Parents and Teachers
MathDice™ is a great game in the classroom and for home schooling. To learn more about the education behind MathDice™, come visit our website at—

www.ThinkFun.com/mathdice.

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MATH DICE™

The Fast Fun Game of Mental Math

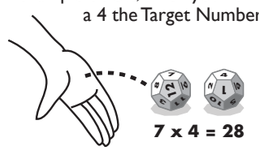
Contents:
- Two 12-sided Dice
- Three 6-sided Dice
- Travel Bag
- Instruction Booklet

Ages 8 to Adult
Fun for players of all math levels

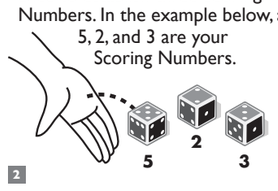
For 2 or More Players
Play competitively, in teams, or practice on your own.

Object: Use your math skills to combine three numbers to match, or come closest to, the Target Number.

To Play:
Start by rolling the two 12-sided Target Dice. Multiply them together to establish a Target Number. In the example below, when you roll a 7 and a 4 the Target Number is 28.



Then roll the three 6-sided Scoring Dice to establish three Scoring Numbers. In the example below, a 5, 2, and 3 are your Scoring Numbers.



Where It Started
MathDice™ was invented by Sam Ritchie, as a "Design a Game" math workshop project for his sixth grade class. Now a teenager, Ritchie is on the United States Junior World Sprint Kayaking team, and hopes to compete in the Olympics some day.

Ritchie's other hope is that MathDice™ will make math more fun and accessible for the generation of kids now in elementary and secondary schools across the country and around the world.

Yeah!

H — WOW! Solve Many Ways.

EXAMPLE	TARGET NUMBER	SCORING NUMBERS	ANSWER EQUATION
1	8	2 4 6	6 + 4 – 2
			2 x 6 – 4
			$(\sqrt[2]{4}) + 6$
			6 + (4 ÷ 2)
2	2	2 3 4	2 x 3 – 4
			$\sqrt[3]{(2 \times 4)}$
			2 x (4 – 3)
			2 ÷ (4 – 3)
			$2^{(4-3)}$
			$(2^3) \div 4$
			(2 + 4) ÷ 3

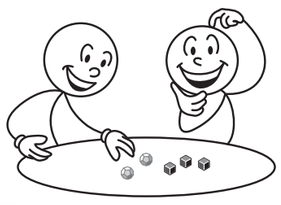
Using the Scoring Numbers, create an equation to calculate the closest number possible to the Target Number. Your answer could be above the Target Number, below the Target Number, or hit the Target Number exactly, depending on the numbers rolled and what you do with them.

To create your equation, use each Scoring Number **once and only once,** along with any combination of the following operations: addition, subtraction, multiplication, division, powers, and roots. You may use the Scoring Numbers and operators in any order.

In our example, two players might shout out the following…

(Remember, the Target Number is 28 and the Scoring Numbers are 5, 2, and 3.)

Player 1 shouts, "25!" (2 + 3) x 5
Player 2 shouts, "30!" 2 x 3 x 5
Player 1 shouts, "29!" $2^5 - 3$
Player 2 shouts, "27!" $(5 - 2)^3$
Player 1 shouts, "28!" $5^2 + 3$, hits the Target Number exactly, and wins the point.



G — WOW! Solve Three Ways.

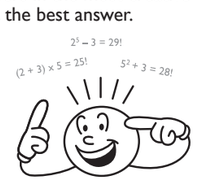
EXAMPLE	TARGET NUMBER	SCORING NUMBERS	ANSWER EQUATION
1	12	2 3 6	2 x 3 + 6
			(6 – 2) x 3
			$(6^2) \div 3$
2	16	2 4 6	(2 x 6) + 4
			(6 – 2) x 4
			$(2^6) \div 4$
3	22	2 4 6	$2^4 + 6$
			$4^2 + 6$
			4 x 6 – 2

F — WOW! Solve Two Ways.

EXAMPLE	TARGET NUMBER	SCORING NUMBERS	ANSWER EQUATION
1	10	2 3 4	2 x 3 + 4
			3 x 4 – 2
2	33	3 5 6	5 x 6 + 3
			(5 + 6) x 3
3	15	2 3 6	2 x 6 + 3
			$3^2 + 6$
4	28	2 4 5	$2^5 - 4$
			(2 + 5) x 4
5	81	2 3 6	$3^{(6-2)}$
			$(3 + 6)^2$

Note how each number is used once and only once in each equation. This rule is especially important to understand when the numbers are used as powers. The player who hit 28 used the "2" to raise the 5 to the second power; the player who reached 27 used the "3" to raise (5 – 2) to the third power.

The fun and flexibility of this game is in combining the three Scoring Numbers in the most creative ways to get the best answer.



Scoring:
Your goal is to beat your opponent by getting closer to the Target Number, faster. Once you have an answer you are satisfied with, call it out. The first player to call out an answer, claims that number.

If the Target Number hasn't been reached, other players then have 15 seconds to respond with a new answer 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.) This play continues, with an additional 15 seconds added after each improvement, until one player hits the Target Number exactly, the other players forfeit the point, or the time limit for calculating is reached.

E — ROOTS AND BEYOND

EXAMPLE	TARGET NUMBER	SCORING NUMBERS	ANSWER EQUATION
1	70	3 4 6	$4^3 + 6$
2	9	2 4 6	$(6^2) \div 4$
3	32	1 2 6	$2^{(6-1)}$
4	33	3 3 6	$3^3 + 6$
5	72	3 3 6	$(6^3) \div 3$
6	108	3 6 6	3 x 6 x 6
7	80	1 3 4	$3^4 - 1$
8	32	2 3 4	$(4^3) \div 2$
9	121	3 4 5	$5^3 - 4$
10	2	3 3 5	$\sqrt[3]{(3 + 5)}$

D — POWERS

EXAMPLE	TARGET NUMBER	SCORING NUMBERS	ANSWER EQUATION
1	9	1 2 2	$(1 + 2)^2$
2	16	2 2 2	$(2 + 2)^2$
3	25	1 2 6	$(6 - 1)^2$
4	36	2 2 3	$(2 \times 3)^2$
5	11	2 2 3	$3^2 + 2$
6	14	2 2 4	$4^2 - 2$
7	18	2 2 6	$(6^2) \div 2$
8	27	2 3 3	$3^2 \times 3$
9	32	2 2 3	$2^{(2+3)}$
10	81	1 3 5	$3^{(5-1)}$

The player with the closest number at the end of the point must state the equation he or she used to reach the answer. If it is correct, the point is won. If incorrect, the player with the next closest answer must state his or her equation, and gets the point if it is correct.

The first player to win four points wins the game. Note: If you are playing competitively, MathDice™ is a "mental math" game…pencil, paper, or a calculator are not allowed.

Simpler Versions of Play:
MathDice™ is a fun, educational game. The rules above describe competitive play. For your enjoyment, please feel free to relax the rules in any way that suits your group of players.

To lower the average difficulty of the calculations, reduce the range of the Target Numbers. To do this, you may:

- Roll only one 12-sided die to establish a Target Number in the range between 1 and 12. This version makes a good game for players who are more confident with addition and subtraction skills, and just starting to get a mastery of multiplication.
- Roll two 12-sided dice, and **add** the two numbers together, to establish a Target Number in the range

C — DIVISION

EXAMPLE	TARGET NUMBER	SCORING NUMBERS	ANSWER EQUATION
1	1	3 3 6	(3 + 3) ÷ 6
2	2	3 4 6	3 x 4 ÷ 6
3	3	1 1 6	6 ÷ (1 + 1)
4	4	2 2 5	5 – (2 ÷ 2)
5	5	2 4 6	(4 + 6) ÷ 2
6	6	4 4 5	5 + (4 ÷ 4)
7	7	3 5 6	5 + (6 ÷ 3)
8	8	3 4 6	(6 x 4) ÷ 3
9	9	2 6 6	6 + (6 ÷ 2)
10	10	3 5 6	(5 x 6) ÷ 3

B — MULTIPLICATION

EXAMPLE	TARGET NUMBER	SCORING NUMBERS	ANSWER EQUATION
1	1	1 3 4	1 x (4 – 3)
2	2	1 1 1	1 x (1 + 1)
3	3	2 3 3	2 x 3 – 3
4	4	2 4 4	2 x 4 – 4
5	5	1 1 6	1 x (6 – 1)
6	6	3 4 6	3 x 4 – 6
7	7	2 3 5	2 x 5 – 3
8	8	2 4 4	(4 – 2) x 4
9	9	3 3 6	3 x (6 – 3)
10	10	2 2 3	(2 + 3) x 2

between 2 and 24. This version makes a good game for players who have confidence in their adding/subtracting/multiplying skills, but are not yet comfortable with more advanced operations.

For a more cooperative environment, choose from the following:

- Everyone who can match the best answer given on a turn, gets a point for that turn.
- Relax time constraints.
- Allow use of pencil and paper or calculators.
- Work together to find as many answers as you can that are close to the Target Number.
- Have fun exploring the numbers and their patterns!

MathDice™ and the Flexibility of Numbers:
Numbers are incredible. As you play MathDice™ and your skills improve, you will come to discover patterns and relationships that will astound you. Really!

To get you started down this path, we've developed eight Practice Tables that you can use to hone your skills. The first five tables each focus on a different operation, and the final three WOW! Tables show examples with multiple ways of reaching the Target Number.

Once you work your way through these stretching drills, you're ready for action!

A — ADDITION / SUBTRACTION

EXAMPLE	TARGET NUMBER	SCORING NUMBERS	ANSWER EQUATION
1	1	1 2 2	1 + 2 – 2
2	2	3 4 5	3 + 4 – 5
3	3	1 1 5	5 – 1 – 1
4	4	1 2 3	2 + 3 – 1
5	5	1 2 6	6 + 1 – 2
6	6	1 3 4	3 + 4 – 1
7	7	2 2 3	2 + 2 + 3
8	8	3 5 6	5 + 6 – 3
9	9	2 3 4	2 + 3 + 4
10	10	2 6 6	6 + 6 – 2

1510 MATH DICE BOOKLET

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