How we Teach Computing at Tudor Primary School

TUDOR PRIMARY SCHOOL

Summer 2022

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"I like computing because it takes you out of the real world. If you feel upset, it makes you feel calmer. I love every single thing about computing, and I'm so glad there are computers in the world"

- **Alex, Year 6**

"Whether you want to uncover the secrets of the universe, or you just want to pursue a career in the 21st century, basic computer programming is an essential skill to learn"

– Stephen Hawking

I love computing because it makes learning fun"

– Emily, Year 3, Tudor Primary

"Everybody should learn to program a computer, because it teaches you how to think."

- Steve Jobs

"I love to type up my work on computers because it looks good and it's easy to write my ideas. I love taking photos on the Ipads and playing games"

- Max, Year 2, Tudor Primary

"I think it's fair to say that personal computers have become the most empowering tool we've ever created. They're tools of communication, they're tools of creativity, and they can be shaped by their user."

- Bill Gates

"I love experimenting with different computing games and how they work, and their similarities and differences"

- Daisy, Year 5, Tudor Primary

Intent

Introduction:

At Tudor Primary School, we understand the key role that computing and technology plays for our pupils. Children are constantly exposed to computers throughout their daily lives in all different forms, such as tablets, phones, laptops and many others. This makes it vital that they have a solid understanding of how they work and are able to access all of the opportunities they provide.

This document will detail how we provide a broad and balanced Computing curriculum across the year groups which covers all areas of the National Computing Curriculum. As a school with a strong thematic approach to learning, technology is used throughout all aspects of the children's school lives in a wide variety of ways. This cross-curricular approach helps children to not only deepen their computing understanding, but also to practically apply their knowledge in different ways. In addition, the concrete application of technology within the context of a thematic curriculum gives the computing learning real meaning for the children, and makes it more relatable and practical for them.

Aims:

In line with the National Curriculum, we aim to ensure that all pupils:

- *can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation*
- *can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems*
- *can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems*
- *are responsible, competent, confident and creative users of information and communication technology.*

Implementation

Switched On Computing:

At Tudor Primary, we follow the Switched on Computing scheme to provide a consistent and in-depth approach across all of the year groups. The Switched On Computing comprises of 6 units from year 1 to year 6, all of which enable the children to progress through their learning:

- Programming
- Computational thinking
- Creativity
- Computer networks
- Communication and collaboration
- Productivity
- Online safety

As the children move up the school these units follow the same sequence, but become more challenging as the student's knowledge is deepened and broadened. The teacher starts by recapping previous knowledge, and then building upon this as a foundation for new knowledge. At Tudor, we then link these Computing Days to our Thematic Curriculum to give them context and meaning for the children.

Here is an example of the KS1 Thematic Computing Map:

Tudor Thematic Computing Map

Theme KS1 YEAR A	Homes under the hammer		From Fork to field		Seaside Rescue	
	Autumn 1 -Year 1 1.3 – making an e-book Draw pictures - Stories about homes e.g. three little pigs	Autumn 1 -Year 2 2.3 – We are photographers -Take photographs and write about them - Take photos on IPad of buildings, use simple editing tools, add to book	Spring 1 - Year 1 1.1 – We are treasure hunters Twinkl Beebot costumes - animals	Spring 1 – Year 2 2.1 We are astronauts	Summer 1 – Year 1 1.4 We are collectors Find images	Summer 1 – Year 2 2.5 – We are detectives Writing an email to the head
Resources	Book creator - iPad	Book creator - iPad	Beebot Discovery coding year 1 unit	Beebot Discovery coding year 2 unit	Clips – IPad Puppet Edu - IPad	Email - Laptops
	Autumn 2 – Year 1 1.6 – We are celebrating – create a card electronically - Diwali, Christmas, birthday	Autumn 2 – Year 2 2.4 – We are researchers - Research an artist, find pictures and put information into a presentation.	Spring 2 – Year 1 1.2 – We are TV Chefs/Gardeners- - Filming instructions and setting up a shot	Spring 2 -Year 2 2. 6 – We are zoologists - Different animals and bug hunts	Summer 2 – Year 1 1.5 – We are storytellers Draw pictures and record voce	Summer 2 – Year 2 2.2 – We are games testers
Resources	2 Publish on laptops	Powerpoint - laptops	Clips – iPad Puppet Edu - IPad	2simple infant tool kit	2Simple 2 Create a story	Scratch Jr

The Thematic maps for all Key Stages can be found on the staff drive.

Further information on the Switched on Computing scheme can be found on their website:

https://www.risingstars-uk.com/series/switched-on-computing

Foundation Stage:

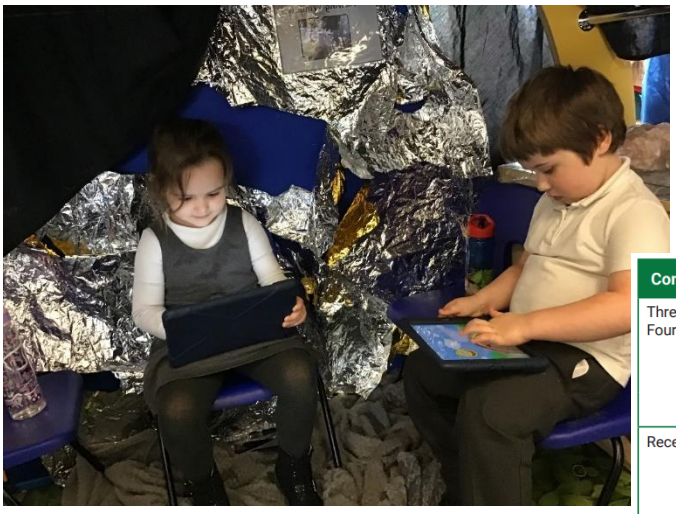
As the Switched On Computing only focusses on Year's 1 to 6, Computing is taught differently in Reception and Nursery. Although computing is no longer a named requirement in the new EYFS development matters guidelines, there are still opportunities for technology to be present in the children's learning. Below is attached a table showing the areas computing is most evidence in the new framework.

During play and learn, there are two desktop computers open and ready with games and programs for the children to explore. There are also games available on the teachers Interactive White Board for the children to use. Children also have access to "talk buttons", where they hold down a button and record themselves speaking, then press another button to have the recording played back to them.

In literacy and numeracy lessons, children are placed in a group of 6 with an adult, and each child has an Ipad. They then play a variety of adult let games or applications to help them with both their computing and their numbers and writing at the same time. Ipads are also used for phonics games, maths games, and for Oxford Reading Tree Books.

In addition to all of these resources, there are also a number of Beebots available for the children to use in both adult led sessions, then in active play. Beebots are little electronic "bees" which children give a set of instructions to in order to make the bee move around a mat on the floor. They help children not only begin to grasp the concept of algorithms (sets of instructions for a computer), but also provide an opportunity for directional language.

Finally, technology is also used by the adults in Foundation stages through the app "tapestry", and to take photographs and videos of the children's learning.



Pre-Requisite Learning Opportunities for Computing in EYFS

Computing			
Three and Four-Year-Olds	Personal, Social and Emotional Development		• Remember rules without needing an adult to remind them.
	Physical Development		• Match their developing physical skills to tasks and activities in the setting.
	Understanding the World		• Explore how things work.
Reception	Personal, Social and Emotional Development		• Show resilience and perseverance in the face of a challenge. • Know and talk about the different factors that support their overall health and wellbeing: -sensible amounts of 'screen time'.
	Physical Development		• Develop their small motor skills so that they can use a range of tools competently, safely and confidently.
	Expressive Arts and Design		• Explore, use and refine a variety of artistic effects to express their ideas and feelings.
ELG	Personal, Social and Emotional Development	Managing Self	• Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. • Explain the reasons for rules, know right from wrong and try to behave accordingly.
	Expressive Arts and Design	Creating with Materials	• Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.

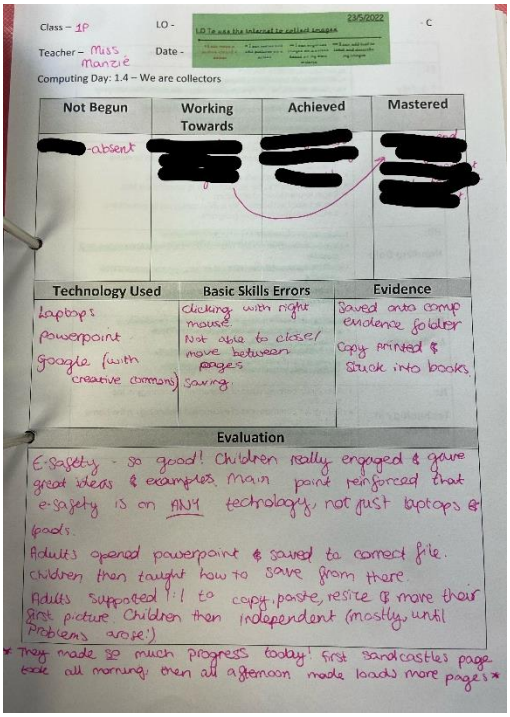
Assessment:

At Tudor Primary School, we use Target Tracker to show our summative assessment of the children's progress in computing. At the end of each term, class teachers assess each child's current attainment level in computing, indicating this using the age-related tracking colours for their current year group. The expectation is that children progress 1 step per half term, so this should be seen as 2 steps progress each term.

As a formative assessment, Class Teacher's use a specifically adapted "Feedback Sheet" to evaluate the class as a whole, identify any common misconceptions and indicate the individual children's achievement as "Not Begun, Working Towards, Achieved or Mastered". Throughout the lesson, the teacher will use this sheet to record how the pupils are getting on, noting down anyone who is struggling or might need support, and also writing down any excellent vocabulary or other verbal evidence that shows the children are understanding the computing skill. On the reverse of the feedback sheet is the year groups "Age-Related Expectations" written as a list of statements. After the lesson, the class teacher will also indicate which of these expectations has been met as a class.

These feedback sheets will be kept until the end of the year, and then handed up to the new class teacher. This enables the teachers to differentiate their learning for children who were unable to access the learning in previous years, or who may have been absent on those days. In addition to this, if children mastered the skill the previous year, the teacher can then prepare and incorporate a higher level of challenge for those pupils.

Attached below is an example of a completed class feedback sheet for a Year 1 Computing day.


Class – 1P LO – 23/5/2022 C
Teacher – Miss Manzie Date –
Computing Day: 1.4 – We are collectors

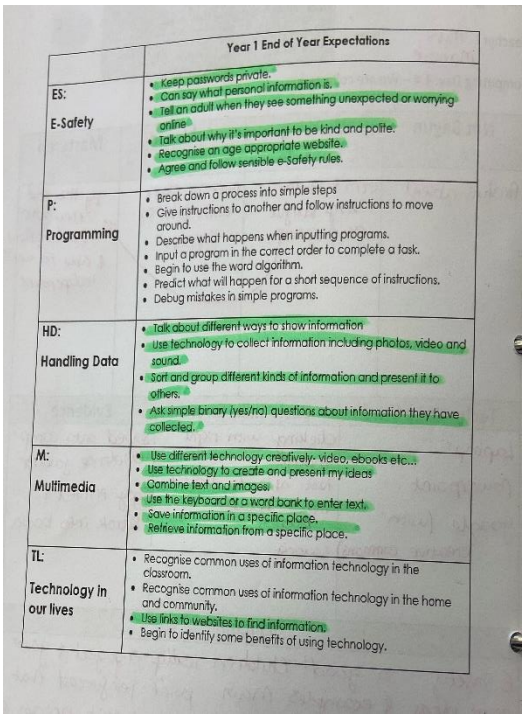
Not Begun	Working Towards	Achieved	Mastered
absent	[redacted]	[redacted]	[redacted]

Technology Used	Basic Skills Errors	Evidence
laptops powerpoint google (with creative commons)	clicking with right mouse Not able to close/ move between pages saving	saved onto comp evidence folder copy printed & stuck into books

Evaluation

E-Safety - so good! Children really engaged & gave great ideas & examples. Main point reinforced that e-safety is on ANY technology, not just laptops & ipads.
Adults opened powerpoint & saved to correct file. Children then taught how to save from there.
Adults supported 1:1 to copy, paste, resize & move their first picture. Children then independent (mostly, until problems arose!)
* They made so much progress today! first sandcastles page took all morning, then all afternoon made loads more pages *

Year 1 Feedback Sheet Front



	Year 1 End of Year Expectations
ES: E-Safety	• Keep passwords private. • Can say what personal information is. • Tell an adult when they see something unexpected or worrying online. • Talk about why it's important to be kind and polite. • Recognise an age appropriate website. • Agree and follow sensible e-Safety rules.
P: Programming	• Break down a process into simple steps • Give instructions to another and follow instructions to move around. • Describe what happens when inputting programs. • Input a program in the correct order to complete a task. • Begin to use the word algorithm. • Predict what will happen for a short sequence of instructions. • Debug mistakes in simple programs.
HD: Handling Data	• Talk about different ways to show information • Use technology to collect information including photos, video and sound. • Sort and group different kinds of information and present it to others. • Ask simple binary (yes/no) questions about information they have collected.
M: Multimedia	• Use different technology creatively- video, ebooks etc... • Use technology to create and present my ideas • Combine text and images • Use the keyboard or a word bank to enter text. • Save information in a specific place. • Retrieve information from a specific place.
TL: Technology in our lives	• Recognise common uses of information technology in the classroom. • Recognise common uses of information technology in the home and community. • Use links to websites to find information. • Begin to identify some benefits of using technology.

Year 1 Feedback Sheet Back

For any additional information or tools to support assessment in computing, please follow the hyperlink to the Assessment Folder.

Technology and Resources:

We are incredibly fortunate at Tudor School to have a wide variety of technology available to all year groups. This is not only useful for class computing days, but is also used to supplement children's learning across all subjects. Often, computers and Ipads are used in other lessons across the curriculum to provide children with different ways of finding information or presenting their learning.

Year 1 Programming their Beebots to race on the carpet, before trying on their treasure maps.

Tommy in Year 2 recorded his video which can be seen by scanning the barcode attached.

In Key Stage 1, there is a set of Laptops which are shared between both Year 1 and 2, and are also available to the Breakfast Club for use in their morning sessions. Both year groups also have their own set of Ipads in each class for the children to use daily in their learning. We regularly use an app called Seesaw, which enables children's work to be uploaded both in school and at home. This can also be used to set homework, or to save evidence on Computing Days (as pictured above). We also have access to lots of resources, such as Beebots, which help our children with basic algorithms and programming. These can also be used in cross curricular ways to plan routes around a map.

In Key Stage 2, is a large variety of different kinds of Laptops and Tablets available for a variety of purposes. There is a trolley of Laptops along the corridor, which can be used for Computing days and also for supplementary learning and activities in class. There is also a brand new set of Chrome Books which are available for the older children to use. In addition to the computers, there is also a full class set of new Ipads with lots of available apps and features to aid children in their learning. On the computers and tablets we have all the applications and programmes needed for Computing days across the years. A few examples of these are scratch, Powerpoint and Moviemaker which are all pictured below.

Daniel in Year 3 has programmed a Scratch with three sprites to move across the screen.

Creating a Movie using Move-Maker in Year 3.

Creating a website in Year 5.

Creating a Powerpoint on the Roman empire.

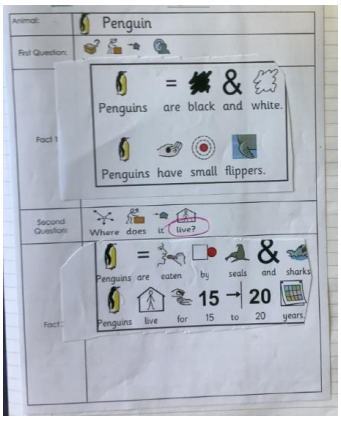
Adaptation for SEN:

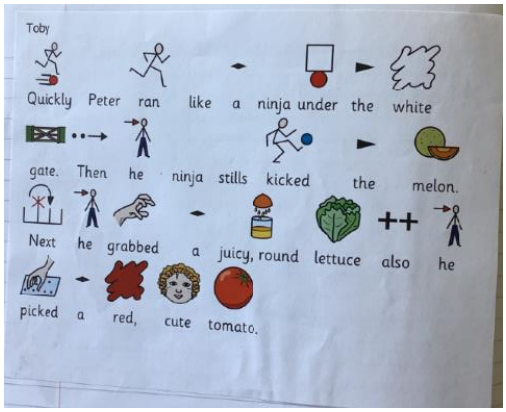
At Tudor we endeavour to ensure every child, no matter what their individual needs or barriers to learning are, has equal access to learning and the same opportunities to achieve. The curriculum is designed to be ambitious and meet the needs of all pupils. In Computing, we ensure that children with additional needs are supported, and lessons are adapted to overcome possible barriers to learning in a variety of ways, including:

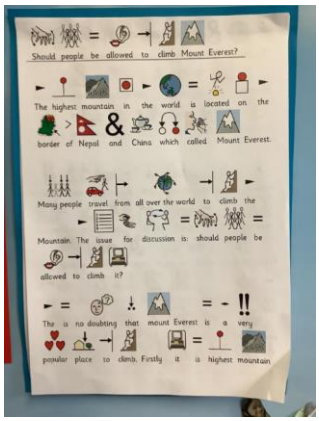
- Using multi-sensory approaches to teaching and learning, including physical activities and role play
- Pre teaching
- Over learning
- Additional adult support
- Resources to support individual physical needs
- Use of learning partners
- Having a variety of resources and materials accessible to all
- Tasks and activities being simplified/adjusted as required
- Alternative ways to record ideas e.g., voice recorders, Clicker, Seesaw
- Scaffolding of tasks e.g. sentence starters, simplified activities

Computing naturally lends itself very well to adaptation, as technology can be used to evidence learning in a variety of ways which remove barriers such as transcription and memory issues. Teachers will always consider the needs of each child in the class when planning Computing days to ensure appropriate adaptations are made so all children can access the learning and achieve their highest potential.

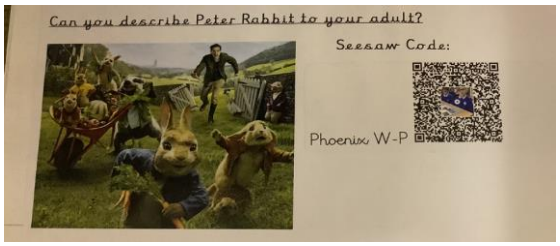
The use of Clicker 8 across the year groups to enable children with additional educational needs to access the curriculum with visuals:







The use of Seesaw across the curriculum to remove the barrier of transcription by evidencing verbal responses and the use of physical manipulatives:



Online Safety:

The importance of internet safety in children's education cannot be overstated. E-Safety is not only a vital part of the Computing curriculum, but it is a fundamental part of Safeguarding and Child protection measures. At Tudor, we make sure that online safety is comprehensively covered as part of our Computing curriculum, as well as in other subjects including PSHE and extracurricular activities.

E-Safety in our Computing Days:

Each and every Computing day starts with 30 minutes of online safety learning. This should contain a review of past e-safety lessons, a summary of the critical elements of each year group, and any e-safety rules that must be followed during the day in order to stay safe. This should then be touched upon throughout the day wherever necessary, and recapped at the end.

For each year group, the Switched on Computing scheme provides a "Online Road Safety" map, which helps teachers see what must be addressed in each Computing day. This Online Safety map is used in the document below, which is divided into parts that connect each Computing day to its e-safety standards, the National Curriculum statements covered, and a brief synopsis of each day's activities.

Follow this hyperlink to access the National Curriculum and E-Safety Computing Day breakdown.

E-Safety in our PSHE Curriculum:

In addition to our Computing days, e-safety is also taught throughout the PSHE curriculum. Concepts are sometimes covered briefly and linked into computing days, such as in Year 1 looking at "Valuing differences" and the importance of being kind. In other lessons, the link to e-safety and computing is more clear, for example in "Keeping Myself Safe" in Year 1 we learn which pictures are safe to share online and which aren't. It is critical that these connections are made clear to the children so that they can recognise the connection between internet safety and other subjects as well as their daily life outside of school. At Tudor, these cross curricular links between e-safety and PSHE are identified in the document attached below.

Follow this hyperlink to access the E-Safety across the curriculum document.

E-Safety within Safeguarding:

As mentioned previously, E-Safety in a fundamental part of Safeguarding and Child Protection measures. In relation to the "Keeping Children Safe in Education" guidance, monitoring and reviewing our school's online safety education is vital to keep our children safe. We at Tudor have a variety of policies where online safety guidance is provided to staff and parents alike.

These documents include:

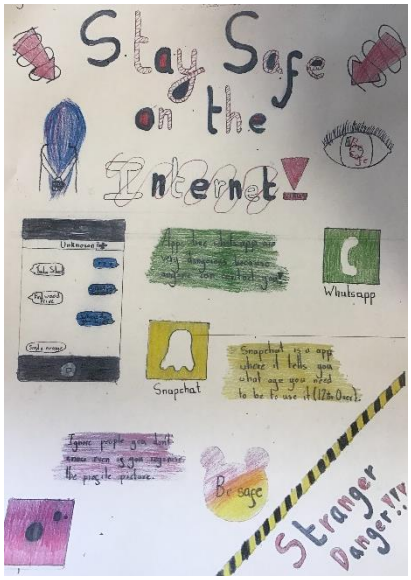
- How we Keep Ourselves Safe at Tudor
- Online Safety Policy
- Child Protection Policy

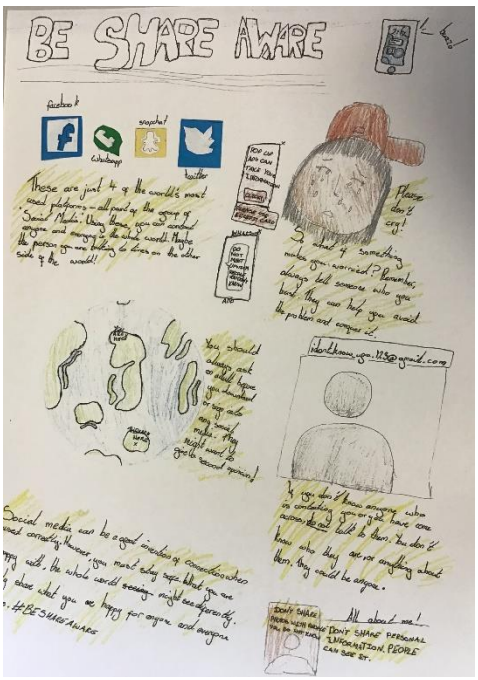
Further information about our Safeguarding links to online safety can be found on our website:

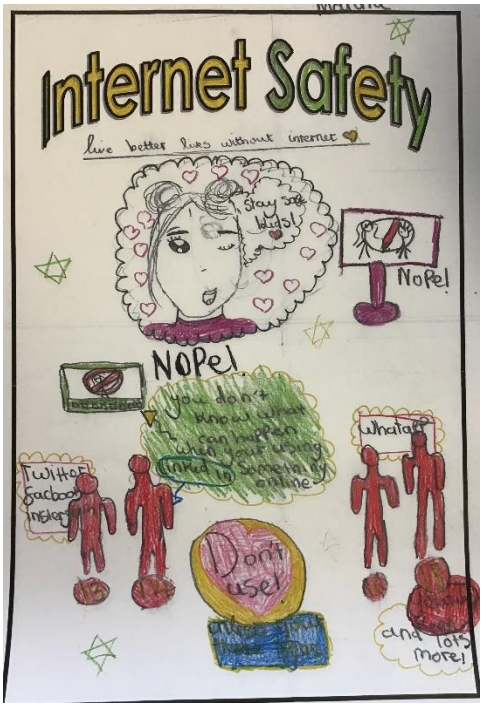
https://www.tudor.herts.sch.uk/page/?title=Safeguarding+and+Child+Protection&pid=82

Safer Internet Day:

In addition to the teaching of online safety in class, we also celebrate "Safer Internet Day" every year. This includes a school assembly to all year groups, and some kind of activity to be taught in class. Last year, we had a school wide poster competition. A stand-alone lesson was taught in each class about how to stay safe online, and then children were set a task to make a poster for the school at home. Here are just a few examples of some of the amazing posters our children produced:







Support for Parents:

As e-safety is so critical for children's safety, it is important that we at Tudor work in partnership with parents to ensure children are protected at home as well as in school. Our website has a page dedicated to internet safety, where key information is shared with parents to keep their children safe online at home. This year, we had a visit from Richard Maskrey (School Consulting Ltd) who spoke with our parents about current online trends, how to keep your children safe and where to go for help and support. He created a fact sheet which is attached to the website for parents to access who may not have been able to attend.

Also available on our school website is a link to Hertfordshire Online Safety Newsletters, and a variety of websites and links to videos which parents can access to find further support and advice.

For any further information about eSafety at Tudor school, please follow the hyperlink below to find the "Internet Safety" section of our school website:

https://www.tudor.herts.sch.uk/page/?title=Internet+Safety&pid=164

Impact

As a result of our implementation of the computing curriculum at Tudor Primary School, our pupils will be responsible, competent, confident and creative users of information and communication technology. Our students will understand the importance of online safety, and know how to keep themselves safe on all forms of technology and the internet. They will have a strong knowledge of the fundamental principles of computing, and will have been provided with the opportunity to apply these in a variety of different contexts throughout their time in school. This will give them the confidence and knowledge to apply their understanding with unfamiliar technology, and to build on their skills as they progress in their education.

Our end of term assessments on target tracker show a clear progression in the children's computing ability as they progress through school. In addition to this, a recent scrutiny of feedback sheets across the school evidenced that teachers are formatively assessing the children's understanding in lessons and supporting those who need additional help. The age-related statements on the reverse of the feedback sheet are also consistently being clearly marked to show the curriculum coverage of each computing day.

In a recent pupil voice survey conducted in Summer 2022, students throughout the school shared they very much enjoy their computing days and look forward to these each half term. Students had a good knowledge of the topics they had covered throughout the year and in the past, and were able to share how their teacher supported them and the feedback they were given on their work. Many students even shared that they enjoyed their work so much that they continued their computing day activities at home utilising websites and applications like seesaw. Students also stated that they used a variety of technologies in many aspects of their school lives, and that they could tell me which devices they used and how it helped them learn. In regards to online safety, children throughout the school shared examples of how they would keep themselves safe online, the importance of keeping personal information private and most critically they all understood they should not talk to or meet with people they don't know online.

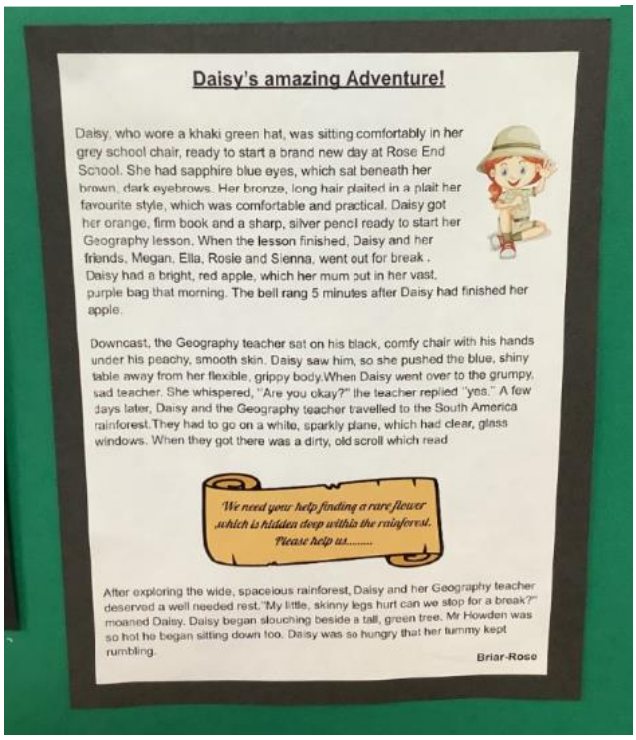
Our Children's Completed Computing Work:

Use of Seesaw in Year 1 Maths to record using cubes to divide numbers into equal groups.

Use of book creator in Year 2 to create a comic strip in English.

Use of the website "Pixlr" to create art work on laptops in Year 5.

Use of word on laptops to edit, improve and type up a completed English writing sequence in Year 6.



Daisy's amazing Adventure!

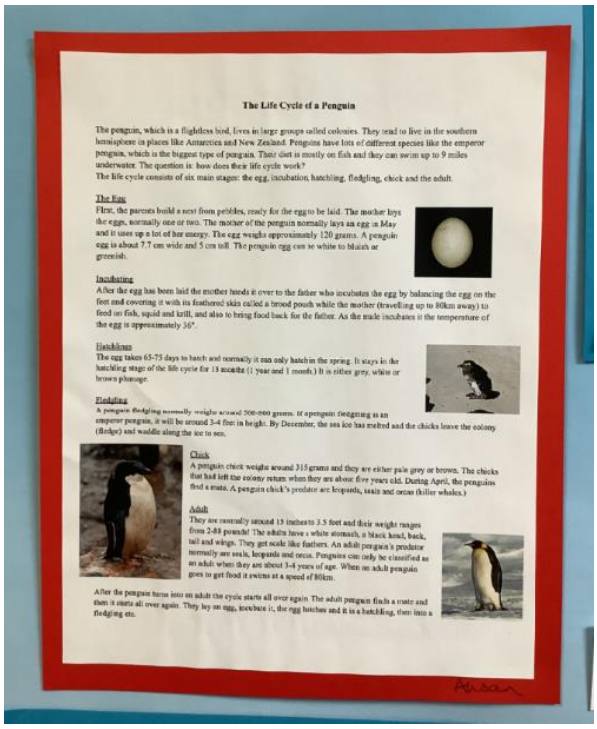
Daisy, who wore a khaki green hat, was sitting comfortably in her grey school chair, ready to start a brand new day at Rose End School. She had sapphire blue eyes, which sat beneath her brown, dark eyebrows. Her bronze, long hair plaited in a plait her favourite style, which was comfortable and practical. Daisy got her orange, firm book and a sharp, silver pencil ready to start her Geography lesson. When the lesson finished, Daisy and her friends, Megan, Ella, Rosie and Sienna, went out for break . Daisy had a bright, red apple, which her mum put in her vast, purple bag that morning. The bell rang 5 minutes after Daisy had finished her apple.

Downcast, the Geography teacher sat on his black, comfy chair with his hands under his peachy, smooth skin. Daisy saw him, so she pushed the blue, shiny table away from her flexible, grippy body.When Daisy went over to the grumpy, sad teacher. She whispered, "Are you okay?" the teacher replied "yes." A few days later, Daisy and the Geography teacher travelled to the South America rainforest.They had to go on a white, sparkly plane, which had clear, glass windows. When they got there was a dirty, old scroll which read

We need your help finding a rare flower which is hidden deep within the rainforest. Please help us.....

After exploring the wide, spacious rainforest, Daisy and her Geography teacher deserved a well needed rest."My little, skinny legs hurt can we stop for a break?" moaned Daisy. Daisy began slouching beside a tall, green tree. Mr Howden was so hot he began sitting down too. Daisy was so hungry that her tummy kept rumbling.

Briar-Rose



The Life Cycle of a Penguin

The penguin, which is a flightless bird, lives in large groups called colonies. They tend to live in the southern hemisphere in places like Antarctica and New Zealand. Penguins have lots of different species like the emperor penguin, which is the biggest type of penguin. Their diet is mostly on fish and they can swim up to 9 miles underwater. The question is: how does their life cycle work?
The life cycle consists of six main stages: the egg, incubation, hatchling, fledgling, chick and the adult.

The Egg
First, the parents build a nest from pebbles, ready for the egg to be laid. The mother lays the eggs, normally one or two. The mother of the penguin normally lays an egg in May and it uses up a lot of her energy. The egg weighs approximately 120 grams. A penguin egg is about 7.7 cm wide and 5 cm tall. The penguin egg can be white to bluish or greenish.

Incubating
After the egg has been laid the mother hands it over to the father who incubates the egg by balancing the egg on the feet and covering it with its feathered skin called a brood pouch while the mother (travelling up to 80km away) to feed on fish, squid and krill, and also to bring food back for the father. As the male incubates it the temperature of the egg is approximately 36°.

Hatchlings
The egg takes 65-75 days to hatch and normally it can only hatch in the spring. It stays in the hatchling stage of the life cycle for 13 months (1 year and 1 month.) It is either grey, white or brown plumage.

Fledgling
A penguin fledgling normally weighs around 500-600 grams. If a penguin fledgeling is an emperor penguin, it will be around 3-4 feet in height. By December, the sea ice has melted and the chicks leave the colony (fledge) and waddle along the ice to sea.

Chick
A penguin chick weighs around 315 grams and they are either pale grey or brown. The chicks that had left the colony return when they are about five years old. During April, the penguins find a mate. A penguin chick's predator are leopards, seals and orcas (killer whales.)

Adult
They are normally around 15 inches to 3.5 feet and their weight ranges from 2-88 pounds! The adults have a white stomach, it black head, back, tail and wings. They get scale like feathers. An adult penguin's predator normally are seals, leopards and orcas. Penguins can only be classified as an adult when they are about 3-4 years of age. When an adult penguin goes to get food it swims at a speed of 80km.

After the penguin turns into an adult the cycle starts all over again. The adult penguin finds a mate and then it starts all over again. They lay an egg, incubate it, the egg hatches and it is a hatchling, then into a fledgling etc.

Use of word on laptops to edit, improve and type up a completed English writing sequence in Year 6.

Use of Powerpoint and google "creative commons" to gather and organise pictures in Year 1.