WHAT IS MATH?   NAME:_____
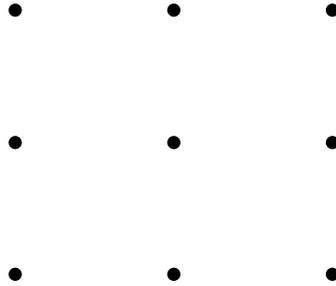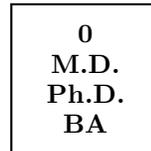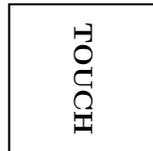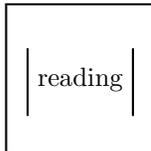
1) Without lifting your pencil from the paper and without retracing any of your lines, connect all 9 dots below using exactly 4 straight lines.

•   •   •

•   •   •

•   •   •

2) Determine the common word or phrase represented by each box below. For example, the first box represents the phrase "reading between the lines."

| reading | TOUCH | STAND
I | MAN
BOARD | 0
M.D.
Ph.D.
BA |

3) How many **SQUARES** of any size are there in this diagram? The answer is **not** 25, and it is **not** 26. It is larger than either of those numbers. Remember the **SQUARES** can be of any size, and your goal is to find and count all of them. (Recall that a square is a four-sided figure that has the same height and width.)
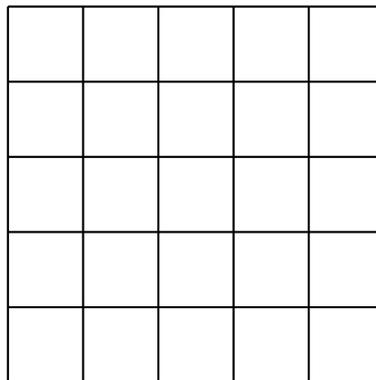
WHAT WILL MATH EVER DO FOR ME?!

American middle school students don't much care that they're worse at math than their counterparts in Hong Kong or Finland. **"I don't need it," my students say. "I'm gonna be a basketball star." Or a beautician, or a car mechanic, or a singer.** It's also hard to get much of a rise out of adults over [this] fact. . . So what if we're tied with Latvia, while nations like Japan and South Korea leave us in the dust? **After all, when was the last time you used algebra?**

But math is not just about computing quadratic equations, knowing geometric proofs or balancing a checkbook. And it's not just about training Americans to become scientists. It has implicit value. **[Math] is about discipline, precision, thoroughness and meticulous analysis. It helps you see patterns, develops your logic skills, teaches you to concentrate and to separate truth from falsehood. These are abilities and qualities that distinguish successful people. Math helps you make wise financial decisions, but also informs you so you can avoid false claims** from advertisers, politicians and others. It helps you determine risk. Some examples:

** If a fair coin is tossed and eight heads come up in a row, most adults would gamble that the next toss would come up tails. But a coin has no memory. There is always a 50-50 chance. See you at the **casino**?

** If you have no sense of big numbers, you can't evaluate the consequences of how **government** spends your money. Why should we worry? Let our kids deal with it

** Enormous amounts of money are spent on quack **medicine**. Many people will reject sound scientific studies on drugs or nutrition if the results don't fit their preconceived notions, yet they might leap to action after reading news stories on the results of small, inconclusive or poorly run studies.

** After an **airplane crash**, studies show that people are more likely to drive than take a plane despite the fact that they are much more likely to be killed or injured while driving. Planes are not like copycat criminals. A plane is not more likely to crash just because another recently did. In fact, the most dangerous time to drive is probably right after a plane crash because so many more people are on the road.

The precision of math, like poetry, gets to the heart of things. It can increase our awareness. It is not possible to really understand science and the scientific method without understanding math. A rainbow is even more beautiful and amazing when we understand it. So is a lightning bolt, an ant or ourselves. Math gives us a powerful tool to understand our universe. I don't wish to overstate: Poetry, music, literature and the fine and performing arts are also gateways to beauty. **Nothing we study is a waste. But the precision of math helps refine how we think in a very special way.**

How do we revitalize the learning of math? I don't have the big answer. I teach middle school and try to find an answer one child at a time. When I can get one to say, "Wow, that's tight," I feel the joy of a small victory.