Productivity and Creativity

Can we carry on teaching our old ICT topics?
Productivity and Creativity

CAN WE CARRY ON TEACHING OUR OLD ICT TOPICS?

It would be wrong to see the new computing curriculum as being about just ‘coding’ or even just computer science. The Royal Society, the Department for Education (DfE), Ofsted and others are all clear about the need for a broad and balanced computing education which encompasses computer science, information technology and digital literacy. It can be helpful to think of these as the foundations, applications and implications of digital technology. The three aspects are intertwined, and many lessons focussing on one will naturally draw on, and help develop understanding of, the other two.

Despite the focus of much of the text here on programming and other aspects of computer science, there are very few topics from the old Information and Communication Technology (ICT) curriculum which don’t retain a place in the new computing curriculum. Those topics which encompassed the broad areas of productivity and creativity remain an important part of computing in the new curriculum.

At Key Stage 1 pupils will have learnt to ‘use technology purposefully to create, organise, store, manipulate and retrieve digital content’, and in Key Stage 2 they were taught to ‘select, use and combine a variety of software (including internet services) on a range of digital devices’, they design and create digital content as well as programs and systems, and they accomplish given goals, including ‘collecting, analysing, evaluating and presenting data and information’.

● These ideas are developed further in Key Stage 3, where the requirements are that pupils are taught to:

- undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users; and
- create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability.

Alongside these familiar objectives there is much computer science and digital literacy content that is new, so it would be difficult, and probably unwise, to attempt to teach all of the units or topics you covered in ICT as well as the new elements of the computing curriculum.

In planning what to include, think back to the units that worked particularly well in your old scheme of work. Avoid having too many units which do little more than allow pupils to practice or reinforce skills they already have. Do include any opportunities to make connections between the three elements of computing, that is, computer science, information technology and digital literacy (foundations, applications and implications) – for example, video editing work provides a great opportunity to develop the ideas of sequencing, which can be linked to sequencing in programming, as well as a chance to consider compression algorithms and file formats; it also can link to digital literacy: have pupils consider the privacy implications of videoing one another and, potentially, sharing this with an audience beyond the class or school.

How can we make IT activities more meaningful for pupils?

Back in 2008 David Jonassen (Jonassen, 2008) coined the term ‘meaningful learning’ to describe learning that met a number of criteria: he and his colleagues were thinking particularly about learning activities that involved using technology, but the principles can be applied more broadly. Jonassen’s list was:

- **Active**: a good IT activity should be one in which learners are **doing** something, not merely reading about something, watching someone else do something or listening to someone talking about something.

- **Constructive**: a good IT activity should be both constructive in the sense of pupils **making** something, that is, working creatively, but also in the sense of making meaning, of developing their mental model of how a particular technology works.

- **Intentional**: ideally, IT activities should allow pupils some element of choice in what they do or how they accomplish something; this can often be done through specifying some required outcomes in functional terms rather...
than particular tools that should be used to accomplish these.

- **Authentic**: where possible, IT activities should be embedded in pupils’ experience, including, perhaps particularly, that of school: look for connections with other areas of the curriculum, for example, embedding the teaching of IT skills in work which develops pupils’ understanding of other topics.

- **Cooperative**: again, where possible, look for activities where pupils can learn with and from one another, ensuring that they have chance to talk purposefully and productively with one another, to share their ideas and insights with each other.

These ideas can be applied directly to projects in IT: for example, pupils could work together to create and then analyse the results from an online survey of other pupils about their views on the breadth of the school’s curriculum, choosing for themselves how they might present the results of their survey. It is just as easy though to apply these to topics in computer science, perhaps setting pupils the challenge of working together to develop a simple phonics game for younger pupils, leaving many of the decisions over implementation to pupils themselves.

There’s some quantitative evidence to support some of Jonassen’s ideas. In his survey of meta-analyses of education research, John Hattie (2008) considers the evidence for the most effective use of technology in education. He argues:

The use of computers is more effective when:

- There is a diversity of teaching strategies.
- There is teacher pre-training in the use of computers as a teaching and learning tool.
- There are multiple opportunities for learning.
- The student, not the teacher, is in control of the learning.
- Peer learning is optimised.
- Feedback is optimised.

In terms of IT, notice Hattie’s emphasis on the student rather than the teacher being in control of the learning, and compare this with Jonassen’s expectation of intentionality, and indeed the Key Stage 2 curriculum requirement that pupils should be able to select as well as use and combine applications. Similarly Hattie’s emphasis on peer learning mirrors Jonassen’s focus on cooperation. An emphasis on the collaborative use of technology is also supported in Steven Higgins and colleagues’ (Higgins et al., 2012) synthesis of meta-analyses of technology in education; they state: ‘collaborative use of technology (in pairs or small groups) is usually more effective than individual use.’

How should pupils go about project work?

It is important to find a balance between getting things done, adopting an agile approach of producing a ‘minimum viable product’ in the limited time available and developing good working habits for more extended projects. One way to achieve this balance is to include a mix of short activities, in which pupils simply roll up their sleeves and create a spreadsheet, make a presentation or shoot and edit some digital photos, and more extended projects in which the processes of planning, implementing, revising and evaluating the project are fully explored, including some occasions when these become part of a cycle of iterative development. Note that these phases mirror the computational thinking concepts and approaches of algorithms and decomposition, creating, debugging and evaluation. Working through the stages of a project in detail, sometimes repeatedly, is good experience for project work elsewhere in the curriculum, and beyond school, although obviously extended projects will take longer to complete than short, focussed tasks.

Where possible, look for ways to get pupils themselves involved in the work of managing...
the projects, including deciding what particular programs, and what equipment, they will need to use, and even in managing their time and the work of others in the team if they are working collaboratively. The sort of project management skills involved in creative IT or digital media work are very similar to those required in developing computer software, so a similar approach can be applied to project work in both the IT and computer science strands of the curriculum.

What applications should pupils work with?

The 2014 programmes of study are quite careful not to specify particular digital media, partly in recognition that new forms of digital content are likely to develop over time, and partly through a desire not to limit the forms in which pupils could explore ideas and express their creativity.

Technology currently available in most schools can be used for work across a very wide range of media including: text (in both print and digital formats), images (both as vector illustrations and bitmap photographs), sound (as both recorded audio and composed music), animations (as stop-frame and scripted), video, and 3D (typically virtual representations, but some schools are starting to explore 3D printing).

Pupils need not be limited to working in just one medium – creative work in digital media will often combine multiple forms: a simple PowerPoint presentation or a website is likely to include text and images and perhaps video, audio and animations. Notice that the programme of study expects pupils to be able to combine applications across a range of devices. Pupils might begin by shooting video and recording audio using a tablet computer, importing this to a laptop to use video editing software, combining this live footage with appropriately licenced images sourced from the web, before uploading their final edited film to an online video-hosting site.

Digital media can also be interactive – perhaps using little more than hyperlinks to allow non-linear navigation, but potentially drawing on more complex scripting or programming.

The Key Stage 3 programme of study is explicit in its expectation that pupils should work on a range of devices if possible, so there should be some opportunity for pupils to draw on web-based services, tablets, smartphones, digital cameras and perhaps other systems rather than just using traditional Windows PCs in their IT work.

What are digital artefacts?

A digital artefact(1) is a thing made using digital technology. The thing may not have a physical existence – it might be a virtual or a transient thing, but it must be something that has been made, something which provides evidence of its maker’s creative work.

There’s a very wide variety of digital artefacts which pupils might create. Oliver Quinlan identifies a number of categories in his landscape review of young people’s digital making for Nesta (Quinlan, 2015):

- digital pictures;
- edited videos or visual effects;
- music;
- animation;
- games;
- websites;
- remixes and mashups;
- apps;
- software;
- robots;
- 3D printed objects;
- edited photos.

Note that the list includes a number of artefacts which are made with code: games, apps and software, but perhaps also animation, visual effects,

---

1 Confusingly, the term also means ‘any undesired or unintended alteration in data introduced in a digital process by an involved technique and/or technology’, the programme of study uses it in its anthropological sense of ‘an artifact that is of a digital nature or creation’.
Productivity and Creativity

websites and robots. To this list we might add more conventional categories of artefacts created using digital tools: text, word-processed documents and desktop publishing, web content below the level of a site such as a blog post, fan fiction or a forum contribution, spreadsheets, presentations, audio other than music and 3D virtual objects (apart from in the context of games and animation).

Sir Ken Robinson defines creativity as ‘the process of having original ideas that have value’ (Robinson, 2011): both aspects here matter – creative work should be original: in school, this should at least mean that it’s a pupil’s own work, not something where they have simply filled in a blank or copied something made by their teacher. Creative work should also be of value: at the very least to the pupil herself but perhaps also to her teacher and a wider audience: this means that pupils should aim to produce the best work they possibly can, and for their teachers, or their peers, to not be afraid to offer constructive critical feedback on work so that it can be improved, further developing the computational thinking concept of evaluation.

As well as originality and value, creative work also implies that the pupil has made something. An emphasis on creativity recognises how powerful the process of making things for others is as a means to learning, as Seymour Papert did in the very early days of Logo programming in schools, coining the term ‘constructionism’ for this as a theory of how people learn (Papert and Harel, 1991). Pupils seem far more likely to develop an understanding of how software works, as well as becoming more skilful in using it, if they have the chance to use it creatively to make something original and valuable for others.

Related to this are ideas of craftsmanship. In describing craftsmanship values Hoover and Oshineye (2009) discuss much that should have a place in creative computing lessons, such as the idea of a growth mindset, recognising the importance of hard work to the mastery of any craft, a willingness to experiment, and to be proven wrong, and the need for craftspeople to have some control over and responsibility for their work. Richard Sennett (2008) discusses the relationship of the craftsperson to their tools, recognising the importance of mastering the tools of a trade, and that tool use can be bound up with creative expression: ‘tools used in certain ways organize this imaginative experience ... with productive results’. In the classroom, help pupils to become masters of the software tools and digital devices they use, helping them to develop confidence, competence and independence as they do so, and then encourage them to use these, playfully or experimentally, as a means towards the expression of their own insights and ideas.

How can pupils learn to reuse, revise and repurpose digital artefacts?

Pupils do not have to work from scratch in creating digital artefacts. It is entirely legitimate for them to start with someone else’s work, adapting this for their own particular purpose and audience, or using others’ work as components within their own.

The Creative Commons licensing scheme (2) enables artists to licence their work for others to reuse or develop without the need for further permission, and current copyright legislation permits some reuse, for purposes of parody (3) and for private study subject to reasonable fair dealing limits. There are extensive online repositories of text, images and audio that can be reused, revised and repurposed, either in the public domain or licensed for reuse under the Creative Commons scheme. Public domain or creative commons video resources are somewhat harder to obtain in general, in part due to the restrictions on downloading imposed by YouTube, however some downloadable, remixable content is available via Vimeo and the Internet Archive.

2 https://creativecommons.org/
3 www.gov.uk/guidance/exceptions-to-copyright#parody-caricature-and-pastiche
Content shared on the Scratch community site automatically carries a Creative Commons licence and can thus be freely remixed by any other Scratch users. Much other software is licenced in a way that permits reuse and further development, and there are a number of different licence terms available. In general open source software will permit free re-use and further development of source code, although the specific conditions vary according to the licence that applies. Projects such as Moodle, Wordpress, Firefox, Scratch, Android and Python have freely downloadable and editable source code, although it would be a brave pupil who decided to develop their own version of Android. To help manage the process of access to, remixing of and contributing back to the main development process for open source projects, GitHub seems to be the platform of choice now.

The negative side of re-use is plagiarism. Re-using another’s work as a basis for your own creative work is acceptable only if the original work is duly acknowledged. Artists sharing their work under a Creative Commons licence or developers releasing code under open source licences are entitled to have their work, and their contribution to other’s creative work properly recognised; such recognition may be the only reward they have for freely sharing their work in this way. Passing off another’s creative work as one’s own is unethical, in breach of most forms of the Creative Commons licence and in contravention of academic discipline codes for higher education and public exams. With code, it is OK to look for others’ solutions on StackOverflow or other sites, and it’s (usually) OK to make use of their solutions in your own work, but only if you acknowledge that you have done so.

**Are there principles for good design?**

Whilst there are purely artistic, creative projects accomplished in digital media, very often in computing pupils are likely to have a sense of audience and purpose to their work. Their creative work is closer to architecture than to sculpture – in most cases it has to be something which its audience will find useful as well as beautiful. That’s not to say that its beauty is unimportant but its design of a product should be led by the needs of its users rather than just the desire for creative expression of its developer.

Any approach to user centred design must acknowledge that functionality is fundamental. As Steve Jobs put it:

*It’s not just what it looks like and feels like. Design is how it works. (Walker, 2003)*

User-centred design doesn’t in itself specify principles of good design, but it does suggest a process that helps ensure that any design is fit for its audience and purpose:

- Specify who will be the users of a product and what they will use it for – audience.
- Identify the goals that must be met for the product to be a success – purpose.
- Plan and implement a solution.
- Evaluate the solution.

A common design approach is to plan, and perhaps partially implement or prototype many possible solutions, evaluating each against the audience and purpose criteria, before taking one solution through to full implementation.

Many lists of design principles have been drawn up. Dieter Rams, the designer of many of Braun’s iconic 20th-century products, had the following list:

- Good design is innovative.
- Good design makes a product useful.
- Good design is aesthetic.
- Good design makes a product understandable.
- Good design is unobtrusive.
- Good design is honest.
- Good design is long-lasting.
- Good design is thorough down to the last detail.
- Good design is environmentally friendly.
- Good design is as little design as possible.

---

4 See [https://opensource.org/licenses](https://opensource.org/licenses)
6 [www.vitsoe.com/gb/about/good-design](http://www.vitsoe.com/gb/about/good-design)
More recently, the Government Digital Service has adopted the following principles for its work developing and refining the UK Government’s online presence and interaction:

- Start with needs.
- Do less.
- Design with data.
- Do the hard work to make it simple.
- Iterate. Then iterate again.
- This is for everyone.
- Understand context.
- Build digital services, not websites.
- Be consistent, not uniform.
- Make things open: it makes things better.\(^7\)

Comparing these and similar lists there seems some agreement over some core principles of good design, such as utility, inclusion, honesty and simplicity. Simplicity seems particularly striking in the context of Key Stage 3 computing, where until recently many of us might have encouraged pupils to include all the possible bangs and whistles, clipart and animation in their media work to demonstrate that they could use every last aspect of the application software. Perhaps when developing digital artefacts as part of the curriculum we should encourage pupils to strive for a simpler design aesthetic which prioritises function rather than form and the needs of users rather than demonstrating prowess with particular tools.

As Apple’s lead designer Sir Jonathan (Jony) Ive explains:

> Simplicity is not the absence of clutter; that’s a consequence of simplicity. Simplicity is somehow essentially describing the purpose and place of an object and product… The quest for simplicity has to pervade every part of the process. It really is fundamental. (Richmond, 2012)

### Classroom activity ideas

- Take a topic in which pupils are interested, perhaps from computing or from another area of the curriculum and ask them to document it in a rigorous, critical way using the digital medium and tools of their choice.
- Working in a medium such as digital images or audio, provide pupils with some Creative Commons licensed content and set them the challenge of remixing this in the most original way that they can.
- Extend pupils’ skills, knowledge and understanding in digital media work beyond what they covered in primary school, for example introducing them to the techniques of 3D animation using the open source Blender platform.

### Further resources


What can pupils do with data?

The new computing curriculum places an emphasis on pupils working with numerical, quantitative data. This is a hugely important application of computer systems, and seems likely to become even more so in the future. There’s much that you can do to provide pupils with a meaningful, authentic experience of working with both small and large datasets, and the skills and insights this work provides can be applied immediately in studying other subjects as well as being useful for pupils as they work with datasets in the future. Given the ready access to tools with which pupils can generate interesting sets of data or access large open data repositories on the web, the rather artificial database activities that many teachers and pupils found understandably dull in old ICT lessons should now be a thing of the past.

Online survey tools, such as Google Forms, allow pupils to design and deploy quick opinion polls or surveys, and then analyse, evaluate and present the results. Choosing topics of genuine interest to pupils, perhaps concerned with aspects of school life, can make activities like this much more engaging, or pupils could use these to survey opinion more broadly about local or national issues about which they have become concerned. In this case, care needs to be taken to avoid written-in, free-text responses to avoid potential e-safety issues. Pupils should think about privacy and ethical aspects of such surveys – good practice includes principles of informed consent and anonymity; the latter is particularly important as otherwise data protection legislation might apply to processing personal data.

Data activities can also draw on automatically-generated data, perhaps using sensors to record environmental information (for example a Scratch script to record the level of sound in class over a school day, or a Raspberry Pi-based weather station, or the data generated automatically in the log files of the school’s website or its VLE (virtual learning environment) if you have access to these. Often there will be a ‘dashboard’ interface available to explore summaries of these data, but you might also be able to provide pupils with the raw data, so they gain some insight into how they are structured and so they can experiment with


analysing them in Excel or other software. You or your pupils could create random simulations to generate large datasets, for example using Excel to simulate rolling two dice 1,000 times. Pupils could then analyse these data to learn more about what was being modelled in the simulation – this is called the ‘Monte Carlo method’ and is an important application of computer modelling.

Figure 5.4 Raspberry Pi weather station, (picture, Miles Berry)

Pupils can also analyse some genuinely big datasets made publicly available on the internet: for example, Google makes it easy to run searches for the occurrence of words or phrases in the vast number of books it has digitised, seeing how this changes over time. Google also allows the trends in search term popularity over time to be explored – for example looking at the relative popularity of searches for ‘ICT’ and ‘Computing’ over time in searches performed in the UK. The DfE provides detailed data on performance and other measures for all English schools, and pupils could use Excel to analyse these data, for example exploring for themselves whether there’s any relationship between proportions of pupils receiving free school meals and a school’s GCSE results.

Figure 5.5 Screenshot from Google Trends, e.g. https://www.google.co.uk/trends/explore?date=all&geo=GB&q=computing,ict

There is an opportunity here to touch on some of the ethical implications of data processing. Pupils might think about the data which the school routinely stores about their activities, particularly that which becomes part of the DfE’s national pupil database.

Classroom activity ideas

- Carry out activities that draw on automatically-generated data, perhaps using sensors (for example a Scratch script to record the level of sound in class; see Further resources).
- Organise your pupils to analyse some big datasets made publicly available on the internet. Help them to use n-gram viewer to search for the occurrence of words or phrases in the vast number of books that Google has digitised and see how this changes over time (see Further resources). Analyse how search term popularity has changed over time, for example look at the relative popularity of searches for ‘Britain’s Got Talent’ and ‘The X Factor’ over time in searches performed in the UK using Google Trends (see below).
- Discuss the ethical implications of data processing (that is, what others do with our data). Ask pupils to think about the detailed profile which internet, email or search engine providers could build up through analysing each user’s activity, as well as to what uses this information might be put.

---

8 https://books.google.com/ngrams
9 www.google.co.uk/trends
10 www.compare-school-performance.service.gov.uk/download-data
How can we best support collaboration?

The research cited earlier by Jonassen, Hattie and Higgins et al. all attests to the benefit of collaboration when using technology in education, but how can such collaborative use of technology be best developed?

The use of digital technology such as smartphones and the internet for communication has had a huge impact on the personal and professional lives of many: over 3 billion are connected to the internet worldwide, and the number of iPhones sold per day has exceeded the number of children born. It’s hard to think of any sphere of life, including secondary education, which hasn’t been changed by the near ubiquitous nature of communication technology.

There’s substantial evidence that young people are comfortable making use of a range of digital technologies to communicate with one another, although the extent to which they act safely and responsibly or show discernment or wisdom when doing so cannot be taken for granted. There’s rather less evidence that young people are skilled in using technologies to work collaboratively on shared projects. Whilst the fit is far from perfect, one way of thinking about communication technology is to look at the size of the groups sending and receiving information, for example:

- one to one: email, skype, instant messaging;
- one to many: blogging, personal website, publishing on YouTube, podcasting, posting to social media, uploading projects to the Scratch community site;
- many to one: searching the web, watching YouTube, browsing social media, downloading and remixing projects from the Scratch or Kodu community sites;
- many to many: discussion forums, Wikipedia.

Irrespective of their access to or familiarity with technology outside of school, at Key Stage 2 all pupils should have learnt about some of the opportunities which networks, including the internet, and the services they provide, offer...
Productivity and Creativity

for communication and collaboration. In the best primary schools, this will have been about developing children’s understanding of these technologies, and some critical discernment about their use, rather than merely a set of skills in using one platform or another.

Can communication technology be embedded across the whole curriculum?

Yes! Many schools are now routinely using digital communication and collaboration technologies as part of their day-to-day work. Learning platforms, VLEs and systems such as Google Classroom provide a reasonably convenient way for teachers to share resources and activities with a class, groups of pupils or even parents. They also offer one way in which pupils’ work can be completed, submitted and sometimes marked online. Whilst the take-up of such technologies has been far lower than originally expected, the digital domain has become the default place for teachers’ and pupils’ work in at least some schools. In schools that have gone down this route, pupils can continue to access content, complete exercises, take part in discussion forums and contribute to collaborative projects from their home computers as well as from school.

The enthusiastic take-up of tablet technology by many schools must almost assume ubiquitous connectivity, so that resources and outcomes can be stored, shared and, in the latter case, assessed.

What sort of audience can pupils reach with their work?

For a previous generation, those who would read a pupil’s work were perhaps just their teacher and maybe their parents; even if the work was put on display, the audience would rarely reach beyond the class itself. These days, it’s easy enough for a school, an individual teacher or even particularly keen pupils to set up a blog, with the option of open access to all those connected to the internet world-wide, so that a child’s work can reach an audience, potentially, of close on 3 billion others.

There has been a great deal of interest and enthusiasm of late in blogging in education: for many this has been about sharing their educational insights with a community of fellow professionals, but it’s also a great way to provide an authentic audience for pupils’ work. Blogs can be used as a basis for partnership projects, as described above, with another class or group of classes.

There are obviously aspects to the safe and responsible use of blogging which teachers and pupils need to be aware of. Pupils should be taught to keep personal information private, so they will need to think carefully about what sort of content is suitable to post to a public blog. It’s really important that comments posted to a class or school blog are moderated by a teacher before pupils get to see these – the workload here isn’t too bad, but this needs doing to keep a blog free of unwanted advertising, inappropriate links or hurtful comments.
Even without blogging, pupils could share their programming work through community sites for tools such as Scratch, Trinket.io and GitHub, although take care that you and they observe the terms and conditions which apply to these platforms.

What opportunities are there for pupils to work collaboratively?

The web and the internet make it easy for pupils to work collaboratively online, just as they have always been able to do in class, working together to research a topic, to draft, revise and complete documents or to make original, creative artefacts of their own, drawing on one another’s skills and ideas.

Web-based platforms such as Google Apps for Education and Office 365 mean that pupils can work on documents, spreadsheets and presentation files together, either inviting comment and review from others, in much the same way as professional writers might, or through real-time collaboration in which several pupils edit the same document at the same time, seeing the changes made by others as they happen – although this takes a little getting used to for some, the efficiency with which joint projects can be undertaken and reviewed can make this a very appealing, and exciting, mode of work.

On a broader canvas, teachers and pupils alike will be aware of the collaborative nature of Wikipedia, and that the contents of Wikipedia pages can be edited by anyone who has access to them. Whilst many in education steer clear of Wikipedia as a result, worrying about it’s reliability, this actually provides a good opportunity for pupils to become more discerning in evaluating digital content, and indeed to correct errors or add content to Wikipedia when they can.
Online collaborative working is a very important part of software development – whilst much of the industry will keep these processes behind closed doors, those interested can get some flavour of this through open source software projects such as Wordpress, Moodle and Firefox, and pupils themselves can get some experience in collaborative software development through the remix feature built into the Scratch community site.

GitHub supports version control and collaboration on software projects and online text. Whilst the learning curve can be quite steep and the interface and associated vocabulary are not particularly intuitive, it has become the platform of choice for open source software development. GitHub offers unlimited private repositories for students and those wishing to use it in school.

It's important to establish an agreed set of rules for any online communication or collaboration activities, as can be seen from the importance given to specifying acceptable use policies and terms and conditions of use for computer networks and online platforms. Whilst pupils need to be aware that these conditions do apply to them, these are rarely written in a language which pupils will find particularly accessible, so teachers ought to spend time briefing pupils on what is expected of them.

It's helpful to have a simple set of guiding principles here: for example, pupils should behave online just as they would offline; this would include not being...
deliberately hurtful, taking care of shared resources, leaving things as you would hope to find them, being prepared to stand up for doing the right thing, even if it’s unpopular, and not talking to strangers.

Pupils ought to be aware that most online systems automatically log the activities that take place in them: that is, that someone (or something) is watching what they do online.

The Wikipedia community has established a set of community guidelines, its ‘five pillars’, which outline how contributors can work together and what constitutes acceptable behaviour in their online system, just as you are likely to have a code of conduct as a school or a class. These principles include ideas such as assuming good faith, being bold but not reckless and striving for a neutral point of view which recognises both sides where there is disagreement.

Classroom activity ideas

- Set up a blog for computing in your school or for each class you teach, and ask pupils to share the best examples of their work and comments on computing stories in the news on the blog, reading and commenting positively on one another’s posts.

- Request a school account from GitHub Education and use this as a way of sharing notes on lessons with your pupils, allowing them to ‘fork’ any handouts, notes or plans to annotate these with their own notes from lessons.

- Pupils could work collaboratively to create a multi-page website, perhaps using GitHub Pages or a wiki platform, to present an informed, balanced review of issues around online safety, responsibility, privacy and security.

Further resources


- eTwinning (n.d.) Connect with classes across Europe. Available from [www.etwinning.net](http://www.etwinning.net)

- GitHub Education (n.d.) Available from [https://education.github.com/](https://education.github.com/)


- Wikispaces (n.d.) *Wikispaces classroom* (creating wikis in school). Available from [www.wikispaces.com/content/classroom](http://www.wikispaces.com/content/classroom)
## References


