

# Dicing with Decimals

## Overview

This activity consists of three games designed to increase students' understanding of decimal place value and enhance their capacity to estimate with decimals. They provide a means of quickly revising or teaching addition of decimals and the significance of the decimal point. All games rely on luck as well as knowledge so can be used several times with any group. They are ideal as 'focus activities' at the beginning of a session or to provide a positive end to a session.

The first two games which use only one decimal place could be used in successive sessions, or Game 1 can be used several times before advancing to Game 2 which presents a little more challenge.

Game 3 introduces the second decimal place and is much more challenging to play. It emphasises the relatively small value of numbers in the second decimal place and can be introduced when students have become thoroughly comfortable with Games 1 and 2.

These games complement other activities related to understanding and estimating decimals, such as 'Exploring Decimals', 'About How Much?' and 'Is the Answer Reasonable?'

## Skills and Knowledge

- Decimal notation
- Decimal place value
- Addition of decimals
- Subtraction of decimals (optional)

## Preparation and Materials

- 1 ten-sided or six-sided dice
- Photocopy Activity Sheet 1: *Dicing with Decimals – Game 1, 2 or 3* (1 per student)

*10-sided dice can be found in dedicated games shops. They are wonderful mathematical tools because they have all of the digits from 0 to 9.*

## Suggested Procedure

### Introducing Game 1

Hand out a copy of Activity Sheet 1 to each learner.

Explain that

- *You will choose a number for each row in the table when the dice is thrown.*
- *You will then add the numbers in the seven rows.*
- *The aim of the game is to get a total as close to, but not more than 9.9.*
- *Any score greater than 9.9 will put you out of the game, or as they say in 'pontoons' or '21' you have 'gone bust'.*



### Extension for Game 2

Scores can be worked out the same as for Game 1, with the difference between the totals and 9.9 becoming the score for each round.

### Introducing Game 3

Hand out a copy of Activity Sheet 3 to each student.

Explain that Game 3 follows similar rules to Game 2, only this time the dice is thrown 9 times to fill the 9 spaces above the double lines. This time the target is 9.99.

It is a good idea to play a sample game on the board so that students can see the wisdom of reserving the higher numbers for the last decimal place to avoid going bust. Once students can understand this strategy they will be more aware of the relatively small value of numbers in the second decimal place (make comparisons with cents vs tens of cents vs whole numbers in money).

### Sample play - Game 3

**Sample play Game 3**  
A six sided dice was used

**Numbers rolled**  
4,5,3,2,1,6,3,5

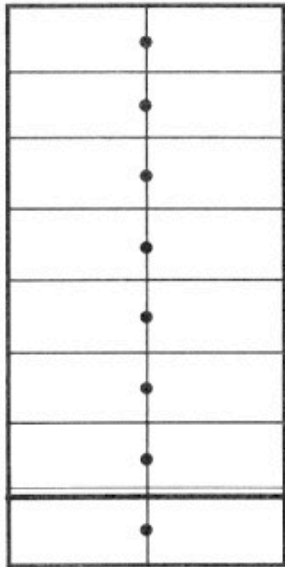
Player A	Player B
5 + 0 2	6 + 5 3
1 + 3 6	1 + 6 1
3 + 1 5	1 + 5 3
9 + 9 3	8 + 6 7

**Optional Score**

99	9.99
9.9	8.67
0.06	1.32

**Player A** wins the round with the lowest score of 0.06..

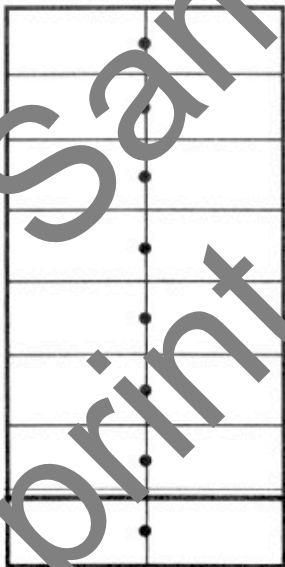




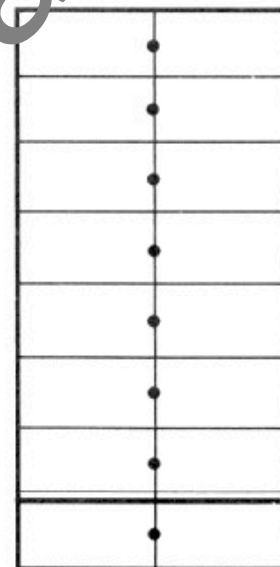
**Target: 9.9**



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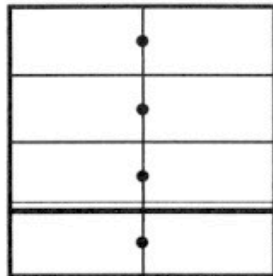


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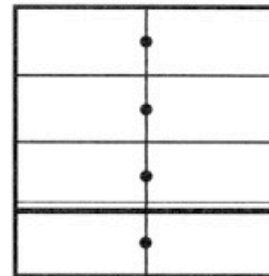


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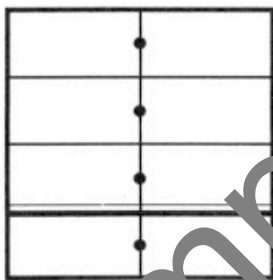




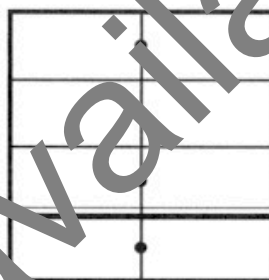
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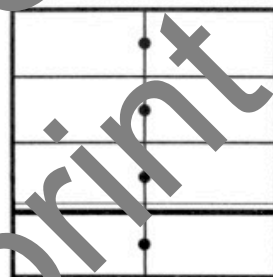
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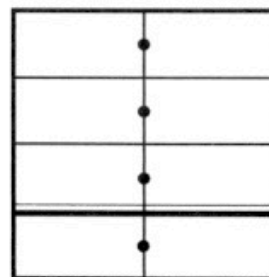
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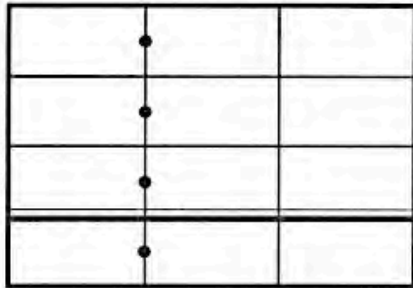


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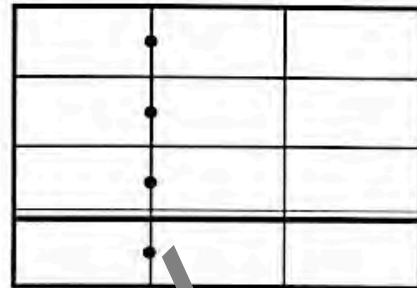


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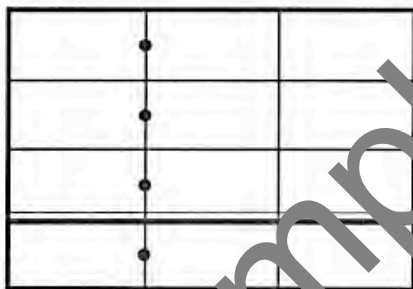




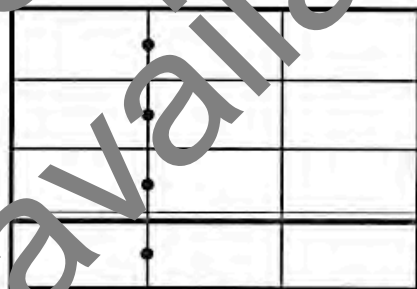
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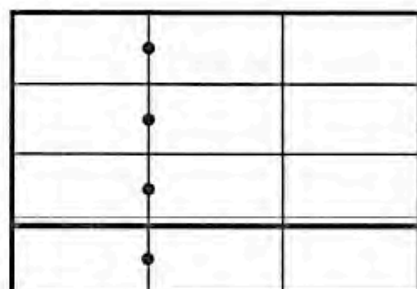
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