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Unusual Strategies

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Abstract

This article lists and describes ten *Unusual Strategies* for teaching topics in secondary math. The term *Unusual* is perhaps misleading, as current trends and instruction in teacher education actively promote the types of strategies listed here, so they are quickly becoming quite common. So, when reading these strategies, think more along the lines of *innovative, dynamic, fresh, student-centered*, etc. Math has tended to be a rather *dry* subject, dominated by teacher-centered lecture and demonstration, student practice consisting mostly of worksheets and homework problems, and assessments taking the form of paper-and-pencil tests, with a growing number of those being in multiple-choice format to ease grading or familiarize students with high-stakes testing procedures. The strategies gathered here are an attempt to provide math teachers with a “beginner’s toolbox” with which to break out of that old pattern.

Here are ten *Unusual Strategies* for teaching various topics in secondary math:

1. simulation activity – “How Many Fish Are In My Pond?” (May, 2001)

This strategy utilizes a simulation of the electrofishing technique to estimate fish populations through mathematical sampling. It is useful in helping students to make “real-world” connections to potential math applications. Doing the simulation should provide a more enduring memory of the concept than just presenting the sampling formula and providing sample data to plug into the formula for practice.

2. kinesthetic activity – “Graph This!” (Thrailkill, 2004)

This strategy utilizes kinesthetic activity. It involves using masking tape to mark out a number line on the floor. Students then participate in various math problems by moving to places on the number line, explaining their values, their opposite values, and their absolute values.

3. technology activity – using Geometer’s Sketchpad

As demonstrated by Carol Love (Love, 2005), using the program Geometer’s Sketchpad is a very powerful and interesting way to demonstrate geometry concepts, and their mathematical counterparts, in a way that is very engaging for the students.

4. technology activity – linear regression applet (Unknown, unknown)

This applet can be used when teaching linear regression. It would allow students to visualize the values that are being computed mathematically. This program has a “Guess Line of Fit” function, so the students can make their own initial guesses before asking the program to computer the actual fit. Since the program allows

direct data entry, it can be used with a lesson where the data is coming from any source, perhaps facilitating an interdisciplinary lesson.

5. family activities – Figure This! (<http://www.figurethis.org>)

The “Figure This!” web site, created by the National Council of Teachers of Mathematics (full info at http://www.figurethis.org/about_ft.htm), provides challenging math activities for middle-school math students that can be done at home with the entire family. I would use activities from this site to help promote the idea that a child’s education is greatly enhanced when the entire family is involved, and to provide a more enduring learning experience through the personal interaction. Most importantly, I would hope doing these activities at home would be perceived as being **fun**, and thus my students would be eager to participate.

6. challenge activities – “Problems of the Week” (<http://mathforum.org/pow/>)

”The Math Forum's Problems of the Week (PoWs) are designed to provide creative, non-routine challenges for students in grades three through twelve. Problem-solving and mathematical communication are key elements of every problem.” (Unknown, 2005) I would use this site as a strategy to challenge students to work on problems that might be outside of the specific topics being currently covered in the classroom. Doing so, hopefully, should reinforce concepts learned previously, and perhaps get students to “look ahead” to concepts yet to be specifically covered in class (thus, reinforcing the notion that “learning” is something students need to get used to on their own, and not just having it spoon-fed to them by their teachers).

7. direct experiment

Some mathematical concepts, especially statistics, can be taught via direct experiment, rather than simulation. For example, an introduction to probability lesson can be taught using manipulatives (either real, or virtual) such as spinners, dice, and jars of marbles, as outlined in “Lesson on Introduction to Probability” from the Mrs. Glosser’s Math Goodies web site (http://www.mathgoodies.com/lessons/vol6/intro_probability.html).

8. using individual whiteboards

We were introduced to the usefulness of individual whiteboards in this EDUC 6046 class, and their usefulness is well documented by others as well, “In math we use white boards as a check for understanding. We work on a problem and they can write their answer down and hold it up.” (Whiteboard Activities, unknown) Individual whiteboards can be used for all math topics, and if boards are made or purchased with graph lines already in place, they can especially useful when working on graphing topics. The article “The 90’s Answer to the Chalkboard?” (Stockdale, unknown), from the same web site, gives several suggestions for making, using, and storing the whiteboards.

9. linking learning activities to real-life events

The sport of baseball has long been a hot bed for statisticians. Detailed records are kept on even the most minute and/or mundane details of the game, providing a nearly limitless supply of information for use in teaching statistics. In “Data Analysis and Baseball” (Talsma, 1999), the author presents several different ways in which baseball data could be used in teaching statistics. In addition to using

data compiled by other sources, it would also be possible to have students compile their own data, since the school year now begins so early and overlaps with 7 to 8 weeks of the regular season, and all of the playoffs.

10. calculator based activities

Graphing calculators have become mandatory tools in the high school classroom, and many of the recent models are capable of much more than just punching in numbers and getting a calculated result or generated graph. Texas Instruments offers a portion of their web site for teachers to exchange calculator-based activities. The “CBR Applications” lesson (Clark, 2004), for example, shows how to use collected motion data (such as distance, velocity, and acceleration) to study exponential functions and graphs/transformations.

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