Computing Curriculum

Intent

We believe that every child should have the right to a curriculum that champions excellence; supporting pupils in achieving to the very best of their abilities. We understand the immense value technology plays not only in supporting the Computing and whole school curriculum but overall in the day-to-day life of our school. We believe that technology can provide:

- enhanced collaborative learning opportunities;
- better engagement of pupils;
- easier access to rich content;
- support conceptual understanding of new concepts and can support the needs of all our pupils.

Our aims are as follows:

- Provide an exciting, rich, relevant and challenging Computing curriculum for all pupils.
- Enthuse and equip children with the capability to use technology throughout their lives.
- Give children access to a variety of high quality hardware, software and unplugged resources.
- Instil critical thinking, reflective learning and a 'can do' attitude for all our pupils, particularly when engaging with technology and its associated resources.
- Teach pupils to understand the importance of governance and legislation regarding how information is used, stored, created, retrieved, shared and manipulated.
- Teach pupils to become responsible, respectful and competent users of data, information and communication technology.
- Equip pupils with skills, strategies and knowledge that will enable them to reap the benefits of the online world, whilst being able to minimise risk to themselves or others.
- Use technology imaginatively and creatively to inspire and engage all pupils, as well as using it to be more efficient in the tasks associated with running an effective school.
- Provide technology solutions for forging better home and school links.
- Utilise computational thinking beyond the Computing curriculum.

Implementation

As a school, we follow the Teach Computing Curriculum developed by the National Centre for Computer Education. The scheme of work has been developed by subject experts, based on the latest pedagogical research and teacher feedback. It provides an innovative progression framework where computing content has been organised into interconnected networks and supports the delivery of the National Curriculum for Computing. The scheme supports our teachers in delivering fun and engaging lessons, which help to raise standards and allow all pupils to achieve to their full potential. It provides strong cross-curricular links and helps to enhance other areas of the wider curriculum. Furthermore, it gives excellent supporting material for less confident teachers. Children are introduced to Microsoft Word, Excel, Publisher and Powerpoint. We also enhance our teaching of E-safety by taking part each year in Safer Internet day.

Gathering Evidence

Any work completed on a Microsoft programme can be saved onto a 'shared' folder which can be accessed by both teachers and students via the local network. Within this folder, there should be a folder for each year group and then a named folder for each child in that year. Work saved here can be viewed as evidence.

Each lesson should also be recorded via a website called Seesaw (https://app.seesaw.me/) which can be accessed via laptop or tablet using a generic email evidence@bactonschool.org.uk. Please see Megan Clarke or a member of SLT for the password. Here, each year group will have 1 slide per lesson taught evidencing the teaching and learning.
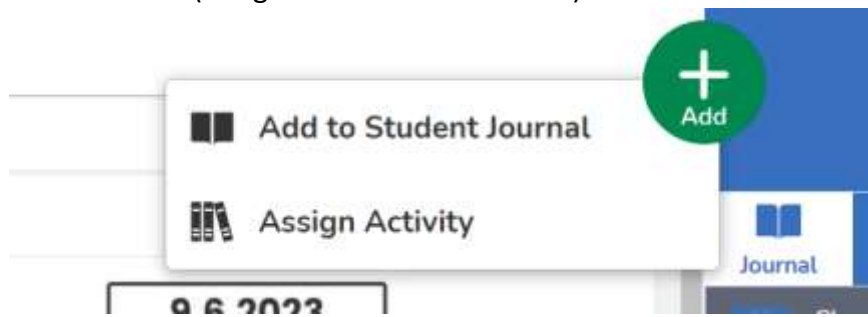
Follow these steps to create an evidence slide (1 per lesson):

1. Log on and check you are in the correct subject area.

Click here and make sure you are on the correct lesson.
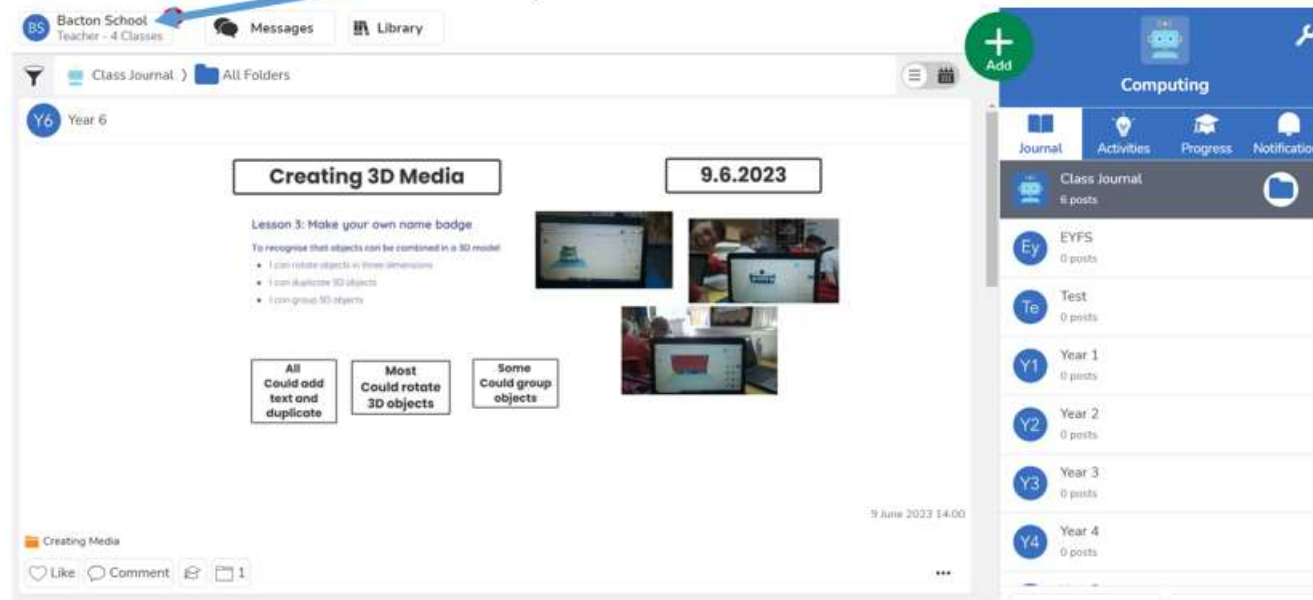
2. Click on 'Add' (the green circle with white +) and select 'add to student journal'.

3. Select 'drawing'

Photo   Drawing   Video

Upload   Note   Link

4. On your slide you need to include the following: date, Unit name, Lesson number and name, LO and SC (copied from Teach Computing planning); Photos of the children's work.

   There also needs to be a statement saying what 'all' the children could do, what 'most' of them could and what 'some' of them could (this would be the challenge).

   Finally, there needs to be a small text box titled 'WTS' with the initials of the children who did not achieve the LO and would be classed as working towards.

Creating Media – 3D Modelling

6.6.2023

Lesson 1 – Introduction to 3D Modelling

To recognise that you can work in three dimensions on a computer

- I can add 3D shapes to a project
- I can view 3D shapes from different perspectives
- I can move 3D shapes relative to one another

Tinkercad

All able to complete the 3 bullet points

Most able to also resize objects

Some able to create complex designs

5. Once the slide has been completed, click on the green tick in the top left hand corner. You will then need to select your year group and click the tick again. Then you will need to select the correct curriculum area and click the green tick.
6. If you need to edit the post once published, click on the 3 dots in the bottom right of the slide and it will give you the option:
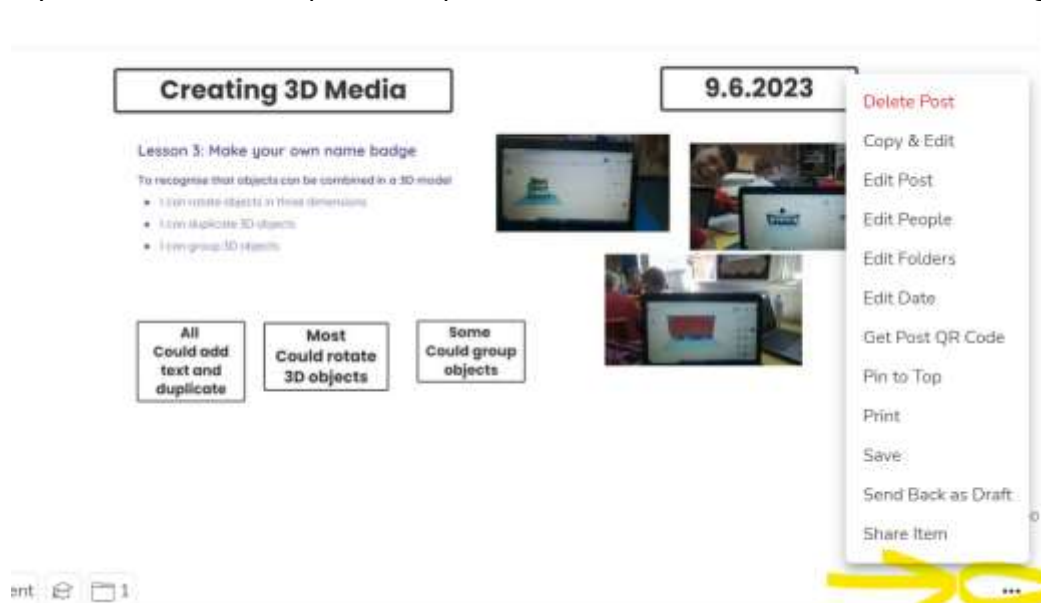
The first slide of each new computing unit should be the 'learning graph' from the Teach Computing website.

Assessment

For guidance on assessment and the expectations for WTS and EXP, please see the 'rubric' document for each unit on the Teach Computing website.

Sticky Knowledge

For the sticky knowledge quizzes, you may want to ask the children to define new subject-specific vocabulary.

Computing			
	Computing systems and networks	**Coding/ Programming**	**Data and information**	**Creating media**
Early Years (Early Learning Goal)	We aim to provide our pupils with a broad, play-based experience of Computing in a range of contexts. We believe the following: • Early Years learning environments should feature ICT scenarios based on experience in the real world, such as in role play. • Pupils gain confidence, control and language skills through opportunities to 'paint' on the interactive board/devices or control remotely operated toys. • Outdoor exploration is an important aspect, supported by ICT toys such as metal detectors, controllable traffic lights and walkie-talkie sets • Recording devices can support children to develop their communication skills. This is especially useful for children who have English as an additional language.			
Key stage One National curriculum expectations Pupils should be taught to:	• Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	• understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions; • create and debug simple programs; • use logical reasoning to predict the behaviour of simple programs;	• use technology purposefully to create, organise, store, manipulate and retrieve digital content; • recognise common uses of information technology beyond school;	

Computing			
	Computing systems and networks	**Coding/ Programming**	**Data and information**	**Creating media**
Key stage Two National curriculum expectations Pupils should be taught to:	• understand computer networks including the internet; how they can provide multiple services, such as the world wide web, and the opportunities they offer for communication and collaboration. • use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	• design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • use sequence, selection, and repetition in programs; work with variables and various forms of input and output; • use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs;	• select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information;	

Spiral curriculum

The units for Key Stages 1 and 2 are based on a spiral curriculum. This means that each of the themes is revisited regularly (at least once in each year group), and pupils revisit each theme through a new unit that consolidates and builds on prior learning within that theme. This style of curriculum design reduces the amount of knowledge lost through forgetting, as topics are revisited yearly.

Long term plan

Unit summaries

	Computing systems and networks	Creating media	Programming A	Data and information	Creating media	Programming B
Year 1	**Technology around us** Recognising technology in school and using it responsibly.	**Digital painting** Choosing appropriate tools in a program to create art, and making comparisons with working non-digitally.	**Moving a robot** Writing short algorithms and programs for floor robots, and predicting program outcomes.	**Grouping data** Exploring object labels, then using them to sort and group objects by properties.	**Digital writing** Using a computer to create and format text, before comparing to writing non-digitally.	**Programming animations** Designing and programming the movement of a character on screen to tell stories.
Year 2	**Information technology around us** Identifying IT and how its responsible use improves our world in school and beyond.	**Digital photography** Capturing and changing digital photographs for different purposes.	**Robot algorithms** Creating and debugging programs, and using logical reasoning to make predictions.	**Pictograms** Collecting data in tally charts and using attributes to organise and present data on a computer.	**Making music** Using a computer as a tool to explore rhythms and melodies, before creating a musical composition.	**Programming quizzes** Designing algorithms and programs that use events to trigger sequences of code to make an interactive quiz.
Year 3	**Stop-frame animation** Capturing and editing digital still images to produce a stop-frame animation that tells a story.	**Sequencing sounds** Creating sequences in a block-based programming language to make music.	**Connecting computers** Identifying that digital devices have inputs, processes, and outputs, and how devices can be connected to make networks.	**Branching databases** Building and using branching databases to group objects using yes/no questions.	**Desktop publishing** Creating documents by modifying text, images, and page layouts for a specified purpose.	**Events and actions in programs** Writing algorithms and programs that use a range of events to trigger sequences of actions.

	Computing systems and networks	Creating media	Programming A	Data and information	Creating media	Programming B
Year 4	**The internet** Recognising the internet as a network of networks including the WWW, and why we should evaluate online content.	**Audio editing** Capturing and editing audio to produce a podcast, ensuring that copyright is considered.	**Repetition in shapes** Using a text-based programming language to explore count-controlled loops when drawing shapes.	**Data logging** Recognising how and why data is collected over time, before using data loggers to carry out an investigation.	**Photo editing** Manipulating digital images, and reflecting on the impact of changes and whether the required purpose is fulfilled.	**Repetition in games** Using a block-based programming language to explore count-controlled and infinite loops when creating a game.
Year 5	**Sharing information** Identifying and exploring how information is shared between digital systems.	**Vector drawing** Creating images in a drawing program by using layers and groups of objects.	**Video editing** Planning, capturing, and editing video to produce a short film.	**Selection in physical computing** Exploring conditions and selection using a programmable microcontroller.	**Flat-file databases** Using a database to order data and create charts to answer questions.	**Selection in quizzes** Exploring selection in programming to design and code an interactive quiz.
Year 6	**Internet communication** Recognising how the WWW can be used to communicate and be searched to find information.	**Variables in games** Exploring variables when designing and coding a game.	**Introduction to spreadsheets** Answering questions by using spreadsheets to organise and calculate data.	**Webpage creation** Designing and creating webpages, giving consideration to copyright, aesthetics, and navigation.	**3D modelling** Planning, developing, and evaluating 3D computer models of physical objects.	**Sensing** Designing and coding a project that captures inputs from a physical device.

National Curriculum Coverage — Key Stage 1 Computing Curriculum	1.1 Technology around us	1.2 Digital painting	1.3 Moving a robot	1.4 Grouping data	1.5 Digital writing	1.6 Programming animations	2.1 Information technology around us	2.2 Digital photography	2.3 Robot algorithims	2.4 Pictograms	2.5 Making music	2.6 Programming quizzes
Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions			✓			✓			✓			✓
Create and debug simple programs			✓			✓			✓			✓
Use logical reasoning to predict the behaviour of simple programs			✓			✓			✓			✓
Use technology purposefully to create, organise, store, manipulate and retrieve digital content	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓
Recognise common uses of information technology beyond school	✓		✓	✓			✓	✓				
Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies	✓				✓	✓	✓			✓		

National Curriculum Coverage — Years 3 and 4	3.1 Connecting computers	3.2 Stop-frame animation	3.3 Sequencing sounds	3.4 Branching databases	3.5 Desktop publishing	3.6 Events and actions in programs	4.1 The Internet	4.2 Audio editing	4.3 Repetition in shapes	4.4 Data logging	4.5 Photo editing	4.6 Repetition in games
Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts			✓			✓			✓			✓
Use sequence, selection, and repetition in programs; work with variables and various forms of input and output	✓		✓			✓			✓	✓		✓
Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs			✓			✓			✓			✓
Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration	✓						✓					
Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content					✓		✓	✓			✓	
Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact							✓	✓			✓	

National Curriculum Coverage — Years 5 and 6	5.1 Sharing information	5.2 Video editing	5.3 Selection in physical computing	5.4 Flat-file databases	5.5 Vector drawing	5.6 Selection in quizzes	6.1 Internet communication	6.2 Webpage creation	6.3 Variables in games	6.4 Introduction to spreadsheets	6.5 3D modelling	6.6 Sensing
Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	✓		✓			✓	✓		✓			✓
Use sequence, selection, and repetition in programs; work with variables and various forms of input and output	✓		✓			✓			✓			✓
Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs			✓			✓			✓			✓
Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration	✓						✓					
Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content		✓		✓			✓	✓				
Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	✓	✓						✓	✓			✓

Each unit has a medium term plan and a set of resourced short term plans to ensure consistency and progression of skills and knowledge.

Impact

Learning in computing will be enjoyed across the school. Teachers will have high expectations and quality evidence will be presented in a variety of forms. Children will use digital and technological vocabulary accurately, alongside a progression in their technical skills. They will be confident using a range of hardware and software. Children will see the digital world as part of their world, extending beyond school, and understand that they have choices to make. They will be confident and respectful digital citizens going on to lead happy and healthy digital lives and know how to recognise and report online safety concerns. Pupil progress will be assessed formatively through assessment opportunities in every lesson.