AMME INC.

RELEASE YOUR STUDENTS' POTENTIAL

PROGRAM HIGHLIGHTS

CHRISTINE HORBAS • TOM STRAUSS • PAUL WEISSE

AMME INC. 8258 Prospect Dr., Kewaskum, WI 53040

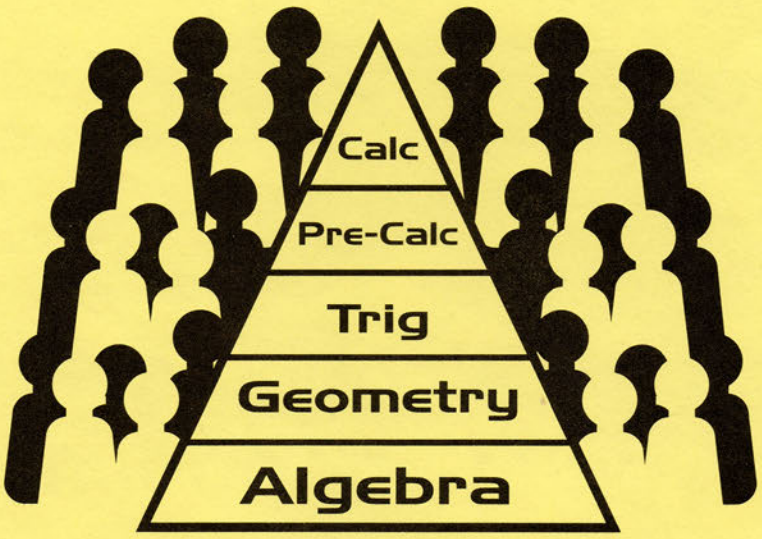
262-689-9184 aim@ammeinc.com

AMME inc.

release their potential

believes

every student can learn math,



even those outside the pyramid.

Reaching students who struggle in math is our specialty.

75% of "reluctant" learners are hands-on, kinesthetic learners. AMME materials can reach them.

Our focus is on students in the lower 50% of your population.

Our exceptional materials give you the opportunity to help these students develop their math skills and regain self-confidence.

We are unique and proud of it!

We know how difficult it is to teach to all the different learning styles in your classroom. We understand how hard you work to help all students.

We can help you.

Our materials are just not ordinary textbooks. All handouts, tests, activities, quizzes, answer keys and teacher notes are in binders and also on a compantion word processing thumb (flash) drive. We trust you with the power to edit or adapt your text to meet their needs.

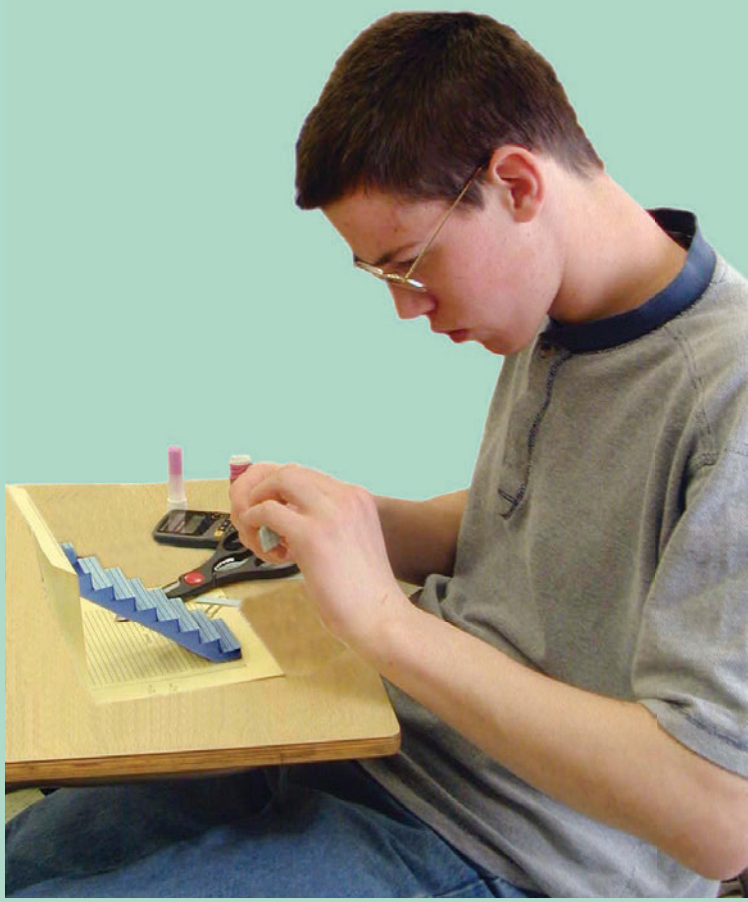
Take time to study this packet and learn what makes us unique. You will see the power of AMME's innovative techniques.

Students Retain What is Taught

To move new concepts into students' long-term memory requires we teach two things:

- The procedure must be taught
- Connections to prior knowledge must be made.

Here, Rick develops his problem-solving skills as he builds a set of model steps.



He is also building on his understanding of risers and runners, which will help him to fully understand the concept of slope.

Teaching this way helps you reach your hands-on, visual learners who often struggle with traditional texts.

AMME materials will help you connect new topics to prior knowledge, thus ensuring long-term understanding.

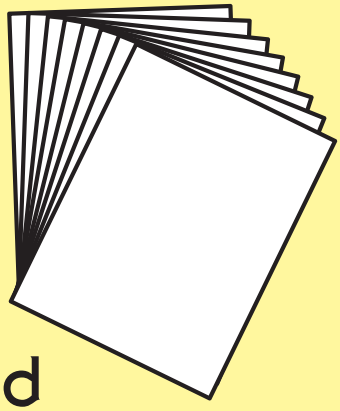
Learning Styles

Differentiation of Instruction

✔ AMME's varied methods of instruction helps the creative, right-brained and visual learners realize they can excel at math.

✔ A strong math foundation will enhance their problem solving ability and empower them to succeed.

These sample handouts show how we teach familiar concepts, but in a way in which the right-brained, visual learners can understand and master.



Handout **2-6** is from **Unit 2** on percent. Shading the rectangles and making estimates is a powerful way to help students understand percent.

(Note:
This packet contains only a page or two of each sample handout. For example, handout 2-6 is actually four pages long.)

2-6 **A New Perception on Percent** Name _____

We are going to learn a great new way to understand percent problems.

1) In one word, "percent" means _____, and also percent is a _____.

2) Jenny opened a new loaf of bread to make sandwiches for her friends. She needed 8 slices out of the 20 slices in the loaf. What percent of the loaf did she use? Let's solve this one together.

Remember, percent means **hundredths** or $^{1}/_{100}$.

a) Since Jenny found there are 20 slices in one loaf, how many loaves to get 100 slices? _____

b) If she needed 8 slices out of each loaf, how many slices would she need in 5 loaves? _____

c) So now we have 40 slices out of 100 total or $^{40}/_{100}$ = _____%.

3) If you made 3 out of 5 free throws in practice, what percent did you make?

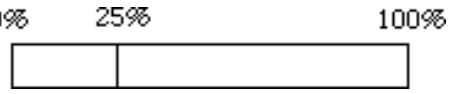
Think: You would have to repeat your practice _____ times to get 100 attempts.

$\frac{3}{5} \times \frac{20}{20} =$ _____ And this is what percent? _____%

4) Our old buddy Elrod went trap shooting. He hit 20 out of 25 shots he took. What percent did he hit? Show your reasoning. _____ = _____%

5) Now you are going to draw sketches to help you see what your answer should be.

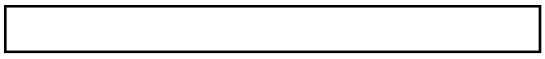
a) Here's a rectangle representing 100%.
I made a mark where I guess 25% would be.



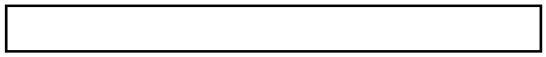
Do you think I did a good job? _____

Divide and **label three numbers** on these rectangles showing the following percents.

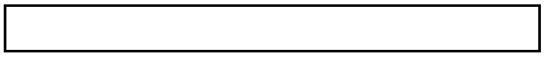
b) 40%



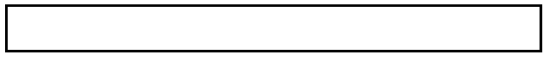
c) 83%



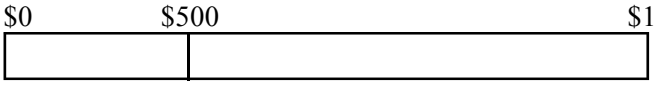
d) 1%



e) 15%

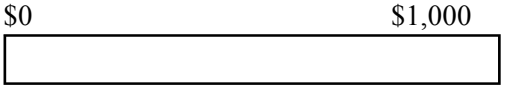


6) Now let's see how good you are at guessing when the total is not 100. This rectangle represents a monthly income of $1,500. This person pays $500 a month just for rent.
Here's what my sketch looks like.

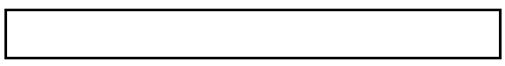


Divide these rectangles and again **label three** numbers on them showing the following:

a) $240 car payment out of $1,000 income



b) 7 weeks out of 9 weeks



c) draw the rectangle to show
$.32 stamp out of a $5 bill

d) 50 minutes out of an hour

6-10 **Two, Two, Two Elrods in One** Name _____

The amazing Elrod will perform a great feat of magic. Algebra-cadabra! There are two of him!

1) Look at the scale below! He has cloned himself. What *math operation* would you use to find the weight of just one of him?_____ How big is he? _____ _____

Here is how we would find his weight using Algebra.

$72 = 2E$ Just divide each side by two.

$\frac{72}{2} = \frac{2E}{2}$

$36 = 1E$

Check

$72 = 2(36)$

72 = _____ It is ZZ.

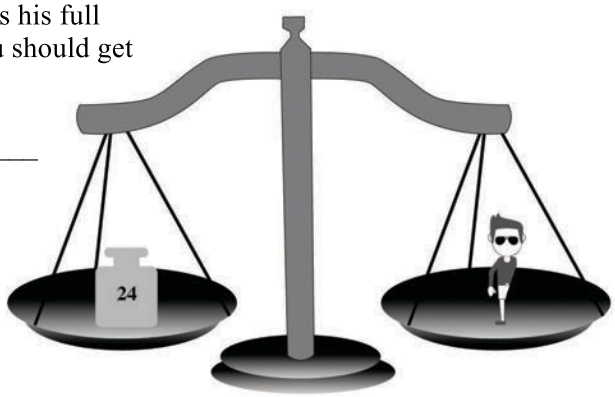
Remember, you only want ONE, UNO, EIN, ICHI, OBIE JUAN, a SOLITARY Elrod.

Warning, warning: this next problem might be a little gross for the squeamish.

2 a) Oh my goodness! Look at what he has done to himself! This time only $^3/_4$ of Elrod is on the scale. I think he will be OK but it is harder for you to figure his weight in your head.

Can you guess how much **one complete Elrod** would weigh? _____ ____

Let us check if you are correct. If that really is his full weight, when you take ¾ of your answer, you should get 24 pounds.



b) Mentally take ¼ of your guess (÷ 4) = _____

To get ¾ , just triple it. _____

Did you get 24? _____

In #3a you will solve it with algebra.

One neat thing about algebra is that it can find answers for **all problems**, even those with "ugly" numbers in them. To solve the above problem: 24 = ¾ E, just **turn ¾ into a decimal**. Be very careful with the decimal here.

3 a) $24 = {}^3/_4 E$ b) $36 = {}^4/_5 P$ c) $^2/_3 Z = 20$

$\frac{\_\_\_}{.75} = \frac{.75\ E}{.75}$

____ = 1E

d) In these short two-step problems, you can just make **mental checks** of your answer. For example, you think the answer to #3b is 45. To find $^4/_5$ of 45, first find one fifth = ____ and then multiply the 9 by 4 = _____. So it does check.

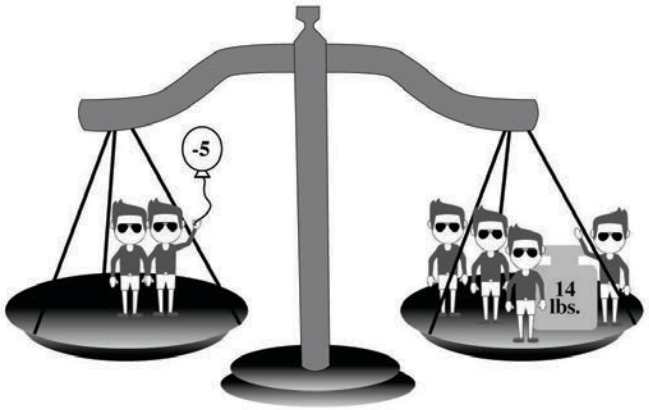
e) Will you check #3c? Did it work?_____

9) Nice job on these last ones.

To get all these Elrods on one side in this picture, you have two options. You can move them either to the left or the right side.

Will you do it both ways for me to see if it makes ant difference?

Your answer may amaze you as he weighs a negative amount.



Move all Elrods to the **right side**

- 2E + (-5) = 4E + 14
- 2E + (-5) + (-2E) = 4E + 14 + _____
- =
- =
- =
- =

Move all Elrods to the **left side**

- 2E + (-5) = 4E + 14
- 2E + (-5) **- 4E** = 4E + 14 **- 4E**
- =
- ____ + ___ **+ 5** = 14 **+ 5**
- -2E = 19
- _____ = _____

Does it matter which side you choose? _____

Solve the following and show all the steps. Of course, you can get Elrod on either side.

First **SIMPLIFY** each side, then get the **VARIABLES ON ONE SIDE** and **SOLVE TO GET THE VARIABLE ALONE.** **(**#11 has *ugly* numbers, but it's a good challenge for you.)

10) 5T + 2T = 4.6T + 9

- =
- =
- =
- =

11) -4.3R + 4 + 8 + 11 = -2.4R + 1

- -4.3R + _____ = -2.4R + 1
- =
- =
- =
- =
- =

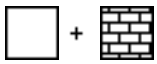
Bonuses for checks:

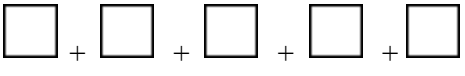
16-12 **White Squares Don't Wear Plaid** Name_____

Adding variables is as easy as adding the number of gift cards you own. You have to keep in mind, though, that when you add, you cannot add things that are different. You know, you cannot add a Game Stop® card to a Apple Tunes® card as they are different businesses.

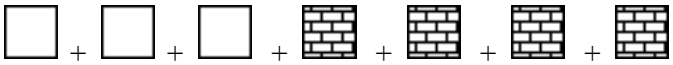
Study this: This is one 'white' square:  We will shorten this by writing $\mathbf{w^2}$ (white square).

This, though, is one 'brick' square:  We will call this $\mathbf{b^2}$.

1) If we added these two together we would write $\mathbf{w^2 + b^2}$: 

2) If you add:  , you could write it as:

$w^2 + w^2 + w^2 + w^2 + w^2$, which equals___$w^2$. (There are 5 white squares.)

3) What if we added:  ?

You could write this as: $w^2 + w^2 + w^2 + b^2 + b^2 + b^2 + b^2 = 3w^2 +$ _____ because there are 3 white squares and 4 brick squares.

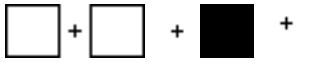
Use the squares below to write expressions and their answers.

"white" square =  "brick" square =  "plaid" square =  "dark" square = 

4)  = $b^2 + b^2 + d^2 + d^2 + d^2$ = _____

5)  = _____ = _____

6)  = _____ = _____

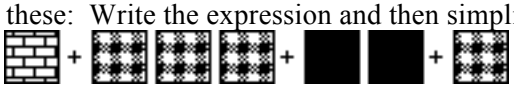
7)  = _____ = _____

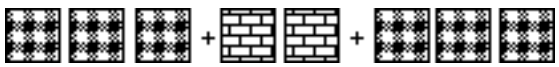
8)  = _____ = _____

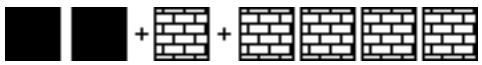
Look at this example: 

This is 3 white squares + 2 white squares + 4 plaid squares or $3w^2 + 2w^2 + 4p^2 = 5w^2 + 4p^2$. You can add the white squares together, but you cannot add white squares to plaid squares.

Try these: Write the expression and then simplify.

9)  = _____ = _____

10)  = _____ = _____

11)  = _____ = _____

12)  = _____ = _____

13)  = _____ = _____

You are doing great! Instead of using these squares, simplify the following expressions by using what you have just learned.

14) $4b^2 + 5d^2 + 2b^2 =$ _____

15) $5p^2 + 3p^2 + 4x^2 + p^2 =$ _____

16) $3x^2 + 7x^2 + 2d^2 + 2w^2 =$ _____

17) $2p^2 + 4m^2 + m^2 + 4p^2 =$ _____

Try these next ones; they have subtraction in them!

18) $3x^2 + 4m^2 - 2x^2 =$ _____

19) $7m^2 + 2m^2 - 6m^2 + 5p^2 =$ _____

20) $m^2 + 3m^2 - 7m^2 =$ _____

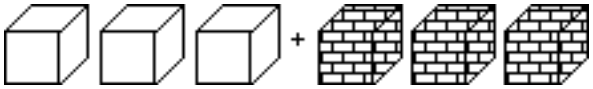
21) $2w^2 - 4x^2 + 5x^2 + 5w^2 =$ _____

Great! Look at this:

This is a white **cube**:  You can shorten it by writing $\mathbf{w^3}$, read "w cubed."

If you add:  You can write it as $w^3 + w^3 + w^3 = 3w^3$.
That is, three white cubes.

See if you can figure these out. Use the notation I've been using.

22)  = _____

23)  = ____ + ____ + ____ = _____

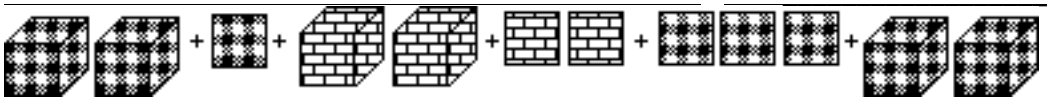
24) Take a look at this example: 
It has cubes and squares. Using the form I've been using, you would have $2p^3 + 2p^2 + 2d^2$.

Of this, what can you combine or add together? _____
That is right. There is nothing you can combine. In words, we would have 2 plaid cubes + 2 plaid squares + 2 dark squares. It does not make sense to add cubes with squares. By golly, that is like adding CD's and eight-tracks. It just doesn't make sense, even if you know what an eight track is. ☺

See if you can add the next few. Write the expression, and then give the answer. Only add what makes sense. If it does not make sense, by golly, do not do it!

25) 

____ + ____ + ____ + ____ + ____ = _____

26) 

_____ = _____

Replace the Sidewalks

AMME students develop an understanding of area and volume as they calculate how much concrete to order to replace a section of sidewalk.

And interesting note is that one of our students got a job with a concrete construction firm after high school.

He told author Tom Strauss that his first week he caught a potential $4,000 error a foreman had made in calculating the cost of the job.

Now you won't have to answer their question...

"When are we ever going to use this stuff?"

At the beginning of Course I
even basic applications are very
challenging for most students.
This shows how little math
they really do understand.

As students develop their problem
solving and communication skills,
they become better prepared,
not only for new standards
but also for their future.

15-Lab A **Let's Paint, The Lab** Name _____

In keeping with National Paint Your Classroom Week, we are going to do our part. Let's find out how many gallons of paint we need to repaint our room. After we buy the paint, I might even let you bring your painting clothes to class and do it.

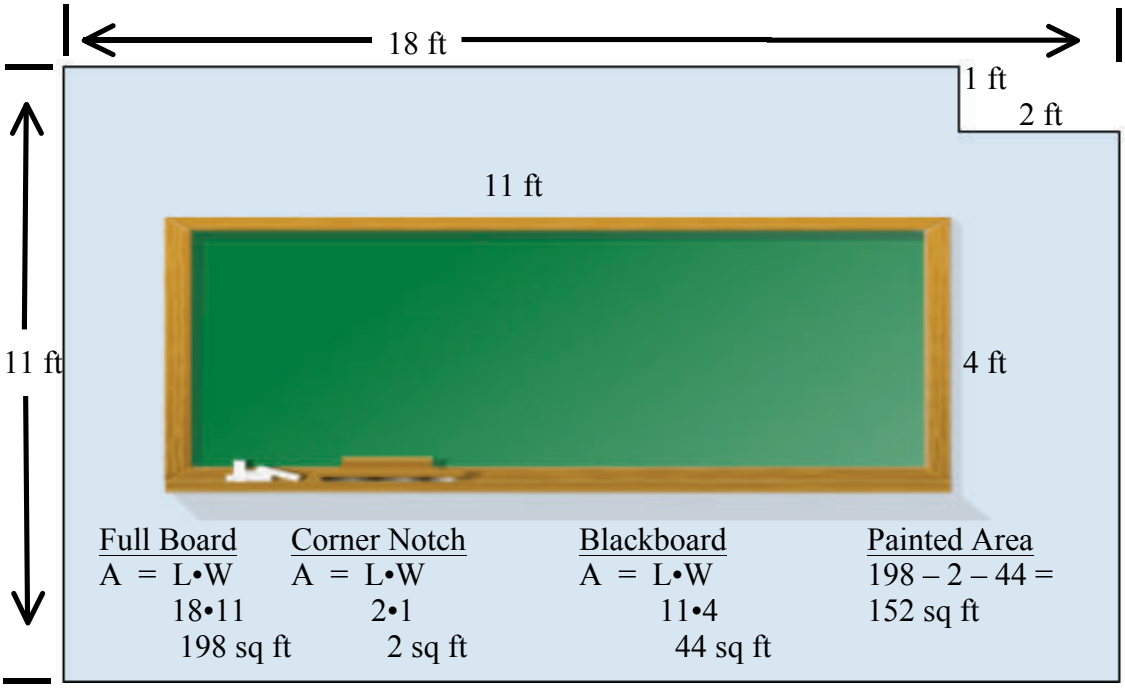
Here are your guidelines:

1) You will just paint what is already painted.

2) ___√ You will turn in **4 sketches.** Each wall will be sketched on the front side of a sheet of paper. Your final work for finding the cost will either be on a fifth sheet of paper or, if there is room, on the same sheet as your fourth sketch.

___√ On each sheet, show **your work for the area of that wall**. Plan ahead to keep all your work on one side of the sheet. Your work **must be organized**. Keep working on your communication skills; I need to understand what you have done.

Here is a sample picture of what a sketch could look like. It is **not** the correct picture to use.



3) ___√ The sketches need to **contain dimensions** on each necessary part. It **is not** critical to find the area of the wall to the nearest square inch, just the nearest square foot. So your measurements can be rounded to the **nearest foot**. The ceiling is 11 feet high.

4) ___ √ Finally, find the cost of painting the room. If you have plenty of room, you can do this work on the sheet with the sketch of the fourth side of the room. If it is too crowded, do it on a separate sheet.

A gallon of paint, which covers about 400 square feet, costs $28.00, and a quart costs $9.50. On the final bill, include the cost of two brushes at $7.35 each, 4 plastic sheets at $2.25 each, and sales tax of 5%.

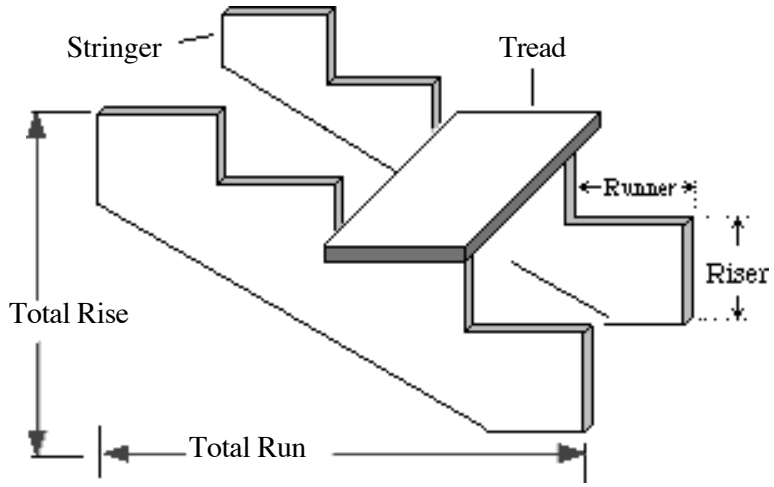
When you figure how many gallons of paint we must order, don't be surprised if it doesn't come out to exactly an even number of gallons. Since we don't like to waste money, you will find out **how many gallons** and **extra quarts** we need to buy. You can also include your **color choice** for the new walls if you would like.

14-Lab B **Steps in the Right Direction** Name _____

It is tool time! In this lab you will construct a scale model of steps that lead from the ground up to a porch. Before we put the tools in your hand, we'd better talk a little about building steps. Study this picture of the parts of the steps because you will need to understand how steps are constructed in order to build them.

1) Carpenters need to understand slope in order to build steps and roof rafters.

   How would a carpenter **determine the total run** of a stringer if the steps were already in place?



2) I am sure you have encountered steps that are difficult to climb. Sometimes they are too wide or have too much rise making them steep and difficult to use. The marble steps to older government buildings and baseball stadiums often have very wide runners. Research has found steps with certain rises and runs are the most comfortable. Tell me the building code for **public building** steps as you learned in 14-0.

   a) Rolling Meadows Nursing Home. rise ≤ _____, run ≥ _____

   b) How do you read: *rise* ≤ *7*"? _____

   c) How do you read: *run* ≥ *11*"? _____

3 a) Residential (or private) homes usually have a different code to follow. In some states the residential code is different. In most states, the building code for homes is rise ≤ 8" and a run ≥ 9". Which set of steps, private or public, is more steep? _____

   b) Explain why you think the public steps are required to be less steep.

4 a) The set of steps above are private steps from a home. **Draw** the tread on the third step.

   b) If you want the rise of each step to be 8", and you put 1½ " thick treads on each step, how high do you cut each of the risers on the steps? _____(Note: Your steps will also be private steps.)

5 a) Even though putting treads on a step seems to make the rise shorter, each step above it is also 1½" higher. In effect they cancel each other out.
   So the answer to question #4 is to still cut each riser to 8", with one exception. Let me help you see the exception.
   Draw in the bottom tread on the above picture. Label the thickness as 1½".

   b) Can you see that the carpenter has to treat the bottom riser differently than the rest? Check out the picture at the right. He (or she) has to cut 1½" off the bottom. That means you would make the bottom riser only _____ tall.

Students use their algebra and geometry skills to determine if the offsets of our running track are correct. They discovered in our school trach were laid out *incorrectly*!

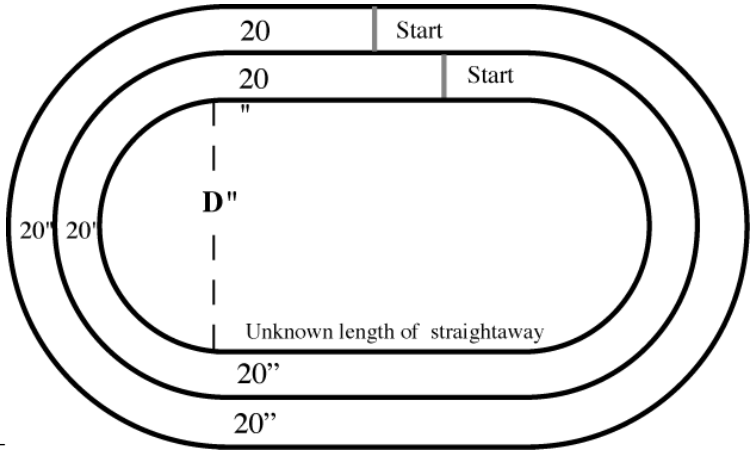
11) Here is one more problem which is very similar to the actual problem **you will be solving on our track**. Find the length of the offsets from lane 1 to lane 2 on this track.

Hint: the straight-aways will make no difference.

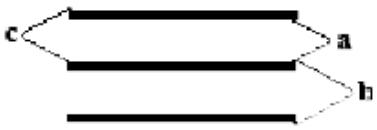
Lane 1 length work

Lane 2 length

Length of offset = _____



When you start to measure the widths of each lane, you will run into your first problem. The painted lines which separate each lane are several inches wide.



Your team will have to **decide if you should measure** from:
a) the inside of the paint on one lane to the inside of the next lane, or
b) from outside to outside, or c) from the inside to the outside.

You will also have to make that same kind of decision when you measure the offsets. **Make sure you explain exactly how you measured in your report.**

LeRoy will grade your report on:
- **How orgainized and accurate the work is. Also, how easy it is to follow.**
- **A chart which contains**:
  1- measured widths of each lane,
  2- the measured lenths of each offset,
  3- the lenths of your calculated offsets.
- **Show your work finding what the correct length of each offset should be.**

"*This material is excellent. I teach students with Learning disabilities and because you have provided lots of hands-on labs and easy step-by-step instructions my students have been successful.*"

Tina H Marshall
Lumpkin County High School, Georgia

"We are having real success with our upperclassmen that were on their last legs to pass a math class before they graduate."

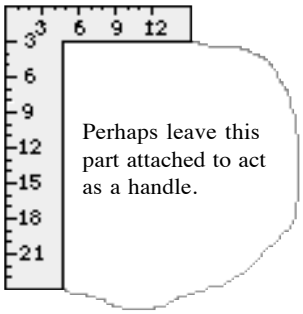
Richard Reynolds
Huntsville, Illinois

"I love this stuff. What a great treat. They don't ask, "When are we can use the stuff?" Parents like it, too."

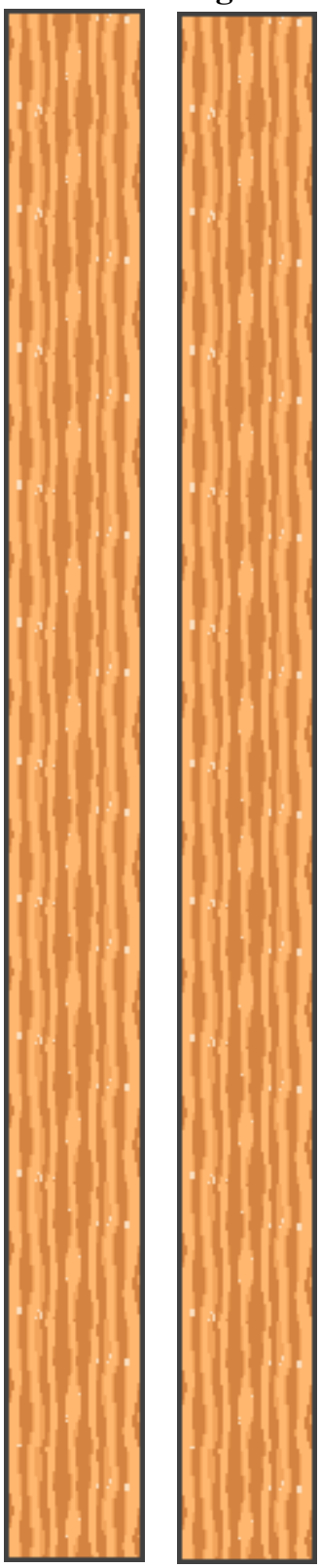
Dave Bucholz
New Lisbon, Wisconsin

14-Lab B **Treads and Stringers**

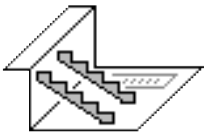
A carpenter uses a **carpenter's square** to lay out the steps on the stringer. Here is your own carpenter's square, **carefully cut it out**. Use the square to lay out the steps just as a carpenter would.



Stringers



Notice the top of the steps aren't even with the top of the porch.



The bottom riser has to be a little shorter to leave room for the thickness of the tread.

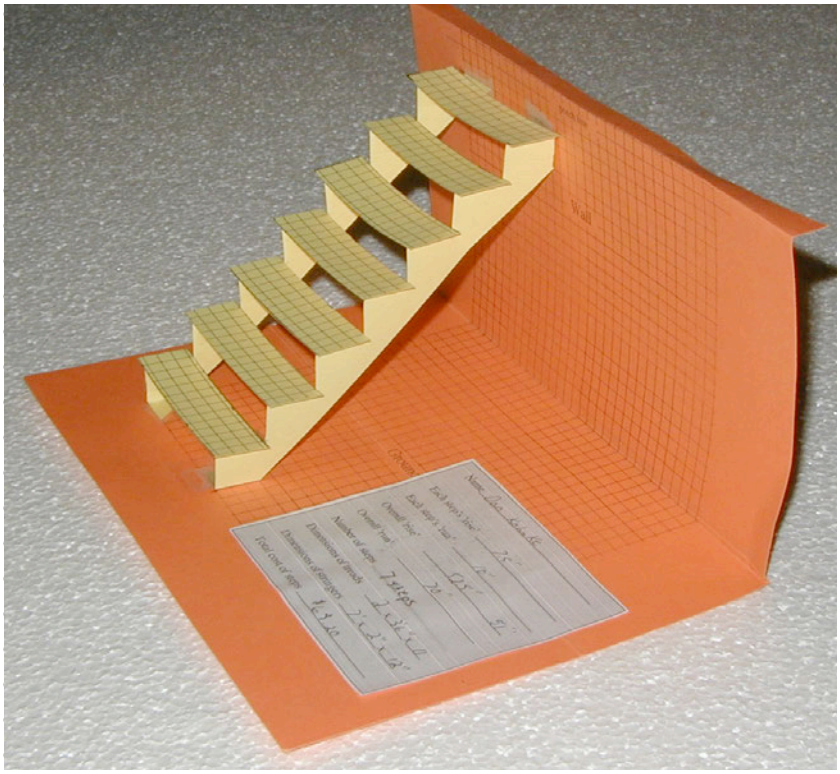
MEASURE TWICE AND CUT ONCE. Don't cut these stringers out until you have them completely drawn. If you plan ahead, you can **leave tabs on the stringer** to attach it to the wall.

You can lay out the **treads** on the grid below. Each square is 3" on a side. **Each tread will be 3' 6" long and 10 inches wide.**

Think hard, you want to leave tabs to glue the treads onto the risers.

Photo of a finished set of steps

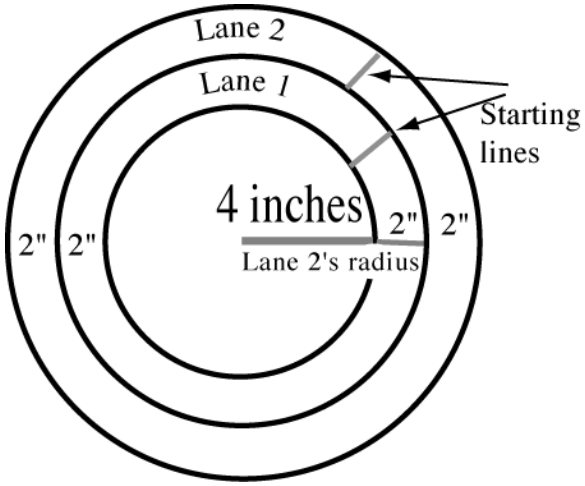
Students come to understand the rise and run of each salt as they build these steps. The attached paper on this bottle contains specifications regarding the building of the steps and includes the total cost.



9-Lab C **LeRoy's Fleas** Name _____

When they were kids, Elrod and his brother LeRoy loved to entertain the neighborhood kids with LeRoy's Flea Olympics. He trained his pet fleas to do all kinds of track and field events. Below is a picture of the running track he built for his fastest fleas. He would put a flea in each lane and have them race.

1) Notice the flea in the outside lane gets a headstart. Why is that?



2) LeRoy also knew that and just guessed at the amount of offset when he marked his track. After the flea in the outside lane won time after time, he thought he may have made a mistake. Will you calculate the correct offset for LeRoy?

a) You can assume that the flea in Lane 1 has been trained to run along the dark inside edge, and the same for Lane 2's flea. Trace the circular path the flea in Lane 1 is running.

b) You will have to use the circumference formula twice, once for each lane. **First draw in the diameter** on the sketch above. Is the diameter for Lane 2 the same as Lane 1?

c) **Lane 1's length**
C=

d) **Lane 2's length**
C=

e) The offset is the extra distance the person on the outside lane has to run. On LeRoy's flea track, what is the offset between Lane 1 and Lane 2?

3 a) If he trained another flea and added a third 2" lane, how much of a headstart (offset) should the flea in lane 3 get compared to the one in lane 2?

Lane 2's length = _____

Work for lane 3's length

b) If his whole troop of eight fleas wanted to race on an 8 lane track, do you think he should make the same offset for all lanes? _____Why?

offset from lane 2 to lane 3 _____ ____

4 If LeRoy made another track with a **bigger infield**, but still kept the 2 inch wide lanes, do you think he needs to make the offsets **longer, shorter,** or keep them **the same length** as his small track?

How do we help poor readers?

- Should we encourage them to take a course in which they do not have to read?

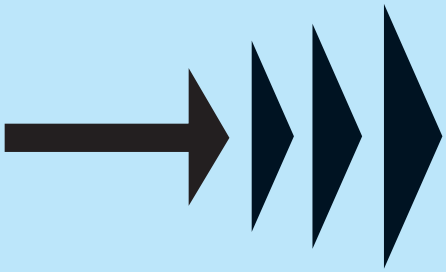
  To the contrary,
  we feel it is our duty to
  help them become better readers.

- Our interactive style of writing, helps all students become more critical readers.

- A readability grade level of 7.2 helps makes our materials accessible to more students.

A lack of organizational skills
is a trait of many students
who struggle in school.

Notice the checkoffs
on each step of this lab.



These checkoffs are one of many
tricks we use to help students
become more critical readers.

Look at the following handouts
to see more examples of our
interactive writing style which
uses short paragraphs,
with frequent checks
for understanding.

1-Lab C **I've Been Framed!** Name _____

In this lab, you are going to learn how to mat a picture. Matting a picture means to put a colored border around it to make it look even better. The color of the mat is very important because it can help bring out the color of one's eyes or make a person's hair even more beautiful.

Maybe you have not thought about it, but different colors of clothing make you look different. You **can** try this at home: hold up different colored articles of clothing near your face so you can see the difference colors can make for your own skin tone and eye color.

____√ 1) Since this lab has a lot of steps, you will see this blank ____√ in the left margin. When you have done a step, just check it off. It will help you keep organized. Check this one now.

____√ 2) Select a picture, **but don't cut any margins off. You will want to leave as much extra as you can.** The mat will hide it.

____√ 3) Even though the pictures below are in black and white, the borders make a difference.

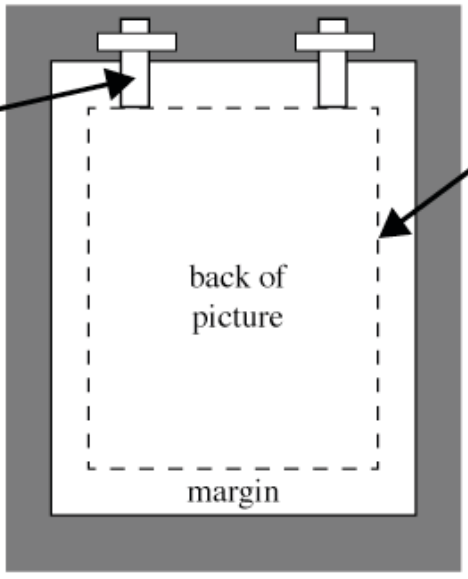
Which picture of Abe do you prefer?

Left or right? _____

To choose the best **mat color**, place your photo on different colors of mat and pick the one which looks the best.

____√ 4) On the left picture, notice the left and right margins are the same size as are the top and bottom ones. On the right one, you can see the bottom margin is larger than the top one. On big pictures, such as 11" x 14", it looks better if the bottom margin is larger than the top.

____√ 5) **Study this diagram**. Your mat will be much larger than the photo you see. Look at the back of the picture of Abe Lincoln. The mat hangs past the edges of the photo. An 8" x 10" picture would use an 11" x 14" mat.



Tape T-Hinges
Some people are surprised to learn the photo is **only attached at the top.**

By doing so the picture won't wrinkle on humid days.

The dotted rectangle shows the hole in the mat where the picture shows through.

LEAVE AT LEAST A QUARTER INCH MARGIN on your picture.
The bigger the margin, the better as it keeps the picture from "falling" out through the front of the mat.

1-2 **Applied Math Rules!** Name _____

You want to be successful this year, so keep trying to "**Read to Succeed**."

1) Please make a guess at what percent of jobs don't require a four-year university degree. _____

Research shows that in 2020 and beyond, 67% of all jobs will require more than a high school diploma. For that reason, it is critical that you continue your education after high school at a technical college, an apprenticeship, military training, a four-year university, or even on-the-job training. This class will help you prepare for all those options.

2) **The ability to communicate well** is critical for success in all areas of life. Throughout this course we will try to help you improve your communication skills. Let's practice. Do your best to write **a sentence** which explains what the bottom of a fraction, the denominator, tells us.

_____

_____

3 a) Many of you probably found it was challenging to accurately describe the denominator.

Let me see if this helps. Everyone can see this candy bar is divided into **fourths** and if you ate three of the parts, then you will have eaten _____ of the candy bar.

b) So the four in the $^{3}/_{4}$ tells us how many **equal** parts the candy bar was divided into.

Here is the definition **you must memorize** by tomorrow.

The **denominator** tells us **how many equal parts an object is divided into.**

c) What does the denominator of a fraction tell us? (Writing it will help you memorize it.)

The denominator tells us _____

_____.

4) Divide the first candy bar into thirds and the second into fifths. (Just make accurate estimates.)

a) b)

5 a) Put an X through two parts in each bar. Those will represent pieces you'll eat.

b) Name how much of each bar you will eat. a) _____ b) _____

6) By looking at your answers and the pictures above them, explain what the **numerator**, or top part, of the fraction tells us. The _____

_____

I hope you wrote something like…

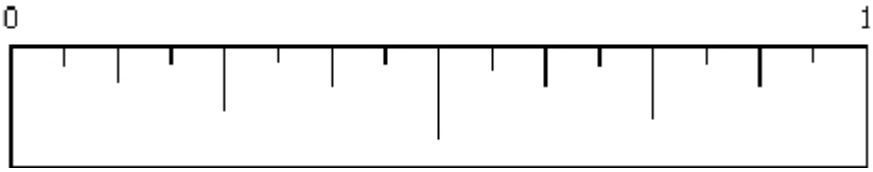
The numerator tells us **how many of those equal parts you have.**

7) Man has always had a need to measure things in attempt to describe how long, how tall, or how far something is. Our measuring system, called **The English System**, has been around a long time and it is quite easy to learn how to use.

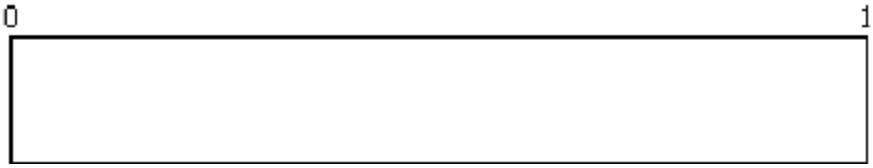
My first goal for you is to make sure you know how to read a ruler.

a) This picture is a magnified inch. How many parts is an inch (on a typical plastic ruler) usually divided into? You are going to bild an inch which looks like the one here.____

____



b) Using your *good eyes*, divide the **rectangle below** in half with a long **vertical** (up and down as in the ruler above) **segment.** You don't need to measure it, just try to be as accurate as you can. **Label ½ above** the middle mark you made.



c) Now, **divide each** of those halves into **half** again.
Since the rectangle is divided into 4 equal parts, **label** the left one $^1/_4$ and $^3/_4$ on the other.

d) Write a **sentence** to explain the following: The $^1/_4$ and the $^3/_4$ are labeled, but why isn't the $^2/_4$ labeled? (Use a capital letter to start and do a good job with the punctuation.)

_____

_____

e) Go back to the rectangle and divide each of the quarters into **half** again. (Draw in 4 more marks.) Now your inch is divided into _____ equal parts. So obviously each of those marks represents $^1/_8$ of an inch.

f) The **numerator tells us how many of** _____

g) Above each mark label them as $^1/_8$, $^3/_8$, $^5/_8$ or $^7/_8$.

h) Finally, you are going to divide the eighths in half again and you've made sixteenths. On your sketch, use your good brain to **label all the sixteenths.**

i) You will measure lots of things this year using tools ranging from micrometers to graduated cylinders. To do so, you need to know the definition of the denominator. What is it?

The denominator of _____

_____

j) The answer to this is also on page one. Finish this sentence: "The **numerator** tells us

_____

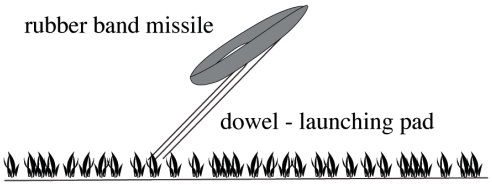
19-Lab A **Rocket Man** Name _____

You are involved in a top-secret mission to gather and analyze data about a new missile system the Father-Land is developing. You are to report the results of your study ASAP.

I have handpicked teams of highly trained, intelligent agents. One will serve as the Missile Launcher, another will act as Launch Control and a third will be the Height Controller. As agents, you can choose which job you will engage in but **do not change roles** during this operation.

Agent 1 – Launcher

- Determine the best way to hold and release the rubber band missile in order to always **duplicate** the launches.
- Fire only at the command of Launch Control.
- Never, under any circumstances, aim a loaded missile at a humanoid.



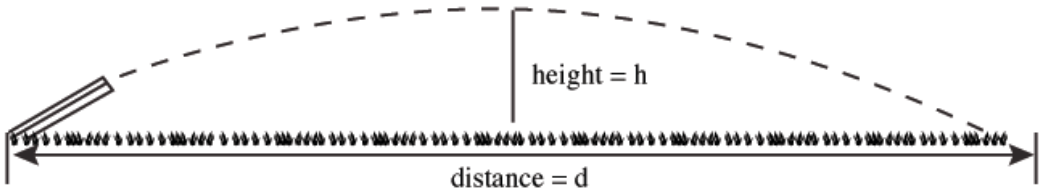
Agent 2 - Launch Control

- You will determine how many times you will need to launch the rubber band to get accurate data. While wind conditions will affect the results, do the best you can.
- Measure the distance of final launches and reject data, which you feel is unacceptable.

Agent 3 - Height Control

- Your will determine, as best you can, the peak height of the missile. It will be a challenging undertaking. The final results will depend on your skills.

- Give the launch command.



Countdown to Launch

___√ 1) Use the protractor to help you insert the dowel in the ground at an approximate 15˚ angle. Make sure it is not aiming in a direction that will affect any other team's launches, nor their down-range area.

___√ 2) Practice five to ten launches to find a good anchor-point and consistent release method. After finding a good anchor-point, **lightly** mark that point on the dowel with a **pencil**.

Your goal is to have the missiles land in the same approximate area. Wind conditions can have a great impact on your missiles, but when you are comfortable with the launch procedure and consistency, move to the next step.

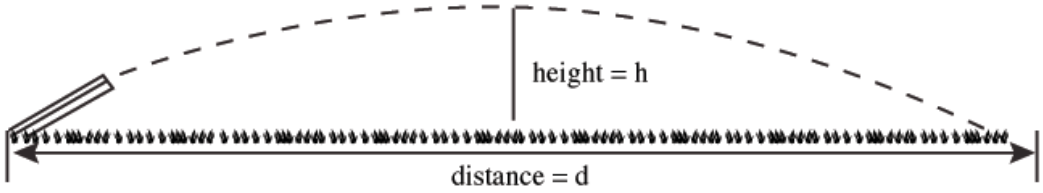
___√ 3) Gather the missiles and shoot several more practice missiles to form somewhat of a cluster. The Launch Controller (L.C. for short) will use radar, sonar, GPS, and instinct to predict the **anticipated point of impact** of the next launch.

Stretch a tape measure, metric side up, from the launch pad to the anticipated point of impact. Clear the impact area of "spent" missiles; you do not have to measure them.

___√ 4) Now it is time for the real launch. The Height Controller's job will be to measure the peak height of this missile, affectionately called the "Rubber Bomb."

The peak height **is at the vertex of the parabola**, so use the tape measure to estimate where the vertex will be. Have the Launch Controller stand close to the line of fire near the vertex.

The LC will hold several meter sticks rubber-banded together to help determine the missile's height as it passes.



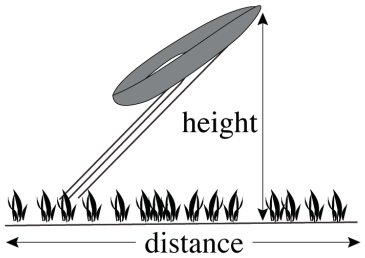
___√ 5) The **H.C.** will face the L.C. looking at the meter sticks as the missile passes. Estimate the highest point, in **meters**, of the flight of the missile's flight. Note: The height will almost assuredly not be a whole number such as 2 meters; it will be something like 1.73 meters. **Have everyone record the height in their chart.**

Warning: If this missile did not land near the estimated area of impact, disavow all knowledge, as the Father Land will, and fire a new Rubber Bomb missile.

___√ 6) Then measure the **actual length of flight** in meters and record results in this chart. Note: Again, the distance will almost assuredly not be a whole number. Measure from the **base of the launching pad** to the **middle** of the rubber band lying on the ground.

___√ 7) Measure, and record, the height and distance of the launching pad in meters. These, too, will only be a **fraction of a meter**.

Record all lengths in **meters**.



Path of Missile Data			Launching Pad Data	
Angle	**Distance traveled**	**Height**	**Height**	**Distance**
15°				
25°				
35°				
45°				

___√ 8) Repeat the experiment, this time using an angle close to 25°. Shoot some practice ones to establish a landing area. Fire *the real one* and measure the height and the length. Don't forget to record the new data about the launching pad.

___√ 9) Do the same thing for a 35° angle and finally a 45° angle of launch.

___√ 10) Collect all your equipment, making sure not to leave any traces of your presence. Store the materials in our headquarters in their proper place.

Just think; students will actually label their work!

Before we use this method, quite a few students came to a problem with a lot of numbers in it and would either:

a) give up, or
b) just start punching numbers in their calculator.

By having labels on their answers, it also helps him to recognize if their answer is not logical.

They also can tell what it is appropriate to round up or round down.

Entice learning

- **Course I** builds students' basic math skills. You will see their confidence grow as their ability improves. This growth continues in Course II.
- Our embedded humor is a proven technique to enhance learning.
- Applications and relevance help capture students' attention.
- Editing can make lessons more meaningful.
- Our handouts have great titles which add interest.

  - Applied Math Rules
  - LeRoy's Fleas
  - It's Snow Problem
  - What's Up Dock?
  - Igloos are Cool
  - The Game of Life

ENTICING

Don Gorske is a Big Mac Maniac!

Talk about a Big Mac attack! It took him 30 years, but as April 18, 2009 he had eaten 23,483th Big Macs! What's more, in the past 37 years, he has only missed seven days of enjoying one.

He keeps accurate records of every Big Mac he has eaten and tells us he ate 267 during his first month in 1972. Don now averages about two a day.

Each year AMME students from around the nation calculate everything he has eaten so far. For example, they determined he has eaten approximately 1,730 pickles, 6,600,000 sesame seeds and the hamburger from 16 cattle. Opposite is the first page of our "Big Mac" handout, the full activity was highlighted in "Scholastic Math Magazine." You may have seen Don on Oprah, Inside Edition, the Jimmy Kimmel Show and others.

5-Lab B **Don Gorske -He's Ronald's Hero and Mine Too** Name _____

Fond du Lac, Wisconsin is lucky to have a native son as famous as Don Gorske. Back in May of 1972, the Fond du Lac, WI McDonalds offered Big Macs for the first time. Don ate one and liked it. He liked it a lot, so he bought another, and another, and another...

He would throw the empty cardboard containers in the back of his car when he was done with them. After one month, even his buddy wouldn't ride with him because of the awful aroma. As Don was emptying the old containers from the car, he realized **he had eaten 265 in only one month**!

Mentally estimate how many he averaged per day. Remember, we are dividing by 30 days, so round

the 265 to a compatible number. = _____

How could anyone eat nine a day without getting sick of them? Since then he has continued to eat Big Macs virtually every day for over thirty-five years. Don keeps a record of every one he has eaten since that first month, although now he usually eats "only" two per day. Since 1972 he has eaten at least one Big Mac every day with the exception of only eight days! In May of 2018 he ate his **30,000th Big Mac** at the Fond du Lac McDonalds. He still believes Big Macs are the world's greatest food!

> Your job in this lab is to find how many: **cattle**, **heads of lettuce**, **pounds of cheese**, **gallons of special sauce**, **pickles**, **onions,** and **sesame seeds** Don has eaten.

Here are the jobs that need to be done and you will decide how to divide them up. **Put your name by the job(s) you will do**. Each person in your group must help out:

_____ Contact a butcher to find how many **pounds of hamburger** they get out of an average "head" of beef.
Whom did you call? _____

What was the average number of pounds?_____

_____ Experiment to find how many slices can be made from one "average" pickle.

How many pickles did you use? _____ Average # of slices? _____

_____ Go to a grocery store and find the weight of several heads of lettuce and onions. **The more you weigh**, the more accurate you will be.

____ heads of lettuce =____ total weight; ____ # onions = _____ total weight

_____ Take a field trip to McDonald's and **count** sesame seeds on Big Mac buns to get the average number of seeds per bun.

_____ Visit, or call, McDonald's and ask the manager for the following information:
Be thoughtful and do it during times when it is **not** their busiest time.

What does each of the patties of beef weigh? How many are used? _____

How much does the lettuce weigh? _____

How much does the cheese weigh and how many slices are used? _____

How many ounces of special sauce are used on Big Macs? _____

How much do the onions weigh? _____

How many pickles are on a Big Mac? _____

The Joy of Editing!

All in materials including the teacher notes, homework handouts, hands-on quizzes, and tests are on Word processing files that will open on both PC and Mac computers.

Think how easy it will be to make a attach worksheets to the school website, make a second test, or even
print out detailed lesson plans for a substitute teacher.

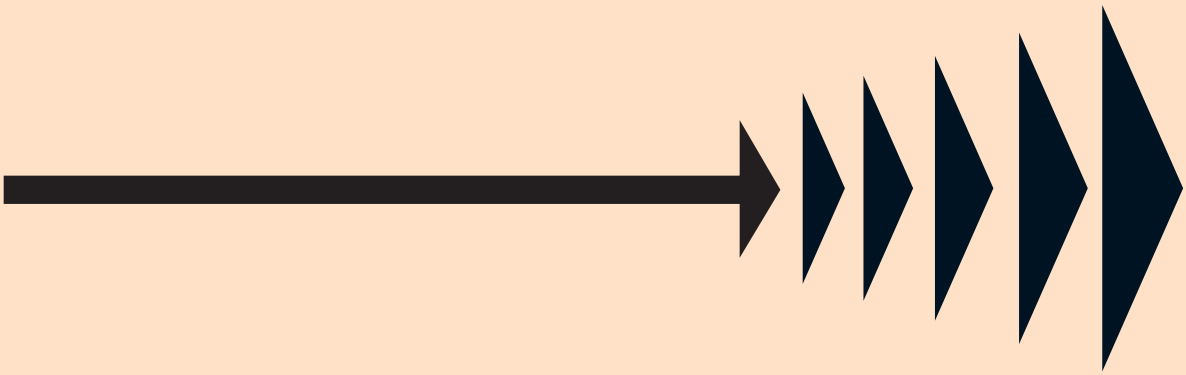
AMME materials are copyrighted, but they are licensed for one district building site. This means, you can share the hands-on geometry and algebra activities with other teachers in your building.

Teachers are allowed to place the software both on a school computer and one at home. As the number sections grow, your school won't worry about purchasing more texts to start the year.

Edit the text!

- **Easily make a second test**
- **Personalize questions**
  (add student & location names to "hook" students)
- **Update data for problems**
  (prices and facts never become outdated)
- **Adapt labs to your environment**
- **Give your sub detailed lesson plans**
- **Make it meaningful**
  (rewrite problems to address the lives of your students including their cultural environment)

Change the names of the cities and numbers of the roads to ones near you.



By doing so, students can better relate and more learning can take place.

3-Lab C **Reading Road Maps** Name _____

Since it is so much fun to travel, everyone should understand the **Federal Highway numbering system**. It's really quite easy to drive in large cities as long as you can understand the system. There are only three important parts for you to know.

I) ODD NUMBERED highways run **NORTH & SOUTH,**
and **EVEN NUMBERED** highways run **EAST & WEST.**

(Just think of Highway 41; it runs north & south. Of course, some odd numbered roads run east or west for a while because of obstructions such as lakes or rivers, but then they turn to run north or south again.
Warning: State highways usually do not follow these rules.)

The numbering system is probably the **most important thing to know** when driving in new territory. While traveling in a large city, it is crucial to know **what exit** you are looking for and the **direction** of the road. It's so easy to drive in the wrong direction if you don't know the Federal highway numbering system.

1) State EVEN or ODD, then clearly explain why. Remember, I expect you to write sentences.

   a) You're going from New York City to Chicago on a Federal Highway. _____

   _____

   _____

   b) You're driving from Texas to Wisconsin on a Federal Highway. _____

   _____

   _____

II) THREE DIGIT HIGHWAYS
If the **first** digit is **EVEN**, then the road is a **BY-PASS.** It takes you around busy cities.
An **ODD first** digit means it is a **slow route** through a city. You will often have stoplights to deal with on a slow route.

2) Tell whether the highway will take you around the city (BY-PASS the city), or whether it is a slow route through the city (SLOW THROUGH). Write "by-pass" or "slow through."

   a) Hwy 831 _____ b) Hwy 594 _____

   c) Hwy 141 _____ d) Hwy 414 _____

3) Toni is in a hurry to get from Fond du Lac to Chicago. When she gets to Milwaukee should she take Highway 145 or Highway 894? _____ Please explain your answer.

4-Lab C **Road Trip Problem** Name _____

You have just been hired for a nice job in a good company. Some of your coworkers were talking about how much fun it would be to do something as a group, so you decided to organize a group trip on December 17th to the Pabst Theater in Milwaukee to see *Stomp*.

In these next few paragraphs, I am going to give you a lot of information. To keep organized, you should **write it down on another sheet of paper**. You can record the date and place now.

You hope to get about 20 people to come along. Rather than have everyone drive his or her own car, it would be more fun to rent a bus (coach) or some vans from Nichol's Bus Company.

Here is what the bus company charges:

Coach- (with driver) $55 per hour, which [illegible] until bus returns plus $1.40 per mile
You can request a bus, which carries 21, 23, or 29 people at the same price.

Van (You supply driver.) $95 plus $1.05 per mile - These vans hold 10 to 12 adults.

The bus will take you to dinner at *Buca di Beppo Restaurant* in Milwaukee [illegible] buy his or her own dinner. Afterwards, the group will head to the theater.

The tickets for the show will cost $55 and you have to **collect that amount when people sign up** so you can order the tickets in advance. If you leave around 4:30 p.m., you can do everything you want to do and still get back by midnight.

1) What is the total cost per person for each choice of transportation?

   Make sure that your work is very **neat, organized and well labeled**. I'll expect you to do your best -- that means you first do your work on another sheet, and then copy it here.

Coach Van

_____ per person _____ per person

Remember, this cost does not include the cost of the tickets.

2) One choice will probably be more expensive than the other and it might be tough to decide on which one you prefer. You don't want to charge too much or people will not go due to the cost. **Here's a trick that works:** list all the **advantages** for selecting the **more expensive choice that you can think of**. That will help you decide if the extra cost is worth it.

   -
   -
   -

The Joy of Editing

As you skim this handout,
you may wish to edit the following:

Stomp?
Change it to a more popular group.

Milwaukee?
Change it to a town near you.

Nichols Bus Service?
Change it to a local bus company.

Are prices outdated?
Change them.

You now have the power to edit your text.

It never gets old, and you will never have a need to buy new texts again.

Detailed daily lesson plans

- Include a day-by-day planner for traditional and block schedules
- Make it easy for beginning teachers and substitutes to follow
- List the objectives and supplies
- Include great teaching hints
- Make AMME teacher-friendly
- Make weekly lesson planning a breeze

AMME, Inc
Applied Math Made Easy - Unit 17

A Radical Idea

Preface:
This unit will help students learn more about square roots and other radicals. Since this is an applied class, students often use decimal approximation of radicals, however we know many students will be taking geometry or advanced algebra after this class so we teach students how to use simplest radical form. As per NCTM recommendations, we do not stress the rationalization of denominators. The Pythagorean theorem and the special 30-60 and 45-45 right triangles will also be studied along with their applications.

Goal:
The student will understand the meaning of square and cube roots and apply them while using the concepts of special right triangles and the Pythagorean theorem to solve real-life problems.

Learner Outcomes:
- The student will be able to recite and understand the definition for the root of a number.
- The student will be able to read the root of a number properly.
- The student will be able to calculate the square root and the cube root of a number using his or her calculator.
- The student will be able to recite squares of all one digit numbers.
- The student will be able to estimate the square root of a two digit number.
- Given one side of a special right triangle, the student will be able to find the lengths of the other two sides.
- The student will learn the difference between an irrational number and a rational number.
- The student will be able to use the Pythagorean theorem to solve for a missing side on a right triangle.
- The student will be able to utilize formulas with radicals.

Supplies needed for this unit:

Lab A - Each pair, or group of three, will need…
meter stick
string, not too thick and about 1.5 meters long
2 weights, we used $^3/_8$ ounce fishing sinkers but the size could vary
stopwatch

17-4 Each student needs at least 27 cubes, we use plastic cubic centimeters

Lab B- 2 sheets of graph paper per student, we used quarter inch squares
scissors
5-6 glue sticks

Lab C - Each pair, or group of three, will need…
4 stakes ($^3/_8$ inch dowels cut into 18 inch lengths work well. The dowels will have to be color coded for each group, we used colored tape in different patterns on the top. They will also be used in Unit 18.)
2 tape measures
cord- at least 60 feet and up to 125 feet (Use a stout, not too elastic brand.)

Timetable:

Day	Traditional Schedule (14 days)	Block Schedule (9 days)
1	Hand back and go over Unit 16 Test Handout 17-0 Pizza Cake	Hand back and go over Unit 16 Test Handout 17-0 Pizza Cake Start Handout 17-2 Is Your Brain Squared…
2	Handout 17-2 Is Your Brain Squared…	Finish Handout 17-2 Is Your Brain Square… 17- Lab A Creating Time
3 & 4	Finish Handout 17-2 17- Lab A Creating Time	Finish 17- Lab A Creating Time Handout 17-4 The Root To Success Handout 17-6 Make It Simple
5	Handout 17-4 The Root To Success	17-Lab B It's All Greek to Me
6 & 7	Handout 17-6 Make It Simple 17-Lab B It's All Greek to Me	Handout 17-8 Time With Pythagoras Handout 17-10 These Are Special
8 & 9	Handout 17-8 Time With Pythagoras	17-Lab C Set Me Up, Spike Handout 17-12 Review
10 & 11	Handout 17-10 These Are Special	17- Test
12	17-Lab C Set Me Up, Spike	
13	Handout 17-12 Review	
14	17- Test	

17-0 It's a Pizza Cake ½ day

• You may wish to go over the Unit 16 test and then use this handout to introduce Unit 17. The problem deals with dividing a 12-inch diameter pizza into two equal parts by cutting a smaller circular pizza from the center of the larger pizza. The students will have the challenge of finding the radius of the "inner pizza." Some students will not know the meaning of square roots and will be encouraged to find the answer by the guess and check method.

• The second problem will introduce cube roots by asking them to find the radius of a hot air balloon with a given volume.

17-2 Is Your Brain Squared Away? 1 to 1½ day

• Students will learn the very important definition of a square root. They will practice estimating the values of square roots and then be taught how to use their calculators to find roots.

• The definition states: $\sqrt{x}$ **is the number you square to get x.** It sounds so simple, but it does take a while for students to comprehend it. Practice by asking students to apply the definition, for example to $\sqrt{4}$. They should say, "$\sqrt{4}$ **is the number you square to get 4.**" The goal is for them to **understand** the definition and a later question such as, "What does $\sqrt{4} \bullet \sqrt{4}$ equal?" will help to tell if they do or don't grasp the idea. Most students will reply, "Four," but when you ask them how they got it, you will probably learn they don't yet follow the definition. Answers may be: "Well, the $\sqrt{4}$ is 2 and 2 • 2 is 4," or "$\sqrt{4} \bullet \sqrt{4}$ is $\sqrt{16}$ and that is 4!" Both of those show they do not understand the definition. Try to help them reason: $\sqrt{4}$ **is the number you square to get 4,** and therefore if I square $\sqrt{4}$ I get 4! There is no intermediate step; $\sqrt{4} \bullet \sqrt{4}$ is 4.

• They will learn the difference between $-x^2$ and $(-x)^2$ as they review the basic exponent laws. Irrational numbers are also introduced.

Supplies: Graph paper

17-Lab C **Set Me Up, Spike** 1 day

• The students will lay out one-half of a volleyball court (or a square 30 feet on each side) outside on your school's lawn. The challenge will be to lay out the right angles to insure the figure is square and not a rhombus. This skill is needed by anyone who is building a deck, laying out a foundation for a garage, and of course, for setting up a volleyball court for a competitive game at a family oicnic.

• Since the last handout dealt with the Pythagorean Theroem, we hope they will make the right angle corners by using a Pythagorean triple. In order to make sure students are using the Pythagorean theorem, we have them use tape measures which are only 25 or 30 feet long, but not long enough to measure the roughly 42' diagonals of the square. Later we check their accuracy by measuring their diagonals, which should be 42' $5\frac{1}{8}$" long.

• Since the challenge is to make the adjacent sides be perpendicular. You will want to be careful some students aren't able to use perpendicular sidewalks or football field chalk lines for reference. Start each group out by tossing the first two stakes in a rough position where they will be, trying to make sure the sides will be oblique to any sidewalks. The students are then told which direction to lay out the final two stakes.

• Each group will get four stakes, heavy cord, and a tape measure. We also like to give them some very small stakes, such as bamboo skewers, which are found in grocery stores. The skewers can be used to more accurately set up the right triangle. It is not necessary that they wrap the cord around all four stakes, but **if they tie the cord on the stakes, tell them have the cord lie on the ground so** they, or others, will not trip on it.

Grade Form

____ fghgg

____ cvbnb

____ assdf

a) **It is important** that you have a measuring tape **at least 42' long**.
b) If your class period is around 50 minutes, time is time is often a problem. As soon as students are finished, measure both diagonals of their court.
c) But before you measure, ask them if you should measure from the inside of the two corner dowels, the outsides, or from center to center. **Record these lengths and also tell them to record the two lengths.**
d) Students are graded both on their write-up and on their accuracy. A grade form is available for this lab, and it is also on your AMME flash drive.

Continued

Supplies Needed: Each group of three will need:

4 stakes ($\frac{3}{8}$-inch dowels cut into 18 inch lengths work well. The dowels will have to be color coded for each group. We used colored tape in different patterns on the top. They will also be used in Unit 18.)
2-3 bamboo skewers
a tape measure – It is important that it is less than 42' in length so students cannot measure the full diagonal. That way they are forced to use the 3-4-5 triangle concept.
Two tape measures would be better than one.
Heavy, non-elastic, cord - at least 60 feet and up to 125 feet.

17-12 **Review** 1 day

• This review is again a practice test. The test, as always, is quite similar.

Where should we begin for math students in the lower 50%?

As classroom teachers ourselves, we quickly came to realize that most of our beginning Applied Math students have almost no understanding of basic math concepts such as fractions and decimals. In order for them to learn key algebraic and geometric concepts, we are convinced **it's critical to first help them build a solid foundation of basic math skills**. Guarding with the basics talk through a visual, hands-on approach, AMME (aim) students become confident in their abilities and soon realize that they too can learn math when it is talk to their strengths.

The rigorous challenges set forth by state standards and but No Child Left Behind Act have most schools trying to find new materials and techniques to make sure that their lowest math students are not left behind. AMME's Course I and II are specifically designed to stand alongside traditional math curriculums and give struggling students the opportunity to catch and even surpass their peers.

AMME Applied Math Course I

Unit 1: Measuring Up in Math
- Students are learning fractions by measuring, the way they are most used in everyday life.
- This unit also focuses on helping students become more critical readers.

Unit 2: 100% Smarter
- Students learn a more visual approach to percents and decimals.
- Students are also learning to become better problem solvers.

Unit 3: Exploding Labels
- Using labels to solve problems. This is our most powerful unit, as it gives students of all reading abilities the chance to solve very complex problems. We have adapted and enhanced dimensional analysis so every student, even those with learning disabilities, can succeed.

Unit 4: It's No Problem!
- More problem solving techniques as this is the unit in which many students come to realize that they are intelligent and can use math to solve challenging real-life applications.

Unit 5: Guesstimation
- Students learn mental math tricks and estimation skills, which are important skills for all students to master.

Unit 6*: Opposites Attract
- Student are now ready to start to learn and understand algebra, especially using a visual approach.
- Signed numbers and inverse operations are used to solve simple equations.

Unit 7: Made in France
- The Metric system is taught in depth. With a hands-on approach, students come to understand the Metric system, as it becomes their system of choice for all types of measuring through Course II.

Unit 8*: ¿Hablás Algebra?
- Students translate English to the algebraic language and solve systems of equations by substitution and graphing.

Unit 9: What's Your Angle?
- Students learn about lines, rays, angles, and perimeter, and all the basic concepts of geometry.

Unit 10: From Numbers to Pictures
- Students accomplish reading graphs and using data to build graphs and charts.

AMME Applied Math Course II

Unit 11: Welcome Back!

- Review of AMME Applied Math Course I. This review allows students who struggled in Geometry and Advanced Algebra a chance to learn and master some of the skills that they need for this course. We also allow students with lower grades in Algebra 1 to enter this course.

Unit 12: Taking Up Space

- Area and perimeter provide real-life applications of geometry.

Unit 13: Fill It Up!

- Volume is a key component of applied math.

Unit 14*: What's My Line?

- Slope and linear equations are now presented and learned. Again a visual approach lends understanding to students, and students see that algebra is logical and not magical. The optional use of graphing calculators also help students to better grasp the concepts.

Unit 15: What's Your Cover?

- Surface area, density, and formula manipulation are all basic concepts in an applied geometry curriculum. Unit 15 teaches these.

Unit 16*: You Deserve the Power

- Exponents and scientific notation are key algebraic components.

Unit 17*: A Radical Idea

- Radicals, Pythagorean Theorem, and special triangles are topics which are used in both applied algebra and geometry.

Unit 18: It's Greek to Me

- Trigonometric ratios are taught with basic right triangle trig.
- Applications of the Law of Sines and the Law of Cosines.

Unit 19*: Powerful Equations

- Quadratic equations and the quadratic formula are taught, and with the help of graphing calculators, students understand these concepts.

Unit 20: can you loan me a buck?

- Simple and compound interest is studied in terms of borrowing or lending.
- Students also use spreadsheets to solve complex problems.

Unit 21: Double or Nothing

- Our hands-on approach helps students grasp statistic and probability concepts such as permutations, combinations, and standard deviation.

*Units that teach "Algebra for all".

AMME helps you release the potential of students who struggle in math.

AMME INC.

RELEASE YOUR STUDENTS' POTENTIAL

AMME's (aim) two-year high school math program is becoming recognized as a most powerful way of reaching the students who are in danger of being left behind. One reason AMME materials were found to be superior is that the authors are classroom teachers who understand the needs of struggling students. These classroom experiences inspire the creation of materials which reach students of all abilities. The state of Washington's Applied Math Council has recommended that all their schools ase AMME materials to help students meet their state standards.

AMME's features give you the chance to reach every student!

- Classroom teachers develop AMME
- A way to reach children being left behind
- Detailed daily lesson plans provide teaching hints
- Hands-on activities are inexpensive and easy to run
- Tutorial approach is helpful for students who are absent
- Skill building handouts prepare for the hands-on activities
- A visual style of learning gives all students access to algebra
- Materials designed to reach students in the bottom two quartiles
- Material on thumb (flash) drive allows you the freedom to edit your text
- The power to reach students who don't see the value in mathematics
- Our writing style allows students of all reading abilities to succeed (7.2 grade level)

Please contact us. We can assist you in putting together a fantastic math program for your students.

8258 Prospect Dr., Kewaskum, WI 53040

262-689-9184 • email: aim@ammeinc.com

AMME INC.

RELEASE YOUR STUDENTS' POTENTIAL

What does it cost and what do we get?

Each course contains easy-to-use binders with detailed teacher notes, hands-on activities, homework assignments, tests, quizzes and answer keys. Your building site-license allows unlimited copies as the number of your math classes grow.

Included are thumb (flash) drives containing word-processing content of everything in the binders. This provides teachers with the power to edit any of AMME's materials to meet specific classroom needs. Each year your text can be better than the year before.

Every teacher has the right to download these files to a home computer making it easy to make a second test, update prices, or in an emergency, email substitute teacher notes.

Course I - first building site-license $2179*
Course II first building site-license $2179*
Unit 21 - Probability and Statistics FREE**
****with purchase of both Course I & II, or $379 with the purchase of either.**

*Districts under 215 seniors receive a $600 discount per course.

Shipping & Handling:
$60 per course set, add $20 for rush shipping

Additional district sites: $1,579 each

Additional complete set of teacher materials: $479 (+$60 S&H)

Release their potential!

Prices are subject to change, so please check our website at www.ammeinc.com before placing an order.

8258 Prospect Dr., Kewaskum, WI 53040
262-689-9184 • email: aim@ammeinc.com