

## The Computing Curriculum

The Computing curriculum is pieced together using the following principles:-

### C1: Disciplinary Knowledge

We want children to understand how technology has shaped the modern world and how it can make products more intelligent, efficient, well-presented and engaging. We want our pupils to feel confident about staying safe online. Pupils in Foundation Stage can utilise technologies to be creative and share their achievements. Pupils from Year 1 onwards receive a curriculum centred around Computing-based careers through the Rising Stars Scheme *Switched On Computing*. We prioritise pupil autonomy and encourage them to select hardware and software that is appropriate to achieving a goal.

### C2: Substantive Knowledge

We look to ensure substantive knowledge is taught and learned in a carefully planned progression. We make links back to previous relevant knowledge and make this explicit to the children in the self assessment exercises we carry out at the outset of each unit.

### C3: Botheredness & Purpose

Wherever possible, we aim to make links with other subject areas - this to generate purpose, for example designing an Aztec world in Kodu or creating an animated map of Viking invasions in Scratch during a history project.

### C4: Spirituality

We look to identify opportunities for spiritual reflection and growth when planning and in practice. *'Knowledge is finite. Wonder is infinite.'* (Matt Haig). For example when teaching about Market Research, we consider how technology can connect us to the opinions and ideas of others through online questionnaires.

### C5: Threads

Wherever possible we plan for units of work to deliver one of our core threads as well as the subject specific objectives. For example our Year 3/4 'Web Developers' unit delivers on our Eco thread by designing a webpage to raise awareness during a body of work about Climate Change.

## Teaching methods used in Computing

Lessons/ units will/ may include the following strategies:-

### **Re 'Engagement':**

We aim, wherever possible, for Computing lessons to be practical and project based. We look to encourage pupils to create their own digital content.

### **E2. Establish a learning culture- growth mindset & learning powers**

- **Open it up**- give tasks for pupils which have no one answer/ where there is no ceiling to the learning/ where there is lots of scope for discussing the learning process and celebrating effort and ideas rather than correct answers.
- **Own it**- pupils encouraged to develop their own ideas/ own questions/ own success criteria/ give own feedback (see PA1)
- **Wonderful mistakes**- should be seen as positive building blocks for learning. Everyone in class to be interested in, even excited by mistakes as an opportunity for learning to take place. 'My Wonderful Mistake' Exit cards- children write as they go out. Talk about mistakes as **First Attempt In Learning**. Teachers share their mistakes. (see E5)

### E3: High expectations & formative intervention

We want to inspire SEN and vulnerable children to develop a passion for Computing. We respond to their needs when planning and delivering lessons. If a pupil or pupils struggling to understand the learning we support them through:-

- **Peer support**- pupil works with another pupil on the concept they are struggling with
- **Support the skill**- eg if they are struggling to solve a problem because of times tables knowledge- then give them the times tables to refer to.
- **Simplify the skill**- same skill but simpler version
- **WAGOLL**- folder of best work from the year before to demonstrate expectations to the pupils.
- **Excellent examples**- best generated from previous work by pupils.

### E4.Engaging activities to start unit/ lesson:

- **Stimulus**- look at objects/ pictures/ video- discuss
- **Purpose**- class receive a letter/ invitation/ message in a bottle

### E5.Quality of Teacher Questions (ref also techniques to develop MASTERY)

- **Keeping it open**
- **What might be the answer**—ask what might be rather than what is the answer to open up the thinking/ language of possibilities
- **Keep it challenging**
- **Asking why**— instead of asking what block is used to give two opposing outcomes in Scratch, ask why is the if/then/else block used for this outcome?
- **Asking for clarification** (explaining, defining, giving examples, supporting, enquiring)
- **Can you develop on that?** What do you mean by..? How does that help? Does anyone have a question to ask about that?
- **Examples**- Ask- 'give me an example of what you mean' // Ask another pupil to follow up on a response by providing an example.
- **Asking for reasons and evidence** (forming an argument/ assumptions/ reasons/ evidence)
- **Why do you think..? How do we know that? What are your reasons for...? Do you have evidence of..? Can you justify your opinion?**

- Analyse

- How could you debug this to make it function more efficiently?

### E8: Working together, talking

- **Develop it**—one pupil gives their response- then another is asked to qualify or build on their response- then a third is asked to qualify the response further and so on
- **Talk partners**- again the pupils need to be trained in use of. Change talk partners weekly- on rolling basis. Pupils need to discuss/ decide what makes a good talk partner and review their perf as talk partners .

### E9: Engaging with Challenge

- **Embrace difficulty**- encourage children to embrace difficult tasks and mistakes and to persevere. eg 'It's great that you're finding that tricky- it means you are learning.'

### E10: Organisation

- **Guided groups**- possibly teacher and TA working with up to 4/5 groups through one lesson- on input/ sessions tailored to their needs... eg more able off the carpet during whole class work...eg less able working with teacher as well as TA at some point during the lesson, eg set two groups off- work with two others- then send these two off and track back to original two etc etc

### Re: Thinking

We prioritise the modelling and trialling process because this is where the thinking happens, where pupils apply the skills they are learning to their own creative projects.

### T1: Generating thinking/ P4C

- **Visualisers**- many uses- eg evaluate a pupil's writing.. eg demonstrate peer marking...eg analysing responses to test...eg evaluate photo of a DT product.
- **Links**—develop synthetic thinking by asking pupils to make links between different objects/ statements etc
- **Odd one out**- develop divergent thinking by asking pupils to identify the odd one out and justify their answer.
- **True or false// right or wrong**—say which statement true/ which false
- **Statements**- Generate responses to a statement and discuss—eg This a picture of a Tudor queen; It is not possible to think without words; exercise leads to a healthy lifestyle; the wolf was innocent girls are cleverer than boys.
- **Thinking with flow diagrams \***—use a flow diagram to work out how one thing might have led to another
- **Define it-\*** divide up into always true and usually true
- **Which one is better?** Provide pupils with two or more examples of the learning (algorithm/ text etc) and they discuss which one is better and why.

### Re Clarity of Learning:

### CL1: Know their starting points

- **Immersion** –before trying to elicit prior knowledge, immerse pupils in the topic- eg visitor in/ resources layed out/ trip out
- **Pre-mortem**- evaluate work from last year's cohort and decide on where misconceptions occurred previously.

### CL2: Be clear about the end point and the big picture

- **Sharing the learning intention**- needs to be clear and unambiguous. Careful to separate clearly the task instructions from the learning intention; provide examples alongside the learning intention to ensure they are fully understood.

### CL3: Be clear about the steps to get there

- **Success Criteria**- The purpose of the success criteria is to make the children absolutely sure about what is in the teacher's mind as the criteria for judging their work . The success criteria can take many forms. Examples might include a model algorithm; a modelled piece of writing; a writing frame; a self-evaluation checklist; a learning mat or a list of vocabulary. Basically they are a visual aide-memoir for pupils and a reference point for teachers when explaining and then evaluating learning during a lesson
- **Model success criteria**- instead of a list, success criteria could be a good model of the learning- eg a model algorithm; a modelled piece of writing; a learnt re-tell, a demonstration sketch—where these can be annotated with success criteria- this makes learning even clearer.

## Re Pupil autonomy:

### PA1: Pupils exploring their own ideas and questions

- **Immersion**- before asking them what they know, pupils are immersed in the topic / provided with experience to stimulate their interest/ ideas/ existing knowledge.
- **Plan from the skills**- pupils are given the skills/ objectives and they generate the activities/ key questions related to these.

### PA2: Pupil self-evaluation

*to enable learners to become aware of their own beliefs and values and their own spirituality; this to guide their own ethical decision making; this to have a positive attitude to the search for meaning;*

- **Self evaluation prompts** - use standard prompts for self evaluation eg ' I changed my attitude about...'

### PA3: Pupil independence

- **Resourcing**- ensure pupils have resources available in class generally and for specific lessons to ensure they feel fully supported in their learning.

### PA4: Pupil to pupil Feedback

- **Peer Evaluation of work**- partners mark work or one group marks another's. Can result in more work being produced- cos can't take part if don't do the work.

## Re Proof of learning:

### PL1: All student response systems

- **Randomiser/ numbers on each chair/ Lolly pop sticks**--Have lolly pop sticks with pupils' names written on. Vary the way you use the lolly pop sticks, for example have a 'joker' stick which allows you to ask anyone you want or use other randomiser strategies. Call out number on a chair to answer. Use randomiser on white board. Use all 3 different methods in each lesson to keep it from going stale. Have pupil photos to pull out of pack.
- **Card fans**— ABCD, Yes/No, 1-5, Strongly agree---Strongly disagree---For example give pupils multiple choice answers and ask them to vote A, B, C or D. (see *Embedded FA p 90*)
- **Talk partners**- again the pupils need to be trained in use of. Change talk partners weekly- on rolling basis. Pupils need to discuss/ decide what makes a good talk partner and review their perf as talk partners . Create cards to show how expected to behave as talk partners

### PL2: Picking up on and responding to needs quickly:

- **Do a quick check**- move quickly around room picking up on how well the pupils 'get' the learning. Work out how many pupils are struggling and respond immediately through-
- **Mini-lesson**- provide those pupils who need it with another mini-lesson- explaining concept in different way
- **Peer support**- pair them up with someone who does understand/ provide group with an expert.
- **Support the skill**- provide the pupils who need it with a resource to support them- for example a x tables square if it is there knowledge of times tables standing between them and achieving the learning.
- **Simplify the skill**- Change the task for the group who are struggling to make the learning more accessible for them.
- **Go back to the beginning**- start again with the group who are struggling and take them right back to the beginning of your teaching/ the unit/ the concept to the point where they do begin to understand.
- **Repetition/ practise/ over-learning**- provide those struggling with further opportunities to repeat and over-learn the skill/ concept.

### PL3: Feedback pupils to teacher

Learning is revisited to ensure that important knowledge and vocabulary has a chance to enter the long-term memory.

- **Hinge questions**- these based on the important concept that critical for pupil understanding. Present to pupils mid lesson to evaluate progress. Must be diagnostic not up for discussion. All pupils must respond. Must be able to collect and interpret all pupil responses within 30 seconds.
- **Diagrams**- pupils represent their understanding as a diagram. Could use existing well known diagrams as start point- eg London tube map—<http://bit.ly/InvNu78>. Concept maps allowing pupils to perceive relationships between concepts.

### PL4: Retrieval Practice

- **End of unit quizzes** -Google Forms, Google Jamboard,

Kahoot-<https://kahoot.com/>; Mentimeter <https://www.mentimeter.com/>;  
Carousel- <https://www.carousel-learning.com/>; Quizizz  
<https://quizizz.com/?lng=en>; Quizlet-<https://quizlet.com/en-gb>; Get Plickers-  
<https://get.plickers.com/>

- **Misconceptions retrieval**– Misconceptions can be general, based on on previous lessons or classwork. Often ones that pupils can find confusing, tend to always get wrong or aren't necessarily true to begin with.
- **Finish the answer...** Give pupils a sentence starter (or a collection of them) and they then must complete the rest of the answer.  
e.g. The Romans were not successful on their first attempt of invasion of Britain because....