# Mathematics

## Number and Algebra



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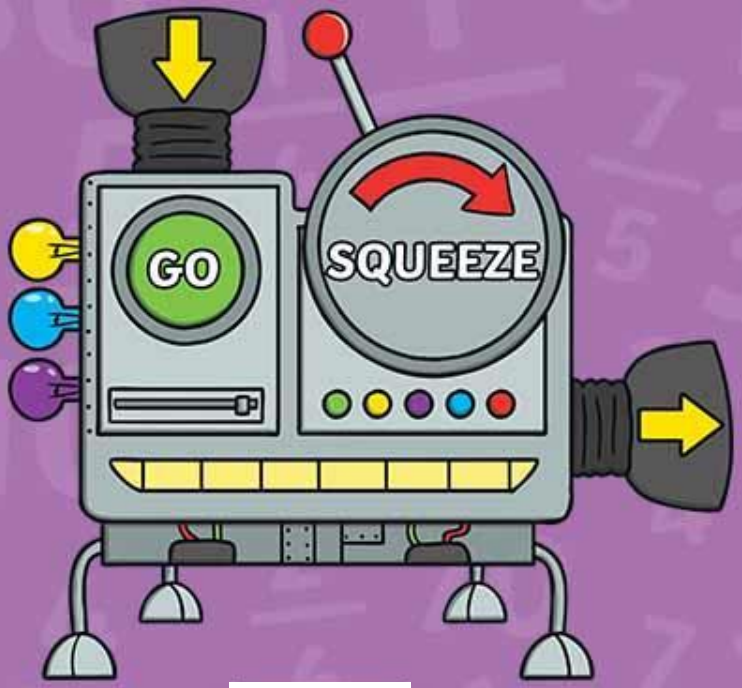
# Place Value Function Machine

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# Aim

- To multiply and divide numbers by 10, 100 and 1000, giving answers up to three decimal places.

# Success Criteria

- I can compare and order decimal numbers.
- I can multiply decimal numbers by 10, 100 and 1000.
- I can divide numbers by 10, 100 and 1000, giving answers up to three decimal places.

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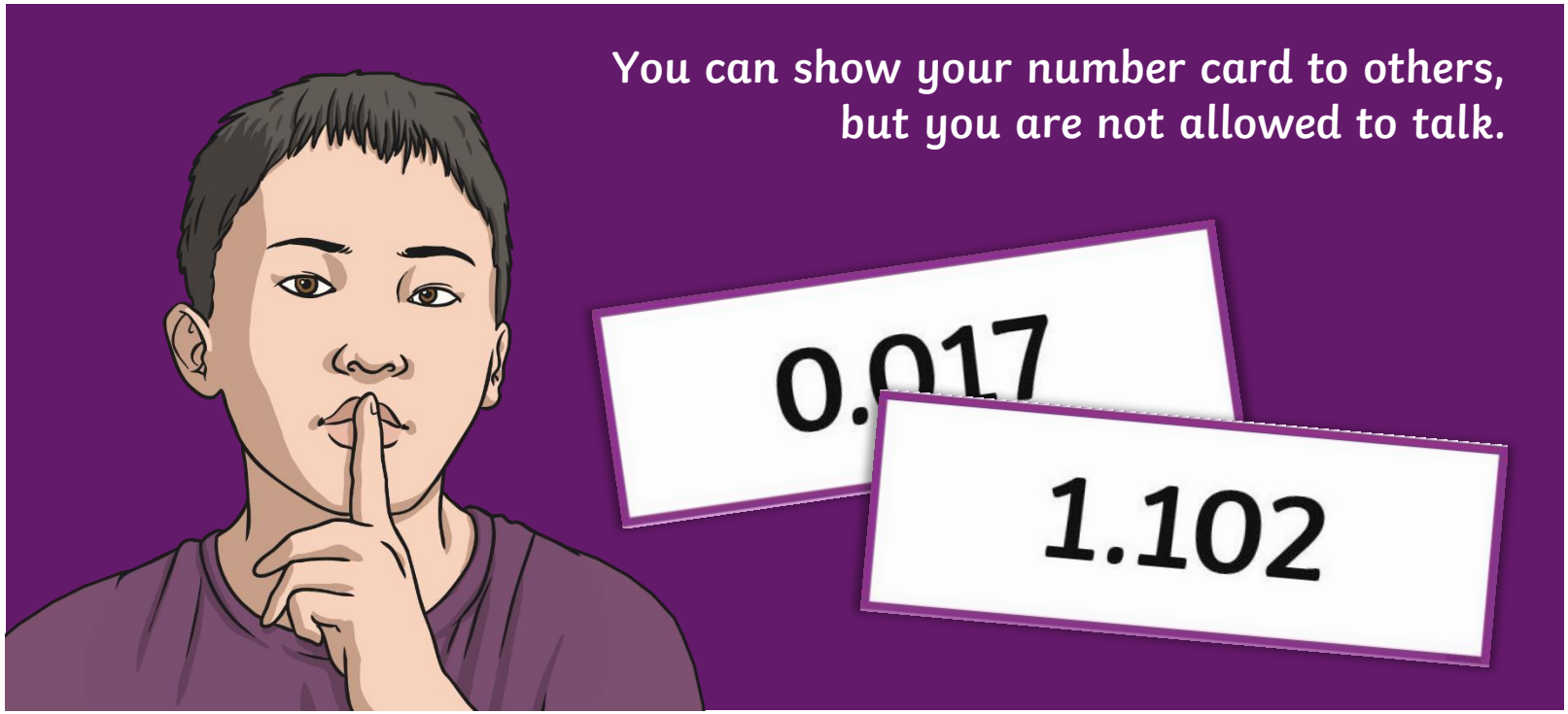
# Get in Line!

Each person has a number card.

Your whole class challenge is to stand in a line so that all your numbers are in order from smallest to biggest!

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# Multiply by 10, 100 and 1000

When we multiply a decimal number by 10, the value of each digit is multiplied ten times.

Click on each digit on the on the place value chart to visualise this. We can describe multiplying a number by 10 by saying **that each digit is moving one space to the left**:

| Thousands | Hundreds | Tens | Ones | tenths | hundredths | thousandths |
|---|---|---|---|---|---|---|
| | | | 1 | 3 | 2 | 5 |

× 10 × 10 × 10

| Thousands | Hundreds | Tens | Ones | tenths | hundredths | thousandths |
|---|---|---|---|---|---|---|
| | | | | | | |

**1.325 x 10 = 13.25**

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# Multiply by 10, 100 and 1000

When we multiply a decimal number by 100, the value of each digit is multiplied one hundred times.

Click on each digit on the on the place value chart to visualise this. We can describe multiplying a number by 100 by saying **that each digit is moving two spaces to the left**:

| Thousands | Hundreds | Tens | Ones | tenths | hundredths | thousandths |
|---|---|---|---|---|---|---|
| | | | 1 | 3 | 2 | 5 |

× 100 × 10 × 10 × 10

| Thousands | Hundreds | Tens | Ones | tenths | hundredths | thousandths |
|---|---|---|---|---|---|---|
| | | | | | | |

**1.325 x 100 = 132.5**

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# Multiply by 10, 100 and 1000

When we multiply a decimal number by 1000, the value of each digit is multiplied one thousand times.

Click on each digit on the on the place value chart to visualise this. We can describe multiplying a number by 1000 by saying **that each digit is moving three spaces to the left**:

| Thousands | Hundreds | Tens | Ones | tenths | hundredths | thousandths |
|---|---|---|---|---|---|---|
| | | | 1 • | 3 | 2 | 5 |

× 1000 × 1000 × 1000 × 1000

| Thousands | Hundreds | Tens | Ones | tenths | hundredths | thousandths |
|---|---|---|---|---|---|---|
| | | | • | | | |

**1.325 x 1000 = 1325**

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# Multiply by 10, 100 and 1000

When we divide a number by 10, the value of each digit is divided ten times.

Click on each digit on the on the place value chart to visualise this. We can describe dividing a number by 10 by saying **that each digit is moving one space to the right**:

| Thousands | Hundreds | Tens | Ones | tenths | hundredths | thousandths |
|---|---|---|---|---|---|---|
| 4 | 2 | 8 | 5 | | | |

÷ 10 ÷ 10 ÷ 10 ÷ 10

| Thousands | Hundreds | Tens | Ones | tenths | hundredths | thousandths |
|---|---|---|---|---|---|---|
| | | | | | | |

**4285 ÷ 10 = 428.5**

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# Multiply by 10, 100 and 1000

When we divide a number by 100, the value of each digit is divided one hundred times.

Click on each digit on the on the place value chart to visualise this. We can describe dividing a number by 100 by saying **that each digit is moving two spaces to the right**:

| Thousands | Hundreds | Tens | Ones | tenths | hundredths | thousandths |
|---|---|---|---|---|---|---|
| 4 | 2 | 8 | 5 | | | |

÷ 100 ÷ 100 ÷ 100 ÷ 100

| Thousands | Hundreds | Tens | Ones | tenths | hundredths | thousandths |
|---|---|---|---|---|---|---|
| | | | | | | |

**4285 ÷ 100 = 42.85**

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# Multiply by 10, 100 and 1000

When we divide a number by 1000, the value of each digit is divided one thousand times.

Click on each digit on the on the place value chart to visualise this. We can describe dividing a number by 1000 by saying **that each digit is moving three spaces to the right**:

| Thousands | Hundreds | Tens | Ones | tenths | hundredths | thousandths |
|---|---|---|---|---|---|---|
| 4 | 2 | 8 | 5 | | | |

÷ 1000 ÷ 1000 ÷ 1000 ÷ 1000

| Thousands | Hundreds | Tens | Ones | tenths | hundredths | thousandths |
|---|---|---|---|---|---|---|
| | | | | | | |

**4285 ÷ 1000 = 4.285**

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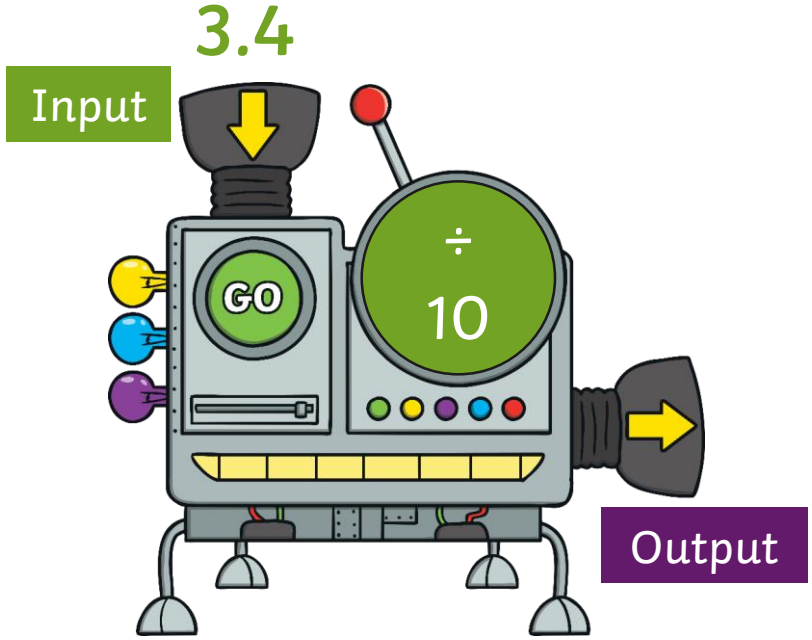
# Function Machine

This is the "Place-Value-O-Matic" function machine.

It multiplies and divides numbers by 10, 100 and 1000. Click on the input button to drop a number into the machine. Write the number you think will be created by the machine.

**Click on the output button to see if you were correct!**

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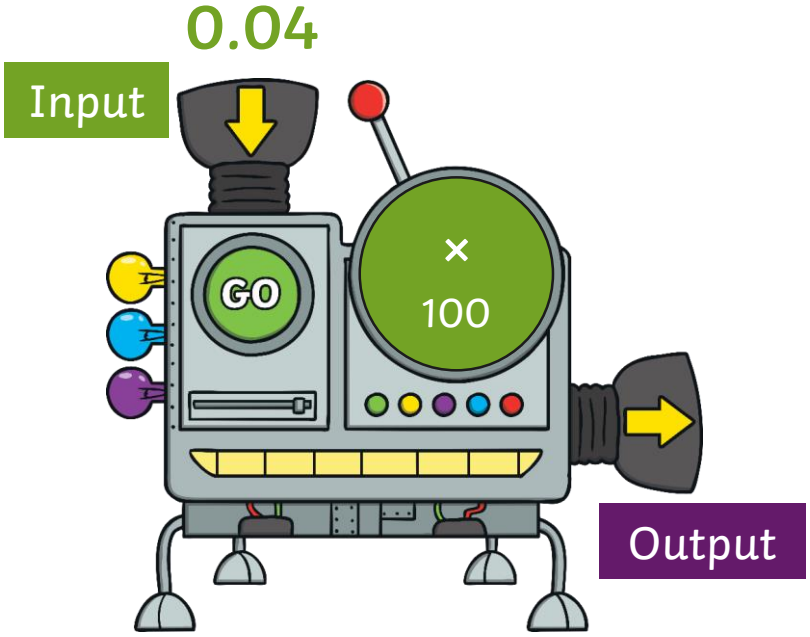


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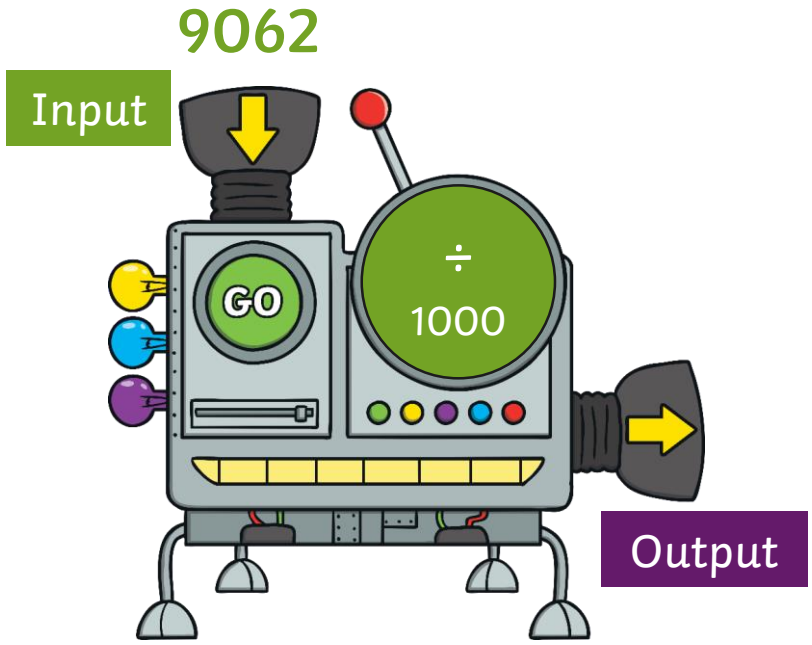


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# Function Machine

Whole Class

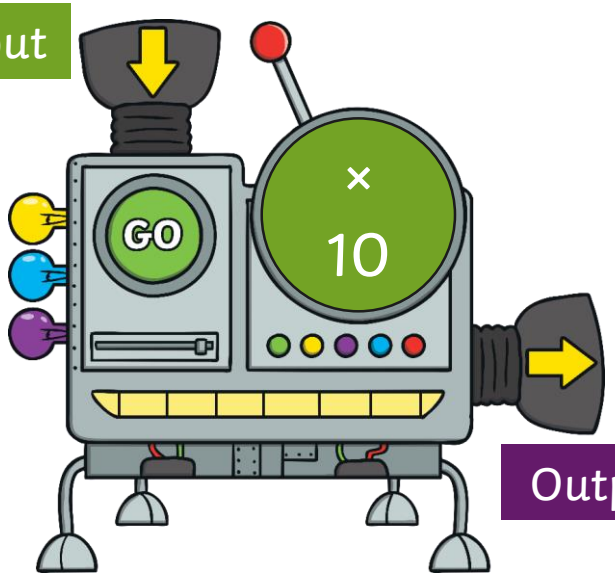
This is the "Place-Value-O-Matic" function machine.

It multiplies and divides numbers by 10, 100 and 1000. Click on the input button to drop a number into the machine. Write the number you think will be created by the machine.

**Click on the output button to see if you were correct!**

5.904

Input




Output

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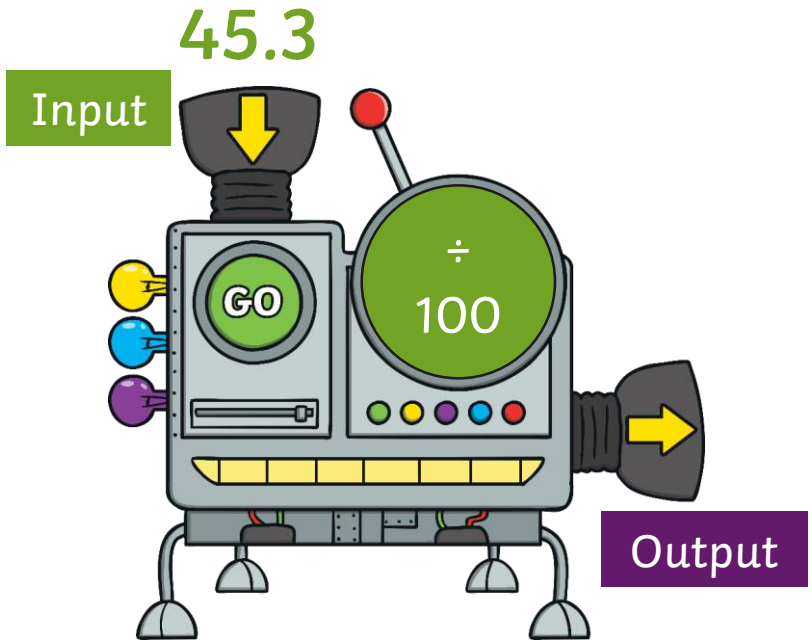


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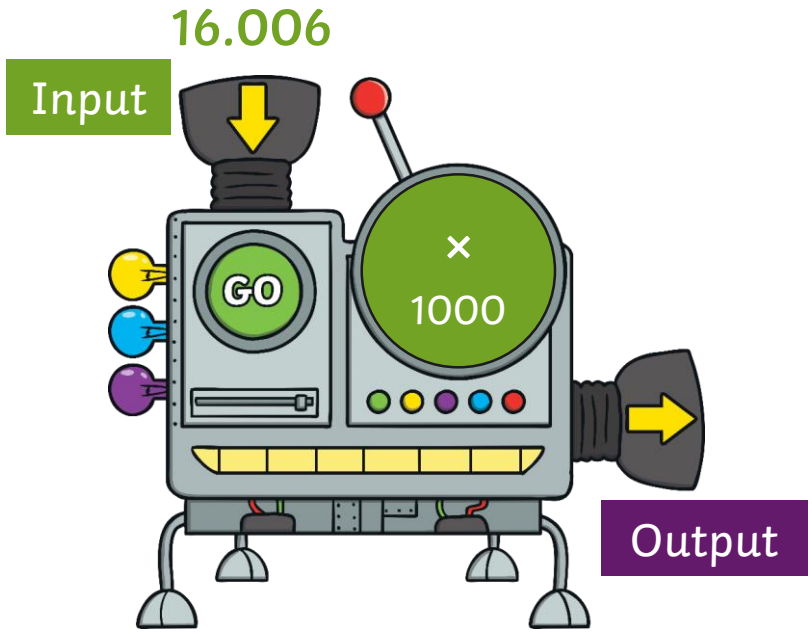


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# Place Value Function Machine

## Decimal Place Value Functio

To multiply and divide numbers by 10, 100 and 1000, giving answers

Complete the missing output numbers for the 'Place-Value-O-Matic' function machines, which multiply and divide numbers by 10, 100 and 1000.

| Input | | Output |
|---|---|---|
| 2.1 | × 10 | |
| 5.57 | | |
| 3.06 | | |
| 4.703 | | |

| Input | | Output |
|---|---|---|
| 3.8 | × 100 | |
| 9.03 | | |
| 3.832 | | |
| 14.703 | | |

| Input | | Output |
|---|---|---|
| 7.9 | × 1000 | |
| 8.02 | | |
| 7.926 | | |
| 25.729 | | |

| Input | | Output |
|---|---|---|
| 67 | | |
| 83.2 | | |
| 20.9 | | |
| 126.8 | | |

| Input | | Output |
|---|---|---|
| 49.2 | | |
| 60.7 | | |
| 115.9 | | |
| 295.3 | | |

| Input | | Output |
|---|---|---|
| 739 | | |
| 1945 | | |
| 20 521 | | |
| 95 732 | | |

## Decimal Place Value Function Machines

To multiply and divide numbers by 10, 100 and 1000, giving answers up to three decimal places.

Complete the missing output numbers for the 'Place-Value-O-Matic' function machines, which multiply and divide numbers by 10, 100 and 1000.

| Input | | Output |
|---|---|---|
| 7.3 | × 10 | |
| | | 68.2 |
| 5.09 | | |
| | | 68.31 |

| Input | | Output |
|---|---|---|
| 67 | ÷ 10 | |
| | | 4.72 |
| 21.9 | | |
| | | 78.29 |

| Input | | Output |
|---|---|---|
| 8.2 | × 100 | |
| | | 845 |
| 7.381 | | |
| | | 8528.5 |

| Input | | Output |
|---|---|---|
| 98.7 | ÷ 100 | |
| | | 0.827 |
| 113.8 | | |
| | | 6.793 |

| Input | | Output |
|---|---|---|
| 7.5 | × 1000 | |
| | | 905 |
| 7.721 | | |
| | | 50 832 |

| Input | | Output |
|---|---|---|
| 731 | ÷ 1000 | |
| | | 94.717 |
| 28 294 | | |
| | | 782.492 |

## ace Value Function Machines

bers by 10, 100 and 1000, giving answers up to three decimal places.

t numbers for the 'Place-Value-O-Matic' function machines, which s by 10, 100 and 1000.

| | | |
|---|---|---|
| | + 1000 | ÷ 100 |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| | + 0.1 | × 1000 |
| | | |
| | | |
| | | |

| | | |
|---|---|---|
| | - 10 | ÷ 1000 |
| | | |
| | | |
| | | |

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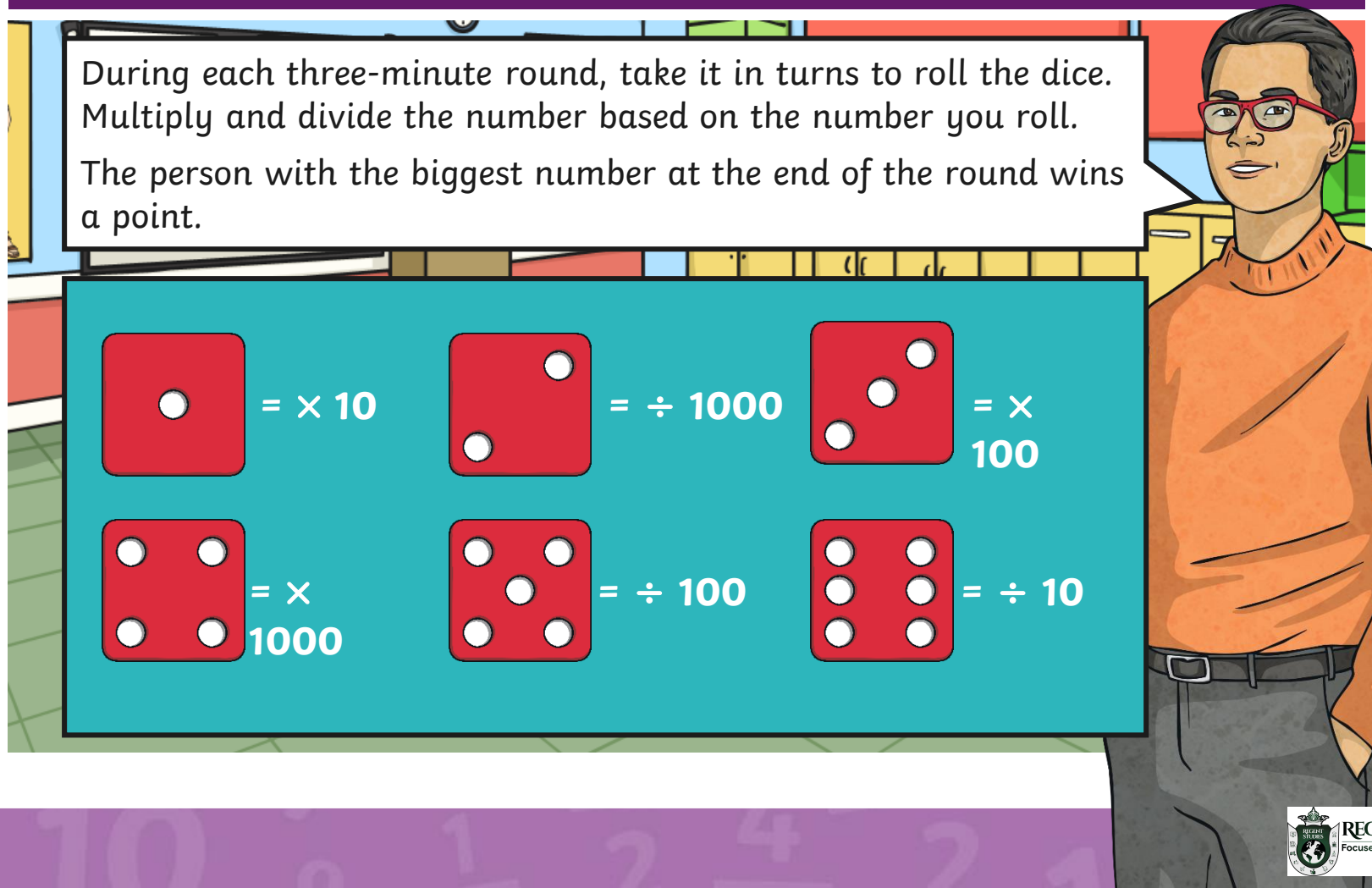
# Dice Game

At the start of each round you will be given a decimal number.

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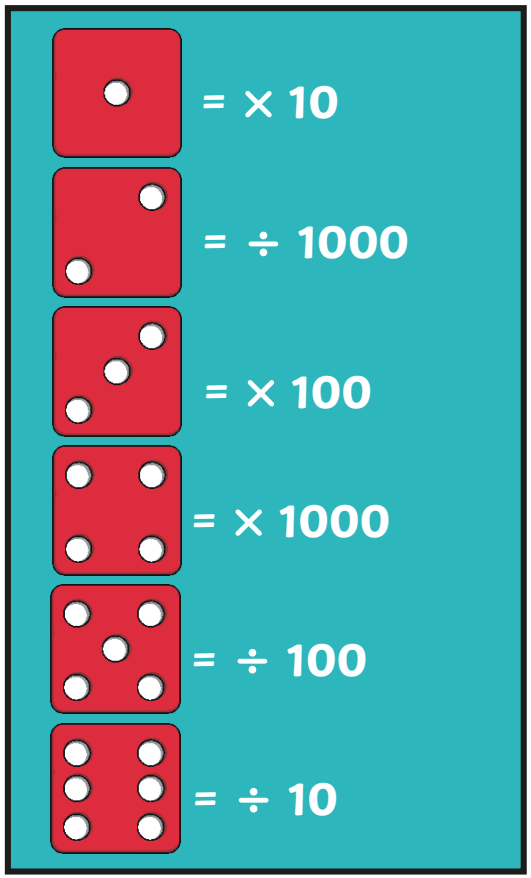
# Dice Game

## Example




9.184

First I roll a 3 so
9.184 x 100 = 918.4

Then I roll a 5 so
918.4 ÷ 100 = 9.184

Then I roll a 4 so
9.184 x 1000 = 9184

... until time's up!

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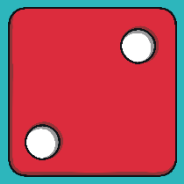
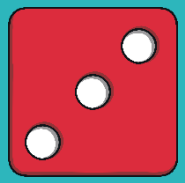
# Dice Game

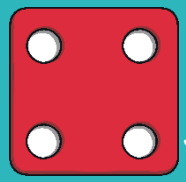
## Round 1

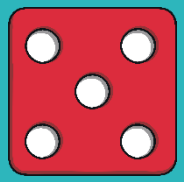
5.372

 = × 10

 = ÷ 1000

 = × 100

 = × 1000

 = ÷ 100

= ÷ 10

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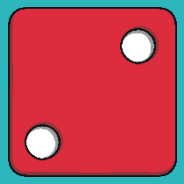
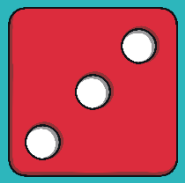
# Dice Game

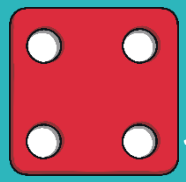
## Round 2

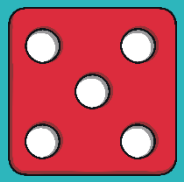
3.031

 = × 10

 = ÷ 1000

 = × 100

 = × 1000

 = ÷ 100

= ÷ 10

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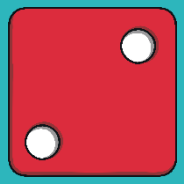
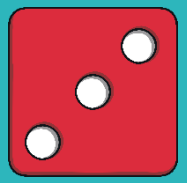
# Dice Game

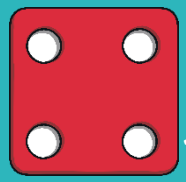
## Round 3

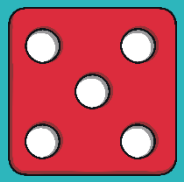
12.805

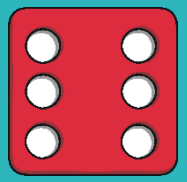
 = × 10

 = ÷ 1000

 = × 100

 = × 1000

 = ÷ 100

 = ÷ 10

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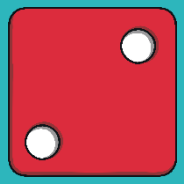
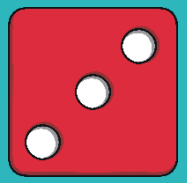
# Dice Game

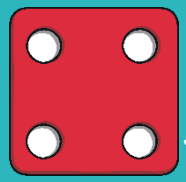
## Round 4

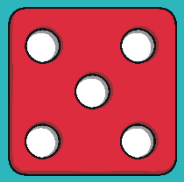
390.651

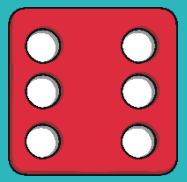
 = × 10

 = ÷ 1000

 = × 100

 = × 1000

 = ÷ 100

 = ÷ 10

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- To multiply and divide numbers by 10, 100 and 1000, giving answers up to three decimal places.

# Success Criteria

- I can compare and order decimal numbers.
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