

# Mad Math-Student Handout

## Description:

Mad Math is an exciting game designed to make you think on your feet. You and your team will pick a set amount of number (digits 0-9) and operator (+, -, \*, /) cards. Your team will create a math equation from those cards with a specific answer. The excitement comes in when you switch problems with another team and have to race to figure out their equation. The team to first figure out the other team's equation wins!

## General Rules-Elementary School

*If you are having trouble visualizing these steps please look at the attached Adobe PDF file that gives visual instructions.*

1. Put all of the operator cards into one pile and all of the number cards into another pile.
2. Pick 3 number cards and 2 operator cards from off the top of each deck.
3. Using your cards, have the numbers with the given operators equal a certain number X.
4. Write the value of X on a piece of designated scrap paper and fold in half. *Remember your order!*
5. Shuffle your cards and switch all cards and scrap paper with another player.
6. Have that team use the same cards and solve for X.
7. If they correctly solve the problem before the other team they get a point.
8. Put the used cards in both decks and re-shuffle. Go to step 1.
9. The game ends when the first team/player to get to 5 points wins.

*Bonus!* If the team solves for the correct answer in a different way than the first team, they get a bonus point.

## Variations

- Point limits can be increased or decreased.
- The number of operators and number cards chosen increases based on the grade level of the student.
- Middle school: 3 operators and 4 number cards.
- High school: 4 operator and 5 number cards.
- The amount of operators can be extended to parenthesis and exponents for students in pre-algebra/algebra.
- You can either solve the problem with the numbers in the order given or not, but specify this rule before starting the game.

# Mad Math-Teacher Instructions

## Materials:

- Deck of number cards (40; 4 per digit)
- Deck of operator cards (40; 10 per operator)
- Pile of scrap paper
- Pens or pencils
- Bells or just have the students say “Ding!” when they get an answer

## Elementary School Level:

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4. Write the value of X on a piece of designated scrap paper and fold in half. *Remember your order!*
5. Shuffle your cards and switch all cards and scrap paper with another player.
6. Have that team use the same cards and solve for X.
7. If they correctly solve the problem before the other team they get a point.
8. Put the used cards in both decks and re-shuffle. Go to step 1.
9. The game ends when the first team/player to get to 5 points wins.

*Bonus!* If the team solves for the correct answer in a different way than the first team, they get a bonus point.

## Middle School Level:

Same rules as elementary school but with four digit cards and three operator cards. The operators parentheses and exponents can be added for pre-algebra level students.

## High School Level:

Same rules but with as many digit and operator cards to which the teacher sees fit.

## Learning Goals:

-Cooperative Learning: Students must work in teams to achieve common goals: 1. Figure out the solution to a math problem and 2. Figure out the other team’s answer.

-Solidify basic math skills: In order to solve problems quickly students must have basic operator skills at their fingertips. The escalation of skills increases with grade level. The repetition of use of operators will solidify these skills.

-Increase quick recall of math concepts: See explanation above

# Mad Math-Teacher Instructions

Alignment with NCTM standards grades 3-4:

Standard	Translation to Mad Math
<b>Number Sense and Operations</b>	
Select, use, and explain the commutative, associative, and identity properties of operations on whole numbers in problem situations	<p>The commutative property is used to gain the correct answer given the number and operator cards.</p> <p>The associative property will come more into play with pre-algebra students and above.</p>
Demonstrate in the classroom an understanding of and the ability to use the conventional algorithms for addition and subtraction (up to five-digit numbers), and multiplication (up to three digits by two digits).	The symbol cards are representing the basic algorithms for addition, multiplication, subtraction and division.
Add and subtract (up to five-digit numbers) and multiply (up to three digits by two digits) accurately and efficiently.	The students must be speedy in their mathematics operations.
Select and use appropriate operations (addition, subtraction, multiplication, division) to solve problems	Students must be able to quickly have a sense of the types of operators used to solve a multi-step equation
<b>Patterns, Relations and Algebra</b>	
Determine values of variables in simple equations	The cards essentially act as variables and the students re-arrange them to find the correct answer.
<b>Data Analysis, Statistics, and Probability</b>	
Classify outcomes as certain, likely, unlikely, or impossible by designing and conducting experiments using concrete objects such as counters, number cubes, spinners, or coins.	Our reflection and extension questions discuss with the students why it is unlikely to get above or below a certain number

# Mad Math-Teacher Instructions

## Winning Strategies:

-Once you pick your cards make sure to make the most difficult problem possible. For instance if you receive a 9 a / and a 3. Make the problem  $3/9= 1/3$  instead of  $9/3=3$ . Feel free to put the answer into fraction/decimal, or use negative numbers to make it more difficult for the other team.

-Keep in mind that once you receive the cards that the other team gives you, you are at the mercy of their problem. The only way to combat this is to practice the game and make your problem as difficult as possible.

-Good Luck!

## Student Questions:

Discuss what each operator does in the number sentence.

+:  
*Makes a number bigger by a little bit. Can possibly cause a negative number to become positive*

-:

\*:

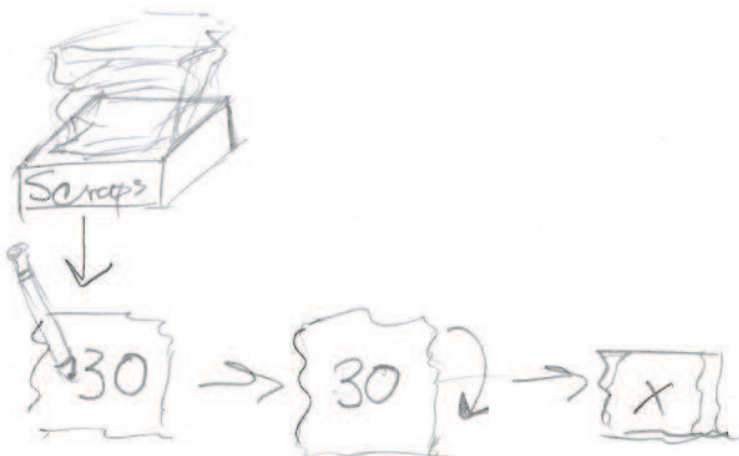
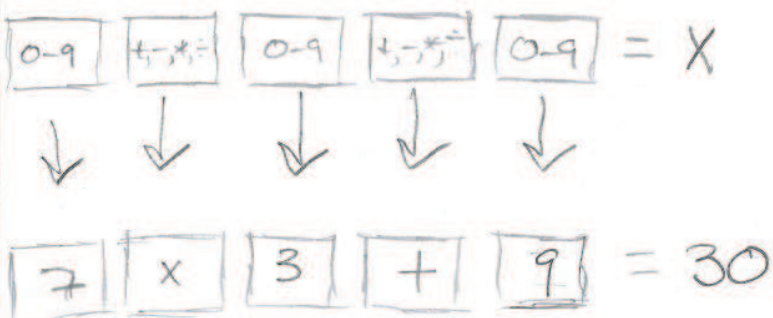
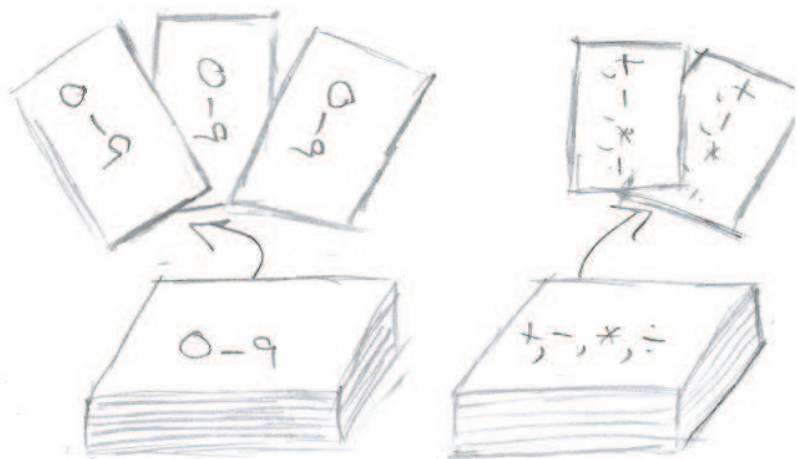
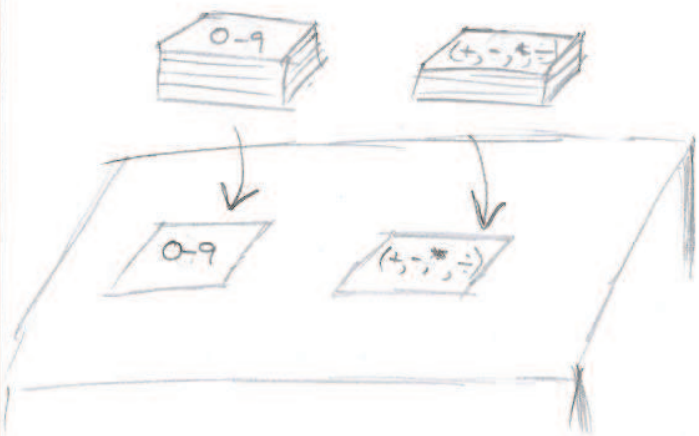
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and how it can be used to make answers difficult. use examples. how can you use this information to understand how to better solve the questions you are given.

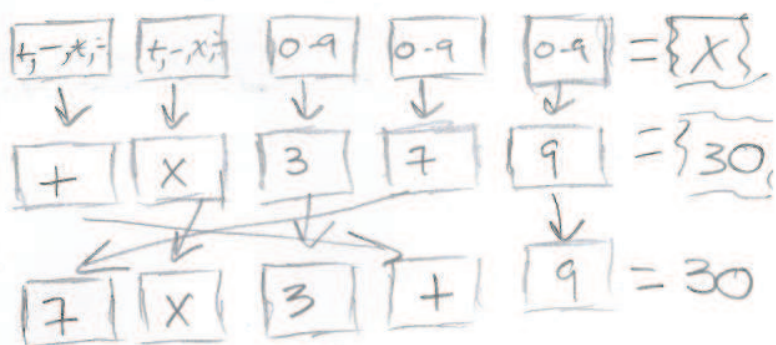
## Extension/Debriefing Questions:

-We asked you earlier to talk about each type of operator and when you would use it. Talk with the rest of the class about how noticing certain operations will help you solve the problems given by the other team quickly.

-Estimate the highest and lowest numbers that you can possibly get in a Mad Math game. Explain your answers.



Team 1

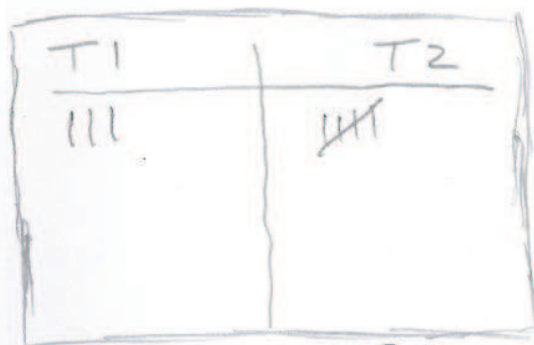
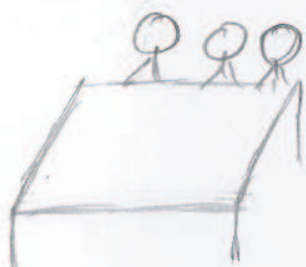


Team 1

Team 2

Team 2

DING!



Team 1

Team 2

