



# Years 5 and 6 Maths Workshop

Fractions et al...

Tuesday 3<sup>rd</sup> October 2017

Ray (Mr Capper to the children)

# The National Curriculum

- Has got harder!
- KS3 work has been pushed down into Years 5 and 6 as a means of 'raising standards'
- A huge focus on written and mental arithmetic, particularly through instant recall and rote
- Times Tables, Times Tables, Times Tables...
- Children are expected to reason more about their Maths

**2016** – 70% of children met the expected standard

**2017** – 75% of children met the expected standard

The pass mark was lowered though from 60 to 57



# Building for SATs

If your child is currently in Year 6, they will sit the following Maths examinations in May 2018:

- Written Arithmetic Paper 1 (40 marks)
- Reasoning Paper 2 (35 marks)
- Reasoning Paper 3 (35 marks)

If your child is currently in Year 5, they will sit the same exams as above. However, these things change all of the time!



# Building for SATs

## Written Arithmetic

- Recalling times table multiplication and division facts (e.g.  $9 \times 7$ ,  $12 \times 8$ ,  $77 \div 7$ )
- Written sums for addition, subtraction, multiplication and division (e.g.  $\pounds 43.67 + \pounds 17.15$ ,  $5686 - 1579$ ,  $19 \times 7$ ,  $184 \div 8$ ) – including decimals for smaller numbers (e.g.  $3.2 + 0.005$ ,  $6.72 \times 4$ )
- Finding percentages of numbers (e.g. 35% of  $\pounds 720$ )
- Finding fractions of numbers (e.g.  $\frac{5}{8}$  of 104)
- Adding and subtracting fractions (e.g.  $\frac{5}{8} - \frac{3}{8}$ ,  $1\frac{7}{8} + \frac{7}{8}$ )
- Multiplying and dividing fractions (e.g.  $\frac{5}{8} \div 2$ ,  $\frac{3}{8} \times 5$ ,  $\frac{3}{4} \times \frac{1}{2}$ )
- Square numbers, cube numbers and the square root of numbers (e.g.  $7^2$ ,  $8^3$ ,  $\sqrt{144}$ )
- Simple algebra (e.g.  $4y + 3 = 15$ , so what is  $y$ ?)
- Multiply and dividing numbers by 10, 100 and 1,000 (e.g.  $7,256 \div 100$ ,  $0.072 \times 100$ )



# Building for SATs – Arithmetic

**14**  $50 + (36 \div 6) =$

1 mark

**15**  $\frac{4}{6} \times \frac{3}{5} =$

1 mark

**17**  $581 \div 7 =$

1 mark

**22**

$$\begin{array}{r} 4781 \\ \times 23 \\ \hline \end{array}$$

Show your method

2 marks

**26**  $\frac{1}{4} + \frac{1}{5} + \frac{1}{10} =$

1 mark

**27**  $\frac{4}{5} \div 4 =$

1 mark



# Building for SATs

## Reasoning

- Application through word problems, both 2 and 3–step
  - money
  - the number system and place value
  - applying number facts from arithmetic
  - more algebra and fractions!
- Data Handling
- Shape, Space and Measure
- Roman Numerals

Can your child identify what they need to do to solve a problem?

Can they apply all of their numerous Maths skills to help them out?

Can they explain/show how they got an answer?

Can they check that their answer is realistic?



# Building for SATs – Reasoning

At the start of June, there were 1,793 toy cars in the shop.

During June,

- 8,728 more toy cars were delivered
- 9,473 toy cars were sold.

How many toy cars were left in the shop at the end of June?

Pack of 12 stickers  
£10.49

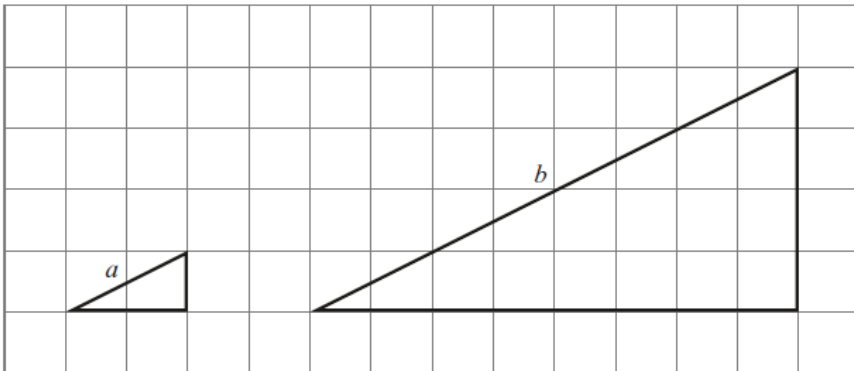
12 stickers  
99p each

Ally buys a pack of 12 stickers for £10.49

Jack buys 12 single stickers for 99p each.

How much more does Jack pay than Ally?

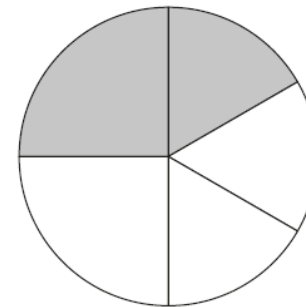
Here are two similar right-angled triangles.



Write the ratio of side  $a$  to side  $b$ .

$a:b =$    $:$

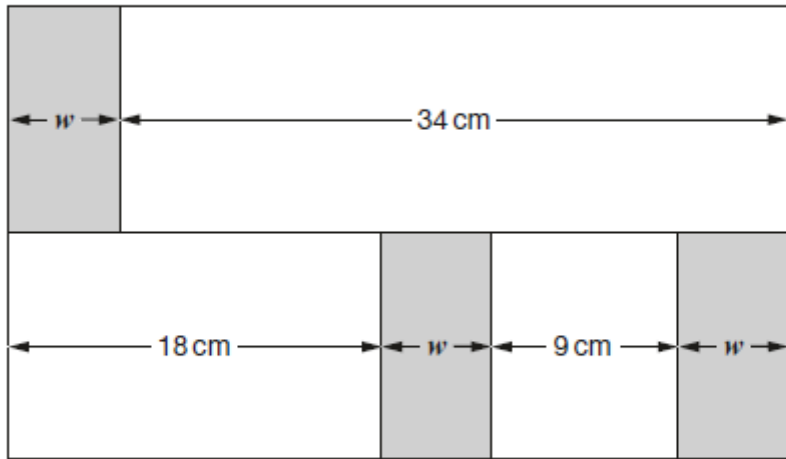
In this circle,  $\frac{1}{4}$  and  $\frac{1}{6}$  are shaded.



What fraction of the whole circle is **not** shaded?

# Building for SATs – Reasoning

In this diagram, the shaded rectangles are all of equal width ( $w$ ).



Calculate the width ( $w$ ) of one shaded rectangle.

William wants to travel to Paris by train.

He needs to arrive in Paris by **5:30 pm**.

Circle the **latest time** that William can leave London.

Leaves London	Arrives Paris
12:01	15:22
12:25	15:56
13:31	16:53
14:01	17:26
14:31	17:53
15:31	18:53
16:01	19:20

A **square** number and a **prime** number have a total of 22

What are the two numbers?

$$\begin{array}{ccc} \boxed{\phantom{00}} & + & \boxed{\phantom{00}} = 22 \\ \text{square} & & \text{prime} \\ \text{number} & & \text{number} \end{array}$$





# Maths Rockets

## Rocket Card Year 5

Challenge 1:	Challenge 2:	Challenge 3:	Challenge 4:	Challenge 5:
a) Adding fractions with the same and different denominators	a) Subtracting fractions with the same and different denominators	a) Multiplying pairs of fractions b) Multiplying fractions by a whole number	a) Dividing pairs of fractions b) Dividing pairs of fractions by a whole number	a) Mixed fraction problems
<p><b>Congratulations! You have completed all of the KS1 and KS2 Mental Maths objectives. Now it is time for you to face your toughest challenge... written arithmetic!</b></p>				
<p><b>Captain</b> Mixed tests for all steps</p>				
<p><b>Chief Navigator</b> Mixed steps 1-3</p>		<p><b>Pilot</b> Mixed steps 4-6</p>		<p><b>First Mate</b> Mixed steps 7-9</p>
<p><b>Step 8</b></p> <p>a) Recognise and use square numbers up to <math>12 \times 12</math> (i.e. <math>4^2 = 4 \times 4 = 16</math>)            b) Use knowledge of fractions to find 10%, 20%, 25% and 50% of a number with the answer being a whole number (i.e. 25% = <math>\frac{1}{4}</math>, so 25% of 80 = <math>80 \div 4</math>)            c) Mentally identify whether a number is a prime number to 50 (i.e. use knowledge of times tables)</p>				
<p><b>Step 7</b></p> <p>a) Use times table facts to divide other numbers mentally (i.e. <math>640 \div 8 = 7, 7.2 \div 0 = ?</math>)            b) Extend simple linear sequences for fractions and decimals (i.e. 0.7, 1.4, 2.2... 1.34, 2, 2.34...)            c) Use knowledge of place value to double and halve decimal numbers (i.e. double 4.2, half of 12.6)</p>				
<p><b>Step 6</b></p> <p>a) Count forwards in multiples of 25, including not starting at zero (i.e. 200, 225, 250...)            b) Use times table facts to multiply other numbers mentally (i.e. <math>7 \times 0.8 = 5.6, 50 \times 0 = ?</math>)            c) Find complements of 1 (i.e. <math>0.73 + 0.27 = 1</math>)</p>				
<p><b>Step 5</b></p> <p>a) Count forwards in multiples of 50, including not starting at zero (i.e. 350, 400, 450...)            b) Count forwards in all multiples of 2, 3, 4, 5, 6, 7, 8, 9 and 10 (i.e. 7, 14, 21...)            c) Use times table facts to divide larger whole numbers mentally (i.e. <math>480 \div 6, 92 \div 4</math>)</p>				
<p><b>Step 4</b></p> <p>a) Count forwards and backwards in steps of thousands to 1,000,000 (i.e. 4,000, 8,000, 12,000...7,000, 14,000...)            b) Count forwards and backwards with positive and negative whole numbers (i.e. the temperature is <math>12^\circ\text{C}</math> in London and <math>-15^\circ\text{C}</math> in Moscow. What is the difference?)            c) Recall division facts for all times tables to <math>12 \times 12</math> (consolidation from years 1-4)*</p>				
<p><b>Step 3</b></p> <p>a) Use times table facts to multiply larger numbers mentally (i.e. <math>15 \times 7 = 10 \times 7 + 5 \times 7, 70 \times 6</math>)            b) Given a number, add and subtract 10/100/1,000 to 100,000 (i.e. what is 1,000 more than 23,751?)            c) Count forwards and backwards in steps of tens of thousands to 1,000,000 (i.e. 30,000, 60,000, 90,000)</p>				
<p><b>Step 2</b></p> <p>a) Divide numbers by 10 and 100 to 2 decimal places (i.e. <math>34.2 \div 100, 1.5 \div 100</math>)            b) Add three 2-digit numbers together mentally (i.e. <math>50 + 25 + 10</math>)            c) Double and halve 3 and 4-digit numbers using knowledge of partitioning/place value (i.e. double 240 = double 200 + double 40 + double 0, Half of 528 = half of 500 + half of 20 + half of 8)</p>				
<p><b>Step 1</b></p> <p>a) Recall multiplication facts for all times tables to <math>12 \times 12</math> (consolidation from years 1-4)*            b) Find all factor pairs for a given number (i.e. factors of 24 are 1, 2, 3, 4, 6, 8, 12 and 24)            c) Multiply numbers by 10 and 100 to 2 decimal places (i.e. <math>2.45 \times 100, 0.12 \times 100</math>)</p>				

## Rocket Card Year 6

### WRITTEN ARITHMETIC

Place Value and the Number System	The Four Operations
<p>a) Read and write all numbers to 10,000,000 in figures and words</p> <p>b) Order and compare numbers to 10,000,000 (i.e. order the following numbers from smallest to largest...)</p> <p>c) Determine the value of each digit in a number to 10,000,000 (i.e. what is the value of the digit 1 in the number 412,580?)</p> <p>d) Read and write numbers to 3 decimal places</p> <p>e) Determine the value of each digit in a decimal number to 3 decimal places</p> <p>f) Round a whole number to the nearest 10, 100 and 1,000</p> <p>g) Round a decimal number to the nearest tenth and hundredth</p> <p>h) Add and subtract negative and positive numbers (i.e. <math>-7 + 15 = 8</math>)</p> <p>i) Find the difference between a negative and a positive number (i.e. the temperature is <math>10^\circ\text{C}</math> in London and is <math>-27^\circ\text{C}</math> in Moscow. What is the difference?)</p> <p>j) Recognise and use square numbers up to <math>12^2</math></p> <p>k) Recognise and use cube numbers up to <math>10^3</math></p> <p>l) Find all prime numbers to 100</p> <p>m) Count forwards and backwards in any given multiple, including decimals (i.e. 0.3, 0.6, 0.9, 1.2...)</p> <p>n) Identify all of the factors of a given number and check whether a number is a factor (i.e. the factors of 72 are 1, 2, 3, 4...)</p>	<p>a) Add two or more whole numbers to 1,000,000</p> <p>b) Add two or more decimal numbers to 3 decimal places</p> <p>c) Add numbers that contain a different number of digits (i.e. <math>6 + 3.20</math>)</p> <p>d) Add 10/100/1,000 to any number to 10,000,000</p> <p>e) Subtract two or more whole numbers to 1,000,000</p> <p>f) Subtract two or more decimal numbers to 3 decimal places</p> <p>g) Subtract numbers that contain a different number of digits (i.e. <math>9 - 2.72</math>)</p> <p>h) Subtract 10/100/1,000 from any number to 10,000,000</p> <p>i) Multiply a number by a single digit (i.e. <math>437 \times 6</math>)</p> <p>j) Multiply a number by a 2-digit number (i.e. <math>200 \times 27</math>)</p> <p>k) Multiply numbers that contain decimals (i.e. <math>45.6 \times 9</math>)</p> <p>l) Multiply any number by 10/100/1,000, including decimals to 3 decimal places (i.e. <math>112 \times 100, 0.067 \times 10</math>)</p> <p>m) Divide a number by a single digit (i.e. <math>448 \div 8</math>)</p> <p>n) Divide a number by a 2-digit number (i.e. <math>1513 \div 17</math>)</p> <p>o) Divide numbers that contain decimals (i.e. <math>£40.80 \div 6</math>)</p> <p>p) Divide any whole number to find a remainder</p> <p>q) Divide any number by 10/100/1,000, including decimals to 3 decimal places (i.e. <math>45.07 \div 100</math>)</p> <p>r) Solve problems using knowledge of BODMAS (i.e. <math>2 + 1 \times 3 = 5</math>, and <math>(2 + 1) \times 3 = 9</math>)</p> <p>s) Calculate the mean average of a set of data</p>
<p><b>Fractions, decimals and percentages</b></p> <p>a) Add fractions with the same denominator (i.e. <math>\frac{3}{4} + \frac{3}{4}</math>)</p> <p>b) Add fractions with different denominators (i.e. <math>\frac{3}{4} + \frac{3}{4}</math>)</p> <p>c) Subtract fractions with the same denominator (i.e. <math>\frac{3}{4} - \frac{3}{4}</math>)</p> <p>d) Subtract fractions with different denominators (i.e. <math>\frac{3}{4} - \frac{3}{4}</math>)</p> <p>e) Multiply a fraction by a fraction (i.e. <math>\frac{3}{4} \times \frac{3}{4}</math>)</p> <p>f) Multiply a fraction by a whole number (i.e. <math>\frac{3}{4} \times 3</math>)</p> <p>g) Divide a fraction by a fraction (i.e. <math>\frac{3}{4} \div \frac{3}{4}</math>)</p> <p>h) Divide a fraction by a whole number (<math>\frac{3}{4} \div 4</math>)</p> <p>i) Find a fraction of an amount when the numerator is more than 1 (i.e. <math>\frac{3}{4}</math> of £128)</p> <p>j) Solve mixed number fraction problems (i.e. <math>2 \frac{3}{4} + \frac{3}{4}</math>)</p> <p>k) Compare fractions by identifying which is larger or smaller (i.e. find common denominators)</p> <p>l) Identify fraction bonds to 1 (i.e. <math>\frac{3}{4} + \frac{1}{4} = 1</math>)</p> <p>m) Find equivalent fractions of a given fraction</p> <p>n) Reduce fractions to their simplest form</p> <p>o) Convert fractions to decimals and percentages</p> <p>p) Find percentages of a given number (i.e. 30% of 450)</p>	<p><b>Algebra</b></p> <p>a) Find the value of the letter in an algebraic equation (i.e. <math>4y + 3 = 23</math>, what is <math>y</math>?)</p> <p>b) Solve an algebraic equation when a value is given (i.e. <math>t = 3</math>, what is <math>7t - 6</math>?)</p> <p>c) Find pairs of numbers that satisfy an equation with 2 unknowns (i.e. <math>y \times t = 60</math>, what could <math>y</math> and <math>t</math> be?)</p> <p>d) Continue missing number patterns (i.e. 0.3, __, 0.9...)</p>
	<p><b>Measurement</b></p> <p>a) Convert between different units of distance (i.e. mm, cm, m, km)</p> <p>b) Convert between different units of weight (i.e. g and kg)</p> <p>c) Convert between different units of capacity (i.e. ml and L)</p> <p>d) Use knowledge of time facts to solve time problems (i.e. order the following from smallest to largest: 2 fortnights, 26 days, April, 648 hours)</p>

# Fractions of quantities

Divide by the bottom and then times by the top.

Question: What is  $\frac{3}{4}$  of £48?

$$£48 \div 4 = £12$$

$$£12 \times 3 = £36$$

$$\frac{1}{4} \text{ of } 160 =$$

$$\frac{3}{4} \text{ of } £96 =$$

$$\frac{5}{8} \text{ of } 256 =$$

$$\frac{3}{5}$$

← numerator

← denominator



# Equivalent Fractions

What you do to the bottom you do to the top.

(Always  $\div$  or  $\times$ )

$\frac{2}{10}$	$\frac{\quad}{5}$
$\frac{2}{8}$	$\frac{\quad}{4}$
$\frac{9}{12}$	$\frac{\quad}{8}$
$\frac{5}{15}$	$\frac{\quad}{3}$
$\frac{10}{12}$	$\frac{\quad}{6}$

$$\frac{1}{4} \xrightarrow{\times 6} \frac{6}{24} = \frac{6}{24} \xrightarrow{\times 6}$$



# Simplifying Fractions

Look at the numbers in your fraction. What can you divide both numbers by? Keep on doing so until you can no longer make the fraction smaller.

$\frac{5}{20}$	
$\frac{6}{9}$	
$\frac{9}{12}$	
$\frac{4}{8}$	
$\frac{8}{10}$	

$$\begin{array}{ccc} \frac{6}{48} & \xrightarrow{\div 2} & \frac{3}{24} & \xrightarrow{\div 3} & \frac{1}{8} \\ & \xrightarrow{\div 2} & & \xrightarrow{\div 3} & \end{array}$$



# Comparing Fractions

	< > or =	
$\frac{1}{3}$		$\frac{4}{6}$
$\frac{3}{6}$		$\frac{1}{2}$
$\frac{3}{10}$		$\frac{1}{5}$
1 whole		$\frac{5}{5}$
$\frac{3}{4}$		$\frac{5}{8}$
$\frac{5}{6}$		$\frac{11}{12}$

When deciding which fraction is bigger, you need to make the number at the bottom the same first.



# Adding Fractions

$$\frac{2}{3} + \frac{1}{6} = \boxed{\phantom{000}}$$

$$\frac{1}{2} + \frac{1}{4} = \boxed{\phantom{000}}$$

$$\frac{1}{4} + \frac{3}{8} = \boxed{\phantom{000}}$$

$$\frac{1}{3} + \frac{1}{6} = \boxed{\phantom{000}}$$

$$\frac{1}{8} + \frac{1}{2} = \boxed{\phantom{000}}$$

Before solving, you need to make both fractions have the same number at the bottom by either  $\times$  or  $\div$ .

$$\frac{2}{15} + \frac{3}{5} = ?$$

$$\frac{2}{15} + \frac{3 \times 3}{5 \times 3}$$

$$\frac{2}{15} + \frac{9}{15} = \frac{2 + 9}{15} = \frac{11}{15}$$

Same



# Subtracting Fractions

$$\frac{1}{2} - \frac{1}{4} = \square$$

$$\frac{1}{3} - \frac{1}{6} = \square$$

$$\frac{2}{3} - \frac{1}{6} = \square$$

$$\frac{3}{4} - \frac{1}{2} = \square$$

$$\frac{5}{6} - \frac{1}{3} = \square$$

Before solving, you need to ensure both fractions have the same number at the bottom by either  $\times$  or  $\div$ .

$$\frac{11}{15} - \frac{3}{5} = ?$$

$$\frac{11}{15} - \frac{3 \times 3}{5 \times 3}$$

$$\frac{11}{15} - \frac{9}{15} = \frac{11 - 9}{15} = \frac{2}{15}$$

Same



# Multiplying Fractions – 1

$$\frac{1}{4} \times \frac{1}{2} =$$

$$\frac{1}{2} \times \frac{1}{3} =$$

$$\frac{1}{5} \times \frac{1}{2} =$$

$$\frac{2}{8} \times \frac{1}{2} =$$

Times the top numbers together and times the bottom numbers together.

Multiply the numerators

$$\frac{2}{5} \times \frac{3}{4} = \frac{6}{20}$$

Multiply the denominators

$$\frac{2}{5} \times \frac{3}{4} = \frac{6}{20}$$

Reduce the fraction if necessary

$$\frac{6}{20} = \frac{3}{10}$$





# Multiplying Fractions – 2

Example:

$$3 \times \frac{2}{9}$$

Multiply tops and bottoms:

$$\frac{3}{1} \times \frac{2}{9} = \frac{3 \times 2}{9} = \frac{6}{9}$$

Simplify:

$$\frac{6}{9} = \frac{2}{3}$$

Times the whole number by the top number of the fraction and then simplify.

1 a.  $\frac{1}{4} \times 5 =$

1 b.  $\frac{2}{4} \times 2 =$

2 a.  $\frac{2}{6} \times 6 =$

2 b.  $3 \times \frac{2}{12} =$



# Dividing Fractions – 1

$$\begin{aligned}\frac{2}{3} \div \frac{4}{5} &= \frac{2}{3} \times \frac{5}{4} \\ &= \frac{2 \times 5}{3 \times 4} \\ &= \frac{10}{12} \\ &= \frac{5}{6}\end{aligned}$$

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Flip the second fraction and then change the sum into a multiplication problem.

Multiply the top 2 numbers and then the bottom 2 numbers together.

Simplify.

$$\frac{1}{4} \div \frac{1}{2} =$$

$$\frac{1}{8} \div \frac{1}{4} =$$

$$\frac{3}{8} \div \frac{3}{4} =$$



# Dividing Fractions – 2

$$\frac{3}{4} \div 3 =$$

$$\frac{1}{4} \div 2 =$$

$$\frac{4}{6} \div 2 =$$

$$\frac{2}{3} \div 4 =$$

$$\frac{1}{4} \div 2 =$$

$$\frac{1}{4 \times 2} = \frac{1}{8}$$

Move the number that you are dividing by to the bottom of the fraction and change the  $\div$  to  $\times$ .



# Resources and support

Website	Summary
<a href="http://uk.mathletics.com/signin/">http://uk.mathletics.com/signin/</a>	All children have a Mathletics login. It covers all areas of Maths that the children need to know in Years 5 and 6
<a href="http://www.crickweb.co.uk/">http://www.crickweb.co.uk/</a>	Curriculum games and activities
<a href="http://www.topmarks.co.uk/">http://www.topmarks.co.uk/</a>	Curriculum games and activities. Click on ' <b>Learning Games</b> ' and then ' <b>7-11</b> '
<a href="http://resources.woodlands-junior.kent.sch.uk/maths/">http://resources.woodlands-junior.kent.sch.uk/maths/</a>	Maths games and activities.
<a href="http://sats.highamstjohns.com/">http://sats.highamstjohns.com/</a>	A few Maths worksheets/questions that can be used as practice. See the ' <b>Numeracy</b> ' and ' <b>Past Papers</b> ' sections.
<a href="http://www.tes.com/">www.tes.com/</a>	A large range of FREE curriculum resources once registered.

Please note: You can find sample SATs papers and general resources online by typing 'KS2 SATs papers' into 

Further SATs and general curriculum resources can be found on



# Resources and support

## Recommended reading

- There are numerous study guides available that are suitable in helping to support home study. Please ensure that they are aligned with the **National Curriculum 2014**.
- You can find revision guides online through Amazon/WHSmith/Waterstones etc. or through any good book shop.
- There is also an abundance of ready made resources for FREE online if you take time to research.



**Collins**

**Also, ask me!!!**