COMPUTING SUBJECT CURRICULUM POLICY 2021

CURRICULUM INTENT STATEMENT:

At TWS the curriculum is designed so that it builds on children's prior learning, provides hands on and enriching experiences, allows the children to develop aspirations, resilience and independence and become articulate, creative individuals.

Every child is recognised as a unique individual. We celebrate and welcome differences within our school and the local and wider community. We are respectful of everyone. We provide a creative and linked curriculum that enables children to make connections, embed learning and build on their knowledge. Children are given opportunities outside of the National Curriculum that enhances and enriches their learning, giving them real life experiences and allowing them to think in enterprising ways.

We believe that childhood should be a happy, investigative and enquiring time where there are no limits to curiosity and there is a thirst for new experiences and knowledge.

Children will leave Thomas Willingale School and Nursery with high aspirations and a strong sense of belonging, they will have the confidence and skills to articulate themselves, make decisions, make connections and self-reflect enabling them to be lifelong learners.

Curriculum Drivers			
Oracy To ensure all children have the skill set to be able to express and articulate themselves accurately, confidently and fluently so that they are able to take on any challenge.	**Environment/Community** Our children will play an active part in the local and wider community, utilising our rich surroundings within their learning and supporting how our community develops.	**Independence** Through engaging and inspiring learning that we provide, we want our children to become more independent learners, be proactive and strategic and transfer their skills to different areas of learning.	**Positive Growth** To instil a positive mind-set which allows children to build aspirations, empathy towards others and opportunities for their future lives; it supports their resilience so that they take chances, learn from failures and deepen their skillset and understanding.

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Basic principles

- Learning is a change to long term memory
- Our aims are to ensure that our pupil experience a wide breadth of study and have, by the end of each Key stage, long- term memory of an ambitious body of procedural and semantic knowledge.

Curriculum Intent Model

- **Curriculum drivers** shape our curriculum breadth. They are derived from an exploration of the background of our students, our beliefs about high quality education and values. They are used to ensure we give our students appropriate and ambitious curriculum opportunities.
- **Cultural capital** gives our children the vital background knowledge required to be informed and thoughtful members of our community who understand and believe in British Values.
- **Curriculum breadth** is shaped by our drivers, cultural capital, subject topics and our ambition for students to study the best of what has been thought and said by many generations of academic scholars.
- Our curriculum distinguishes between subject topics and threshold concepts**. Subject topics** are the specific aspect of subjects that are studied.
- **Threshold concepts** tie together the subject topics into meaningful schema. The same concepts are explored in a wide breadth of topics. Through this 'forwards and backwards engineering' of the curriculum, students return to the same concepts over and over and gradually build understanding on them.
- For each of the threshold concepts three **Milestones,** each of which include the procedural and semantic knowledge students need to understand the threshold concepts, provides a progression model.
- **Knowledge categories** in each subject give students a way of expressing their understanding of the threshold concepts.
- **Knowledge webs** help students to relate each topic to previously studied topics and to form strong, meaningful schema.
- **Cognitive science** tells us that working memory is limited and that cognitive load is too high is students are rushed through content. This limits the acquisition of long term memory. Cognitive science also tells us that in order for students to become creative thinkers, or have a greater depth of understanding they must first master the basics, which takes time.
- Within in each milestone, students gradually progress in their procedural fluency and semantic strength through three cognitive domains: basic, advancing and deep. The goal for students is to display sustained mastery at the 'advancing' stage of understanding by the end of each milestone and for the most able to have a greater depth of understanding at the deep stage. The time scale for sustained mastery or greater depth is, therefore two years of study.
- As part of our progression model we use a different pedagogical style in each of the cognitive domains of basic, advancing and deep. This is based on the research of Sweller,

Kirscher and Rosenshine who argue for direct instruction in the early stages of learning, and discovery based approaches later. We use direct instruction in the basic domain and problem based discovery in the deep domain. This is called the reversal effect.

- As part of our progression model we use tasks in curriculum books which shows our curriculum expectations. Teacher assessment is then recorded twice yearly.

Computing

Definition of Computing

Computing is concerned with how computers and computer systems work, and how they are designed and programmed. Pupils studying computing will gain an understanding of computational systems of all kinds, whether or not they include computers. Computational thinking provides insights into many areas of the curriculum, and influences work at the cutting edge of a wide range of disciplines. It incorporates techniques and methods for solving problems and advancing knowledge, and includes a distinct way of thinking and working that sets it apart from other disciplines. Computing is a practical subject, in which invention and resourcefulness are encouraged. The ideas of computing are applied to understanding real-world systems and creating purposeful products.

Essential Characteristics

As a result of our Computing teaching we aim for our students to have…

- Competence in coding for a variety of practical and inventive purposes, including the application of ideas within other subjects.
- The ability to connect with others safely and respectfully, understanding the need to act within the law and with moral and ethical integrity.
- An understanding of the connected nature of devices.
- The ability to communicate ideas well by using applications and devices throughout the curriculum.
- The ability to collect, organise and manipulate data effectively.

Threshold Concepts for Computing in the Curriculum

The children undertake a broad and balanced programme that takes account of abilities, aptitudes and physical, emotional and intellectual development. Through Computing the children learn a range of skills, concepts, attitudes and methods of working. They will…

- **Code**
  This concept involves developing an understanding of instructions, logic and sequences.

- **Connect**
  This concept involves developing an understanding of how to safely connect with others.

- **Communicate**
  This concept involves using apps to communicate one's ideas.

- **Collect**
  This concept involves developing an understanding of databases and their uses.

Early Years

By the end of reception children should be able to recognise that a range of technology is used in places such as homes and schools. They select and use technology for particular purposes.

Nursery

- Knows how to operate simple equipment.
- Shows an interest in technological toys with knobs or pulleys, or real objects.
- Shows skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images.
- Knows that information can be retrieved from computers.

Reception

- Completes a simple program on a computer.
- Interacts with age-appropriate computer software

Key Stage 1

By the end of year 2, children should be able to…

- Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following a sequence of instructions.
- Write and test simple programs.
- Use logical reasoning to predict the behaviour of simple programs.
- Organise, store, manipulate and retrieve data in a range of digital formats.
- Communicate safely and respectfully online, keeping personal information private and recognise common uses of information technology beyond school.

Key Stage 2

By the end of year 6, children should be able to…

- Design and write programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.
- Use sequence, selections and repetition in programs; work with variables and various forms of input and output; generate appropriate inputs and predicted outputs to test programs.
- Use logical reasoning to explain how a simple algorithm works, 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.

- Describe how internet search engines find and store data; use search engines effectively; be discerning in evaluating digital content; respect individuals and intellectual property; use technology responsibly, securely and safely.
- Select, use and combine a variety of software (including internet services) on a range of digital devices to accomplish given goals, including collecting, analysing, evaluating and presenting data and information.

Computing Curriculum Planning

• Our teaching is based on current National Curriculum Programmes of Study and the Chris Quigley Essentials program. It is implemented through a cross-curricular themed approach. In the foundation stage, we follow the Knowledge and Understanding of the World area of learning from the Early Years Foundation Stage.

• Themes are included in the long term planning for each year group.

• Teachers are expected to complete medium term planning which outlines key aspects of learning.

• Medium term plans can be subject specific, or may be more cross curricular

Assessment and Recording

Staff are expected to gather evidence of what individual pupils know, understand and can do in Computing by observing them at work, listening to and discussing with them, and evaluating any work they produce.

• Computing is assessed at the end of a unit, usually twice a year, using the milestones and Early Years Outcomes.

• The Computing subject leader analyses data biannually.

• All work should be evidenced through photographs and screen shots, as well as saving examples of completed work in the assessment folders. Subsequent lessons should be adapted as necessary.

Roles and Responsibilities

The subject is led by the Computing subject leader as a whole, working closely with the STEM working party and with class teachers. Throughout the year, time is set aside to review standards and monitor curriculum provision and ensure resources are up to date.

Monitoring

Monitoring takes place regularly through:

- pupil perception questionnaires
- sampling children's work

- teacher planning
- book scrutinies