

KS2 Topical Maths Problems Summer Term

May - July 2020

**35 real world maths
investigations to practise
reasoning and problem solving**



Recycling facts



Earth Day 22nd April 2020

Earth Day is an annual event held to demonstrate support for environmental protection. It was first celebrated in 1970 and Earth Day events now take place in more than 193 countries!

- 55% of our rubbish at home could be recycled.
- Recycling one tonne of paper saves 17 trees, 6,000 gallons of water and produces 73% less air pollution than non-recycled paper.
- Plastic bags and rubbish thrown into our oceans kill about 1,200,000 marine mammals, fish and sea creatures every year.
- 1 recycled plastic bottle would save enough energy to power a 60-watt light bulb for 3 hours.
- On average, 16% of the money you spend on a product pays for the packaging, which ultimately ends up as rubbish.
- The average person in the UK gets through 38kg of newspapers per year. It takes 24 trees to make 1 ton of newspaper.
- 275,000 tonnes of plastic are used each year in the UK, that's about 15 million bottles per day.
- Most families throw away about 40kg of plastic per year, which could otherwise be recycled.

Use the facts to answer the following questions:

1. If in a week you save 8 plastic bottles for recycling. How long would the energy saved by recycling them power a 60-watt light bulb for?
2. How many gallons of water could be saved by recycling 250kg of paper?
3. If your house produces 20kg of rubbish in a week, how much of that could be recycled?
4. You buy a drink costing £1.25. How much of that cost pays for the packaging?
5. How many trees are used to make the newspapers thrown away by 100 people in a year?
6. Approximately how many marine animals are killed by the rubbish thrown into the oceans every day?



Flag Fun

St George's Day
23rd April 2020

St George is the patron saint of England, it is said he fought a dragon! St George's Day is the feast day to celebrate him, on 23rd April. We commemorate him on this day because it is traditionally accepted to be the day he died.

St George is patron saint not only of England but also of Aragon, Catalonia, Georgia, Lithuania, Palestine, Portugal, Germany and Greece; and of Moscow, Istanbul, Genoa and Venice. Here are the flags for some of these countries:

England



Georgia



Portugal



Greece



Istanbul (Turkey)



Palestine



1. Choose one flag and identify all the parallel and perpendicular lines.
2. Choose a different flag and estimate the size of 4 angles. Now measure them and see how accurate your estimates were.
3. Choose a different flag and a colour on it. Calculate the fraction of the flag that is your chosen colour. What is that as a percentage?
4. Choose a different flag and show its lines of symmetry.
5. Choose a different flag. If it has lines of symmetry change the design so that it is no longer symmetrical. If it doesn't have any lines of symmetry, change the design so that it has two lines of symmetry.



Rectangle Riddle

Shakespeare's Birthday 23rd April

William Shakespeare, a very famous playwright, was born in Stratford-upon-Avon in 1564. He was born in the house pictured opposite! The exact date of his birth is not recorded, but it has been calculated that it is most likely to have been on the 23rd April.



How many rectangles can you see in the part of the house outlined in red?



Race Results

London Marathon 26th April 2020

The London Marathon is a long-distance running event held in London. The event was first run on 29th March 1981 and has been held in the spring of every year since. The marathon is run over a largely flat course around the River Thames, and spans 42.195 kilometres (26 miles and 385 yards).

Here are the race times for the **top 5 men** in the 2016 London Marathon:

Place overall	Name	HALF	FINISH
1	» Hehir, Sean (IRL)	01:06:35	02:17:20
2	» Martelletti, Paul (GBR)	01:08:29	02:17:26
3	» Frazer, Thomas (IRL)	01:06:54	02:19:17
4	» Scott, Aaron (GBR)	01:09:02	02:19:18
5	» Way, Steven (GBR)	01:09:02	02:20:50

Here are the race times for the **top 5 women** in the 2016 London Marathon:

Place category	Name	HALF	FINISH
1	» Barlow, Tracy (GBR)	01:16:42	02:33:20
2	» Muir, Tina (GBR)	01:18:53	02:37:35
3	» Munn, Hayley (GBR)	01:18:25	02:38:04
4	» Bruinvels, Georgie (GBR)	01:17:32	02:38:13
5	» Hilland, Rebecca (GBR)	01:19:29	02:39:45

1. How much faster was the 1st man than the 5th place man?
2. How much faster was the 1st woman than the 5th place woman?
3. How much slower was the 1st woman than the 1st man?
4. What was the average half marathon time for the top 5 men, rounded to the nearest minute?
5. What was the average marathon finish time for the top 5 women, rounded to the nearest minute?
6. If your teacher can run 5km in 25 minutes, how long would it take them to run a marathon? (You can round the marathon distance to the nearest whole number for your calculation)

The results for yesterday's marathon [can be found here](#):

Do questions 1-5 above using the 2017 data.

How do the results for 2016 compare to the results for 2017?



Dance Dilemma

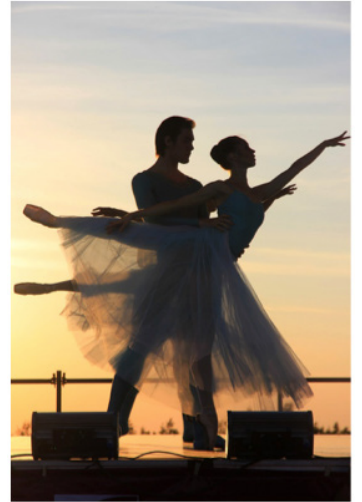
Dance Day
29th April 2020

International Dance Day started in 1982 and it celebrates the art of dance around the world. Each year a special committee chooses a personality to create an International Dance Day message to be shared all around the world!

- When they danced in pairs one person was sitting out.
- When they danced in trios two people were sitting out.
- When they danced in quartets three people were sitting out.
- When they danced in groups of five three people were sitting out.

Use the information above to answer this question:

How many people were at the dance?



Informative Illustrations

**National Share-a-
Story Month**
1st – 31st May
2020

National Share-a-Story Month is an annual celebration of the power of storytelling and story sharing. The theme for 2019 is 'Travelling Tales', celebrating the power of illustrations.

Create your own book of illustrations to help others understand what tricky mathematical words or concepts mean. You can use the ones below or think of some of your own.



Area	Perimeter	Prime number
Factor	Multiple	Parallel
Perpendicular	Equivalent fractions	Mixed numbers and improper fractions
Negative numbers	Percentages	Rounding
Ratio	Proportion	Properties of shapes

Brainteaser!

Create a booklet or a series of illustrations for younger children to help them understand the four operations, telling the time or fractions.



Hosting a HumaniTea

Red Cross Appeal Week 6th – 12th May 2020

During this week people up and down the country dedicate their time and energy to raising money for the British Red Cross, who help people in crisis, both overseas and in the UK.

One way of raising money is to host a HumantiTea event at school. Use the cake recipes and price lists below (or find your own recipes) to plan your event and work out your expected profit.

1. a) If 50 people were going to attend, how much tea and cake do you think they'd need?
b) How much would they cost?
2. How much would you have to charge for a piece of cake and a cup of tea to cover your costs and raise money for the Red Cross?

Vanilla Cupcakes (makes 10)

- 250g butter
- 110g caster sugar
- 2 eggs
- 1 tsp vanilla extract

Chocolate Brownies (makes 15)

- 180g butter
- 250g caster sugar
- 3 eggs
- 80g plain flour
- 180g dark chocolate
- 50g white chocolate

Price list

80 tea bags £1	500g self-raising flour 40p
200g coffee (makes 100 cups) £2.80	500g plain flour 40p
1l milk 75p	1kg icing sugar £1.70
500g granulated sugar 70p	150g dark chocolate 75p
250g butter £1.20	150g white chocolate
75p	
1kg caster sugar £1.60	150g milk chocolate 75p
6 eggs 90p	250g cocoa powder £2



Sunscreen Statistics

National Sun Awareness Week 4th - 10th May 2020

National Sun Awareness Week is part of the British Association of Dermatologists' annual campaign to raise awareness of skin cancer. Skin cancer can make you really ill, and can even kill. This is why you should always wear sunscreen when it's very sunny!

1. After applying sunscreen, you should wait 20 minutes before going outside. How many seconds is this?
2. Most sunscreens don't go out of date for approximately 2 years. How many months is this?
3. Waterproof sunscreens lose some of their effectiveness after 40 minutes in the water. What fraction of an hour is this?
4. 80% of people don't apply sunscreen before going outside. In an office with 60 workers, how many would not apply sunscreen before going outside?



Brainteaser!

A sunscreen's Sun Protection Factor (SPF) number refers to the factor by which it enhances a person's natural sun protection. If someone normally burns in 20 minutes, then a sunscreen with an SPF of 15 would protect them for 300 minutes ($\text{SPF } 15 \times 20 \text{ minutes} = 300 \text{ minutes}$).

If a person normally burns in 15 minutes, how long would a sunscreen with an SPF of 30 protect them for? Give your answer in hours and minutes.



Code Cracker

Europe Day
9th May 2020

Europe Day celebrates peace and unity in Europe. The date is extra special as it marks the beginning of the 'Schuman declaration' when, during a speech in 1950, Robert Schuman first laid out his idea for political peace in Europe.

Complete these calculations and find the corresponding letters in the code cracker grid to find out the aim of the Schuman declaration.



- | | |
|---|--|
| 1) $3275 + 330 = \underline{\hspace{2cm}}$ | 9) $7.2 \times 5 = \underline{\hspace{2cm}}$ |
| 2) $8 \text{ squared} = \underline{\hspace{2cm}}$ | 10) $15\% \text{ of } 40 = \underline{\hspace{2cm}}$ |
| 3) $40 \times 60 = \underline{\hspace{2cm}}$ | 11) $2.5 \text{ hours} = \underline{\hspace{2cm}} \text{ minutes}$ |
| 4) $30,000 \div 10 = \underline{\hspace{2cm}}$ | 12) $\text{A straight line} = \underline{\hspace{2cm}}^\circ$ |
| 5) $9 \times 8 = \underline{\hspace{2cm}}$ | 13) $36 \times 100 = \underline{\hspace{2cm}}$ |
| 6) $30 \times 4 = \underline{\hspace{2cm}} \times 2$ | 14) $10,000 - 8420 = \underline{\hspace{2cm}}$ |
| 7) $\frac{3}{4} \text{ of } 200 = \underline{\hspace{2cm}}$ | 15) $4.2 \text{ litres} = \underline{\hspace{2cm}} \text{ ml}$ |
| 8) $0.2 = \underline{\hspace{2cm}}\%$ | 16) $420 \div \underline{\hspace{2cm}} = 0.6 \times 10$ |

A	B	C	D	E	F	G	H	I	J	K	L	M
3000	36	90	3710	60	63	19	4200	1580	450	72	70	2400
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
6	64	180	42	20	3600	3605	150	9	150	240	360	27

Aim: $\frac{\underline{\hspace{1cm}} \underline{\hspace{1cm}}}{(1) \quad (2)} \div \frac{\underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}}}{(3) \quad (4) \quad (5) \quad (6)} \div \frac{\underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}}}{(7) \quad (4) \quad (8)} \div \frac{\underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}}}{(9) \quad (6) \quad (1) \quad (7) \quad (6) \quad (6) \quad (10)} \div$

$\frac{\underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}}}{(6) \quad (11) \quad (8) \quad (2) \quad (12) \quad (6)} \div \frac{\underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}}}{(10) \quad (4) \quad (1) \quad (14) \quad (2) \quad (10) \quad (13)} \div$

$\frac{\underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}} \underline{\hspace{1cm}}}{(11) \quad (10) \quad (1) \quad (15) \quad (14) \quad (10) \quad (5) \quad (4) \quad (9) \quad (16) \quad (6)} \div$

*The numbers in brackets are the question numbers.



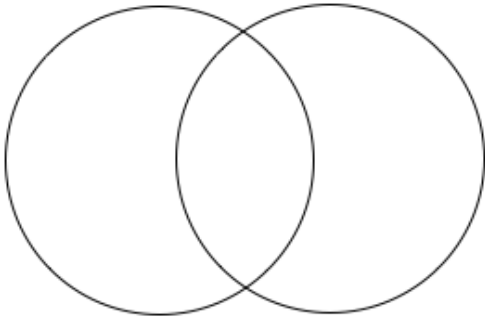
Letter Sort

**Florence
Nightingale's
Birthday
12th May**

Florence Nightingale was a trailblazing figure in nursing who greatly affected 19th and 20th century policies around proper care. She was known for her night rounds to aid the wounded during the Crimean War and was called the 'Lady with the Lamp'.

F L O R E N C E N I G H T I N G A L E

Use the diagrams below to find different ways to sort the letters in Florence Nightingale's name.





Coin Challenge

Christian Aid Week
10th – 16th May
2020

Christian Aid Week was set up 60 years ago to support the charity's work with refugees in Europe following the Second World War. Christian Aid now works with 700 local organisations across 50 developing countries. Working with poor communities, it trains people to deal with the effects of climate change and prepares them for the threat of natural disasters. They also help people become more educated, and spread peace around the globe.

You will need one 10p coin and one 5p coin.

Two classes decided to have a competition to see who could raise the most money for Christian Aid Week by creating coin lines.



Class 5B collected 10p pieces and put them edge to edge to make a long line. The completed line was 25m long.



Class 5S collected 5p pieces and put them edge to edge to make a long line. Their completed line was 30m long.

Work out:

Which class collected the most money?



Football Fractions

FA Cup Final (1) 23rd May 2020

The FA Cup (or the Football Association Challenge Cup) is a football competition that happens each year. You've probably heard of it! It was first played during the 1871-72 season and is actually the oldest football competition in the world!

Try one of these football fractions games:

Fractions of amounts

<http://www.bbc.co.uk/guides/zyrj7ty>

<http://primarygamesarena.com/Play/Football-Maths-Penalty-Shootout-3770>

Simplifying fractions

<http://www.math4children.com/Grade4/games/fractions-football.html>

<http://www.math-play.com/simplifying-fractions-game/simplifying-fractions-soccer-game.html>

Adding fractions

<http://www.fractions4kids.com/add-fractions-horizontal-arrangement-football-games/>

Converting fractions to decimals

<http://www.fractions4kids.com/convert-fractions-to-decimals->



Average Analysis

FA Cup Final (2) 23rd May 2020

The FA Cup (or the Football Association Challenge Cup) is a football competition that happens each year. You've probably heard of it! It was first played during the 1871-72 season and is actually the oldest football competition in the world!

Here are the results from the 2017 FA Cup 1/8-finals and Quarter-finals:

ENGLAND: FA Cup				Draw
Quarter-finals				
13.03. 19:45	Chelsea	Manchester United		1 : 0
12.03. 14:00	Tottenham	Millwall		6 : 0
11.03. 17:30	Arsenal	Lincoln City		5 : 0
11.03. 12:15	Middlesbrough	Manchester City		0 : 2
1/8-finals				
01.03. 19:45	Manchester City	Huddersfield		5 : 1
20.02. 19:55	Sutton	Arsenal		0 : 2
19.02. 16:15	Blackburn	Manchester United		1 : 2
19.02. 14:00	Fulham	Tottenham		0 : 3
18.02. 17:30	Wolves	Chelsea		0 : 2
18.02. 15:00	Huddersfield	Manchester City		0 : 0
18.02. 15:00	Middlesbrough	Oxford Utd		3 : 2
18.02. 15:00	Millwall	Leicester		1 : 0
18.02. 12:30	Burnley	Lincoln City		0 : 1

Using the image above, work out the answers to the following questions:

1. How many goals were scored in total?
2. Which team scored the highest number of goals in both rounds?
3. Which teams scored 3 goals in both rounds?
4. Which match had the largest goal difference?
5. Which match resulted in a draw?
6. Calculate the mean, mode and median number of goals scored. Round any decimal numbers to 1 decimal place.



Vesak kuudu

**Vesak/Buddha
Day**
7th May 2020

Millions of Buddhists celebrate Vesak Day, on the birthday of Gautama Buddha, the founder of Buddhism. Temples are covered with decorations and flowers and some community groups organise acts of charity.

In Sri Lanka colourful lanterns called Vesak kuudu are hung along streets and in front of homes on Vesak Day.

What do you notice about the lanterns?

What shapes can you see?

Can you see symmetry or repeating patterns?



Practise drawing some of the shapes you can see accurately - you will need a **ruler** and a **protractor**.

1. Can you calculate the area and perimeter of the shapes you have drawn?
2. Design or make your own Vesak kuudu, using symmetry



Magic Maths

Walk to School
Week
18th – 25th May
2020

This year on the Tuesday of Walk to School Week, pupils, parents, and teachers everywhere can raise money by wearing their happy shoes (e.g. gorilla feet, or shiny shoes)!

Impress your friends with this maths magic trick that lets you work out their shoe size and age!



Give your friend a piece of paper and a pencil and ask them to do the following calculations without showing you:

1. Write down your age.
2. Multiply it by one-fifth of 100.
3. Add on today's date (e.g. 16 if it's the 16th of the month).
4. Multiply by 20% of 25.
5. Now add on your shoe size (if it's a half size round to the next whole number).
6. Finally subtract 5 times today's date.
7. Show me your final answer!

Now look at their answer. If, for example, somebody shows you 1105, that means there are 11 hundreds. This is their age. The remaining digits 05 (or 5) show their shoe size.

Brainteaser!

Can you explain why this trick works?

Can you show how it works algebraically?



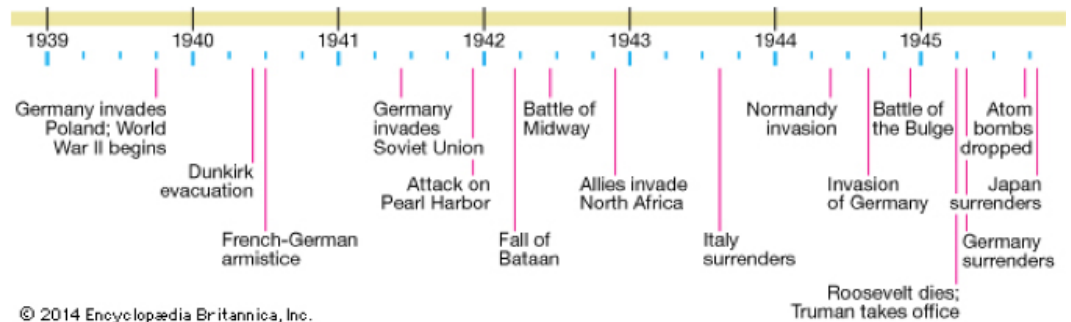
Tricky Timelines

Local and Community History Month

1st – 31st May 2020

Local History and Community month aims to increase awareness of local history, promote history in general to the local community and encourage all members of the community to get involved in history! Activities happen across the UK and include trips, library exhibitions and local lectures.

This timeline shows some of the main events in WW2:



Use the timeline to answer the questions below:

1. In which year did Germany invade Poland? (Give the month and year)
2. How long was it between the French-German armistice and the Fall of Bataan?
3. Use the timeline to write your own questions for a friend to answer



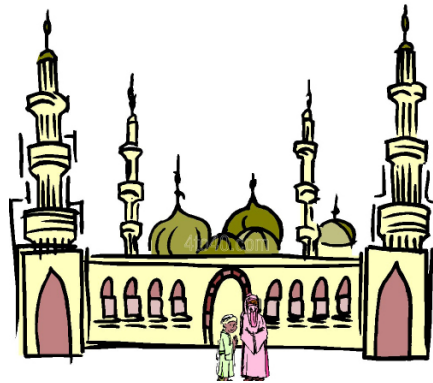
Fasting Times

Ramadan
23rd April -
23rd May 2020

Ramadan is the ninth month of the Islamic lunar calendar.

Every day during this month, Muslims around the world spend the daylight hours in a complete fast. Ramadan is much more than just not eating and drinking; it is a time to purify the soul, refocus attention on God, and practise self-discipline and sacrifice.

1. a) How many days does Ramadan last?
b) How many hours is this?
2. If daylight hours are from 04:45 to 21:15, how many hours are spent fasting each day?
 - a) Each week?
 - b) For the whole of Ramadan?
3. Give the answers to question 2 in days (rounded to the nearest whole day).



A Cake Sale to be Proud of!

Pride Month 1st June – 30th June

Pride Month is held in June every year. During June, events are organised to celebrate progress and equality for the LGBT community. A good example of progress for the LGBT community is the right of men to marry men and women to marry women in England, Scotland and Wales. In 2019, there are lots of public figures who are proud members of the LGBT community like US talk show host Ellen

To celebrate Pride Month, some Year 3 pupils raised money for an LGBT Charity by selling cupcakes with rainbow designs on the icing. Have a look at the table below and answer some questions about the money they raised. Each strike in the Tally column represents £2.50.



Pupil	Tally (£2.50)
Naomi	
Tharani	
Fred	
Reshawn	

1. How much more money did Fred raise than Tharani?
2. What is the difference between the amounts raised by Naomi and Reshawn?
3. How much money was raised altogether?
4. Can you represent the pupils' sales in a bar chart?



Accident Arithmetic

Child Safety Week
1st - 7th June
2020

The theme of this year's Child Safety Week is "Safe children: together we've got this." Friends, families, and communities are being asked to show they care by playing their part in keeping children safe. As well as sharing their experience and knowledge, about accidentals and the really practical, simple things they do to prevent them.

1. 30,000 children go to A&E every year with signs of poisoning. How many children is this each month?
2. 130,000 children are injured in the garden every year. How many children is this each week?
3. One million children aged 14 and under go to Accident and Emergency every year following an injury in the home. How many children is this each month? Round your answer to the nearest whole number.
4. 39% of all children's accidents in the home are from falling. How many children are injured in a fall each year?



Distance Dilemma

Bike Week
6th - 14th June
2020

Bike Week is an annual opportunity to promote cycling, and show how cycling can easily be part of everyday life by encouraging 'everyday cycling for everyone. Cycling is really good for you, it keeps your body healthy and the fresh air is great for your lungs!

Anjali and Sam live in different towns.

Both towns are 8 kilometres away from the nearest cinema.

Anjali rides her bike at 6 kilometres per hour and Sam rides his at 5 kilometres an hour.

They both want to arrive at the cinema at 1pm.

What time should each of them start riding?

What time should each of them start riding?



Line Art

Children's Art
Week: 6th - 14th
June 2020

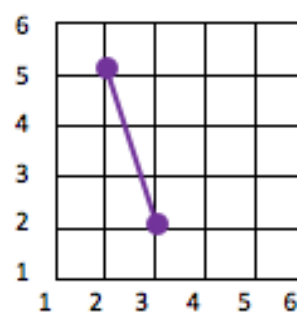
Children's Art Week is a growing campaign to encourage children's creativity. A number of organisations will be holding events to engage, inspire and excite children, in galleries, arts centres, museums, libraries, schools, and community or youth centres across the country.

To create your art work choose 6 coloured pencils or pens and give each of them a number from 1 to 6.

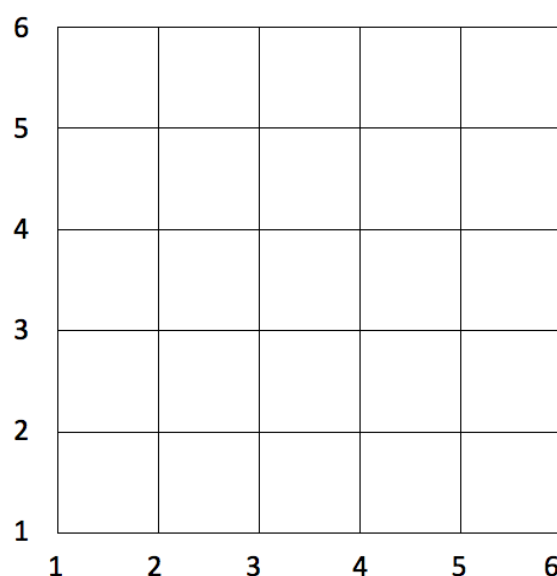
Number	Colour
1	
2	
3	
4	
5	
6	

1. Roll a dice to decide which colour your first line will be.
2. Roll two dice to give you the co-ordinate of the starting point of your line. Mark this point on the co-ordinate grid.
3. Roll both dice again to tell you where to draw your line to.
4. Draw your line with a ruler.
5. Repeat until you are happy with your art work.

Example:



1. Throw one dice: 3 = purple
2. Throw two dice: 2 and 5.
You can start your line at (2,5) or (5,2)
3. Throw two dice: 1 and 3.
You can end your line at (1,3) or (3,1)
4. You can end your line at (1,3) or (3,1)
5. Draw the line with a ruler
6. Repeat



Digit Dilemmas

The Queen's Official Birthday 13th June 2020

The Queen celebrates two birthdays every year: her actual birthday on 21st April and her official birthday on a Saturday in June. The official birthday is held in the summer as it means there's a better chance of good weather for the ceremony.

The Queen's official birthday is celebrated with the Birthday Parade, which is also known as Trooping the Colour.

The Queen was born in



1. What is the largest number you can make using these digits? What is the smallest number you can make?
2. What is the nearest number you can make to 200? You do not have to use all the digits.
3. How many different 4-digit numbers can you make using these digits?
4. Order the numbers you made in Q3, starting with the smallest.
5. Use all 4 digits to make this number sentence correct:

$$\boxed{}\boxed{} + \boxed{}\boxed{} = 90$$

6. Make as many 3-digit numbers as you can that round to 200 when rounded to the nearest 100.

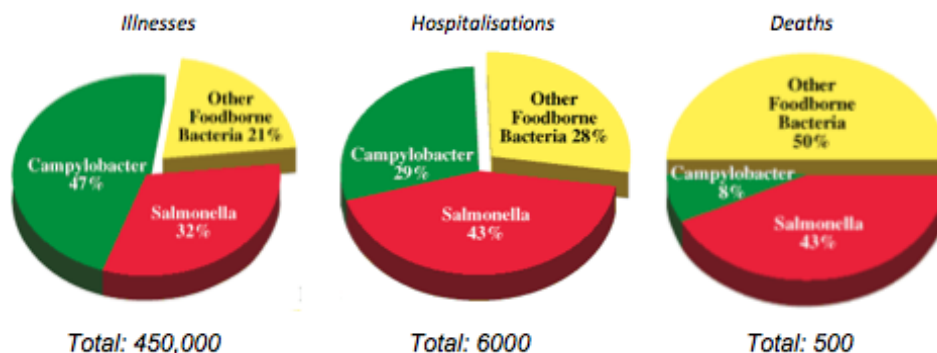


Piechart Problems

Food Safety Week: 4th - 10th June 2020

Food Safety Week promotes good food hygiene behaviours. It is important to take care with food and hygiene to make sure you don't get sick!

These pie charts show how many people were made ill, were hospitalised or died due to food poisoning caused by Campylobacter and Salmonella in one month.



Use the pie charts to answer the questions below:

1. How many people were made ill by Salmonella bacteria?
2. How many more people were hospitalised by food poisoning caused by Salmonella or Campylobacter, than by food poisoning caused by other foodborne bacteria?
3. How many more people were hospitalised by Campylobacter food poisoning than died from it?
4. How many people would be hospitalised due to Salmonella food poisoning in 1 year?

Recipe Ratios

Eid Ul Fitr
23rd - 24th May
2020

Many Muslims in the UK celebrate Eid ul-Fitr (also known as Id al-Fitr or Eid al-Fitr) on the first day of Shawwal in the Islamic calendar. It marks the end of the month-long fast of Ramadan and the start of a feast that lasts up to three days. People dress in their finest clothes and adorn their homes with lights and other decorations.

Pumpkin halwa is a popular sweet dish that is made for special occasions such as Eid.



This recipe makes enough pumpkin halwa for 4 people:

- 450g pumpkin
- 550ml milk
- 1 teaspoon cardamom seeds, crushed
- 1 tablespoon sultanas
- 28g unsalted butter
- 115g sugar
- 42g flaked almonds

Now rewrite the recipe for:

1. 12 people.
2. 6 people.
3. 9 people.

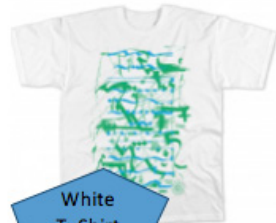


Merchandise Maths

Refugee Week
15th - 21st
June 2020

In the UK, Refugee Week is a nationwide programme of arts, cultural and educational events that celebrate the contribution of refugees to the UK, and encourages a better understanding between communities and people.

These Refugee Week items are sold online to raise money:



White
T-Shirt
£30



Grey
T-Shirt
£10



20
Balloons
£2.50



Badge
£2.50

1. Mrs George buys some Refugee Week merchandise for her class. She buys a white t-shirt for herself, two grey ones for her teaching assistants, 30 balloons and 30 badges. How much does she spend?
2. Alana spent £35 on Refugee Week items. She bought 4 packets of balloons. What else could she have bought?
3. What fraction of the cost of a grey t-shirt is the cost of a badge?
4. What fraction of the cost of a white t-shirt is the cost of a badge?
5. After Refugee Week the items are reduced by 15%. How much does each item cost in the sale?
6. What is the mean price of all the items?

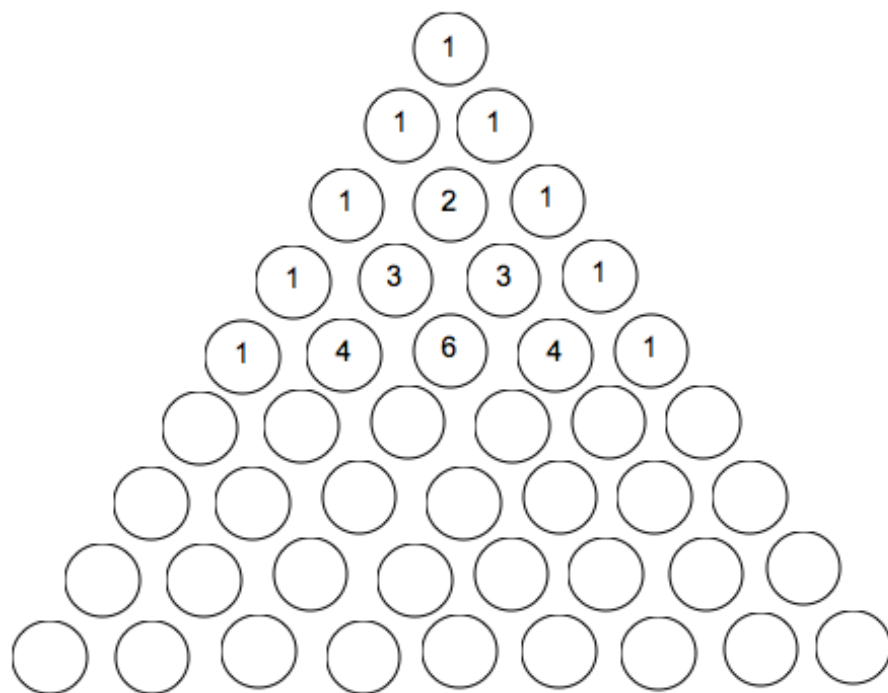


Pascal's Triangle

**Blaise Pascal's
Birthday: 19th
June**

Blaise Pascal was a French mathematician, physicist, inventor, writer and Christian philosopher. He was a child prodigy who was educated by his father, a tax collector in Rouen.

This is Pascal's Triangle:



1. How is the triangle made?
2. Complete the next 4 rows of the triangle.
3. Find the sum of each row. Can you see a pattern?
4. Can you see any other number patterns in the triangle?



Sunrise and Sunset Statistics



First Day of Summer: 20th June 2020

Summer officially begins in the Northern Hemisphere on 21st June, on a day referred to as the summer solstice. The summer solstice marks the point when the sun reaches its highest point in the sky. This is the longest day of the year, after this the days get shorter until the winter solstice which occurs around 22nd December.

Complete this table to show how the length of the day changes through the year:

	Sunrise	Sunset	Day Length (in hours and minutes)	Day Length (in minutes)
January 21 st	07:53	16:31		
February 21 st	07:02	17:27		
March 21 st	06:01	18:15		
April 21 st	05:52	20:07		
May 21 st	05:00	20:55		
June 21 st	04:43	21:21		
July 21 st	05:09	21:04		
August 21 st	05:56	20:10		
September 21 st	06:45	19:01		
October 21 st	07:35	17:54		
November 21 st	07:29	16:04		
December 21 st	08:04	15:54		



Sports Day Data

National School
Sport Week
22nd - 26th June
2020

National School
Sport Week
encourages children
to be more active
and celebrate PE
and school sport.

At the school sports day, some children took part in a long jump competition.

- Jo jumped 1.57m
- Ali jumped $\frac{1}{2}$ m further than Mark.
- Pippa jumped 12cm further than Jo.
- Mauro jumped 0.3m further than Evie.
- Timo jumped 27cm further than Pippa.
- Jack jumped $\frac{1}{4}$ m less than the 2nd place child.
- Timo jumped $\frac{3}{4}$ m less than Amelia.
- Shane jumped 0.6m further than Timo.
- Mark jumped 0.21m less than Mauro.
- Evie jumped 70mm less than Shane.



Who won the competition?

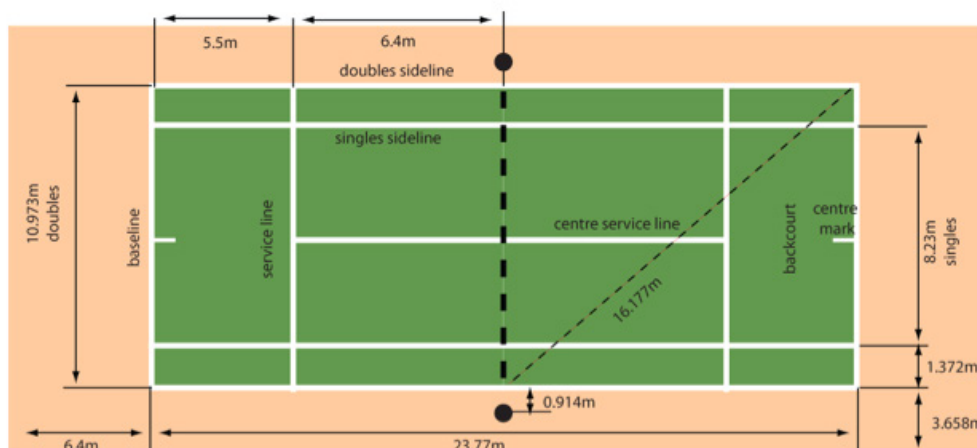


Court Calculations

Wimbledon
29th June - 12th
July 2020

Wimbledon is the oldest tennis tournament in the world, and is widely considered the most prestigious. It has been held at the All England Club in Wimbledon, London, since 1877 and is played on outdoor grass courts.

This diagram shows the dimensions of a tennis court:



1. How much wider is the doubles court than the single court?
2. What is the perimeter of the doubles court?
3. What is the area of the doubles tennis court? (Round each length measurement to the nearest whole number before you do the calculation)
4. How much larger is the area of the doubles court than the area of the singles court? (Round each length measurement to the nearest whole number before you do the calculation)
5. How many rectangles can you count within the large green rectangle?



Fireworks Fun

American Independence Day 4th July 2020

Independence Day is the most significant national holiday in the United States. It celebrates the Declaration of Independence, adopted on 4th July 1776, when the thirteen colonies of America declared themselves to be states and no longer part of the British Empire.

Firework displays and parties are the most popular activities that take place to celebrate Independence Day.



On Independence Day, Joel bought some fireworks to celebrate. Some of the fireworks made 9 bangs, some of them made 7 bangs. When the fireworks were set off they made 87 bangs together.

How many of them made 7 bangs?



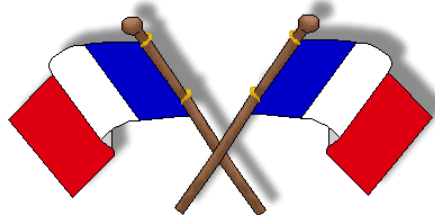
Cycling Calculations

Tour de France
27th June - 19th
July 2020

The Tour de France is an annual long-distance race for professional cyclists first held in 1903. It takes place primarily on the roads of France, over a period of about three weeks. There are multiple stages which are separately timed and several of these stages encompass mountainous terrain in the Alps and the Pyrenees.

The 2018 Tour de France cyclists will each cover a distance of 2082 miles.

1. How many kilometres does each cyclist ride? (1 mile = approximately 1.6km)
2. The race takes 21 days. How many miles are ridden per day?
3. 198 riders start the Tour de France. If they all make it to the end, how much distance would be covered in total, in miles?
4. If a cyclist travels at an average speed of 25mph, how long would it take them to complete the Tour de France?



Training Timetable

Armed Forces Day 27th June 2020

Armed Forces Day is held annually to honour the work and dedication of our brave Servicemen and women.

This is the training routine for a soldier:

- 6:15am Get up
- 6:30am Physical training
- 7:15am Breakfast
- 8:00am Morning parade
- 8:45am Manoeuvres
- 11:00am Swedish drill
- 12:45pm Lunch
- 2:00pm Rifle drill
- 3:00pm Lecture
- 5:00pm Dinner
- 6:00pm Free time
- 10:00pm Bed



Now answer the following questions:

1. How long to trainee soldiers get for breakfast?
2. How much time is spent doing Swedish drill?
3. How much longer is spent at a lecture than at morning parade?
4. How long after lunch is dinner?
5. What time is rifle drill? Write your answer using 24 hour clock notation.
6. How long is spent doing physical training? Give your answer in seconds.
7. What fraction of a day is for free time?



Ice Cream Combinations

Holiday Maths:
July 2020

In the UK schools are closed for the summer for approximately 6 weeks, from mid-July until the start of September. People traditionally go on holiday during this time and go for day trips to places such as theme parks and beaches.

Ice creams are a popular treat during the holidays.

You can have 3 different flavours of ice cream on your cone.



1. Which 3 flavours would you choose?
2. How many different combinations could you have with those 3 flavours?



Seaside Logic Puzzle

Holiday Maths:
July 2020

In the UK schools are closed for the summer for approximately 6 weeks, from mid-July until the start of September. People traditionally go on holiday during this time and go for day trips to places such as theme parks and beaches.

Work out the missing total in the logic puzzle below:

			9.1
			7.7
			5.3
6.3		8.6	



Theme Park Design

Holiday Maths: July 2020

In the UK schools are closed for the summer for approximately 6 weeks, from mid-July until the start of September. People traditionally go on holiday during this time and go for day trips to places such as theme parks and beaches.

Your team has £600,000 to build your own theme park. Your theme park must have rides, a car park, toilets, cafes, shops and paths.



Design your theme park on squared paper, using the following information:

Item	Number of squares	Cost
Large ride	8	£50,000
Small ride	5	£24,000
Cafe	5	£11,000
Shop	4	£6,000
Toilets	3	£2,000
Paths		£150 per square
Car park		£400 per square
Boating lake (optional)		£3,000 per square
Splash park (optional)		£2,000 per square
Crazy golf (optional)		£2,000 per square
Adventure playground (optional)		£1,500 per square
Indoor soft play (optional)		£3,000 per square
4D cinema (optional)	6	£32,000



Event	Date	Problem	Content Domain Ref	Answers
Earth Day	22nd April	Recycling Facts	5C8b 5F10 6C7c 6C8 6R2	1. Answer depends on the number of children in the class, if there are 30 children, then 27/30. 2. $8 \times 3 = 24$ hours 3. $\frac{1}{4}$ of 6,000 = 1,500 gallons 4. 55% of 20 = 11kg 5. 16% of £1.25 = 20p 6. 100 people = 3,800kg newspaper = 3.8 tonnes. $24 \times 3.8 = 91.2$ trees = 92 trees 7. 1,200,000 per year = 100,000 per month = 25,000 per week = 3,571 per day
St George's Day	23rd April	Flag Fun	3G2 4G2b 5G4a 5G4c	Answers will depend on flags chosen for each question.
Shakespeare's birthday	23rd April	Rectangle Riddle	4G2a	48

Event	Date	Problem	Content Domain Ref	Answers
London Marathon	26th April	Race Results	3M4f 4F7 5M4 5S1 6S3	1. 3 minutes and 30 seconds 2. 6 minutes and 25 seconds 3. 16 minutes 4. $340 \text{ minutes} \div 5 = 68 \text{ minutes} = 1 \text{ hour and } 8 \text{ minutes}$ 5. $787 \text{ minutes} \div 5 = 157.4 \text{ minutes} = 2 \text{ hours and } 37 \text{ minutes}$ 6. $42 \div 5 = 8.4$ $8.4 \times 25 = 210 \text{ minutes} = 3 \text{ hours } 30 \text{ minutes}$
Dance Day	29th April	Dance Dilemma	5C8a	23 people
National Share a Story Month	1st – 31st May	Informative Illustrations	Depends on topics chosen	N/A

Event	Date	Problem	Content Domain Ref	Answers
Red Cross Appeal Week	6th – 12th May	Hosting a HumaniTea	5C8b 5F10 5M9a 6C6 6R1	N/A
National Sun Awareness Week	4th - 10th May	Sunscreen Statistics	5M4 6C6 6R2	1. $20 \times 60 = 1200$ seconds 2. $2 \times 12 = 24$ months 3. $\frac{40}{60} = \frac{2}{3}$ of an hour 4. 80% of 60 = 48 people 5. $15 \times 30 = 450$ minutes = 7 hours 30 minutes
Europe Day	9th May	Code Cracker	6C6	To make war between Europe's nations unthinkable.

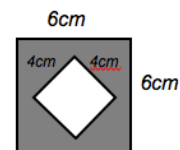
Event	Date	Problem	Content Domain Ref	Answers
Florence Nightingale's birthday	12th May	Letter Sort	3G2 4G2a 4G2b 4G4	Sorting criteria could include: • Vowels • Lines of symmetry • Rotational symmetry • Right angles • Acute angles • Parallel lines • Position in the alphabet
Aid Week	10th - 16th May	Challenge	6M9	Both classes collected the same amount.
FA Cup Final	23rd May	Football Fractions	6F2 6F4 6F6	N/A
FA Cup Final (2)	23rd May	Average Analysis	4S2 5S1 6S3	1. 37 goals 2. Tottenham (9 goals) 3. Chelsea and Middlesborough 4. Tottenham v Milwall 5. Huddersfield v Manchester City 6. Mean: $37 \div 26 = 1.4$ Mode: 0 Median: 1

Event	Date	Problem	Content Domain Ref	Answers
Vesak/ Buddha Day	7th May	Vesak kuudu	5M7b 5G2b 5G4c 5P2 6M7b 6G2a 6G3a 6G3b	Pupils answers should prove that they can use their knowledge of shape properties and angles to draw accurate squares and triangles, using a ruler and protractor. Ensure they can create symmetrical designs.
Walk to School Week	18th - 25th May	Magic Maths	6C6 6F11 6R2 6A1	If x = friend's age, y = today's date and z = friend's shoe size, then: 1. x 2. $20x$ 3. $20x + y$ 4. $100x + 5y$ 5. $100x + 5y + z$ 6. $100x + z$
Local and community History Month	1st – 31st May	Tricky Timelines	3M4f 4M4c 5C4	1. September 1939 2. 21 months = 1 year and 9 months

Event	Date	Problem	Content Domain Ref	Answers
Start of Ramadan	23rd April - 23rd May	Fasting Times	5M4 6C8 6F10	1a. 30 days 1b. $04:45 - 21:15 = 16.5$ hours per day 2a. $16.5 \times 7 = 115.5$ hours per week 2b. $16.5 \times 30 = 495$ hours during Ramadan 3. 1 day $115.5 \div 24 = 4.8125 = 5$ days $495 \div 24 = 20.625 = 21$ days
Pride Month	1st June - 30th June	A Cake Sale to be Proud of!	3S2 6S1	1. £25 2. £20 3. £120 4. N/A

Event	Extension ideas
Passover	Repeat the exercise for: • 4 frogs in each family with 9 lily pads • 5 frogs in each family with 11 lily pads • 6 frogs in each family with 13 lily pads Can children see a pattern? Can they use the pattern to work out how many jumps would be needed for 8 frogs in each family on 17 lily pads? Write a general statement which explains how to work out the number of jumps (j) if you know the number of frogs (f).
Earth Day	• Children write their own problems based on the facts given. • Carry out a class recycling survey to find out how much rubbish they recycle each day. The rubbish could be categorised and weighed, then data can be presented appropriately. • Class recycling data can be used to calculate energy/ water saved.
St. George's Day	• Create own flags that meet certain criteria, e.g. 2 lines of symmetry, $\frac{1}{4}$ red and 4 equilateral triangles
Shakespeare's birthday	• Repeat the activity for a different part of the house. • Look at the number of shapes on sections of other buildings (e.g. triangles on The Louvre or rhombuses on The Gherkin). • The activity could be extended to calculating angles and lengths.
London Marathon	• Plan a marathon route in the nearest town. • Estimate how long it would take them to run a marathon, perhaps by running a set distance and timing how long it takes, then multiplying up. • Create graphs of race results, e.g. nationalities of runners, 2016 compared to 2017.

Event	Extension ideas
World Malaria Day	- Continue the graph to predict which year Malaria will be eradicated in. - Research the number of deaths caused by other diseases such as Cholera and see how they compare to Malaria. - Look at the number of deaths caused by Malaria in different countries and produce a bar graph.
Dance Day	Dance activities based on shape, symmetry and direction.
National Share a Story Day	- Look at shapes and angles in book illustrations. - Make comic books where the pictures have to be made from 2D shapes.
Red Cross Appeal Week	Do a similar activity based on different ways of raising money, e.g. sponsored cycle, quiz night, parachute jump, danceathon.
National Sun Awareness Week	To be safe in the sun you need to put sunscreen on every 2 hours between 10am and 4pm. You should use 2 teaspoons for your face and 2 tablespoons for the rest of your body. How many days will a 250ml bottle of sunscreen last?
Europe Day	Children create their own code crackers with messages for their friends to decipher.
Wesak/ Vesak/ Buddha Day	- Calculate the area and perimeter of shapes drawn. - What is the area of the shaded part of the shape? - Record some angles on a picture of a Vesak kuudu. - Can children calculate the missing angles?



Event	Extension ideas
Florence Nightingale's birthday	• Use Venn and Carroll diagrams for other sorting activities. • Try sorting the letters using a 3 circle Venn diagram
Walk to School Week	• Children try the trick out on people at home. • More maths tricks can be found here: https://www.easycalculation.com/funny/tricks/trick1.php http://www.murderousmaths.co.uk/games/seven.htm http://www.sumssimple.com/maths-magic-numbers_01.html
Local and Community History Month	• Create a timeline based on local history and write questions to go with it. • Look at events taking place locally and make links to maths. • Look at timelines with a range of different scales.
FA Cup Final	• Children could create their own football fractions board game.
FA Cup Final	• Look at how adding data from more recent rounds affects the averages. • Look at statistics on players in these teams and present data effectively. • Look at links: Is there a link between average age of players and goals scored, for example?

Event	Date	Problem	Content Domain Ref	Answers
Child Safety Week	1st - 7th June	Accident Arithmetic	5M4 6C7b 6F9c 6R2	1. $30,000 \div 12 = 2,500$ children each month 2. $130,000 \div 52 = 2,500$ children each week 3. $1,000,000 \div 12 = 83,333.33... = 83,333$ children each month 4. 39% of $1,000,000 = 390,000$ children
Bike Week	6th - 14th June	Distance Dilemma	5M9b	Anjali 11:40am Sam 11:24am
Children's Art Week	6th - 14th June	Line Art	4P3a	N/A
Queen's Official Birthday	13h June	Digit Dilemmas	5N2 5N4 5N6 5C1	1. 9621, 1269 2. 196 3. 24 (See Q4) 4. 1269, 1296, 1629, 1692, 1926, 1962, 2169, 2196, 2619, 2691, 2916, 2961, 6129, 6192, 6219, 6291, 6912, 6921, 9126, 9162, 9216, 9261, 9612, 9621 5. $61 + 29 = 90$ or $21 + 69 = 90$ 6. 162, 169, 192, 196, 216 and 219
Food Safety Week	4th - 10th June	Pie Chart Problems	6R2 6S1	1. 32% of $450,000 = 144,000$ 2. Other foodborne bacteria = 28% of $6000 = 1680$ Campylobacter + Salmonella = $6000 - 1680 = 4320$ $4320 - 1680 = 2640$ 3. $(29\% \text{ of } 6000) - (8\% \text{ of } 500) = 1740 - 40 = 1700$ 4. $43\% \text{ of } 6000 = 2580$ $2580 \times 12 = 30,960$

Event	Date	Problem	Content Domain Ref	Answers
Eid Ul Fitr	23rd - 24th May	Recipe Ratios	6R4	12 people: 1350g pumpkin 1650ml milk 3 teaspoons cardamom seeds, crushed 3 tablespoons sultanas 84g unsalted butter 345g sugar 126g flaked almonds 6 people: 675g pumpkin 825ml milk 1.5 teaspoons cardamom seeds, crushed 1.5 tablespoons sultanas 42g unsalted butter 172.5g sugar 63g flaked almonds 9 people: 1012.5g pumpkin 1237.5ml milk 2.25 teaspoons cardamom seeds, crushed 2.25 tablespoons sultanas 63g unsalted butter 258.75g sugar 94.5g flaked almonds

Event	Date	Problem	Content Domain Ref	Answers
Refugee Week	15th - 21st June	Merchandise Maths	5M9a 6F10 6R2 6A5 6S3	1. $£30 + (2 \times £10) + (1.5 \times £2.50) + (30 \times £2.50) = £128.75$ 2. 2 grey t-shirts + 2 badges or 1 grey t-shirt + 6 badges 3. $\frac{1}{4}$ 4. $\frac{1}{12}$ 5. White t-shirt £25.50 Grey t-shirt £8.50 Balloons £2.13 Badge £2.13 6. £11.25
Blaise Pascal's Birthday	19th June	Pascal's triangle	5S2 6S1 6S3	1. Each number is the sum of the two numbers directly above it. 2. $ \begin{array}{cccccc} & & 1 & 5 & 10 & 10 & 5 & 1 \\ & & & 1 & 6 & 15 & 20 & 15 & 6 & 1 \\ & & & & 1 & 7 & 21 & 35 & 35 & 21 & 7 & 1 \\ & & & & & 1 & 8 & 28 & 56 & 70 & 56 & 28 & 8 & 1 \end{array} $ 3. They double. 4. Children might notice: the symmetry of the triangle, the 2nd diagonal of counting numbers, the third diagonal of triangular numbers etc.

Event	Date	Problem	Content Domain Ref	Answers
First Day of Summer	20th June	Sunrise and Sunset Statistics	3M4f 5M4	J: 8h 37m = 517m F: 10h 24m = 624m M: 12h 14m = 734m A: 14h 15m = 855m M: 15h 54m = 954m J: 16h 38m = 998m J: 15h 55m = 955m A: 14h 14m = 854m S: 12h 15m = 735m O: 10h 19m = 619m N: 8h 34m = 514m D: 7h 49m = 469m
National School Sport Week	22nd - 26th June	Sports Day Data	5M5 5M9b	Ali won (Jo 157cm, Ali 308cm, Mark 258cm, Pippa 169cm, Mauro 279cm, Evie 249cm, Timo 196cm, Jack 254cm, Amelia 271cm, Shane 256cm)
Wimbledon	29th June to 12th July	Court Calculations	4M7a 5M7b 5M9b 6M7c	1. $10.973 - 8.23 = 2.743\text{m}$ 2. $(23.77 \times 2) + (10.973 \times 2) = 69.486$ 3. $11 \times 24 = 264\text{m}^2$ 4. $264 - (24 \times 8) = 72\text{m}^2$ Challenge: 66

Event	Date	Problem	Content Domain Ref	Answers
American Independence Day	4th July	Fireworks Fun	4N1 6A4	6
Tour de France	27th June - 19th July	Cycling Calculations	5M9b 6M6	1. $2082 \times 1.6 = 3331\text{km}$ 2. $2082 \div 21 = 99$ miles 3. $198 \times 2082 = 412,236$ miles 4. $2082 \div 25 = 83.3$ hours = 3 days, 11 hours and 20 minutes
Armed Forces Day	27th June	Training Timetable	5M9a	1. 45 minutes 2. 1 hour 45 minutes 3. 15 minutes more 4. 4 hours 15 minutes 5. 14:00 6. 2,700 seconds 7. $\frac{1}{6}$
Holiday Maths Week	July	Ice-cream Combinations	6A5	There are 6 combinations
Holiday Maths Week	July	Seaside Logic Puzzle	5F10	The missing total is 7.2  = 3.5  = 2.1  = 1.6
Holiday Maths Week	July	Design	5M9a	N/A

Event	Extension ideas
Child Safety Week	• For Q1, 2 and 3 calculate the number of accidents per day. • Produce a bar graph to show the data in Qs 1, 2 and 4. • Find out how child accident rates in the UK compare to another country and present the data appropriately.
Bike Week	• Repeat the question with different speeds/ distances. • Calculate the speed they both travelled in miles per hour. • Work out how long it would take each of them to travel 15km.
Children's Art Week	• Investigate probability: What is the probability that each colour will be selected? How many lines did you draw in total? How many would you expect to be (choose one of the 6 colours used)? What is the probability that a line would start at (3,3)?
Queen's Official Birthday	• The queen will be 92 this year. How many number sentences can the children write with an answer of 90? Encourage them to use fractions, decimals and % as an extra challenge.
Food Safety Week	• Produce a bar graph showing the data in the pie charts. • Research cases of food poisoning each year since 2010 and produce a line graph.
Eid Ul Fitr	• Plan an Eid feast for 6 people by finding suitable recipes and rewriting them for 6 people. • Calculate the cost of the food required.
Refugee Week	• Give children a quantity of money to spend in the shop and ask them to record the different ways they could spend it. • If someone pays for items costing £12.50, how many different ways could they pay the exact price using coins and notes?

Event	Extension ideas
Blaise Pascal's Birthday	Investigate Fibonacci numbers or triangular numbers.
First Day of Summer	- Calculate between which two months there is the biggest change in daylight length. - Find out the sunrise and sunset times for today- how many hours of daylight will there be? - Produce a line graph showing sunrise and sunset times. Use it to predict sunrise and sunset times on the 1st day of each month.
National School Sport Week	- Order the children according to their position in the competition. - Write each distance jumped in m, cm and mm. - Calculate the average distance jumped. - Calculate the total distance jumped by all 10 children. What is this in km? Miles? - If each child jumped 5% further on their second jump, how far did they jump? - Hold a class sporting competition. and record results to work out who won.
Wimbledon	- Choose rectangles on the diagram and calculate their areas and perimeters. - Investigate the triangle formed at the bottom right of the court- perimeter, area, angles etc. - How do the area and perimeter of a tennis court compare to those of other courts, e.g. netball, badminton, squash?
American Independence Day	- If hotel costs were reduced by 15%, how much would the family save on their break? - How far away is Paris? What is the cost per kilometre of the flight? - What is the average cost of the break per person?
Tour de France	If an amateur cyclist travels at 15 mph, how much longer would it take them to complete the Tour de France circuit than a professional cyclist?

Event	Extension ideas
Holiday Maths Week 1	• What would happen if you could have more than one scoop of each flavour? • Repeat the activity for 4 scoops of ice-cream. • Is there a way to work this out without recording all the combinations?
Holiday Maths Week 2	• Children to produce their own version of this puzzle for a friend to solve.
Holiday Maths Week 3	• If 1 square = 10m² calculate the area given to each item (e.g. large rides). • Give children running costs for each item. How much would it cost to run their theme park for 1 day?

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