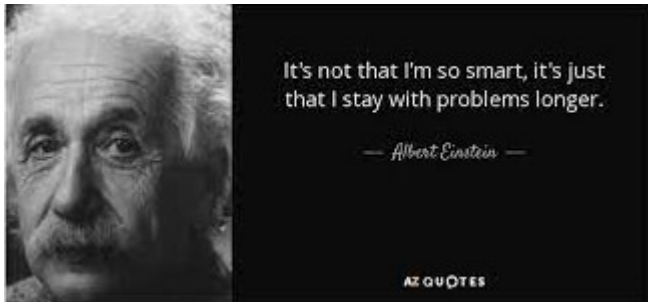


Welcome Back to School!

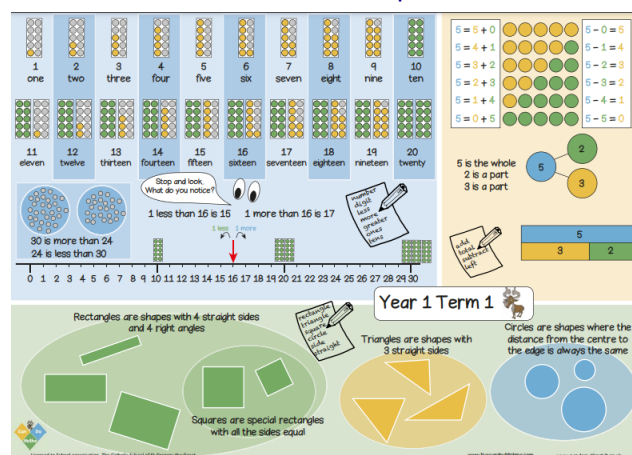


A very warm welcome back to school and a special welcome to families joining us for the first time. We hope the children are settling well into their new classes, getting to know their new teaching teams and adapting to the school routines. The maths team at St Gregory's are committed to providing the best maths education we can for your children, maintaining its high profile in school and encouraging positive attitudes, effort and participation. For the first few lessons of the year,

there is always a focus on **positive mindset**. We know maths can be hard and mathematicians are not necessarily people who find it easy, they just stick at it longer in order to overcome the difficulty - hence the Einstein quote! Our aim is for pupils in our care to have that appreciation and have the **belief** that with **effort** and **perseverance** they too can enjoy and attain in maths. Further information can be found on the maths pages on the school website packed with information about our [vision and approach to maths teaching and learning](#), [information about the 99 club](#), and [links](#) to useful documents, great websites and slides from previous parent workshops.

What the children are learning each term

We know from studies that strong relationships and communication between school and home really benefit children's learning. Knowing what your child is learning in class makes it easier for you to talk about it at home, which not only strengthens and consolidates the work they do at school but also helps them understand that what they are learning is valued and valuable. To help you do this, we make the brilliant **Knowledge Organisers** from our maths scheme of work available on our website. These are **visual representations** of the **key learning, manipulatives and vocabulary** for each term for each year group (except for **EYFS**). We really encourage you to have a look at the relevant knowledge organiser(s) for your child(ren) to **help you support** their maths learning. Year 1 term 1 is shown below as an example.



If you have a child in EYFS, see our [leaflet](#), which explains the key concepts covered and how you can help at home. Also available in [Polish](#).

Changes in modern teaching methods means maths is sometimes a difficult subject to support at home. These [videos](#) (from White Rose Maths) aim to bridge the gap between school and home by explaining current teaching methods.

Growth Mindset

In the first week of each academic year at Saint Gregory's, we spend time with our classes thinking about what it is to be a mathematician and how having a positive 'can do' attitude makes such a difference towards our mathematics learning. Adopting a **growth mindset** is at the heart of our maths approach at Saint Gregory's. Our learners understand how new challenges and making mistakes help their brains to grow!



We encourage the belief that everyone can succeed in maths so that our pupils are motivated to try new challenges and to keep going when things are tricky. **Growth mindset**, is the term for this belief that **we can improve our abilities by using learning behaviours such as effort, resilience, perseverance and practice** and all the other characteristics included in the St Gregory's learner profile.

Each class has a vision for maths which reflects what our maths classrooms are like and each vision reinforces a 'can do' attitude.

Maths at St Gregory's!

We practise and explore.
We make mistakes and learn from them.
We take our time and think about what we are doing.
We reason about what we are doing.
We record what we are doing.
We use maths equipment.
We say 'I can't do that YET!'
We notice things and make connections.
We seek challenges and solve problems.
We use mathematical language.
We celebrate all our efforts and learn together.
We keep going when it is difficult.
We see everyone as mathematicians.



Parents play a vital role in promoting a positive attitude to maths...

- **Talk positively about maths!** If children hear the people around them saying they can't do maths, or that they don't like maths, this is likely to have a negative impact on children's learning.
- **Set high expectations!** Doing this will show children that you believe they really can succeed.
- **Celebrate mistakes!** Mistakes should be encouraged, explored and celebrated. Research shows that mistakes actually increase a child's capacity to learn and grow the brain (Boaler, 2016). Explain to children that their brain is like a muscle which gets stronger with exercise – they'll find it fascinating!
- **Praise carefully!** It's so easy, when you're feeling proud, to say things like "well done – you're so clever". This can reinforce a belief that children are either good, or not good, at something. Try to celebrate effort by saying things like – "well done – you tried so hard".
- **Talk about learning!** When talking to children about their day, ask them about what they learned. Question whether they tried hard, and whether they were challenged. Celebrating the learning process is key.
- **Encourage practice!** If children dislike maths, they may not want to do their homework. Remember to tell children that practice is the key to success!

Click [here](#) to read more about Growth Mindset at St Gregs.

Famous mathematicians

Mathematics is a creative and highly interconnected discipline that **has been developed over centuries**. Because of this, during our Mindset maths sessions this year, we also spent time learning about famous mathematicians which in most cases are linked to each year group's current topic.

Some examples include:

Year 5, who are studying Ancient Greece in History, explored Archimedes' water displacement theory related to the golden crown problem. This was also the origin for the famous 'Eureka' exclamation! The children measured different objects in beakers of water calculating the difference when the water rose (was displaced).

Year 1 learnt about Ada Lovelace – an inspiring English mathematician and computer scientist from the 19th Century. They then programmed the Beebot robots to follow paths in different directions.

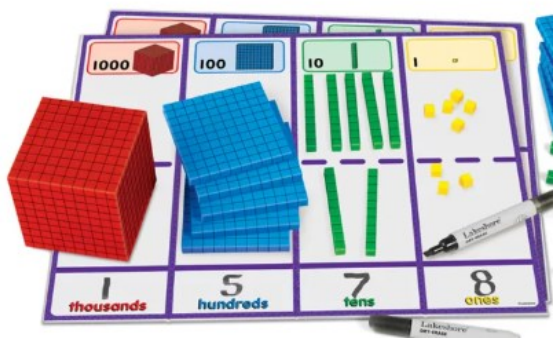
Year 6 researched Percy A. MacMahon, who was a Cheltenham mathematician that patented several successful puzzles. They applied their problem solving skills to solve examples of his best known puzzle – a matching puzzle that was also brought in for the children to try during a puzzle problem solving session in the Summer term.

Year 2, who are studying the 1969 Apollo 11 mission to the moon, learnt about Dorothy Vaughan – a gifted American mathematician, computer programmer and pioneering figure for change at the United States NASA Space Centre. They created fact files about her life.

As you can see, we are working hard to make links between our maths learning and real life contexts through famous mathematicians, careers and daily life. If you think you can support us in this further (perhaps you would like to come in or write about how you use maths) please contact the maths team through the parents@st-gregorygreat.gloucs.sch.uk email or through the office. Many thanks!



Place Value



In many classes at the start of the academic year, following the *Growth Mindset* refreshers, there is usually a big focus on **place value**, as this is such a fundamentally crucial concept for children to master.

Place value is the term used to describe the **value of a digit in a number**, which of course depends on where it is.

Although there are only **10 digits** in our number system (0-9), we can make any number using combinations of them within our place value system.

As numbers sequentially increase and we use up all available digits, we have to move to the next *place* to continue. So if there is a 9 in the *ones place* and we want to increase the value by 1, we have to move left to the next place, *the tens place*. Writing '10' shows that we now have one set of 10; 20 is two sets of 10 etc.

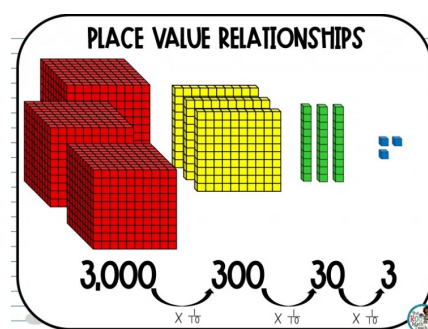
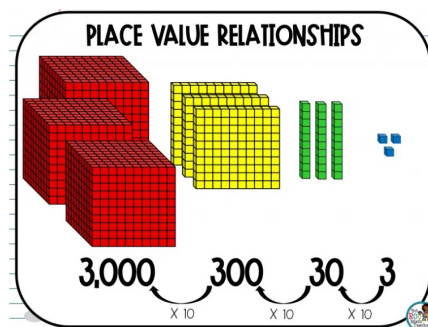
When we get to 99 (9 sets of ten and 9 additional ones) we have again used up all our available digits, and have to move to the *next* place, the hundreds place: we write '100' - and can think of this as one set of 100, or ten sets of 10 or even a hundred sets of 1, and this flexibility of thinking is extremely useful.

100	10	1
	9	9

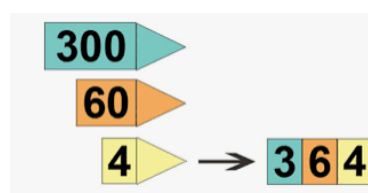
100	10	1
1	0	0

Place Value Cont'd...

A '3' in the ones place means three sets of 1 (3), but in the tens place means three 10s (30), and in the hundreds place three 100s (300) etc. So **moving digits one place to the left increases their value by a factor of 10** and **moving them one place to the right decreases the value by the same factor**. It is this feature that makes multiplying and dividing by 10 and its powers, effortless (once you get the hang of it!)



The number 364 (below) has three 100s (300), six 10s (60) and four 1s (4) and is equal to $300+60+4$.



This ability to think **flexibly**, **partition** and **combine** numbers and **use place value knowledge** to easily **multiply and divide by 10 and powers of 10**, are all key skills for children to learn and are used in many areas of maths.

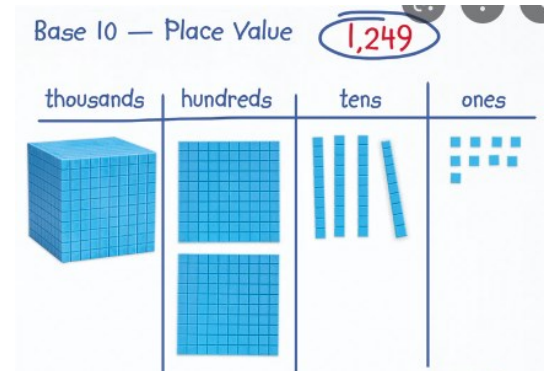


Place Value Cont'd...

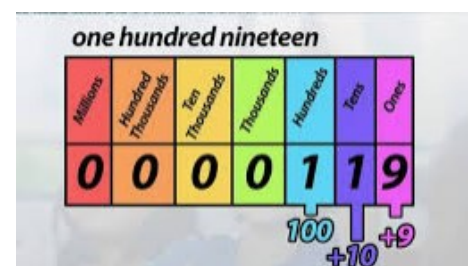
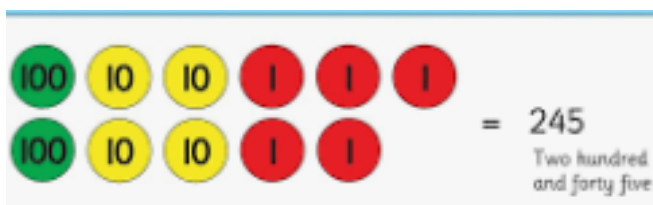
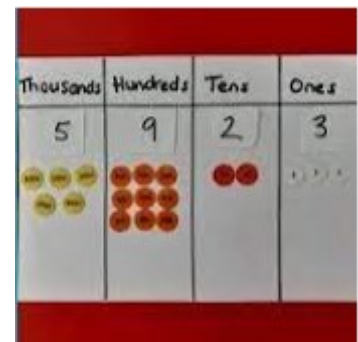
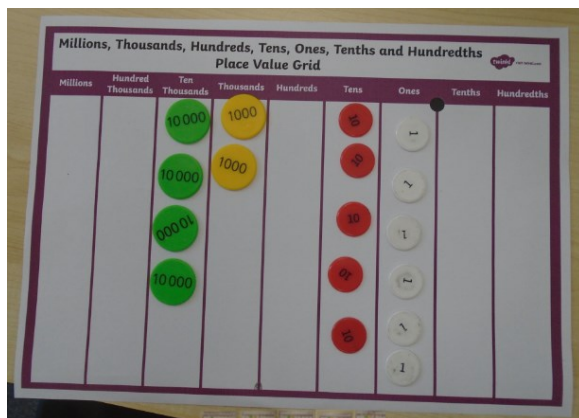
Many tools are used in class to help the children with their understanding of place value, including real apparatus to hold and manipulate as well as images on boards, in books or worksheets.

Some examples include:

- Base 10 blocks or dienes. These help the children understand the relative value of the digits they are writing depending on whether they represent ones, tens, hundreds or thousands.



- Once children get beyond thousands, it's no longer practical to use dienes, so counters are used instead. Children need to have mastered the difference between ones, tens, hundreds, thousands etc before using them because all the counters are the same size, but definitely not the same value! Making numbers from counters then writing them in a place value chart reinforces the value of each digit.



Click the following links to watch videos explaining place value:

[White Rose](#)

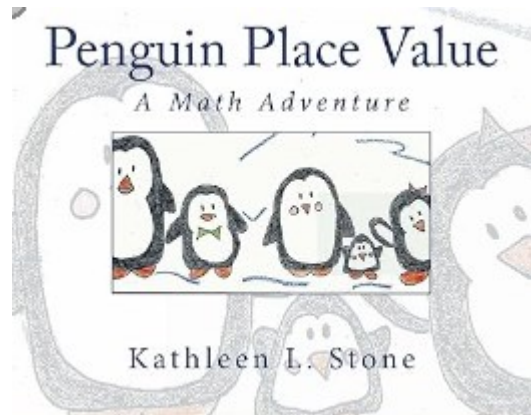
[Oxford Owl](#) (scroll down to 2nd video "What is place value?")

Book Recommendations

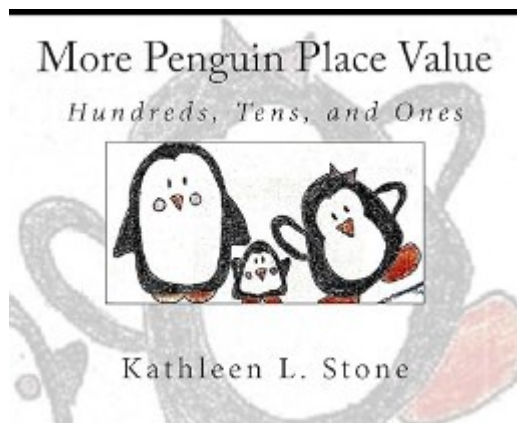
Due to the huge benefits and crucial importance of reading, the maths team like to recommend some maths related books each issue: we can brush up on our maths AND get some reading practice all at the same time—WIN:WIN! Because many classrooms are kicking off with the topic of place value, here are some books about it:

Penguin Place Value by Kathleen L Stone.

Help this happy little family of penguins discover how many fish they've caught using your place value skills!



More Penguin Place Value by Kathleen L Stone



Amazon blurb... “More Penguin Place Value” is a sequel to the popular children’s book, “Penguin Place Value.” This delightful book provides opportunities for children to practice their place value skills with hundreds, tens, and ones. They will also be introduced to expanded notation form and number words. Children will enjoy reading the further adventures of this cute penguin family that they were introduced to in “Penguin Place Value.” The rhythmical text and charming illustrations, along with the interactive nature of the story, will keep young learners engaged. Suggested learning activities, included at the end of the book, provide further practice of this important skill.

Zero the Hero by Joan Holub

Zero. Zip. Zilch. Nada. That's what all the other numbers think of Zero. He doesn't add anything in addition. He's of no use in division. And don't even ask what he does in multiplication. (Hint: Poof!) But Zero knows he's worth a lot, and when the other numbers get into trouble, he swoops in to prove that his talents are innumerable.



What our children say about maths at St Gregory's

We asked four of our year six pupils about maths at St Gregory's. This is what they said...

*It's one of our favourite subjects... overall it's a fun subject... I like solving problems and puzzles using numbers... maths isn't always easy... mistakes are useful because you can learn something from the way you did it wrong... you can use brain, buddy, boss (try yourself, ask a friend, ask a teacher)... I find it fun... if things are too easy it means there's no challenge and you're not learning anything ... it's really useful in life: when you get older you have to deal with banking, paying bills... if you're working in a shop and a customer pays you too much you might have to work out how much change to give them... if you're a builder you will have to measure materials... you have to weigh stuff for baking and cooking ... there are lots of resources to help us understand, like place value charts, place value counters, dienes... the written methods we learn in lessons help us... we like a challenge sometimes... when it's really difficult it helps to have a positive attitude; this means looking forward to your learning, believing you can do it even if you can't do it yet... in order to achieve, you have to work hard, persevere and ask for help if you need it... there's just the right amount in each lesson... journaling (note taking) can be helpful ... bar models are useful to 'see' the problem and it shows clearly what you have to do... 99 club is good because it goes all the way to Bronze, Silver and Gold after 99 club; these clubs include word problems and representations, not just calculations so can help for SATs... using DNA helps us answer the Go Deep tasks (**DO** the task yourself, write down what you **NOTICE**, write how you would **ADVISE** someone attempting a similar task)...we have to use all the qualities in the learner profile, especially for the Go Deeper tasks... Colin and Coco help make it fun, although they don't always learn from their mistakes!*

Thank you to Pippa, Matylda, Dilraaj and Carter from Painswick class.

Maths in real life



Who enjoys a bit of Bake Off?

I know lots of people who do, and I'm one of them! A number of years ago, the good people at mathscareers.org.uk put together an article detailing the **maths skills** needed to win The Great British Bake Off! These included **measuring** ingredients, using **ratios** to scale ingredients up or down, **timing** calculations for baking, using **fractions** (e.g. contestants might be asked to use *five-sixths* of their dough for something specific), **dividing** their cake mixture equally to make perfectly miniature Victoria sponges all the same size etc! Who knew there was so much maths involved in baking?



Click [here](#) to read the full article...

How I use maths in my job...



Elly Smart, Mrs Winter's friend, is a vegan chef; she invents recipes and makes food using only products that are plant based - i.e. she doesn't use any animal products. She told us how she has to use maths in her job every day!

" You might not associate cooking with maths, but I actually have to use maths every single day in my job! Here are just some of the things I do which require maths skills:

- I have to carefully **weigh** ingredients
- When I'm producing new recipes, I often have to **convert units** of measurement, e.g. from liquid ml to g, or from metric to imperial measures
- I have to use **ratios** to scale up (for more people) or down (for fewer people)
- I have to know how to **work out timings**, using elapsed time to know when to start each part of a meal so it is all ready to eat to on time
- I have to have a good grasp of **money** when I'm buying ingredients, pricing my products or for producing recipes for students requiring meals on a budget, and for doing my tax returns
- I use all **four maths operations** for my tax returns: e.g. addition and multiplication for totaling how much money I've made in a year, subtraction to deduct costs like ingredients and division to work out how much to put aside each month
- I have to understand **percentages**, for example to work out how much to pay an agency who introduces customers to me. Agencies typically charge around 20% for a job they have introduced."

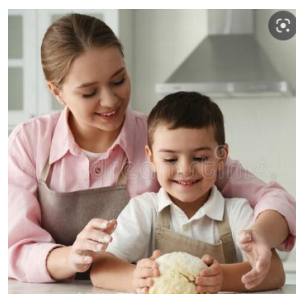
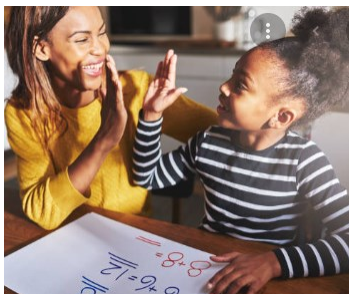
Who knew there was so much maths needed to be a chef? Thanks Elly - Smart by name, Smart by nature!

How can I best support maths at home?

Here are some **top tips** for **engaging your children with maths**, which can make an *enormous* difference to their attitudes, engagement and attainment!

- **Have fun** and model **positive attitudes** to maths—this alone can have a huge effect!
- Use **maths talk** every day—count stairs, money, toys, objects.
- **Sing** counting songs, e.g. Ten Green Bottles. Try [bbc nursery rhymes](#).
- Ask children to say **how many** without counting—then check!
- **Play games** with dice/dominoes and say [how many dots](#) without counting!
- **Identify shapes**—wheels, windows, tiles, mirrors.
- **Do baking** together—great for all areas of maths e.g. measuring, sharing etc!
- Develop **memory skills**—e.g. phone numbers, times tables, nursery rhymes.
- Ask children to **help lay the table** with enough cutlery and crockery.
- Collect, **sort and group** items, e.g. stones, feathers, conkers, leaves.
- **Make / continue patterns** of items, e.g. building blocks, toys, items from garden.
- **Spot numbers** when out and about e.g. on buses, houses, clocks, phones etc.
- **Use tens frames** often e.g. for reward charts, or scoring in games.
- **Watch [Numberblocks](#)** on Cbeebies—TV programme written by maths specialists.
- Deliberately **make mistakes**—showing it's normal to make them and fun to spot them.
- Play **outdoor games** like skittles, hopscotch.
- **Read [books](#) with maths concepts** e.g. One is a Snail, Ten is a crab, The Doorbell Rang.
- Draw attention to **more or less**, bigger smaller, taller shorter etc.
- Ask questions such as **“How many more?”**, **How many altogether?”** **“How many left?”**
- **Learn their [methods](#)** e.g. bar modelling, column addition / subtraction.
- **Practice reading the time** including on analogue clocks.
- **Use fractions** in daily life.
- **Practice [times tables](#)**—they're *essential*!
- Talk about when and how you use **maths at home or at work**.
- Involve them with **problem solving** e.g. at the supermarket 2for1 deals, 25% off sale
- Use **open questions** when helping with homework instead of 'doing it for them' e.g. how did you get that answer? / what method did you use?
- Play to their **love of technology**. Lots of maths apps are free including [Khan Academy](#), Mr Thorne's Maths, [DoodleMaths](#)
- **Provide challenge**—use [NRICH](#) or [Transum](#).

For more detail, see the attached [link](#)



With every good wish from the Maths Team.