Year 6 to 7 Maths Transition Pack


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## Message from the Head of Department

We are looking forward to meeting you in September but until then I have put together a pack of work together to help continue to develop your maths skills.

In this pack there are some activities that you will do during your time at The Prescot School along with cross numbers and puzzles to help with your numeracy and problem solving skills.

At The Prescot School we want you to enjoy your time in maths so that you can make the best possible progress you are capable of to help you succeed later in life. No matter the path you take in life; maths will play a vital part so let's work together to make sure you leave the Prescot School fully equipped with the mathematical skills you need to have the best options available to you.

Good luck and we will all see you in September

At the Prescot School we like to use something called "Tick or Trash"
These are worksheets that require you to decide who has the correct answer based on your mathematical understanding and skills developed in primary and in maths class at The Prescot School.

Sometimes one has got the right answer but every now and then bot could be correct or both wrong. These are designed to get you thinking about the questions and to help you understand that some questions have multiple answers (e.g. powers, units).

Task: Round each question to the given number of places. Find who has the correct answer (neither could have it or both could be right) and shade that box in. The one with the most correct answers at the end is the winner.

Have a go at the following activities on some important maths topics from both primary and secondary school. Working out is encouraged as in maths it's not just about getting the right answer, it's about your methods and effort.

| A | Rounding | F | Area |
| :---: | :---: | :---: | :---: |
| B | Time | G | Algebra basics |
| C | Negative numbers | H | Fractions of an amount |
| D | BIDMAS/BODMAS | I | + and - fractions |
| E | FDP | J | Calculating percentages |

(A) ROUNDING

|  |  |  |  |
| :---: | :---: | :---: | :---: |
| 1 | 200 | 248 to the nearest <br> hundred. | 300 |
| 2 | 600 | 576 to the eearest 10. | 580 |
| 3 | 7 | 6501 to the nearest thousand. | 6000 |
| 4 | 10000 | 9951 to the nearest | 9900 |
| 5 | 4000 | 5320 to the nearest thousand. | 5000 |
| 6 | 8 | 8.43 to the nearest whole number. | 8.00 |
| 7 | 9 | 9.72 to the nearest whole number. | 10 |
| 8 | 1.2 | 1.2354 to 1 decimal place. | 1.1 |
| 9 | 6 | $\begin{aligned} & \begin{array}{l} \text { 1.583 to decimal } \\ \text { places. } \end{array} \\ & \hline \text {. } \end{aligned}$ | 1.6 |
|  |  | Genius Ques |  |
| A number is rounded to the nearest whole number. The answer is 24 . Give 3 possible numbers that have been rounded. |  |  |  |
| Maths Legend Question! |  |  |  |
| Use rounding to estimate: $17 \times 2.5$ |  |  |  |

(B) TIME

|  |  |  |  |
| :---: | :---: | :---: | :---: |
| ${ }^{1}$ | 12:40 |  | 01:40 |
| 2 | 1:50am |  | 13:50 |
| ${ }^{3}$ | 16:20 | $\begin{gathered} 20 \text { past } 4 \\ \text { (Afternoon) } \end{gathered}$ | 4:20 pm |
| 4 | 11:20 | 11:20pm | 23:20 |
| 5 | 3:07pm | 15:07 | 3:07am |
| 6 | 9:00am | Bedtime | 9:00pm |
| 7 | 07:00 | Breakfast | 7:00pm |
| 8 | 12:10 | 10 past midnight | 00:10 |
| 9 | 12:10 | 10 past midday | 00:10 |

## Maths Genius Question!

Give a time (12 hours and 24 hour) where the following is likely to happen:
a) Do Homework
b) Eat Lunch
c) Wake up
(C) NEGATIVES

|  | Tick one answer <br> and trash the <br> other. <br> + and - <br> NEGATIVES | $-7+4$ |
| :---: | :---: | :---: |
| -3 | $-13-7$ | 3 |
| -20 | $6--2$ | -6 |
| 8 | $8-2$ | 4 |
| 6 | $5-10$ | -5 |
| 5 | $-4+-3$ | -1 |
| -7 | $15-10$ | -5 |
| 5 | $-6+-7$ | 1 |
| -13 | $5+-8$ | -3 |
| -13 | $-12+7$ | 5 |
| -5 | $-15 \div 3$ | -5 |
| 5 | $-3 \times-2$ | -6 |
| 6 | $20 \div-4$ | 5 |
| -5 | $5 \times-9$ | 45 |
| -45 | $-6 \times 2$ | -12 |
| 12 | $-3 \times-10$ | 30 |
| -30 | $-60 \div 3$ | -20 |
| 20 | $-30 \div-2$ | -15 |
| 15 | $40 \div-2$ | 20 |
| -20 |  |  |

(D) BIDMAS/BODMAS/ORDER OF OPERATIONS

|  |  |  |  |
| :---: | :---: | :---: | :---: |
| 1 | 15 | $7+2 \times 4$ | 56 |
| 2 | -8 | $16 \div 1-3$ | 13 |
| 3 | 7 | $15 \div(3+2)$ | 3 |
| 4 | 76 | $100-6+2 \times 3$ | 88 |
| 5 | 8 | $2 \times 5-v 4$ | 6 |
| 6 | 36 | $9 \div 3+15 \times 2$ | 33 |
| 7 | 63 | $19 \times 2+5^{2}$ | 513 |
| 8 | 100 | $8^{2}+2 \times 3^{2}$ | 82 |
| 9 | 13 | $11+11-6^{2} \div 2$ | 4 |

Maths Genius Question!
Insert brackets into the following so that they are correct:
(a) $10 \times 2+6=80$
(b) $5+5 \div 5=2$
(c) $18-6 \div 2=6$

## Maths Legend Question!

a) Michaels says that $9+3 \times 2=15$, is he right, justify your answer
b) Katie says that $6+4 \times 9=90$, is she right, justify your answer.
(E) FRACTIONS, DECIMALS, PERCENATGES

|  |  |  |  |
| :---: | :---: | :---: | :---: |
| ${ }^{1}$ | $\frac{37}{50}$ | 74\% | 0.74 |
| 2 | 0.9 | $\frac{9}{10}$ | 9\% |
| ${ }^{3}$ | $\frac{45}{100}$ | 0.45 | 45\% |
| ${ }^{4}$ | 0.4 | 1 Quarter | $\frac{1}{4}$ |
| 5 | 6.25 | $\frac{5}{8}$ | 625\% |
| 6 | 60\% | 0.06 | 6\% |
| 7 | $\frac{1}{50}$ | 2\% | 0.2 |
| 8 | 845\% | 0.845 | 84.5\% |

Maths Genius Question!
Find the decimal and percentage equivalents to:
a) $\frac{7}{8}$
b) $\frac{4}{5}$
C) $\frac{13}{25}$

Maths Legend Question!
Find a set of percentage, fraction and decimal for a number of your choosing.
(F) AREA

|  | 20 cm | Find the area of a rectangle with sides <br> of length 4 cm and 5 cm. | $20 \mathrm{~cm}^{2}$ |
| :---: | :---: | :---: | :---: |
| 1 | 24 cm | Find the perimeter of a square with <br> side length of 6 cm. | $36 \mathrm{~cm}^{2}$ |
| 3 | $1.2 \mathrm{~m}^{2}$ | Find the area of a rectangle with side <br> lengths 60 cm and 2 m. | $1200 \mathrm{~cm}^{2}$ |
| 4 | $84 \mathrm{~cm}^{2}$ | Find the area of a trapezium with <br> paralle lines of length 5 cm and 9 cm <br> with a height of 6 cm | $42 \mathrm{~cm}^{2}$ |
| 5 | $35 \mathrm{~cm}^{2}$ | Find the area of a triangle with a base <br> of 5 cm and a height of 7 cm. | $17.5 \mathrm{~cm}^{2}$ |
| 6 | $4 \pi \mathrm{~cm}^{2}$ | Find the area of a circle with radius <br> $2 \mathrm{~cm} .\left(\mathrm{HINT}\right.$ : Use Area= $\pi \mathrm{r}^{2}$ | $12.566 \ldots . . \mathrm{cm}^{2}$ |

Maths Genius Question!
Find the area and perimeter of the shape below.


## Maths Legend Question!

1. Give an expression for the area and perimeter of the shape:

2. The area of a shape is $32 \mathrm{~cm}^{2}-\ln$ your books draw two possible shapes that have this area.
(G) ALGEBRA - Simple equations

|  |  |  |  |
| :---: | :---: | :---: | :---: |
| 1 | $x=6$ | $2 \mathrm{x}=8$ | $x=4$ |
| 2 | $\mathrm{x}=5$ | $x+7=12$ | $x=17$ |
| 3 | $\mathrm{x}=19$ | $3 \mathrm{x}=21$ | $\mathrm{x}=7$ |
| 4 | $\mathrm{x}=17$ | $x-9=8$ | $\mathrm{x}=1$ |
| 5 | $y=10$ | $\frac{y}{7}=3$ | $y=21$ |
| 6 | $\mathrm{t}=9$ | $\frac{t}{5}=45$ | $t=225$ |
| 7 | $\mathrm{x}=13$ | $2 \mathrm{x}+7=19$ | $\mathrm{x}=6$ |
| 8 | $x=8$ | $5 x+8=-32$ | $x=-8$ |
| 9 | $\mathrm{x}=1.5$ | $2 \mathrm{y}+10=13$ | no answer |
| Mathematical Understanding |  |  |  |
| 10 | $A=1, B=2, C=3 . \ldots . . Z=26$ <br> because that's its position in the alphabet | Letters in maths. What do they actually mean? | Letters represent unknown numbers of any type. These can be decimals or integers |
| EXTENSION - USING AND APPLYING |  |  |  |
| Write an expression for the perimeter of this rectangle |  |  |  |

(H) FRACTIONS OF AN AMOUNT

|  |  |  |  |
| :---: | :---: | :---: | :---: |
| 1 | 5 | Find $\frac{2}{3}$ of 15 | 10 |
| 2 | 24 | Find $\frac{4}{5}$ of 30 | 25 |
| 3 | 6 | Find $\frac{2}{7}$ of 21 | 14 |
| 4 | 8 | Find $\frac{5}{6}$ of 48 | 40 |
| 5 | 15 | Find $\frac{2}{3}$ of 21 | 14 |
| 6 | 9 | Find $\frac{1}{3}$ of 27 | 3 |
| 7 | 14 | Find $\frac{3}{10}$ of 70 | 21 |
| 8 | 8 | Find $\frac{1}{9}$ of 72 | 9 |
| 9 | 21 | Find $\frac{3}{8}$ of 64 | 24 |
| MATHS GENIUS QUESTION |  |  |  |
| Alex says that $\frac{2}{5}$ of 60 is 12 Is he right? |  |  |  |
| MATHS LEGEND QUESTION |  |  |  |
| Which is bigger $\frac{3}{7}$ of 28 or $\frac{4}{5}$ of 20 |  |  |  |

(I) ADDING \& SUBTRACTING FRACTIONS

|  |  |  |  |
| :---: | :---: | :---: | :---: |
| 1 | $\frac{3}{4}$ | $\frac{2}{3}+\frac{1}{12}$ | $\frac{9}{12}$ |
| 2 | $\frac{70}{99}$ | $\frac{4}{9}+\frac{3}{11}$ | $\frac{71}{99}$ |
| 3 | $\frac{22}{48}$ | $\frac{1}{3}+\frac{1}{8}$ | $\frac{11}{24}$ |
| 4 | $\frac{19}{60}$ | $\frac{2}{5}-\frac{1}{12}$ | $\frac{1}{6}$ |
| 5 | $\frac{18}{35}$ | $\frac{2}{7}+\frac{1}{5}$ | $\frac{17}{35}$ |
| 6 | $\frac{4}{45}$ | $\frac{7}{9}-\frac{3}{5}$ | $\frac{8}{45}$ |
| 7 | $\frac{3}{40}$ | $\frac{3}{4}-\frac{7}{10}$ | $\frac{1}{20}$ |
| 8 | $\frac{29}{60}$ | $\frac{9}{10}-\frac{5}{12}$ | $\frac{27}{60}$ |
| 9 | $\frac{17}{26}$ | $\frac{2}{13}+\frac{1}{2}$ | $\frac{7}{26}$ |
| CHALLENGE QUESTIONS - Mixed numbers |  |  |  |
| 10 | $9 \frac{11}{15}$ | $7 \frac{2}{5}+2 \frac{1}{3}$ | $9 \frac{13}{15}$ |
| 11 | $3 \frac{3}{56}$ | $4 \frac{2}{7}-1 \frac{1}{8}$ | $3 \frac{9}{56}$ |
| 12 | $18 \frac{1}{4}$ | $6 \frac{1}{3}+7 \frac{3}{4}+4 \frac{1}{6}$ | $18 \frac{3}{4}$ |

## (J) PERCENTAGES OF AN AMOUNT


Maths Genius Question!
Order the following from smallest to largest. (Calculator allowed)
a) $150 \%$ of 60
b) $40 \%$ of 200
c) $60 \%$ of 100
d) $99 \%$ of 80

## Mystery 1 (use your mathematical understanding and skills to solve the mystery)

## Who

One of the 4 characters below has murdered Mrs X. Analyse the number problems to discover the murderer.
Each one has said which of the numerical statements they believe are true or false. The innocent people have only made 1 or 2 errors. The guilty person has made 3 errors.

| A) $40 \%$ of 500 is 200 | E) $0.6 \times 300=50$ |
| :--- | :--- |
| B) Half of 390 is 180 |  |
| C) 0.6 is the same as $6 \%$ |  |
| D) 0.25 is the same as 2.5 | G) Half of $\frac{8}{\mathbf{1 0}}$ is $\frac{4}{5}$ |
| H) 0.085 is the same as $8 \frac{1}{2} \%$ |  | | The mad scientist said |
| :--- | :--- |
| A is true |
| C is true |
| D is false |
| H is true |

## Where

The murder took place where these are in ascending order

$$
0.109, \frac{\mathbf{1}}{10}, 11 \%, \frac{90}{1000}, 0.099
$$

| Nottingham if this order is correct | $\frac{\mathbf{9 0}}{\mathbf{1 0 0 0}}, 0.099, \frac{\mathbf{1}}{\mathbf{1 0}}, 0.109,11 \%$ |
| :--- | :--- |
| Derby if this order is correct | $0.109,0.099, \frac{\mathbf{1}}{\mathbf{1 0}}, \frac{\mathbf{9 0}}{\mathbf{1 0 0 0}}, 11 \%$ |
| Sheffield if this order is correct | $11 \%, 0.109, \frac{\mathbf{1}}{\mathbf{1 0}}, 0.099, \frac{\mathbf{9 0}}{\mathbf{1 0 0 0}}$ |
| Leicester if this order is correct | $\frac{\mathbf{1}}{\mathbf{1 0}}, \frac{\mathbf{9 0}}{\mathbf{1 0 0 0}}, 11 \%, 0.099,0.109$ |

When Calculate each answer to find the time and date

| Add these fractions together$\frac{5}{8}+2 \frac{1}{6}=$ |  | A) $2 \frac{6}{14}$ <br> The time was 6:14 pm |  | B) $2 \frac{19}{24}$ <br> The time was 19:24 |
| :---: | :---: | :---: | :---: | :---: |
|  |  | C) $2 \frac{6}{24}$ <br> The time was 6:24 pm |  | D) $\frac{18}{14}$ <br> The time was 8:14 pm |
| Subtract these fractions |  | A) $1 \frac{1}{10}$ <br> The date was $1 / 1 / 10$ |  | B) $1 \frac{3}{10}$ <br> The date was $1 / 3 / 10$ |
|  |  | C) $1 \frac{7}{10}$ <br> The date was 1/7/10 |  | D) $3 \frac{7}{10}$ <br> The date was 3/7/10 |
| Why. Decode the message to find out why Mrs X was killed |  |  |  |  |
| a | b | c | d | e |
| $20 \div 0.5$ | $1.8 \times 1 / 2$ | $4.5+6.5$ | $36 \times 3 / 4$ | $3 \div 1 / 4$ |
| f | g | h | i | J |
| $\frac{2}{5} \times 15$ | $\frac{3}{10} \times 5$ | $37 / 8+11 / 8$ | $0.95 \times 2$ | Half of 66 |
| k | 1 | m | n | 0 |
| $\frac{7}{12}-\frac{1}{6}$ | $6 \div \frac{1}{5}$ | $1 / 4 \times 2 \times 2$ | $0.7 \times 0.7$ | $5 / 8 \times 4$ |
| p | q | $r$ | 5 | t |
| 5\% of 40 | 26\% as a decimal | 15\% of 50 | $1 / 4 \times \frac{4}{5}$ | 10\% of 36 |
| u | v | w | X | y or z |
| $3 \div 3 / 4$ | $1.5 \div 2$ | 4-33/4 | $\frac{3}{5} \text { of } 30$ | $11 / 2 \times 6$ |


| $\frac{1}{5}$ | 5 | 12 | 27 | 1.9 | 27 | 0.49 | 3.6 | 30 | 1.9 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |  |
| $\frac{5}{12}$ | 12 | 6 | 7.5 | 40 | 11 | 3.6 | 1.9 | 2.5 | 0.49 |
|  |  |  |  |  |  |  |  |  |  |
| $\frac{1}{5}$ | 40 | 0.49 | 27 | 1.9 | 30 | 2.5 | 0.75 | 12 | 3.6 |
|  |  |  |  |  |  |  |  |  |  |
| 5 | 12 | 1 | Final Accusation |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
| Who |  |  |  |  |  |  |  |  |  |
| Where |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| When |  |  |  |  |  |  |  |  |  |
| Why |  |  |  |  |  |  |  |  |  |

## Mystery 2 (use your mathematical understanding and skills to solve the mystery)

## Who

One of the four characters below has committed a murder. Analyse the statements from each suspect. The 3 innocent characters make at least 2 truthful statements. The guilty person makes 3 errors.


The mad scientist said the following
*A is $(1,4)$
*E is $(3,1)$
*The x coordinate of G is more than the $x$ coordinate for $F$
*A and B make a vertical line
*G is $(5,4)$
${ }^{*} \mathrm{~F}$ is $(4,3)$
${ }^{*} \mathrm{C}$ is $(1,0)$
*B is $(2,1)$

The silly boy said
${ }^{*} F$ is $(3,4)$
${ }^{*} \mathrm{C}$ and E are on the same horizontal line
*The y coordinate of B is less than the y coordinate of A
*D is ( 0,2 )
The artist said

* C and E are on the same vertical line
*A is (4,1)
*D is $(2,0)$
${ }^{*} \mathrm{C}, \mathrm{B}$ and G are on the same diagonal line


## Where

The murder was committed within this grid. Following the clues below, you have to mark " $x$ " at the right spot.


- The $x$ and $y$ coordinates add up to an even number
- The $x$ coordinate is more than the $y$ coordinate
- Both of the coordinates are odd numbers
- The difference between the $x$ and $y$ coordinate is a square number


## When

The time and day of the murder can be decoded from the grid below.

```
(2,2) (1,1) (1,5) (3,2) (5,2) (5,5)
(3,2) (5,2) (5,3) (4,2) (4,4) (4,1)
(1,2)}(3,3
(5,3) (4,3) (5,2) (1,1) (5,5) (4,2)
(4,5)}(1,5)(5,1
```



Final Accusation
The murderer is
The coordinates of the place the murder happened are
( , )
The time and day are

One of these 6 people has murdered one of the others. Each has made 4 statements about the following list of numbers.

> The murderer has made 3 errors. The victim has made 0 errors. The other suspects have made 1 or 2 errors.

## $5,8,13,16,21,38,49,52,61,64,72$

## Chloe says

- There are 5 odd numbers
- There are 2 square numbers
- There are 2 multiples of 7
- The lowest prime number in the
list is 13
Pauline says


Phil said

- There are 2 cubes in the list
- There are 2 multiples of 9 in the list
- The largest gap between numbers is 9 .
- The answer to $2^{5}$ is in the list
Miss Lune says
- $2^{4}$ is in the list
- $\quad \mathrm{V} 169$ is in the list
- There are no factors of 18 in the list
- The product of the 2 lowest odd numbers is

- There are 3 primes
- The difference between the $1^{\text {st }} 2$ odd numbers in the list is 8
- There are 6 even
 numbers
- There are 3 factors of 64 in the list

Carl says

- The answer to V121 is in the list
- There are 2 multiples of 13 in the list
- There are 4 square numbers
- There are 4 multiples of 8



## Geoff says

- There are 2 cubes in the list
- $2^{6}$ is in the list
- V81 is in the list
- There are no
 multiples of 12


## Where

The murder was committed in a Midlands town near to Birmingham.


It was Wolverhampton if there are 3 prime numbers in the 20's
It was Kidderminster if there are 4 multiples of 30 between 100 and 200
It was Nuneaton if there are 9 factors of 36
It was Walsall if there are 5 perfect square numbers between 50 and 150

When.
Calculate the time and date from these
(eg hours answer $=17$ minutes part $=28$ gives a time of 17:28

| The hour part of the time is the answer to | $\mathrm{v} 16 \times\left(4^{2}-\mathrm{V} 121\right)$ |
| :--- | :--- |
| The minute part of the time is the answer to | $3^{3}$ |
| The day part of the date is | The factors of 8 added together |
| The month part of the date is | The $3^{\text {rd }}$ multiple of 4 |
| The year part of the date is | $\left(10^{3} \times \mathrm{V} 4\right)+\mathrm{v} 100$ |


| Why |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| a | b | c | d | e |
| $4^{2}$ | V100 | $1^{2}+1^{3}$ | $10^{2} \div 4$ | $3^{2}-\sqrt{ } 4$ |
| f | g | h | i | j |
| Next prime after 13 | $1^{\text {st }}$ prime no in the 20's | $3+3^{2}$ | $5^{\text {th }}$ prime number | $2^{\text {nd }}$ prime $\times 4^{\text {th }}$ prime |
| k | 1 | m | n | 0 |
| LCM of 2 \& 7 | $2^{2}$ | V169 | $1{ }^{10}$ | $2^{3}$ |
| $p$ | q | r | s | t |
| HCF of 30 \& 45 | $5^{2}-1^{2}$ | Cube root of 125 | V400 | V9 |
| u | $v$ | w | x | y or z |
| V36 | V81 | $4^{2}+1^{2}+1^{2}+1^{2}$ | $9^{\text {th }}$ multiple of 2 | $5^{2}-\mathrm{V} 9$ |


| $\mathbf{1 2}$ | 7 | 25 | 8 | 7 | 20 | 1 | 3 | 14 | 1 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |  |  |  |  |  |
| 8 | 19 | 12 | 8 | 19 | 3 | 8 | 20 | 24 | 6 |
| 16 |  |  |  |  |  |  |  |  |  |
|  |  | 7 | 16 | 1 | 6 | 13 | 10 | 7 | 5 |


| THE FINAL ACCUSATION |  |
| :--- | :--- |
| Who |  |
| Where |  |
| When |  |
| Why |  |

## Cross Number 1

| 1 |  | 2 |  | 3 |  |  | 4 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 5 | 6 |  |  |  |  |
| 7 | 8 |  |  |  | 9 |  |  |
|  | 10 |  |  | 11 |  |  |  |
| 12 |  |  | 13 |  |  | 14 |  |
| 15 |  |  |  |  |  | 16 | 17 |
|  |  |  | 18 |  | 19 |  |  |
| 20 |  |  |  |  | 21 |  |  |

Enter the answers to the sums below into the matching squares on the numbered grid

Clues Across

|  |  |  |  |
| :--- | :--- | :--- | :--- |
| 1: | $191 \times 2$ | $1:$ | $20 \%$ of 1770 |
| $3:$ | $1327+2404$ | $2:$ | Square root of 484 |
| $5:$ | $50 \%$ of 480 | $3:$ | Three-quarters of 40 |
| $7:$ | $6 \times 7$ | $4:$ | $4722-2856$ |
| $9:$ | 424 divided by 4 | $6:$ | $1872+2879$ |
| $10:$ | $1986+2971$ | $8:$ | 264 divided by 11 |
| $13:$ | A quarter of 5056 | $11:$ | $4035+3245$ |
| $15:$ | $41 \times 5$ | $12:$ | One third of 3699 |
| $16:$ | $75 \%$ of 76 | $14:$ | $75 \%$ of 60 |
| $18:$ | $953-547$ | $17:$ | $1453-741$ |
| $20:$ | $1273+2358$ | $18:$ | First prime number after 40 |
| $21:$ | 1856 divided by 8 | $19:$ | Half of 124 |
|  |  |  |  |

## Cross Number 2



Enter the answers to the sums below into the matching squares on the numbered grid

Clues Across

|  |  |  |  |
| :--- | :--- | :--- | :--- |
| 1: | $983-509$ | $1:$ | $1342-896$ |
| $3:$ | $1134+1209$ | $2:$ | 344 divided by 8 |
| $5:$ | 1428 divided by 4 | $3:$ | Three-quarters of 36 |
| $7:$ | $20 \%$ of 335 | $4:$ | $1765+1532$ |
| $9:$ | $53 \times 3$ | $8:$ | $1847 \times 3$ |
| $10:$ | $1721 \times 2$ | $11:$ | 5678 divided brime number after 70 |
| $13:$ | $4935-3112$ | $12:$ | Seven-eighths of 2552 |
| $15:$ | One third of 759 | $14:$ | $7 \times 5$ |
| $16:$ | 522 divided by 9 | $17:$ | $80 \%$ of 1040 |
| $18:$ | $25 \%$ of 1180 | $18:$ | 5 squared |
| $20:$ | $1133+2542$ | $19:$ | Half of 114 |
| $21:$ | $66 \times 12$ |  |  |
|  |  |  |  |

## Cross Number 3



Enter the answers to the sums below into the matching squares on the numbered grid

Clues Across

|  |  |  |  |
| :--- | :--- | :--- | :--- |
| 1: | $50 \%$ of 982 | $1:$ | Half of 878 |
| $3:$ | $2518+2135$ | $2:$ | Square root of 144 |
| $5:$ | $79 \times 3$ | $3:$ | 376 divided by 8 |
| $7:$ | Three-quarters of 128 | $4:$ | $7543-3915$ |
| $9:$ | $513+429$ | $6:$ | $737 \times 5$ |
| $10:$ | $153 \times 11$ | $8:$ | First prime number after 60 |
| $13:$ | $2668+3174$ | $11:$ | $7677-3789$ |
| $15:$ | 2022 divided by 3 | $12:$ | 7346 divided by 2 |
| $16:$ | $179-114$ | $14:$ | 156 divided by 6 |
| $18:$ | $75 \%$ of 912 | $17:$ | Four-fifths of 730 |
| $20:$ | $1739+2245$ | $19:$ | 8 squared |
| $21:$ | Two-thirds of 846 |  |  |
|  |  |  |  |

## Cross Number 4



Enter the answers to the sums below into the matching squares on the numbered grid

## Clues Across

|  |  |  |  |
| :--- | :--- | :--- | :--- |
| 1: | $114 \times 4$ | $1:$ | $25 \%$ of 1836 |
| 3: | $5936-3163$ | $2:$ | 715 divided by 11 |
| 5: | One third of 1695 | $3:$ | Five-sixths of 30 |
| $7:$ | $75 \%$ of 132 | $4:$ | $8134-4535$ |
| $9:$ | 1298 divided by 2 | $6:$ | $3942+2944$ |
| $10:$ | $5795-3214$ | $8:$ | 736 divided by 8 |
| $13:$ | $3815+2736$ | $11:$ | $4216-2631$ |
| $15:$ | $97 \times 7$ | $12:$ | $2396+2288$ |
| $16:$ | Three-quarters of 104 | $14:$ | Square root of 289 |
| $18:$ | $50 \%$ of 1310 | $17:$ | 3576 divided by 4 |
| $20:$ | $2681+1953$ | $18:$ | Half of 128 |
| $21:$ | $82 \times 7$ | $19:$ | $11 \times 5$ |
|  |  |  |  |

## Cross Number 5

| 1 |  |  | 2 |  | 3 |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  | 5 | 6 |  |  |  |

Enter the answers to the sums below into the matching squares on the numbered grid

Clues Across

|  |  |  |  |
| :--- | :--- | :--- | :--- |
| 1: | 2868 divided by 4 | $1:$ | $1943-1164$ |
| $3:$ | $3357+2319$ | $2:$ | 684 divided by 9 |
| $5:$ | $227 \times 3$ | $3:$ | $75 \%$ of 68 |
| $7:$ | Last prime number before 100 | $4:$ | $4237+2294$ |
| $9:$ | 3381 divided by 7 | $6:$ | $802 \times 11$ |
| $10:$ | $5439-3714$ | $8:$ | 426 divided by 6 |
| $13:$ | $564 \times 4$ | $11:$ | $3471+1792$ |
| $15:$ | One third of 1758 | $12:$ | $2656+2911$ |
| $16:$ | $10 \%$ of 820 | $14:$ | $25 \%$ of 272 |
| $18:$ | Half of 1076 | $17:$ | $53 \times 5$ |
| $20:$ | $5395+2523$ | $18:$ | $191-133$ |
| $21:$ | $20 \%$ of 625 | $19:$ | 9 squared |
|  |  |  |  |

## Cross Number 6

| 1 |  |  |  |  |  | 3 |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

Enter the answers to the sums below into the matching squares on the numbered grid

Clues Across

|  |  |  |  |
| :--- | :--- | :--- | :--- |
| 1: | $93 \times 9$ | $1:$ | $1934-1115$ |
| $3:$ | $1492+894$ | $2:$ | $11 \times 7$ |
| $5:$ | 3975 divided by 5 | $3:$ | $20 \%$ of 125 |
| $7:$ | 776 divided by 8 | $4:$ | $3243+3179$ |
| $9:$ | $1254-602$ | $6:$ | $1863 \times 5$ |
| $10:$ | $4291+5222$ | $8:$ | Last prime number before 80 |
| $13:$ | $3562+2167$ | $11:$ | Seven-eighths of 4280 |
| $15:$ | 5117 divided by 7 | $12:$ | $3394 \times 2$ |
| $16:$ | Three-quarters of 24 | $14:$ | 546 divided by 6 |
| $18:$ | $50 \%$ of 1904 | $17:$ | $75 \%$ of 1156 |
| $20:$ | $1036 \times 8$ | $18:$ | $184-86$ |
| $21:$ | 2361 divided by 3 | $19:$ | One third of 81 |
|  |  |  |  |


| 1 |  |  |  |  | 3 |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

Enter the answers to the sums below into the matching squares on the numbered grid

Clues Across

|  |  | Clues |  |
| :--- | :--- | :--- | :--- |
| 1: | 8451 divided by 9 | $1:$ | $124 \times 8$ |
| $3:$ | $4371+3527$ | $2:$ | 1078 divided by 11 |
| $5:$ | Three-quarters of 1084 | $3:$ | Half of 146 |
| $7:$ | First prime number after 20 | $4:$ | $4786+3967$ |
| $9:$ | $123 \times 5$ | $6:$ | $75 \%$ of 1524 |
| $10:$ | $5426+3521$ | $8:$ | $19 \times 2$ |
| $13:$ | $7399-3921$ | $11:$ | $1497 \times 5$ |
| $15:$ | 5026 divided by 7 | $12:$ | Eight-ninths of 8757 |
| $16:$ | 408 divided by 12 | $14:$ | $176-93$ |
| $18:$ | $50 \%$ of 1502 | $17:$ | $80 \%$ of 610 |
| $20:$ | $2613+1619$ | $18:$ | $9 \times 8$ |
| $21:$ | $934-586$ | $19:$ | Square root of 169 |
|  |  |  |  |

## Cross Number 8

| 1 |  |  |  |  |  | 3 |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

Enter the answers to the sums below into the matching squares on the numbered grid

Clues Across

|  |  |  |  |
| :--- | :--- | :--- | :--- |
| 1: | Four-fifths of 1195 | $1:$ | $183 \times 5$ |
| $3:$ | $3275+2943$ | $2:$ | Last prime number before 70 |
| $5:$ | $261 \times 3$ | $3:$ | One third of 189 |
| $7:$ | $50 \%$ of 104 | $4:$ | $5139+3135$ |
| $9:$ | Three-quarters of 796 | $6:$ | $2747 \times 3$ |
| $10:$ | $2882+5366$ | $8:$ | $25 \%$ of 112 |
| $13:$ | $3543-2046$ | $11:$ | $2231+6213$ |
| $15:$ | 1673 divided by 7 | $12:$ | $4912-2680$ |
| $16:$ | 168 divided by 8 | $14:$ | $80 \%$ of 90 |
| $18:$ | $20 \%$ of 1235 | $17:$ | Half of 298 |
| $20:$ | $4213-1667$ | $18:$ | 234 divided by 9 |
| $21:$ | 1548 divided by 12 | $19:$ | $206-135$ |
|  |  |  |  |

## Cross Number 9

| 1 |  |  |  |  |  | 3 |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

Enter the answers to the sums below into the matching squares on the numbered grid

Clues Across

|  |  |  |  |
| :--- | :--- | :--- | :--- |
| 1: | $50 \%$ of 1828 | $1:$ | $131 \times 7$ |
| $3:$ | $334 \times 7$ | $2:$ | 328 divided by 8 |
| $5:$ | Three-quarters of 160 | $3:$ | Square root of 400 |
| $7:$ | 375 divided by 5 | $4:$ | $3966+4189$ |
| $9:$ | $20 \%$ of 1475 | $6:$ | $4921-2479$ |
| $10:$ | $3755+5391$ | $8:$ | Last prime number before 60 |
| $13:$ | $6324-4208$ | $11:$ | $2676+3465$ |
| $15:$ | 1410 divided by 6 | $12:$ | $2833-1584$ |
| $16:$ | $179-85$ | $14:$ | One third of 207 |
| $18:$ | $25 \%$ of 844 | $17:$ | $51 \times 9$ |
| $20:$ | $4793+4496$ | $18:$ | $5 \%$ of 580 |
| $21:$ | 1251 divided by 9 | $19:$ | Square root of 121 |
|  |  |  |  |


| 1 |  |  | 2 |  | 3 |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  | 5 | 6 |  |  |  |

Enter the answers to the sums below into the matching squares on the numbered grid

Clues Across

|  |  | Clues |  |
| :--- | :--- | :--- | :--- |
| 1: | 1566 divided by 6 | $1:$ | $75 \%$ of 324 |
| $3:$ | $2415+3214$ | $2:$ | Square root of 225 |
| $5:$ | $50 \%$ of 1066 | $3:$ | 636 divided by 12 |
| $7:$ | First prime number after 30 | $4:$ | $4549+5216$ |
| $9:$ | $2133-1147$ | $6:$ | $7214-3566$ |
| $10:$ | $641 \times 6$ | $8:$ | $5 \%$ of 260 |
| $13:$ | $3810+4343$ | $11:$ | $3462+2716$ |
| $15:$ | $25 \%$ of 736 | $12:$ | $4391-3229$ |
| $16:$ | Two-fifths of 115 | $14:$ | 272 divided by 8 |
| $18:$ | 3465 divided by 9 | $17:$ | $1434-743$ |
| $20:$ | One third of 7566 | $18:$ | $8 \times 4$ |
| $21:$ | 11 squared | $19:$ | Three-quarters of 68 |
|  |  |  |  |





PUZZLE 4


PUZZLE 5





Puzzles
Use your previous maths skills to help solve the following problems

## Square it up

You need six drinking straws each the same length. Cut two of them in half.
You now have eight straws, four long and four short.

You can make 2 squares from the eight straws.


Arrange your eight straws to make 3 squares, all the same size.

## Teaching objectives

Solve mathematical problems or puzzles.
Visualise 2-D shapes.

## Joins

Join any four numbers.
Find their total.
Joins can go up, down or sideways, but not diagonally.
The score shown is $8+15+6+18=47$.


Find the highest possible score.
Find the lowest possible score.

Try joining five numbers.
Now try joining five numbers using only diagonal joins.

## Teaching objectives

Solve mathematical problems or puzzles.
Add and subtract two-digit numbers mentally.

## Money bags

Ram divided 15 pennies among four small bags.

He could then pay any sum of money from $1 p$ to 15 p, without opening any bag.

How many pennies did Ram put in each bag?


## Teaching objectives

Solve mathematical problems or puzzles.
Explain methods and reasoning.

## Presents

Gurmit paid $£ 21$ for five presents.


For $A$ and $B$ he paid a total of $£ 6$.
For $B$ and $C$ he paid a total of $£ 10$.
For $C$ and $D$ he paid a total of $£ 7$.
For $D$ and $E$ he paid a total of $£ 9$.

How much did Gurmit pay for each present?

## Teaching objectives

Solve a given problem by organising information.
Explain methods and reasoning.

## Spot the shapes 2

1. How many triangles can you count?

2. How many squares can you count?

3. Draw your own diagram to count triangles.

Don't use too many lines!
How many triangles can a friend find?
Can you find more?

## Teaching objectives

Solve mathematical problems or puzzles.
Visualise 2-D shapes.
Explain methods and reasoning.

## Make five numbers

Take ten cards numbered 0 to 9.


Each time use all ten cards.

Arrange the cards to make:
a. five numbers that are multiples of 3
b. five numbers that are multiples of 7
c. five prime numbers

Make up more problems to use all ten cards to make five special numbers.

Teaching objectives
Solve mathematical problems or puzzles.
Know 3 and 7 times tables.
Recognise prime numbers.

## Maze

Start with zero.
Find a route from 'Start' to 'End' that totals 100 exactly.


Which route has the highest total?
Which has the lowest total?

Now try some different starting numbers.

## Teaching objectives

Solve mathematical problems or puzzles.
Add and subtract two-digit numbers mentally.
Multiply and divide by single-digit numbers.

## Flash Harry



In April Flash Harry bought a saddle for $£ 100$.
In May he sold it for $£ 200$.

In June he was sorry he had sold it.
So he bought it back for $£ 300$.

In July he got tired of it.
So he sold it for $£ 400$.

Overall, did Flash Harry make or lose money? How much did he make or lose?

## Teaching objectives

Solve mathematical problems or puzzles.
Use negative numbers.

## Age old problems

1. My age this year is a multiple of 8 . Next year it will be a multiple of 7 .
How old am I?
2. Last year my age was a square number.

Next year it will be a cube number.
How old am I?
How long must I wait until my age is both a square number and a cube?
3. My Mum was 27 when I was born. 8 years ago she was twice as old as I shall be in 5 years' time. How old am I now?


## Teaching objectives

Solve mathematical problems or puzzles.
Know multiplication facts to $10 \times 10$.
Recognise square and cube numbers.

## Franco's fast food



This is what food costs at Franco's café.

1 curry and 1 tea cost $£ 4$.
2 curries and 2 puddings cost $£ 9$.
1 pudding and 2 teas cost $£ 2$.

What do you have to pay in total for 1 curry, 1 pudding and 1 tea?
What does each item cost on its own?

## Teaching objectives

Solve mathematical problems or puzzles.
Explain methods and reasoning.

## Albert Square



36 people live in the eight houses in Albert Square.
Each house has a different number of people living in it. Each line of three houses has 15 people living in it. How many people live in each house?

## Teaching objectives

Solve mathematical problems or puzzles.
Add several small numbers mentally.
Explain methods and reasoning.

## A bit fishy

A goldfish costs $£ 1.80$.
An angel fish costs $£ 1.40$.


Nasreen paid exactly $£ 20$ for some fish.
How many of each kind did she buy?

## Teaching objectives

Solve problems involving ratio and proportion.
Choose and use efficient calculation strategies to solve a problem.
Explain methods and reasoning.

## Pet shop



1. Jim bought a cat and dog for $£ 60$ each.

Later he sold them.
He made a profit of $20 \%$ on the dog.
He made a loss of $20 \%$ on the cat.
How much did he get altogether when he sold the cat and dog?
2. Jim bought another cat and dog.

He sold them for $£ 60$ each.
He made a profit of $20 \%$ on the dog.
He made a loss of $20 \%$ on the cat.
Did he make a profit or loss on the whole deal?

## Teaching objectives

Solve mathematical problems or puzzles.
Find simple percentages.

## Shape puzzle

Each shape stands for a number.

The numbers shown are the totals of the line of four numbers in the row or column.


Find the remaining totals.

## Teaching objectives

Solve mathematical problems or puzzles.
Use a symbol to stand for an unknown number.
Explain methods and reasoning.

## Bus routes



Six towns are connected by bus routes.
The bus goes from A back to $A$.
It visits each of the other towns once. How many different bus routes are there?


This table shows the bus fare for each direct route. $B$ to $A$ costs the same as $A$ to $B$, and so on.

| $A$ to $B$ | B to $C$ | $C$ to $D$ | D to E | E to F | F to A | B to D | B to F | $C$ to E | $C$ to F |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathrm{£4}$ | $£ 3$ | $£ 4$ | $£ 4$ | $£ 3$ | $£ 4$ | $£ 5$ | $£ 3$ | $£ 2$ | $£ 2$ |

Which round trip from $A$ to $A$ is the cheapest?

## Teaching objectives

Solve a problem by extracting and interpreting data Add several numbers mentally.

## Slick Jim

Slick Jim won the lottery.

He spent two thirds of his winnings on a very posh house.


He spent two thirds of what he had left on a luxury yacht.

Then he spent two thirds of what he had left on a hot air balloon.


He spent his last £20000 on a flashy car.


How much did Slick Jim win on the lottery?

## Teaching objectives

Solve a problem by organising information.
Find fractions of quantities.
Understand the relationship between multiplication and division.

## Cola in the bath

A can of cola holds 33 centilitres.


If you had a bath in cola - don't try it! approximately how many cans of cola would you need? Hint: 1 cubic centimetre is the same as 1 millilitre.


## Teaching objectives

Solve mathematical problems or puzzles.
Estimate lengths and convert units of capacity.
Develop calculator skills and use a calculator effectively.

## Make 200

## $\begin{array}{lllllllll}1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9\end{array}$

Choose four of these digits.
Each one must be different.
Put one digit in each box.


This makes two 2-digit numbers reading across and two 2-digit numbers reading down.
Add up all four of the numbers.

In this example the total is 100 .
$12+47+14+27=100$

| 1 | 2 |
| :--- | :--- |
| 4 | 7 |

How many different ways of making 200 can you find?

## Teaching objectives

Solve mathematical problems or puzzles.
Know what each digit represents.
Add several two-digit numbers.

