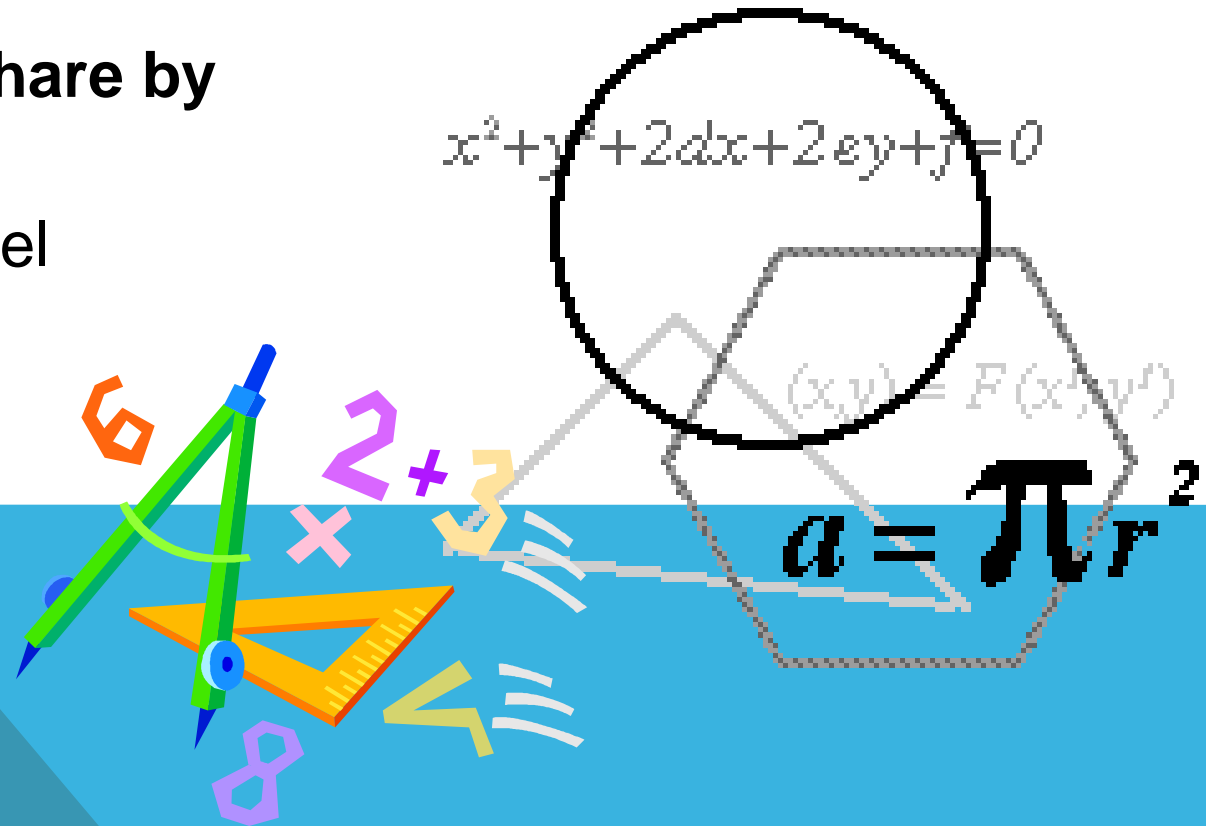
RESOURCES FOR TEACHERS

www.teachingchannel.org

- Teaching Channel is a video showcase -- on the Internet and TV -- of innovative and effective teaching practices in America's schools.
- Lesson Ideas: Mush Forward with the Iditarod!
- https://www.teachingchannel.org/blog/2014/02/20/iditarod-lesson-ideas/

http://www.realworldmath.org/

- **Real World Math is a collection of free math activities for Google Earth designed for students and educators. Mathematics is much more than a set of problems in a textbook. In the virtual world of Google Earth, concepts and challenges can be presented in a meaningful way that portray the usefulness of the ideas.**

MORE RESOURCES FOR TEACHERS

www.youtube.com

- I Can Count To 100
  - http://www.youtube.com/watch?v=W0o-uizBWDM
- Whatcha Gonna Do Count By 2's 5's and 10's
  - http://www.youtube.com/watch?v=vq3cDj3Uj3I
- 3D shape song by Harry Kindergarten
  - https://www.youtube.com/watch?v=2cg-Uc556-Q
- Perimeter Song
  - http://www.youtube.com/watch?v=KwXBMGdSWmI
- Quadratic Formula - the Musical
  - https://www.youtube.com/watch?v=1oSc-TpQqQI

MORE RESOURCES FOR TEACHERS

FaceBook Pages

- **Teacher Resources**
  - https://www.facebook.com/search/keyword/?q=teacher%20resources

- **Elementary Teacher Resources**
  - https://www.facebook.com/ElementaryTeacherResources

- **Teacher-Teacher Resources**
  - https://www.facebook.com/TeacherTeacherResources

- **Teacher Created Resources**
  - https://www.facebook.com/teachercreatedresources

MORE RESOURCES FOR TEACHERS

- **Teacher Tube**
  - http://www.teachertube.com

- **StudyJams**
  - http://studyjams.scholastic.com/studyjams/jams/math/index.htm

- **Sheppards Software**
  - http://www.sheppardsoftware.com/math.htm

- **Cool Math – An amusement park of math and more…**
  - http://www.coolmath.com/
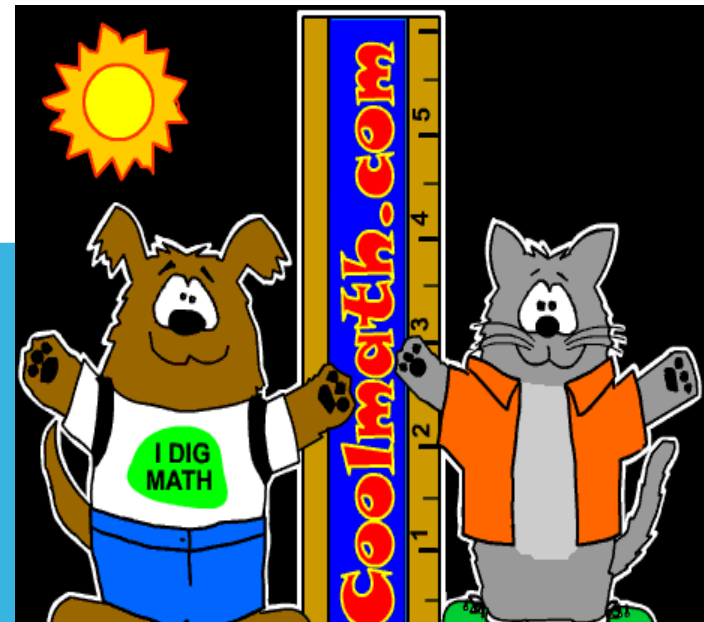
MORE RESOURCES FOR TEACHERS

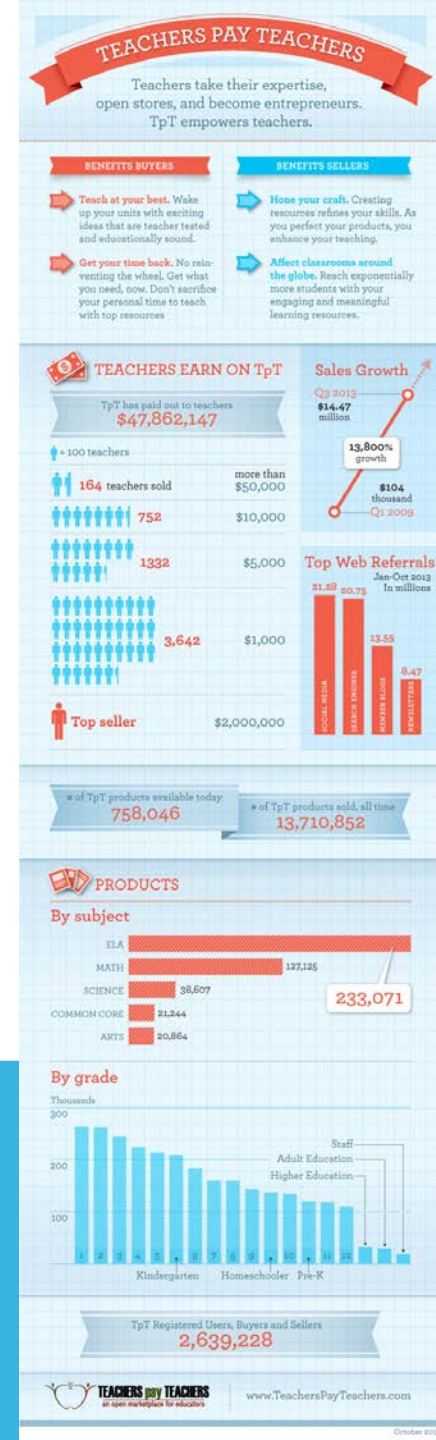- **TeacherpayTeacher.com**

  Teachers Pay Teachers is the world's first
  and largest open marketplace for educators
  to buy, sell, and share their original resources.
  TpT helps teachers to teach at their best and
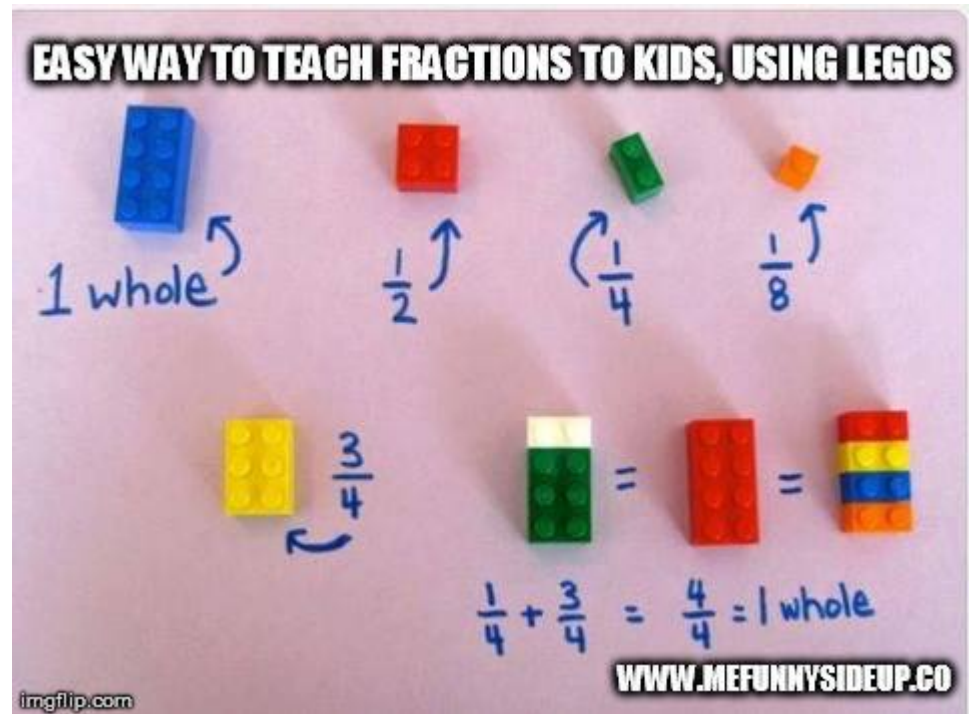 provides a community where teachers succeed.

  PRICES
  Free
  Under $5
  $10 and up

ONE LAST RESOURCE . . .

TEACHING FRACTIONS

WHAT ARE YOU DOING?

WHAT CAN YOU DO?

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