

Curriculum topics:

- Place Value
- Rounding
- Addition & Subtraction

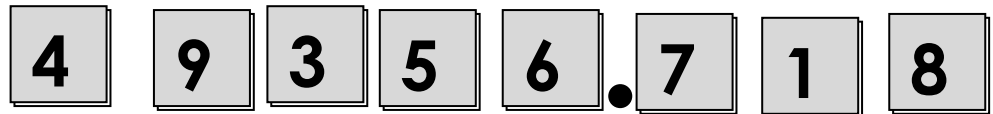
Subject:

Math

Grade range: 1 – 8

PLACE YOUR NUMBER VALUE

A Game to Teach Place Value Concepts



This fast-paced game reinforces place value, rounding, and comparison of number values. It may be customized to include decimals, fractions, and/or negative numbers.

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-location

Place Your Number Value

10,000
ten
thousands
1000
thousands
100
hundreds
10
tens
1
ones
decimal point
1/10
tenths
1/100
hundredths
1/1000
thousandths

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Materials required

For each player:

- Place Value Board
- Digit tiles, 40 (4 sets of 0 to 9)
- Container for digit tiles
- Tokens, 10
- Target Number Strips (see Blackline Master on page 5), 1 per round

[A pattern for the game board & digit tiles can be downloaded at <http://www.raft.net/raft-idea?isid=576>.]

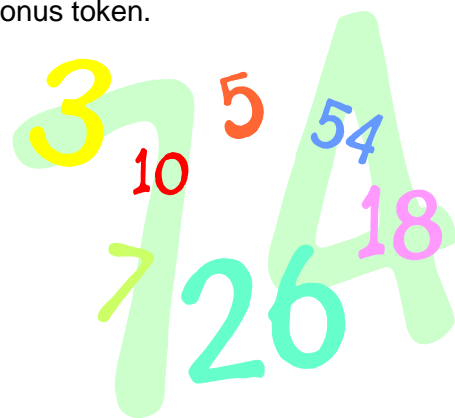
Preparation before the game

- 1 Teacher: Copy Target Number Strips as required and cut along dotted lines. Each player needs a Target Number Strip for each round.
- 2 Choose 5 numbers per round, based on what the students are studying.

Playing the game (for 2 – 4 players)

Each player has a game board, a set of digit tiles, and one Target Number Strip per round

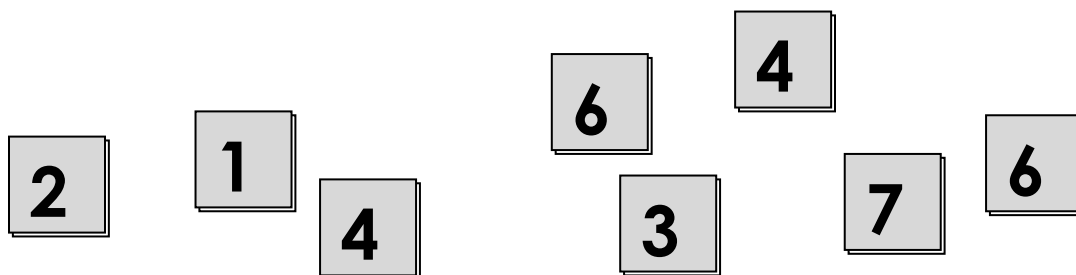
- 1 Players cover any unused portions of the board, if needed (e.g., if only using whole numbers, cover the decimal section on right side of the board).
- 2 Teacher announces the target numbers at the beginning of each round. Players write the numbers onto the rectangles on target strip and place the strip to the right of the game board, see illustration on page 3.
- 3 Each player draws digit tiles, one at time, and places each tile on the game board (in line with a target number). The goal is to make numbers equal or close to each target number. Players may move a digit tile once it has been placed on the game board, but may not discard any tile.
- 4 Play continues until tiles have been placed for each target number.
- 5 Once the game is finished, each player earns tokens as follows:
 - 1 token goes to the player who has the number closest to (above or below) the target number. In case of a tie, each tied player receives a token.
 - Any player who matches the target number exactly, earns a bonus token.
- 6 The player with the most tokens wins the round!



The math behind the activity

Where a digit appears in a number affects its value. In base 10, thanks to place value the same 10 symbols can be used to make an unlimited range of numbers. It took humans 28,000 years to come up with the notion of place value. Before the place value system was invented, symbols had to be repeated to express the right amount. The Romans, for example, wrote 8 as VIII, where V represents 5 and I represents 1 - see RAFT idea sheet [Roman Numeral Dice](#) for more information.

The notion of place value was first conceived by the Babylonians somewhere between 2,000 B.C.E. and 1,000 B.C.E. with a base of 60 (although it lacked a symbol for the number 0). Around 500 A.D. the Hindu-Arabic number system was invented using ten digits, from 0 to 9. Place value makes addition and multiplication easier to perform.



Target Number

245

11311

3680

3.99

34.51

Place Your Number Value

10,000
ten
thousands
1000
thousands
100
hundreds
10
tens
1
ones
decimal point
1/10
tenths
1/100
hundredths
1/1000
thousandths

| | | | | | | | | |
|---|---|---|---|---|---|---|---|--|
| | | 2 | 4 | 6 | . | | | |
| 1 | 1 | 3 | 1 | 1 | . | | | |
| | 3 | 6 | 8 | 1 | . | | | |
| | | | | 4 | . | 0 | 1 | |
| | | | 3 | 4 | . | 5 | 1 | |

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Curriculum Standards:

Place Value of whole numbers

(Common Core Math Standards:

Number & Operations in Base Ten:

Grade 1, 2 & 3 ;

Grade 2, 1, 3, & 4;

Grade 3, 1;

Grade 4, 1, 2, & 3)

Comparing decimals (Common Core Math Standards:

Number & Operations Fractions:

Grade 4, 7)

Place Value of decimal numbers

(Common Core Math Standards:

Grade 5, Number & Operations in Base Ten, 1, 2, 3, 4, & 7)

Problem Solving and Reasoning

(Common Core Math Standards:

Mathematical Practices Grades 1-8)

Additional standards at: <http://www.raft.net/raft-idea?isid=576>

Learn more

- For younger students, provide base ten blocks to represent target numbers.
- For upper grades, once the target numbers are drawn, players work together to calculate 5% and 10% above and below each target number. This method can be used with a large group or entire class. Once the game is finished, each player calculates the number of tokens earned:
 - 3 tokens if the number exactly matches the target number (100%).
 - 2 tokens if the number is within 5% of the target number.
 - 1 token if the number is within 10% of the target number.
- If using percentages to determine scores – as described above - each student can have individual target numbers to match.

Related activities: See RAFT Idea Sheets:

1000 Wins –

<http://www.raft.net/ideas/1000 Wins.pdf>

Abacus Primer –

<http://www.raft.net/ideas/Abucus Primer.pdf>

Binary Bracelets –

<http://www.raft.net/ideas/Binary Bracelets.pdf>

Binary Dots –

<http://www.raft.net/ideas/Binary Dots.pdf>

Give and Take –

<http://www.raft.net/ideas/Give and Take.pdf>

Roman Numeral Dice –

<http://www.raft.net/ideas/Roman Numeral Dice.pdf>

Resources

Visit www.raft.net/raft-idea?isid=576 for “how-to” video demos & more ideas!

See these websites for more information on the following topics:

- **History of Zero and Place Value -**
<http://mathforum.org/library/drmath/view/52566.html>
- **Place Value teaching tips and fun computer activities -**
https://eee.uci.edu/wiki/index.php/Whole_Number_Place_Value
- **Videos and exercises on place value from the Khan Academy –**
https://www.khanacademy.org/math/arithmetic/multiplication-division/place_value
- **Teacher designed math courses from the New Jersey Center for Teaching & Learning –** <https://njctl.org/courses/math>

Acknowledgements:

Inspired by Tsing Bardin and Mary Laycock.

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|---------------|--|---------------|--|---------------|--|---------------|--|---------------|--|
| Target Number | | Target Number | | Target Number | | Target Number | | Target Number | |
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