

Curriculum topics:

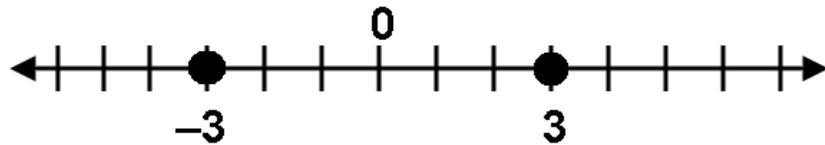
- Absolute Value
- Number Lines
- Adding Positive and Negative Numbers

Subject: Math

Grade range: 5 – 9

THE ABSOLUTELY VALUABLE GAME!

Practice using absolute values



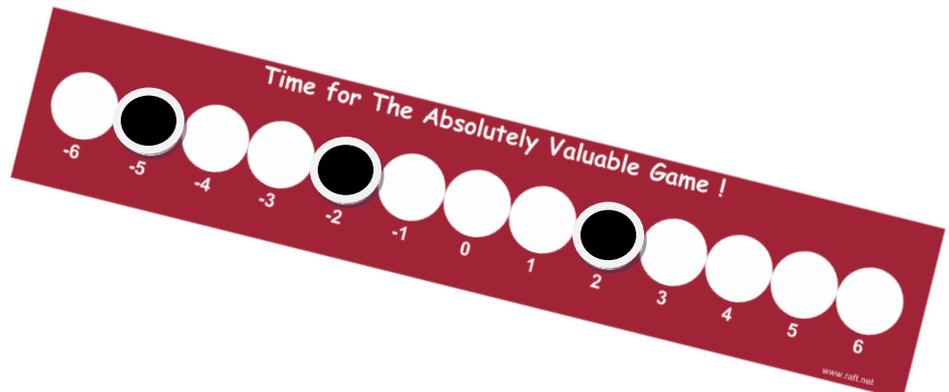
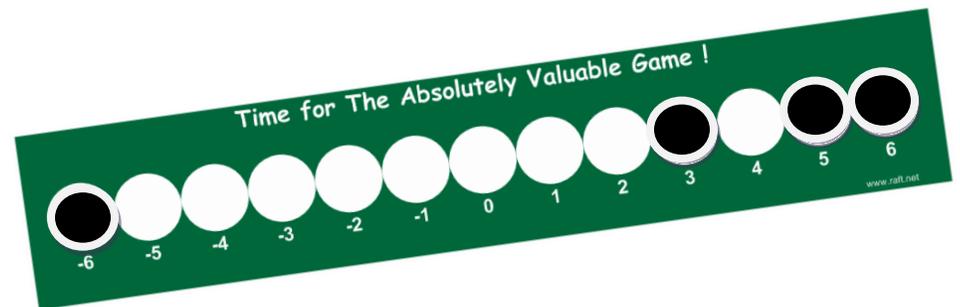
In this fast-paced game of addition, students discover that the “absolute value” of a number is simply its distance from zero on a number line.

Who we are:

Resource Area for Teaching (RAFT) helps educators transform the learning experience through affordable “hands-on” activities that engage students and inspire the joy and discovery of learning.

For more ideas and to see RAFT Locations

www.raft.net/visit-raft-locations



Materials required

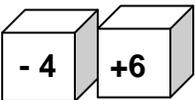
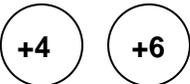
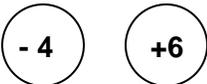
- *The Absolutely Valuable Game* Board (one per player) (see page 4)
- Two 6-sided dice, each a different color
- 13 pawns per player

Playing the game (for 2 players or teams)

Winning the game: After five turns, the player with the total score closest to zero wins the game.

Educator Note: If students work in teams, substitute “team” for “player” in the instructions.

- 1 Place one game board in front of each player.
- 2 Choose one color die to represent positive numbers. The other die will represent negative numbers.
- 3 Each player rolls both dice and adds the numbers (remember, one number is negative!) The lowest total goes first.
- 4 Taking turns, each player tosses the dice and makes one of three choices. Use these choices to determine a strategy.

	Choice A	Choice B	Choice C
	Cover two circles that equal the absolute value of each die.	Cover one circle that equals the absolute value of the sum of both dice.	Cover two circles that equal the actual value of each die.
Sample Roll: 	Cover: 	Cover: 	Cover: 

Note:

- New pieces can only be placed on uncovered circles.
- If a circle that is needed for a choice is already covered, that choice cannot be used.
- Once a piece is placed correctly on the board, it cannot be moved.
- If a player cannot make any of the choices, the turn moves to the next player.

- 5 Players take turns rolling the dice and covering circles until each player has rolled the dice for 5 turns.
- 6 At the end of a game, each player adds up all the uncovered (empty) circles on their game board, and then takes the absolute value of the sum.
- 7 The player with the lowest absolute value wins the game!

Curriculum Standards:

Positive and Negative Numbers
(Common Core Math Standards: Grade 6, The Number System, 5)

Rational numbers
(Common Core Math Standards: Grade 6, The Number System, 6)

Ordering and absolute value of rational numbers
(Common Core Math Standards: Grade 6, The Number System, 7)

Addition & subtraction of rational numbers; number lines
(Common Core Math Standards: Grade 7, The Number System, 1)

Additional standards at:
<http://www.raft.net/raft-idea?isid=652>

The math behind the activity

The **absolute value** of a number is its distance from zero on a number line.

The absolute value of x , denoted " $|x|$ " (read as "the absolute value of x "), is the distance of x from zero. Since absolute value only addresses **distance**, not **direction**, it is never negative.

For example, -3 and 3 are both a distance of three units from zero. So $|3|$ equals 3 and $|-3|$ also equals 3 .

People use absolute value when they are more interested in distance than direction. For example, when planning the shortest route for a car trip, adding the absolute values of each part of the trip tells the driver the best way to go.

Learn more

- In addition to playing as individuals, students can play in teams of 2. Each team acts like one player: using one board and making one move per turn.
- Playing multiple games in a row creates new opportunities for strategy. Write down the actual sum (positive or negative) after each game, and take the absolute value of the grand total to see who wins the "grand prize."
- Alternatively, play so that the player having a score farthest from zero wins the game.

Related activities: See RAFT Idea Sheets:

Positive and Negative Integers:

Above and Below Zero Game -

<http://www.raft.net/ideas/Above and Below Zero Game.pdf>

Positive and Negative Integers on a Number Line:

Hi-Ho!, Hi-Low! -

<http://www.raft.net/ideas/Hi Ho Hi Low.pdf>

Resources

Visit www.raft.net/raft-idea?isid=652 for "how-to" video demos & more ideas!

See these websites for more information on the following topics:

- **Absolute Value Problems** – <http://www.purplemath.com/modules/solveabs.htm>
- **Absolute Value** – <http://www.themathpage.com/alg/absolute-value.htm>
- **Videos and exercises on negative numbers and absolute value from the Khan Academy** - <https://www.khanacademy.org/math/arithmetic/absolute-value>
- **Teacher designed math courses from the New Jersey Center for Teaching & Learning** – <https://njctl.org/courses/math>

The Absolutely Valuable Game Boards

