Heart of England - Mathematics
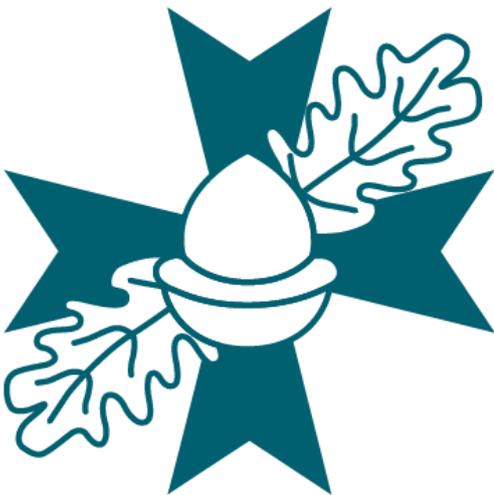
Name _____

It is important that you train your brain during the summer holidays and keep your problem solving skills up to date.

This booklet includes some questions for you to answer so give it your best shot, and hand any answers in to your Mathematics teacher by

Monday 17th September

There is also a star challenge for the brave amongst you.

GOOD LUCK!

practice makes permanent

You can complete all of the questions without using a calculator so try by using only your brains at first, then with a calculator if you are having real difficulty.

Be Quick!   (Time how long it takes to complete these 5 problems)

1. I am a square number. My factors are greater than 6 & less than 8. What am I? _____

2. I am a square number, smaller than 150, larger than 100. The sum of my digits is 9. What number multiplied by itself made me? _____

3. I am a square with sides of 9cm. What is my area? _____

4. I am made from 2 identical squares placed side by side. Their total area is 72cm². What is the length of 1 side of 1 of my squares? _____

5. All my sides are the same length. I have 1 more side than an octagon. What am I? _____

Write how long you took to do these. _____

Quiz Time

1. Tom has to be at school by 8:45am. He takes 10 mins to wash, 12 minutes to dress & 26 minutes to eat breakfast. If it takes him 17 mins to walk to school, what time should he get up? _____

2. Solve the riddle to find the number to open the bank vault.

There is a 2 in the 1,000s place. The digit in the 10s place is 4x the digit in the 1,000s place. The digit in the 100s place is ½ the digit in the 10s place. The digit in the units place is the next prime no. after 5. The final digit is twice the units digit, less 5.

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The Main Chance

1. Using the counter below, write true or false for these statements.

   a) I have an even chance of spinning an odd number. _____

   b) I have an even chance of spinning an odd number. _____
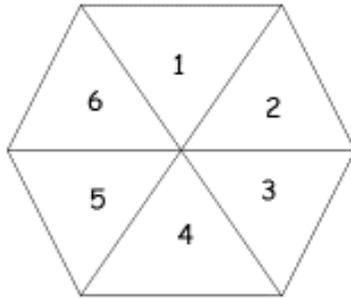
2. Katie puts 6 counters into a bag. 3 are green. 2 are red. 1 is blue.

   a) What is her chance of taking out a green counter? _____

   b) What is her chance of taking out a red or blue counter? _____

   c) Which colour of counter is least likely to be drawn? _____

3. Katie adds 5 blue counters & 1 green counter.

a) Which colour of counter is most likely to be drawn? _____

b) Which colour of counter is least likely to be drawn? _____

Problem Medley

1. Tim travelled from home to town by bus. His fare was £2. How far did he travel if the fare is £1.20 for the 1st half a kilometre & 20p for each additional 250m? _____

2. The peel of a banana is about $\frac{1}{8}$ of the total weight of a banana. If you buy 2kg of bananas at 90p a kilo, how much are you paying for the banana peel? _____

3. Chung bought 8 t shirts from the local cash & carry as birthday presents for his cousins. The t shirts were £5.20 each. An additional 17.5% was added at the checkout. How much change did he have from £100? _____

4. If you saved £2 on Jan 1st, £4 on Feb 1st, £6 on March 1st, & so on, how much would you save in 1 year? _____

5. A supermarket has parking for 2,000 cars. 120 of the spaces are for people with disabilities & $\frac{1}{10}$ are for parents with children. On Tuesday 80 disabled & 70 parent & child spaces are taken. Altogether the car park was 30% full. How many cars were parked in spaces not reserved for the disabled or parents with children? _____

6. Lucy decided to put rabbit proof fencing around her vegetable plot. The plot measured 10m x 20m. If the posts for the fencing were placed 2m apart, how many posts were used? _____

7. Emiko asked the girls at her party to take some strawberries from a basket. The 1st girl took 1 strawberry, the 2nd girl took 3, the 3rd girl took 5, & so on until each of the 7 guests had taken some strawberries. Now the basket was empty. How many strawberries were there in the basket to start with? _____

Number Puzzles

1. Nikki gave Luke ½ of her crayons. Luke gave Chelsea ½ of the crayons that he had received from Nikki. Chelsea kept 12 crayons & gave the remaining 6 to Eve. How many crayons did Nikki give to Luke? _____

2. The sum of the page numbers on the open pages of a large dictionary is 573. What are the page numbers? _____

3. Solve this. Do not use a calculator.

	→	x 8	→	÷ 0.7	→	x 6	→	÷ 9	→	102.4

4. Sam wrote all the whole numbers between 1 & 100. How many times did he write the number 2? _____

5. Jamie asked if he could have pocket money. His father gave him a choice: either £1.25 a week, or 1p on Mon, 2p on Tues, 4p on Wed & so on to Sun.

a) How much pocket money would Jamie receive each week using the 2nd payment method? _____

b) Which way would give him more pocket money? _____

c) How much more would he get? _____

6. Megan noticed that the number of hours left on Tues was $\frac{1}{5}$ of the number of hours already passed. What time was it? _____

Family Fractions

1. The 10 yr olds from the Smith, Jones & Khan families each chose 1 of these fractions. $\frac{1}{2}$ $\frac{3}{8}$ $\frac{3}{4}$

   Change the fractions to decimal numbers & place them on this number line.

   0   1

2. The children in the Smith family wear 5[th]s fractions on their t shirts. The children in the Jones family wear 8[th]s fractions on their t shirts. The children in the Khan family wear 7[th]s fractions on their t shirts.

a) Sort these fractions into the correct family. To show your choice, write the 1st letter of the family next to each fraction.

$\frac{12}{21}$ $\frac{6}{15}$ $\frac{8}{14}$ $\frac{12}{32}$ $\frac{4}{7}$ $\frac{20}{50}$ $\frac{24}{64}$ $\frac{16}{28}$ $\frac{9}{24}$ $\frac{6}{16}$ $\frac{4}{10}$ $\frac{32}{56}$ $\frac{10}{25}$

b) Find the simplest form of the fractions for each family & write them below.

Smith _____ Jones _____ Khan _____

3. Mr Smith decided to share £100 between his 4 children. He gave the oldest $\frac{2}{5}$ of the money. To the 2nd oldest he gave $\frac{2}{7}$ of the money. To the 2nd youngest he gave $\frac{2}{9}$ of the money. How much money was left for the youngest child?

   £_____

4. Mr Khan offered his 3 children a choice: $\frac{9}{10}$ of a pizza shared between them or a $\frac{1}{4}$ of a pizza each.

a) Which way gives the larger piece of pizza for each child? _____
b) What fraction of the total pizza would the larger piece for 1 child be? _____

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Star Challenge

In a lake, there is a patch of lily pads.

Every day, the patch doubles in size.

If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake?

Virtual Learning Environment

You **do not** need to login before you come to us in September but it may be useful to write the web address down somewhere.

You will use it a lot at Heart of England

MathsWatch: vle.mathswatch.com

You will be given an individual login in **September** to use this website throughout your time at HOE. Your Maths teachers will set your homework tasks on here, and you will use the many videos to revise for assessments.

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