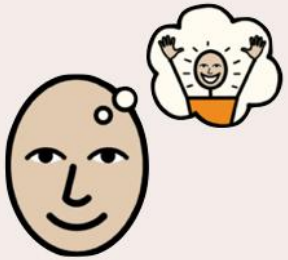
Science

Curriculum Drivers

Aspiration

Community



Creativity

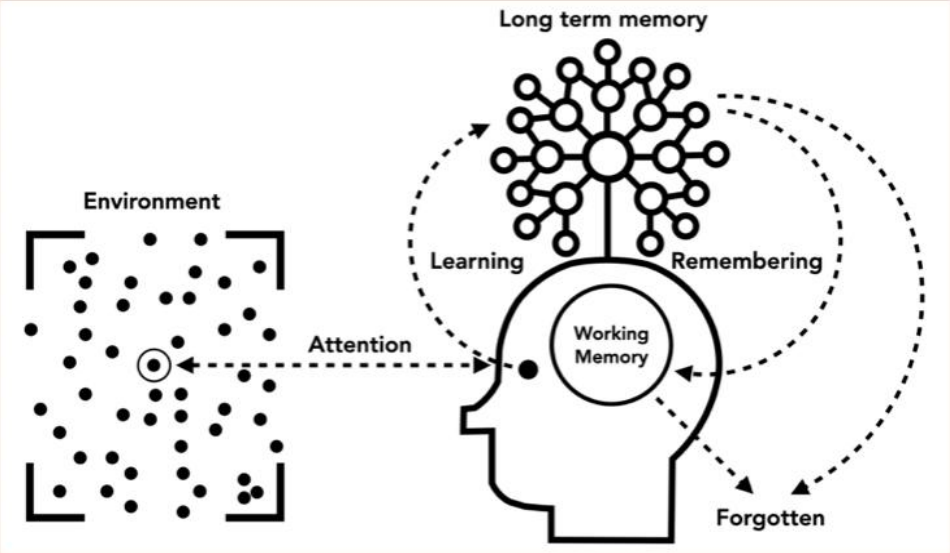
Language and communication

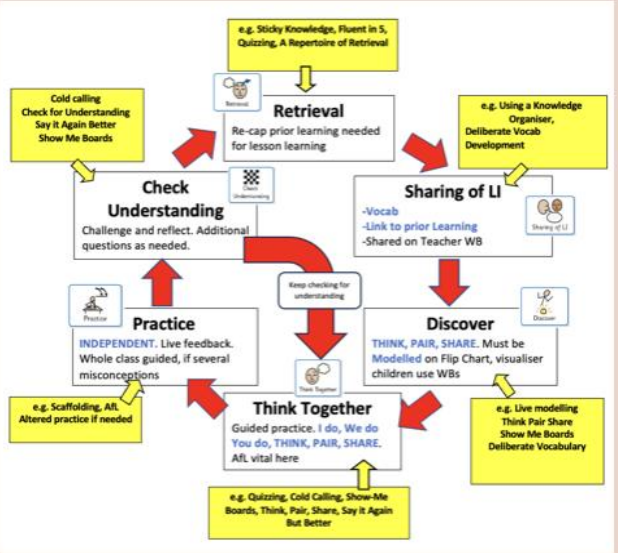
Curriculum Drivers

At Marden Vale we believe that our curriculum should offer not only the national curriculum but life skills and experiences beyond this. When designing our curriculum, we took into account the needs of our learners and community, our vision and values, and the location of our school. These curriculum drivers are used to underpin the development work we undertake in all areas of school life and to ensure our curriculum offer is enriched and personalised to our children and their families.

Our four key drivers are Aspiration, Community, Creativity and Language and Communication.

Learning model and lesson design





Tom Sherrington's learning model underpins our teaching and learning by ensuring that lessons are well-sequenced and structured with clear learning intentions. We prioritise active student engagement, regular retrieval practice and high-quality feedback, allowing students to consolidate and retain knowledge effectively. The model supports teachers in assessing progress through formative assessment and adapting teaching to meet individual needs. A focus on delivering lessons with optimal cognitive load and promoting independent learning, helps students develop a deep understanding of the curriculum and the skills necessary for lifelong learning.

Our Curriculum Drivers

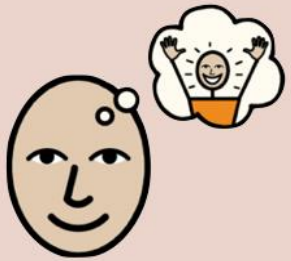
Aspiration

Our computing curriculum underpins a successful future for our children, giving them no limits to what their ambitions are and enabling them to live out their goals. We provide a range of access to technology through our curriculum and encourage the use of technology in all subjects. Our curriculum ensures that children leave Marden Vale CofE Academy as digitally literate, active and responsible participants in a modern, digital world.

Community

Our computing curriculum enables our learners to develop a sense of pride in themselves and their learning, ensuring that they are able to take this into their own community. Through the use of collaborative learning in computing, we encourage children to develop respect for others. Through our teaching of online safety, we enable our children to become part of the global online community in a sensible, positive, responsible and safe manner.

Creativity



Our computing curriculum inspires all pupils to be creative through the use of the creating media aspects of our learning. We encourage pupils to collaborate and design their own programs, systems and content, with no limits on creativity. We empower our children to explore new concepts and continually build on their knowledge and experience of technology.

Language and communication

Our computing curriculum provides opportunities for children to explore how the internet can provide a range of opportunities to communicate and allow children to become expressive communicators in our modern world. Children are educated on how to express themselves online safely and effectively through our comprehensive curriculum and focus on online safety. Children are also encouraged to work collaboratively with others through all of our units to enhance language and communication skills in all of our pupils.

Intent

We believe a high-quality science education should engage, inspire and challenge pupils, giving them the knowledge and skills to understand the world around them. Our curriculum builds knowledge in a meaningful sequence, helping pupils make connections and deepen their learning. They will be inspired by the work of great scientists and develop an understanding of how science has shaped society past and present. Through first-hand activities, pupils will strengthen enquiry skills and build secure knowledge in biology, chemistry and physics. Our aim is for all pupils to leave equipped with the scientific understanding to apply science today and in the future, supported by a concept-based approach that builds strong schema.

Implementation

Science is taught weekly at Marden Vale, using The 10 Big Ideas of Science Education, White Rose Science and the National Curriculum to shape our bespoke programme. Units build on prior knowledge and progress towards increasingly complex concepts and processes. Lessons follow a mastery approach, encouraging pupils to make links, revisit learning, and strengthen understanding. Scientific vocabulary is mapped and taught rigorously so children can recognise, use and apply it with confidence. Regular opportunities to revisit and practise ensure knowledge and key skills are embedded throughout.

Impact

Children at Marden Vale will:

- Demonstrate scientific knowledge through checkpoint assessments and big questions, using accurate vocabulary.
- Make predictions and connections supported by their own understanding.
- Plan and carry out investigations, individually and collaboratively, using equipment accurately and recognising the importance of fair testing (KS2).
- Communicate findings systematically through ICT, diagrams, graphs and charts.
- Understand the work of significant scientists and how discoveries have shaped our understanding of the world.

Science at Marden Vale

Biology

- **Alive (Structure & Function)**
  - Plants: Identify species; Identify parts and their function; Life processes
  - Animal: Identify species; Identify parts and their function; Life processes
- **Thrive & Survive (Nutrition & growth)**
  - Plants: Conditions for healthy growth; Habitats; Food chains
  - Animal: Conditions for healthy growth; Habitats; Food chains
- **Reproduction**
  - Plants: Life Cycles
  - Animal: Life Cycles
- **Diversity**
  - Plants & Animals: Evolution and adaption

Chemistry

- **Properties of materials**: Objects; Materials; Properties; Suitability; States of matter
- **Changing materials**: Physical changes; Fossils; Soils; Changing state; Water cycle

Physics

- **Forces**
  - Non-contact: Magnetism; Gravity; Solar system; Movement of Earth
  - Contact: Twist, push, pull; Friction; resistance; Gearing
- **Energy**: Seasonal changes; Light; Sound; Electricity

Scientific Enquiry

- **Investigating Cause and Effect**
  - Observing/ Measuring
  - Measuring Data
  - Asking and Exploring Questions
  - Asking and Exploring Questions
- **Analysing Results**
  - Concluding, predicting and evaluating
  - Applying Scientific Knowledge

Our Big Ideas that link the learning	Biology	Chemistry	Physics	Scientific Enquiry
Second Order Concepts	Reproduction	Survive and Thrive	Diversity	Alive
	Forces	Energy	Properties of Materials	Changing materials

Science at Marden Vale: The 10 Big Ideas of Science Education

The 10 Big Ideas of Science Education	Key Concept	Second Order Concept
1. All matter in the universe is made up of very small particles.	Chemistry	Materials
2. Objects can affect other objects at a distance.	Physics	Forces (non-contact)
3. Changing the movement of an objects requires a net force to be acting on in.	Physics	Forces (Contact)
4. The total amount of energy in the universe is always the same but can be transferred from one energy source to another during an event.	Physics	Energy
5. The composition of the earth and its atmosphere, and the processes occurring within them, shape the earth's surface and its climate.	N/A	Not taught at Primary Level Education
6. Our solar system is a very small part of one of billions of galaxies in our universe.	N/A	Not taught at Primary Level Education
7. Organisms are organised on a cellular basis and have finite life span.	Biology	Alive (Structure and Function)
8. Organisms require a supply of energy and materials for which they often depend on, or compete with, other organisms.	Biology	Survive and Thrive
9. Genetic information is passed down from one generation of organisms to the next.	Biology	Reproduction
10. The diversity of organisms, living and extinct, is the result of evolution.	Biology	Diversity

Our Big Ideas

Chemistry

All matter in the universe is made of very small particles.

Scientific Enquiry

Collecting, analysing, evaluating and presenting data and information

Physics

Objects can affect other objects at a distance.

Changing the movement of an object requires a net force to be acting on it.

The total amount of energy in the universe is always the same but can be transferred from one energy store to another during and event.

Biology

Organisms are organised on a cellular basis and have a finite lifespan.

Organisms require a supply of energy and materials for which they often depend on or compete.

Science at Marden Vale

EYFS

- Forces
- Materials
- Animals
- Plants
- All about me

Year 1

- Term 1: How are animals the same and different?
- Term 2: Seasons -Autumn (Plants)
- Term 3: Seasons - Winter (Plants)
- Term 4: Seasons - Spring (Plants)
- Term 5: How do we identify different materials?
- Term 6: Seasons - Summer (Plants)

Year 2

- Term 6: Habitats (Animals and plants)
- Term 5: What do plants need to thrive and survive?
- Term 4: Plants and their offspring.
- Term 3: Animals and their offspring.
- Term 2: What do animals need to thrive and survive?
- Term 1: What can you use different materials for?

Year 3

- Term 1: How can we control light?
- Term 2: How do forces affect objects?
- Term 3: Structure of animals and plants.
- Term 4: What do animals need to thrive and survive?
- Term 5: How do flowering plants reproduce?
- Term 6: How do rocks and soils change?

Year 4

- Term 6: Electricity
- Term 5: Why are food chains important?
- Term 4: How can we classify living things?
- Term 3: The digestive system.
- Term 2: How can we control sound?
- Term 1: How can the state of materials change?

Year 5

- Term 1: Are all changes to materials irreversible?
- Term 2: How can forces affect movement?
- Term 3: Space.
- Term 4: Animal structure and growth.
- Term 5: How do different animals reproduce?
- Term 6: How do different plants reproduce?

Year 6

- Term 6: Electricity
- Term 5: How does light allow us to see?
- Term 4: Adaptations Thrive and survive
- Term 3: Adaptations Thrive and survive
- Term 2: Classification
- Term 1: How can I enable my body to thrive?

Our second order concepts shape the questions we ask

Alive

Living things have a structure which enable a living function.

Thrive and survive

Living things need energy to power those functions to survive and thrive.

Diversity

Living things adapt and evolve their structure and function over many years to ensure the longevity of species thriving and surviving.

Reproduction

As living things age and grow; they pass through stages in which structure and functions enable reproduction. This allows species to continue to thrive and survive.

Forces

Non-contact forces attract and repel.

Contact forces oppose each other (resist).

Energy

Energy enables things to function and transforms from one form to another.

Properties of Materials

Materials have properties which enables function and therefore a use.

Changing materials

If you change the material's properties (structure) you change its use (function).