Science Policy

Successful – Confident – Responsible

ACER ACADEMY MISSION STATEMENT

To be inclusive
To provide nurturing/caring environments.
For children to feel safe.
To work with integrity and a strong moral compass.
To have the highest expectations and standards.

Policy developed by:	
Policy to be reviewed:	
Summary of changes	New policy

Science Policy – Rationale

- The rationale of this Science policy is to:
  - introduce the key aims and objectives of the Science department.
  - to explain the curriculum design and coverage.
  - to explain the effective Teaching and Learning strategies involved in Science

Acer's Science Policy Vision (Why)

- To develop pupils' curiosity and excitement about the world around them
- To develop pupil's ability to work scientifically.
  - To explore how science is used in real world situations
  - To provide opportunities to discuss ethical issues relating to scientific discoveries

Curriculum intent

- The intent for the Science curriculum is laid out in the National Curriculum in the science programme of study for key stage 3 and 4 . These are the things that we intend our students will study over their time at the Acer Academy. The starting points for our students is varied even within classes. As such we cannot easily define the educational outcomes of all our students by cohort. This has to be very individualised based on their starting points.

Curriculum Organization

- **National Curriculum -** Our science curriculum is designed to adhere to the national standards, ensuring that all instructional content and learning objectives align with the prescribed guidelines. By following the national curriculum, we guarantee that our students receive a comprehensive, high-quality education.
- **Big Ideas**- In science education, we integrate all our units into overarching big ideas. These central concepts enable students to connect their learning to a broader context, helping them understand how individual lessons fit into the bigger picture. By structuring learning in this way, we facilitate the creation of meaningful connections, which aids in the retention and retrieval of knowledge in the future.
- **Spiralised Design** - Students develop a deeper understanding of big ideas through multiple interactions with the underlying concepts. By connecting smaller, concrete ideas to more abstract ones, students are better equipped to apply these concepts to unfamiliar topics. Our spiralized curriculum ensures that each big idea is broken down into four smaller topics that increase in complexity. For example, in the ‘Waves’ unit, topics progress from the simpler, more concrete ‘Light’ and ‘Sound’ to the more abstract ‘Wave Properties’ and ‘Wave Effects’.

Timetable Allocation

Year Group	Lessons per week
Year 7	4
Year 8	4
Year 9	4
Year 10	4
Year 11	4

The ‘Big Ideas’ identified in Science

Reactions	Including Metal and Non-Metals, Acids & Alkalis, and Chemical Energy.
Earth	Including Earth Structure, Universe, Climate, and Resources.
Organisms	Including Movement, Cells, Breathing and Digestion.
Ecosystem	Including Interdependence, Plant Reproduction, Respiration and Photosynthesis.
Genes	Including Variation, Human Reproduction, Evolution and Inheritance..

The ‘Big Ideas’ identified in Science

Forces	Including Speed, gravity, Contact Forces, and Pressure.
Electromagnets	Including Voltage & Resistance, Current, Electromagnets, Magnetism.
Energy	Including Energy Costs, Energy Transfer, Work, Heating and Cooling.
Waves	Including Sound, Light, Wave Effects, Wave Properties.
Matter	Including Particle Model, Separating Mixtures, Periodic Table, Elements..

Working Scientifically

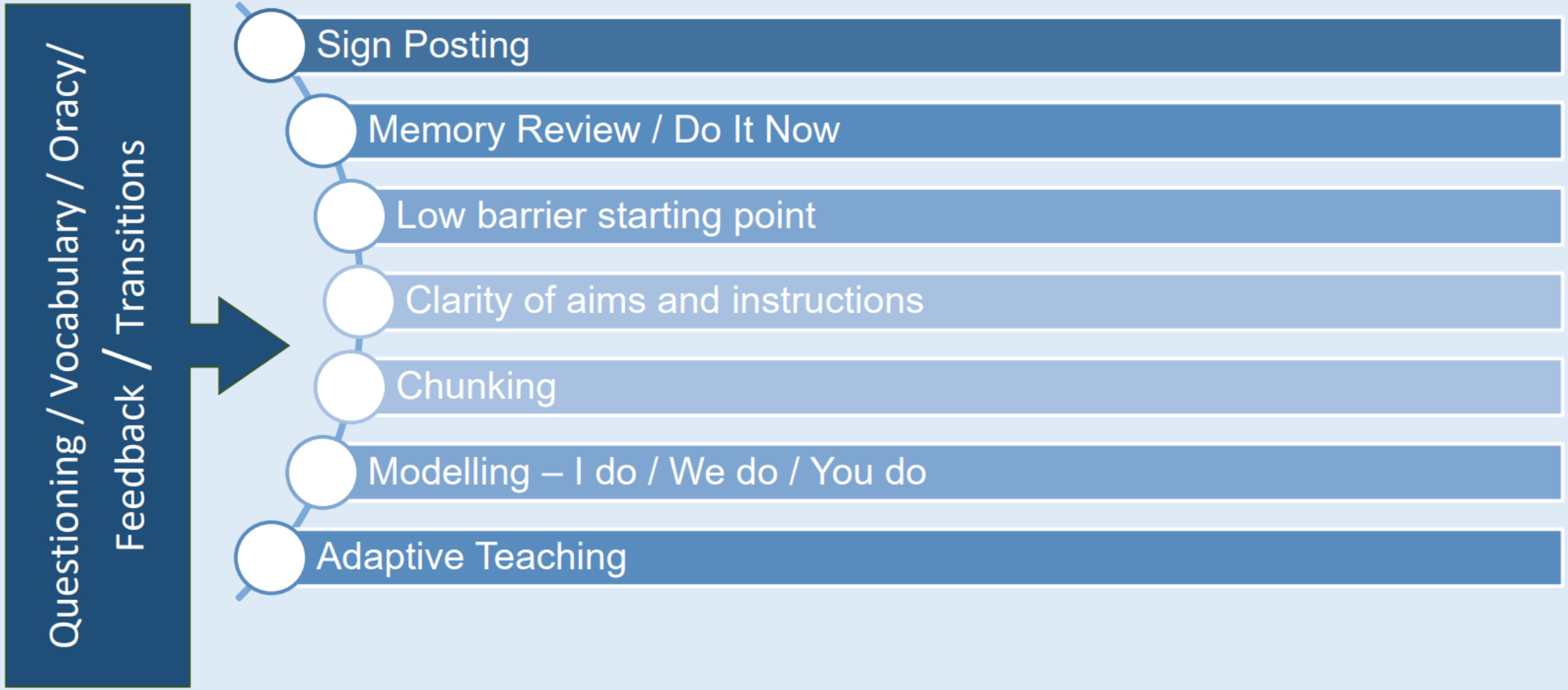
Working scientifically gets students working in similar ways to scientists.
Similar to the subject content, there are two dimensions for each working scientific process: know and apply.
Know is know-how, or being able to carry out the skills accurately and fluently. This has to be taught; pupils are not expected to learn disciplinary knowledge as a by-product of doing an experiment.

Apply the taught skills and knowledge to a range of practical opportunities.

Pupils' disciplinary knowledge advances in four areas throughout the Science curriculum.

1. Methods to answer scientific questions.
2. Apparatus and techniques.
3. Analysing, presenting, and evaluating scientific data to draw valid conclusions.
4. Development of scientific knowledge over time and it’s implications.

Lesson structure



Assessment Type	Details	Frequency
Initial baselining exercise	A test drawing on questions from across the KS3 curriculum to gain a baseline	On entry
End of unit tests	Tests based specifically on the work covered during a topic. These are not always completed at the immediate finish of the topic so that we can test that long-term remembering has been achieved.	Ongoing
Pupil assessment	Self- assessment sheets for pupils to assess their progress against unit objectives	Ongoing
Teacher assessment	Teachers to assess pupils progress against the intended outcomes for a unit.	Ongoing
Low Stake assessments	Ongoing teacher assessment used to direct planning on the outcomes of low stakes testing.	Ongoing
Data capture	Formal data captured across all strands of the curriculum using formative and summative methods.	Once per term baselining new students

British Values & SMSC

- **Extremism and radicalization** - All teachers in the science department are familiar with the indicators of vulnerability to extremism and radicalisation and the procedures for dealing with concerns. When delivering lessons in science we look out for indicators and report any concerns. We work to prevent pupils from developing extreme and radical views by embedding SMSC principles throughout the science curriculum.
- **Promoting values** - During lessons in science we strive to create a learning environment which promotes respect, diversity and self-awareness and equips all of our pupils with the knowledge, skills, attitudes and values they will need to succeed in their future lives.
- **Planning for British Values** – we have looked at all areas of our science curriculum and have identified the coverage of the British values through the topics that we have selected. This is detailed on our scheme of work.

- British Value and SMSC coverage is considered throughout the planning stages of the curriculum and plotted in our coverage grids. Examples of this can be seen on the next slide.

British Values and SMSC

British Values and SMSC and identified and planned for through the Scheme of work.

Strand	Unit:
Social	Collaborative activities, such as bridge -building and conducting food tests in groups, encourage teamwork and effective communication.
Moral	Moral development is addressed through discussions about the use of stem cells, climate change and vaccinations. Students engage in conversations about responsibility, both personal and societal, concerning the impact of life decisions on individual health and broader public health.
Spiritual	Spiritual development is fostered through an exploration of the solar system and how life evolved. Students may develop a sense of awe and wonder as they delve into the complexities of how well adapted organsims are. Additionally, discussions on the interconnectedness of life choices with overall well-being may encourage reflection on the importance of maintaining a harmonious relationship between physical health and spiritual well-being.
Cultural	Students consider how cultural beliefs may affect their choices in areas such as assisted reproduction and use of stem cells.
British Values	Scientific study aligns with British values by emphasizing democratic principles through discussions on laws surrounding assisted reproduction. The rule of law is evident in the exploration of established guidelines, promoting an understanding that adherence to rules contributes to public health. Individual liberty is central to the unit as students contemplate their life choices, recognizing the balance between personal freedom and responsibility for one's health and well being.

British Values and SMSC

In order to promote spiritual, moral, social and cultural values, we use examples of different points of view that are widely held. One way of doing this is to present cartoon style profiles as shown here: