



The University of Georgia

Mathematics Education Program

J. Wilson, EMAT 6600

A Little SMADness

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Goal: to introduce an arithmetic brain teaser



If you are looking for a way to put a little more life in your classroom, the game of SMADness may be just what you are looking for. SMAD is the acronym for (Subtract, Multiply, Add, Divide).

The game

It is played using four dice. One person, usually the teacher, will act as the die roller. The students, working in teams of two or more, are required to use the numbers rolled to create the numbers 1-10 on each roll using the operations of SMAD. Each number can only be used once in the creation of each number. When a team has produced the numbers 1-10, one member should shout 'SMADNESS.' The team members are required to show the results to the entire class. Another team may challenge the results. If the

results are not upheld, the other team can provide alternative results. The team that creates the numbers 1-10 fastest (and accurately) wins.

Here is an example. The teacher rolls the numbers 1, 4, 2, 6.

The solution set for obtaining the numbers 1-10 can be as follows:

NUMBER	SMAD operation
1	$6 - 2 - 4 + 1$
2	$(6 - 4 - 1) * 2$
3	$(6 + 2) - (4 + 1)$
4	$6 - 4 + 1 + 1$
5	$(6 + 1) - (2 * 1)$
6	$(6 / 2) + (4 - 1)$
7	$(6 + 4) - (2 + 1)$
8	$(6 * 2) - (4 * 1)$
9	$6 + 1 + 4 - 2$
10	$(6 + 4) * (2 - 1)$

Note that this is not the only way of generating numbers 1 – 10.

For this discussion, we limit the activities to the 4 basic operations and parentheses. However, the activities could be extended to include operations such as exponents and logarithms.

Impossible Numbers

There are combinations of numbers that cannot be used to form the numbers 1 – 10 by using the 4 basic operations and parentheses. A (non-exhaustive) list of

such numbers, is given below. The number that is impossible to get is on the right column. Bear in mind that this number may not be the only impossible number from the group using the four basic operations.

Numbers rolled	Impossible Numbers
1, 1, 1, 1	10, 9, 8
1, 1, 1, 2	10
1, 1, 1, 3	10
2, 2, 2, 2	9
4, 4, 4, 4	10
5, 5, 5, 5	8
5, 5, 5, 6	3,5,7
5, 5, 6, 6	8
6, 6, 6, 5	9
6, 6, 6, 6	10

So go ahead and try this game out with your class. If you find any other set of numbers that has at least one impossible solution to share, click [here](#).

Strategies

Teamwork is very important. It might be more beneficial to give each team member a set of numbers to work with, than to have each member working out all numbers. For example, if there are three team members, one could work the numbers 1 - 3, the other work numbers 4-6, and the third work on numbers 7-10. The team member who finishes his or her set

fastest will then work with the others who are still working on their sets of numbers.

Reference

Howard, K., & Tecrony, D. [Let the SMADness begin: A Great Skill Builder for All Ages](#)
