

# **Numeracy Minimum Core**

## **Carousel**

### **Answer Booklet**

### Approximation Game

38.5 mm	4 cm
2002 mm	2m
495 cm	5m
0.495 m	50 cm
38.5 cm	40 cm
2002 m	2 km
0.795 cm	8 mm
385 m	400 m
3.85 km	4 km
0.795 km	No match
No match	1 m

### Dimensions

1D	2D	3D
km	km <sup>2</sup>	km <sup>3</sup>
Has length	Has length and width	Has length, width and depth
Measured in feet and inches	Measured in square feet and square inches	Has volume
A perimeter	Wall coverage of a litre paint	Measured in cubic feet and cubic inches
A line	A square	A cube
Washing line	An area	Capacity of a refrigerator
Measured in metres and centimetres	Measured in square metres and square centimetres	Measured in cubic metres and cubic centimetres

### Sorting Data

Qualitative	Quantitative	
	Continuous	Discrete
The highest educational qualification gained	The height of a room	The number of children in a family
A person's religion.	The temperature of a room	The number of rainy days in November
Colour of hair	Length of a person's foot	Size of shoe
Make of car	The speed of a car	A person's age

### Common Fractions/Decimal Fractions/Percentages Equivalences

0.9	$\frac{3}{5}$	$\frac{6}{10}$	$\frac{6}{8}$	75%	100%	1.0	69%	0.69	40%
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$\frac{2}{5}$	$\frac{1}{8}$	12.5%	$\frac{3}{10}$	0.3	0.375	$\frac{3}{8}$	0.03	$\frac{3}{100}$	17.5%
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0.175	50%	$\frac{1}{2}$	0.7	$\frac{7}{10}$	0.25	25%	$\frac{1}{3}$	0.3'	0.01
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1%	$\frac{4}{5}$	80%	0.1	$\frac{1}{10}$	$\frac{1}{5}$	0.2	$\frac{2}{3}$	66.6'%	$\frac{9}{10}$
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### Calculating Temperature Change – Using negative numbers

**A**  
The temperature change;  
from  $3^{\circ}$  to  $8^{\circ}$

**B**  
The temperature change;  
from  $9^{\circ}$  to  $4^{\circ}$

**C**  
The temperature change;  
from  $-9^{\circ}$  to  $-4^{\circ}$

**D**  
The temperature change;  
from  $-1^{\circ}$  to  $-6^{\circ}$

**E**  
The temperature change;  
from  $-2^{\circ}$  to  $3^{\circ}$

**F**  
The temperature change;  
from  $2^{\circ}$  to  $-3^{\circ}$

**G**  
The temperature change;  
from  $0^{\circ}$  to  $5^{\circ}$

**H**  
The temperature change;  
from  $-5^{\circ}$  to  $0^{\circ}$

A, C, E, G, H  $+5^{\circ}$

B, D, F  $-5^{\circ}$

### Percentages

#### 1) Percentage Increase

A friend was earning a salary of £21 920 and after a pay rise in January 2004 is now earning £22 580.

What percentage increase is this?

Find increase	$£22\ 580 - £21\ 920 = £660$
Write increase as fraction of original amount	$\frac{660}{21920}$
Find percentage increase by multiplying by 100	$\frac{660}{21920} \times 100 = 3\%$

#### (2) 'Backwards' Percentage

*In a recent sale, there was a 30% reduction on all goods. What was the original price of a jacket sold in the sale for £38.50?*

£38.50 represents the amount after 30% reduction	$£38.50 = 70\%$
If 70% represents £38.50 1% represents	$\frac{£38.50}{70}$
100% represents the original price	$\frac{£38.50}{70} \times 100 = \mathbf{£55.00}$

## Skills for Life Improvement Programme

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### 3) Adding VAT (value added tax)

Show a non-calculator method to add VAT (17.5%) to a building job priced at £280

$10\% \text{ £}28 = \text{£}28$ $5\% \text{ £}28 = \text{£}14$ <u><math>2\frac{1}{2}\% \text{ £}28 = \text{£} 7</math></u> + $17\frac{1}{2}\% \text{ £}28 = \text{£}49$	
$10\% \text{ £}28 = \text{£}28$ $20\% \text{ £}28 = \text{£}56$ $1\% \text{ £}28 = \text{£}2.80$ $2\% \text{ £}28 = \text{£}5.60$ $\frac{1}{2}\% \text{ £}28 = \text{£}1.40$ $2\frac{1}{2}\% \text{ £}28 = \text{£}7.00$	$17\frac{1}{2}\% = 20\% - 2\frac{1}{2}\%$ $= \text{£}56 - \text{£}7$ $= \text{£}49$

### Working with scale

- The three graphs represent the same information. Explain why they look so different.
  - *The scales are different. The actual data only ranges from 513 – 545 learners but the three graphs cover different ranges of data and the scale increments vary greatly.*
  - *Graph 1 covers the data range 510 – 550 and the scale has increments of 5 learners. Therefore, small changes can be made to look more significant.*
  
- Graph 2 covers the data range 450 – 600 and the scale has increments of 25 learners.
  - *Graph 3 covers the data range 0 - 600 and the scale has increments of 100 learners. Therefore, large changes can be made to look less significant.*
  
- Which graph might be used to:
  - argue for the need for redundancies at the college?
    - *Graph A makes it look as though there has been a huge drop in the number of learners.*
  - include in a college brochure?
    - *Graph C might be used to disguise the fact that there has been a drop in learner numbers.*
  
- Give a context in which graph A could give a false impression of the facts
  - *A small decrease in prices could be made to look like a large decrease.*
  
- Give a context in which graph C could give a false impression of the facts
  - *A significant reduction in the number of trains on time could be made to look like there has been no significant change.*

### Standard form

<b>2567</b>	$2.567 \times 10^3$
<b>2000000000</b>	$2.0 \times 10^9$
<b>2678589</b>	$2.678589 \times 10^6$
<b>5893.2</b>	$5.8932 \times 10^3$
<b>8306000</b>	$8.306 \times 10^6$
<b>1769000000</b>	$1.769 \times 10^9$
<b>28000</b>	$2.8 \times 10^4$
<b>5000000</b>	$5.0 \times 10^6$
<b>58.9</b>	$5.89 \times 10^1$
<b>83067</b>	$8.3067 \times 10^4$
<b>26745.9</b>	$2.67459 \times 10^4$
<b>35672080</b>	$3.567208 \times 10^7$
<b>0.589</b>	$5.89 \times 10^{-1}$
<b>0.0000593</b>	$5.93 \times 10^{-5}$
<b>0.0028</b>	$2.8 \times 10^{-3}$
<b>0.00256</b>	$2.56 \times 10^{-3}$
<b>0.026</b>	$2.6 \times 10^{-2}$
<b>0.00083</b>	$8.3 \times 10^{-4}$

### Shapes and Solids

Solid with 12 edges	Cuboid	A solid with four triangular faces	Tetrahedron	
This quadrilateral has all its angles equal but not its sides	Rectangle	Part of a circle cut out by two radii	Sector	
A quadrilateral with 4 axes of symmetry	Square	A solid with a regular cross section	Prism or Cone	
A closed shape made from one curved line and one straight line	Segment	The regular 3-sided polygon	Equilateral triangle	
A quadrilateral with only one axis of symmetry	Kite	A solid with a circular cross-section	Cone or Cylinder	
No match	Trapezium	Parallelogram	Right-angled triangle	Rhombus

A cone is included in the final definition, as it does not say a 'regular' circular cross-section.

A cylinder is included in the prism definition as it is a type of prism, though the description given is general.

**Note** the definition of the rhombus is a reverse of that for the rectangle i.e. it is a quadrilateral with all its sides equal, but not its angles.

### $\pi$ is

#### Descriptions of $\pi$

##### The following are true

$\pi$  is a constant

$\pi$  is a ratio

$\pi$  is a number

$\pi$  is a Greek letter

$\pi$  is irrational

##### The following are approximations of $\pi$

3.1415926536

3

$\frac{22}{7}$

##### The following are false descriptions of $\pi$

Circumference

Area

Circle