Maths Home Learning Task

Year 7

Problem Solving

Name

__________________________________________________________

Tutor Group

__________________________________________________________

Teacher

__________________________________________________________

Given out: Monday 16 May  Hand in: Monday 23 May

Parent/Carer Comment

__________________________________________________________

Staff Comment

Level

ATL

Target To improve:
Instructions

You should attempt as many of the problems as you can. These are the **minimum** amounts expected of you:

Sets 1 and 2: Attempt all of the problems.

Sets 3 and 4: Attempt the first 5 problems.

This booklet should take 5 hours to complete so spread the work out over all 5 days.

Complete the tasks neatly in the spaces provided and show all working.

Remember to fill in the evaluation sheet at the end before you hand the booklet in.

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**Success Criteria:**
Levels are awarded for the way you work on a problem as well as the answers so **you must show all your working.** The level awarded is written at the top and bottom of each problem.

- **Level 3:** Try different approaches to overcome difficulties in solving problems.
- **Level 4:** Come up with your own approaches and record your work clearly.
- **Level 5:** Describe situations using mathematical language and explain your reasoning.
- **Level 6:** Break up problems into simpler parts and give a logical argument.

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**Keywords you need to understand:**
expression, equation, net, reasoning, logic
Problem 1: How many triangles? (Level 3)

How many triangles can you see in this picture?
Show your working clearly.
Problem 2: Making Sums  (Level 4)

You are given these seven cards:

2 4 6 8 + − =

They can be arranged to make expressions like this:

2 4 + 6 − 8 =

This expression equals 22 because 24 + 6 − 8 = 22.

1. What is the largest total you can make that uses all 7 cards?
   
   You should try at least 5 examples.
2. The cards can also be arranged to make *equations* like this: *(equations include the total as well as the expression)*

\[
\begin{array}{ccc}
6 & - & 2 = 4
\end{array}
\]

How many different equations can you make from the cards? Can you make an equation that uses all five cards?
Problem 3: Cube Nets  (Level 5)

For each cube circle the correct net that would make it.

1.  
   A  B  C  D  E  F
   D  E  C  B  A  
   C  F  D  E  A  

2.  
   F  B  A  C  E  D
   B  E  D  C  A  
   A  F  C  D  B  

3.  
   C  A  E  B  D  
   A  E  B  C  F  
   E  B  C  A  D  

4.  
   B  D  E  A  C  F
   D  B  E  A  C  
   E  A  F  B  C  

Level 5
The picture shows the points scored for each letter in a Scrabble set. You can use this to work out how many points your name will score.

Michael works out that his name scores:
3+1+3+4+1+1+1=14 points.

1. Work out how many points your name scores. Is it more, less or the same as Michael’s?

2. In a game of Scrabble each player gets 7 letters. Find some 7-letter words and work out their scores. What is the largest score you can make?

3. How many words can you make that score exactly 15 points?
Problem 5: Lollies (Level 5)

Anna has a bag of lollies to share with Bashir.

They share the lollies equally and there is one left over. Suggest some possible numbers of lollies there could have been in the bag.

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Their friends Carl, Demi and Erica arrive so Anna and Bashir decide to share out the lollies among all of them.

They share the lollies out again and now there are 2 left over. Suggest how many lollies there could be now.

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Use this space for your working

Bashir says that he had 5 more lollies before their friends arrived. How many lollies were in the bag?

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Use this space for your working

Level 5
Problem 6: Shape Times Shape (Level 6)

Each of the shapes stands for a number between 0 and 12. Each different shape is a different number. 2 numbers are missing.

\[
\begin{align*}
\square \times \square \times \square &= \pentagon \\
\square \times \Diamond &= \pentagon \\
\triangle \times \Box &= \star \\
\triangle \times \Box &= \nabla \\
\triangle \times \triangle &= \mathbf{+} \\
\square \times \bigcirc &= \bigcirc \\
\triangle \times \Box &= \triangle \\
\Box \times \bigcirc &= \Box \\
\Box \times \Box &= \bigcirc \\
\Diamond \times \square &= \square
\end{align*}
\]

1. Use the multiplication clues to work out which shape stands for which number.

*Use this space for your working:*

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Write your solution here:

\begin{align*}
\square &= \bigcirc = \\
\square &= \star = \\
\pentagon &= \nabla = \\
\Diamond &= \mathbf{+} = \\
\bigcirc &= \Box = \\
\Box &= \bigcirc = \\
\Box &= \Box = \\
\Diamond &= \square = \\
\end{align*}
```

The missing numbers are: ___________________________
Problem 7: How many routes?  (Level 6)

Look at the diagram showing the word MATHS.

Starting at the letter M and moving along the lines, how many different routes can you take that spell out the word MATHS?

One route is shown here.
Here is a similar diagram for the word SQUARES.

Find out how many routes there are that spell the word SQUARES.

Investigate routes that spell the word DIAGONALS.

Level 6
I am a R.......................................Learner.

I know this because .................................................................

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I believe I am working at Level ............... My target is Level ............... 
To improve I need to practise:

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