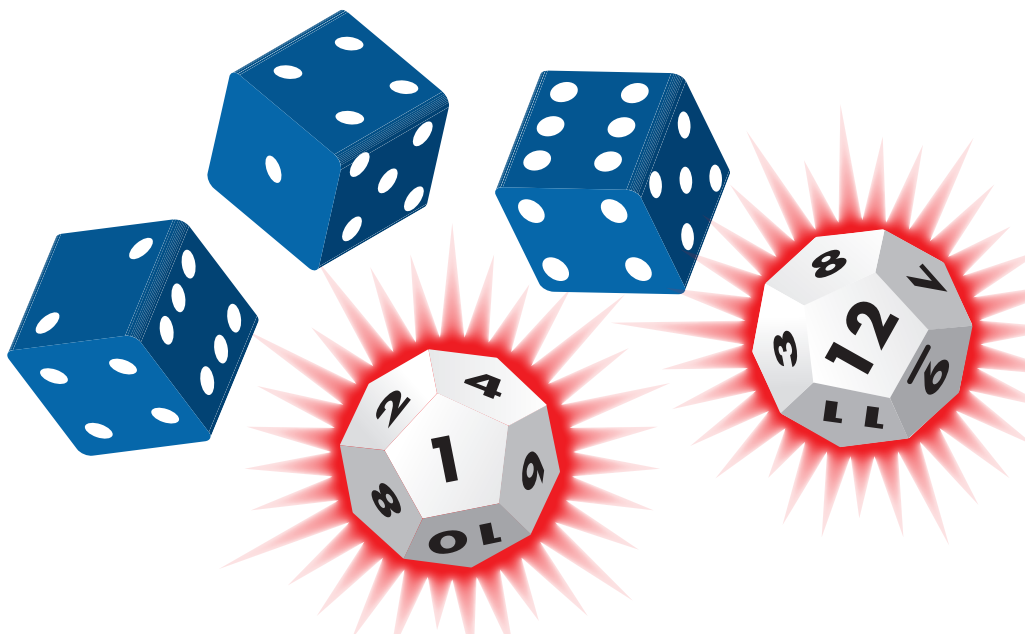


LEARNING GUIDE

MATH DICE[®]

TOURNAMENT KIT



Proven to Sharpen Math Skills!

BENEFITS:

- Strengthens addition, subtraction, multiplication and division skills
- Teaches the rules of exponents
- Creates differentiated learning and play experiences
- Allows you to hold your own Math Dice Tournament

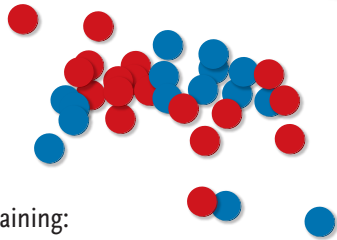
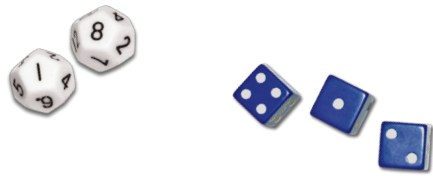


GRADES
5-8

DESIGNED FOR USE WITH 12 TO 18 STUDENTS

MATH DICE[®]

TOURNAMENT KIT



Includes

- 6 Sets of Math Dice Each Containing:
 - Two 12-sided Target Dice
 - Three 6-sided Scoring Dice
- 15 Blackline Masters Including:
 - 6 Station Assignment Sheets
 - 3 On Target Game Sheets
 - 3 Four in a Row Game Sheets
 - Tournament Score Sheet
 - Math Dice Champion Certificate
 - Multiplication and Powers Training Tables Sheet
- 150 Double-sided Game Chips

Table of Contents

Introduction	3
Math Dice Game Instructions	4
How to Run a Math Dice Tournament.	6
Determining a Math Dice Champion.	8
Other Games to Play Using Math Dice	8
On Target–Individual or Team Play	8
On Target–Competitive Play	9
On Target–Classroom Play	10
Four In a Row	11

Introduction

Get students excited about math by holding your very own Math Dice[®] tournament! This kit contains instructions and materials to run a tournament with 12 to 18 students. Playing Math Dice is a fun and flexible way to teach the rules of exponents and strengthen addition, subtraction, multiplication and division skills.

There are many different ways that you can use Math Dice in your classroom. Math Dice based game sheets and training tables are included to add variety to the Math Dice experience and to give students ample opportunity for practice. Here are some things that you might consider doing to help students prepare for a tournament:

1. Explain the rules of Math Dice and have students play the game in pairs or groups.
2. Break students into pairs and have them play On Target and Four in a Row. Once students have mastered the Beginner versions of these games have them try Advanced. For an added challenge, you will find “Make Your Own” versions. Have fun filling in your own numbers on these sheets!
3. Play a round of On Target with the full classroom.
4. Hand out the Multiplication and Powers Training Tables. The faster your students are at multiplication tables and powers the better they’ll be at Math Dice!

The possibilities for practicing Math Dice are endless. Every game will be different and the more students improve their math skills, the more interesting the games will become!

Materials are created as blackline masters to make duplication easy. The kit can be used year after year. If you would like to see additional Math Dice resources or order more sets of Math Dice, go to: http://www.thinkfun.com/teachers_resources/MathDice

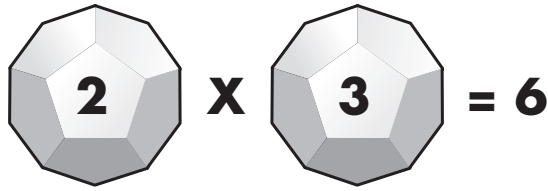
Have fun creating Math Dice champions!

Math Dice Game Instructions

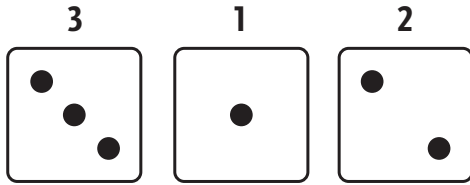
Object: Players try to match or come closest to a Target Number using three Scoring Numbers in an equation.

How to Play:

1. One player rolls the two 12-sided Target Dice and multiplies these numbers together to establish a Target Number. All players should agree that this is the Target Number before play begins.



2. Another player rolls the three 6-sided Scoring Dice to establish the three Scoring Numbers.



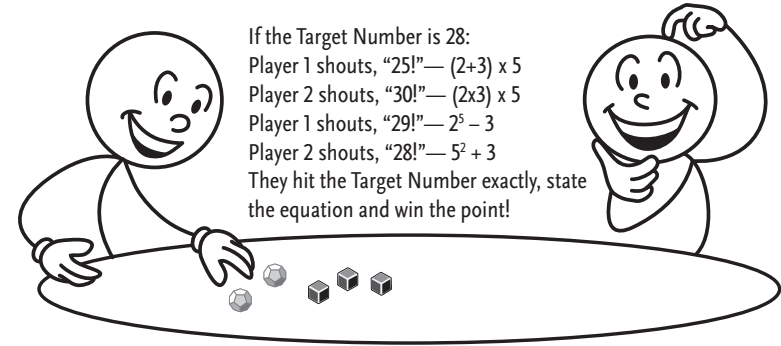
3. Using each Scoring Number only once, players create a math equation that equals the Target Number OR comes as close as possible to the Target Number. Addition, subtraction, multiplication, division and even powers can be used!

Examples: $(1+2) + 3 = 6$ OR $(1 \times 2) \times 3 = 6$

4. Once a player has an answer, he or she calls that number out to claim it.
5. If the answer called out does not hit the Target Number exactly, all other players have 30 seconds to respond with a new number that is closer to the Target Number. The player with the current best answer must remain silent while the other players try for a better answer.
6. Each time a player offers a better answer, the 30 second time resets so that other players have a chance to respond. Players go back and forth with their answers until one player either hits the target exactly or players agree that they cannot find a closer answer.
7. The player with the closest number at the end of the round must state the equation he or she used to reach the answer. If the equation is correct, the point is awarded to

this player. If it is incorrect, the player with the next closest answer can state his or her equation to get the point.

8. The first player to win four points wins the game! Note: In a tournament, the winner will be determined differently. See page 8.



Example Round

Rule Clarifications:

1. A winning answer can be above the Target Number, below the Target Number or the exact Target Number.
2. A player's answer must always BEAT his or her opponent's number to be successful, meaning that it must be CLOSER to the Target Number.
3. If two or more players call out either the same number or two numbers equidistant from the Target Number at the same time, no one claims that number and the game continues. If neither player can come up with a better answer or if both players simultaneously say the Target Number, a tie is declared and no point is awarded.
4. If neither player can come up with an initial answer within 30 seconds, the round is a draw and players roll again.
5. The only time a player must state an equation is when all players agree that this is the closest answer to the Target Number or when a Target Number is hit.
6. Fractions can be achieved through the use of division and they are permitted as valid answers.
7. In order to use an exponent in an operation, a Scoring Number can be used as the exponent number or two Scoring Numbers can be combined to come up with the exponent.

**Example: if your Scoring Numbers are 2, 3, 2,
the equations could be: $(2+3)^2$ OR $2^{(2+3)}$**
 5^2 2^5

How to Run a Math Dice Tournament

This tournament is designed to work for any number of students between 12 and 18.

Object: To be awarded Math Dice champion by having the most points at the end of the tournament.

Setup:

1. Arrange six stations and place a Station Assignment sheet and a set of Math Dice on each.
2. A tournament Match will be between two or three players, so two or three students will sit at each station: If there are exactly 12 or exactly 18 students in your tournament just seat players evenly amongst the stations. For a tournament including 13 to 17 students, the students must be seated in a particular way. Divide players 1 through 12 evenly amongst the stations, then seat the remaining students following these specific station assignments:

Student #	Starting Station
13	3
14	4
15	1
16	5
17	2

3. Hand out a Tournament Score Sheet and a pencil to each student.
4. There should be at least one referee or time keeper who does not play the game (this can be the instructor).
5. The referee should decide at the beginning of the tournament whether scratch paper is allowed or whether all calculations must be done mentally.

How to Play & How to Score:

1. There will be 5 five-minute Matches in a tournament. (Note: you can decide to make the matches longer or shorter depending on what works for your students.)
2. Players play as many Math Dice Rounds as they can during a Match.
3. Follow the Math Dice Game Instructions (see page 4).
4. For each Round Win, a player puts a tally in the “Tally # of Round Wins” column of his or her Score Sheet.

Station Number	Tally # of Round Wins	Circle Your Points for the Match
1	1	2 PLAYERS
2	1	3 PLAYERS
3	1	2 PLAYERS
4	1	
5	1	

5. Thirty seconds before the end of a tournament Match the referee will call out “No New Rounds.” At this time players may finish out their current Round, but may not roll the dice again to start a new Round.
6. At the end of a Match, players tally their Round Wins, and compare their number with the other players at their station.
7. Players circle the points they gained for the Match in the “Circle Your Points for the Match” column:

- a. In a 3-player Match: 1st place gets 2 points, 2nd place gets 1 point and last place gets 0 points.
- b. In a 2-player Match: 1st place gets 2 points and last place gets 0 points.

Match	Station	Player 1	Player 2	Player 3	Tally # of Round Wins
1	2	1	0	0	1
2	3	1	0	0	1
3	4	1	0	0	1
4	3	1	0	0	1
5	5	1	0	0	1
Total Round Wins					7

It is important that students follow scoring in this manner so that it is easier to determine a clear champion at the end of the tournament.

8. Before beginning the next Match, players look at the Station Assignment sheet at their station to find out which station they will play at next. Station Assignment sheets clearly tell players where to go based on placement in a Match. Make sure that players read the sheet according to the number of players currently at their table.
9. Players complete all 5 Matches in this manner.

Below is a Station Assignment Reference Guide:

Station #	2 Players at Station		3 Players at Station		
	First Place goes to Station:	Second Place goes to Station:	First Place goes to Station:	Second Place goes to Station:	Third Place goes to Station:
1	3	1	5	3	1
2	3	1	6	3	1
3	5	2	5	3	2
4	5	2	5	4	2
5	6	4	6	4	1
6	6	4	6	4	2

Note: The Station Assignment sheets are designed so that as players move from one station to the next, they will be matched with other players of similar abilities.

Determining a Math Dice Champion

1. Players add their points for all 5 Matches. The highest score a player can have is 10.
2. The player with the most points is the champion! In some instances there will be several players tied for champion. In this case, you can hold a Finals Match to determine the winner:
 - a. All winning players compete against one another in one final Math Dice Match. The player at the end of the Match with the most wins is the champion.
 - b. If you have four players tied for champion you may decide to have them compete in pairs. The winners of each pair will then compete for the champion award.
3. You may choose to have one champion per tournament, multiple champions or an ongoing Math Dice competition with a tournament per week and a final champion based on cumulative points at the end of a month.
4. If you track results from one week to the next, you might decide to give an award for Most Improved Player.
5. Have fun and be creative with how you decide to hold and run your tournaments!

Other Games to Play Using Math Dice

On Target – Individual or Team Play

Object: Cover all twelve Targets on the game sheet in as few turns as possible.

Setup:

1. The On Target game sheet and 13 game chips are needed to play. You will notice that there are three On Target sheets. One sheet is labeled Beginner and contains the numbers 1 through 12, the second sheet is labeled Advanced and contains higher numbers, and the third sheet, Make Your Own, allows players to choose their own numbers to fill in.
2. Players may choose to have a paper and pencil close by to record their equations as they play.
3. A single chip should be placed at “5” on the Turn Marker at the bottom of the game sheet.
4. The other chips can be left off to the side for use during play.
5. Roll the three 6-sided Scoring Dice and place them in the area marked Scoring Dice at the bottom of the sheet.

To Play:

1. Players use the three Scoring Dice to create equations that equal the Target Numbers (1 through 12) shown on the sheet. Each time a Target is hit it can be covered with a chip. Players should think of as many equations as they can to hit the different Targets on the board. The more Targets hit in one turn the better!
2. When players cannot hit any more Targets using the Scoring Dice, one (and only one) die can be changed to ANY other number.
3. The Turn Marker is now moved to the right one space to “4”.
4. Now that one of the Scoring Dice has changed, players try making new equations to hit and cover additional Targets.
5. Play continues in this manner until all 12 Targets have been covered.
6. If all 12 Targets are covered in five turns or less, it's a win! The final score is equal to the number that the Turn Marker covers at the end of the game. The higher the score the better!

On Target - Competitive Play (Played in Pairs)

Object: To hit the most Targets on the game sheet.

Setup:

1. The On Target game sheet and 13 game chips are needed to play.
2. Each player rolls a die. The player with the highest number is Player 1 and starts the game.
3. Player 1 chooses a color (blue or red) and places a chip with this color facing up in the Place Holder spot on the game sheet.
4. Player 1 rolls the three 6-sided Scoring Dice and places them on the game sheet in the spot marked Scoring Dice.

To Play:

1. Player 1 begins the first Round by attempting to hit a single Target Number on the sheet using the three Scoring Dice. If a Target is hit, this player covers it with his or her color chip.
2. It is now Player 2's turn. Player 2 attempts to reach a different Target with the same three dice. If a Target is hit, his or her color token is placed over the corresponding number on the sheet.

3. Play continues back and forth with each player trying to hit a single Target.
4. If on his or her turn a player cannot hit a Target, the other player has a chance to try to hit as many additional Target Numbers as he or she can before the Round is over.
5. When neither player can hit another Target, the Place Holder chip is turned to Player 2's color. Player 2 now must change one and only one Scoring Die to another number. He or she begins the next Round by trying to hit one of the remaining Target Numbers.
6. Play continues back and forth in this manner until all of the Targets on the sheet are covered with chips.
7. The player with the most chips on the sheet at the end is the winner!

On Target - Classroom Play

Playing On Target as a classroom can foster good conversation and will help kids express the thinking and strategies that they use as they play. Here is a way that you can play with a classroom or large group.

1. Divide students into small teams. Give each team an On Target sheet, 13 game chips, three Scoring Dice and a pencil and paper.
2. Designate one Recorder on each team.
3. Assign one student in the room to roll the three Scoring Dice and announce the numbers. All teams should set their Scoring Dice to these numbers so that they start the game in the same way.
4. Each individual team now plays On Target per the Team game rules.
5. As teams play, the Recorder writes down the equations used to come up with the various Targets. Every time a turn is over and a die is changed, the Recorder makes a note of what Scoring Number changed.
6. Once all teams are finished playing, have a classroom discussion to compare the results of each game.
 - a. What were each team's scores?
 - b. How many Target Numbers did teams hit in the first turn?
 - c. After the first turn, what Scoring Die did teams change? What number did they change the die to? What was their thinking when they made this change?
 - d. How did the results vary from team to team?

Four in a Row (Played in Pairs)

Object: Be the first player to get four chips in a row horizontally, vertically or diagonally.

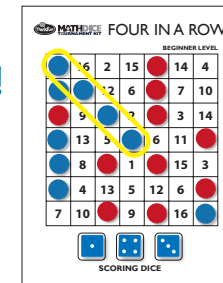
Setup:

1. You will need the Four in a Row game sheet to play. 25 tokens will be sufficient for the average game. You will notice that there are three Four in a Row sheets, Beginner, Advanced, and Make Your Own, in which you can choose your own numbers to fill in. Choose the sheet that is most appropriate for your students.
2. Players choose their colors for the game (blue or red).

To Play:

1. Roll a die to determine the Starting Player.
2. The Starting Player rolls the three 6-sided Scoring Dice and places them in the Scoring Dice area.
3. He or she uses the three Scoring Dice in an equation that will yield an answer equal to one of the numbers on the game sheet. This number is then covered with his or her colored game chip.
4. The next player now has a turn. He or she must change one and only one Scoring Die to a new number. This player now takes a turn at using these numbers to hit and cover a different number on the sheet with his or her chip.
5. Play continues until one player has successfully placed four of his or her chips in an unbroken straight line. This player is the winner!

Blue Wins!



Where It Started

Math Dice® was invented by Sam Ritchie as a “Design a Game” math workshop project for his sixth grade class. Now a software engineer at Twitter,® Ritchie continues to seek out new, innovative ways to inspire thinkers through game play. He recently used his programming expertise to create the mobile app for ThinkFun’s Rush Hour game... and Math Dice is coming soon! Sam hopes that Math Dice will make math more fun and accessible for kids around the world!

ThinkFun's Mission is to Ignite Your Mind!®

ThinkFun® is the world's leader in addictively fun games that stretch and sharpen your mind. From lighting up young minds to creating fun for the whole family, ThinkFun's innovative games and mobile apps make you think while they make you smile.

We can't wait to connect with you on:



www.ThinkFun.com

