ST. BEDE'S CATHOLIC JUNIOR SCHOOL

celebrates life and learning

SCIENCE POLICY

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MISSION STATEMENT

St. Bede, patron of our school, wrote:

"It was always my delight to learn and to teach".

We are a celebrating community, living the Gospel Values, committed to educating children in the light of the Catholic Faith.

We journey together so that we

"Might have life - life in all its fullness".

John 10:10

RATIONALE

In St. Bede's Catholic Junior School it is appreciated that in this ever changing world, children need to be given opportunities to satisfy their curiosity, develop, enhance and enrich their skills of scientific enquiry and reflection, and respect, and celebrate the universe that God has created.

AIMS

St. Bede's aims

- to develop individual scientific skills and concepts by providing challenging and stimulating learning opportunities, using the National Curriculum 2014 Programme of Study.
- to liaise with Key Stage 1 and Key Stage 3 staff to promote continuity and progression in science.
- to deliver all the elements of the Programme of Study for Science and provide further opportunities for investigation where possible.
- to experience the rigour of scientific enquiry and to resolve questions raised, through the progressive development of skills.
- to provide opportunities for learning, through planned, safe enquiries.
- to provide activities where achievement is not dependent upon previously required number and language skills.

- to satisfy the innate fascination, curiosity and enjoyment that the child has about God's world.
- to develop a knowledge-rich and humanity-rich science curriculum; helping the children to develop the wisdom to reflect and empathise on how they can use science to protect and improve their future.
- to enable children to become effective communicators of scientific ideas, facts and data.
- to develop the skills of working systematically in both independent and group situations.

OBJECTIVES

We deliver these aims by:-

- delivering the Programmes of Study, giving all children equal access;
- developing children's scientific language;
- putting science in the context of everyday life;
- finding evidence to support simple scientific ideas;
- enabling children to communicate effectively in a range of appropriate forms;
- ensuring children's health and safety by enabling them to recognise hazards and learn how to control them;
- empowering children to plan their own experimental work, by teaching them the skills they need;
- facilitating children to obtain evidence by using their senses and to make observations and record measurements;
- allowing children to consider the evidence and explain what they have found out.

PLANNING AND ORGANISATION

The staff and Governors have agreed to deliver the National Curriculum Programme of Study. Teachers are responsible for delivering the appropriate lesson each week, allocating sufficient time to deliver all the learning objectives and being aware of the learning outcome against which they are assessing the children. The staff currently use the Kapow Primary Science scheme to ensure that pupils are working towards their age-related expectations. Teachers also deliver pre and post unit assessment quizzes which are used to ascertain progress within each unit.

Scientific enquiry skills are identified in each lesson plan and learning from these enquiry-based sessions is shared throughout workbooks. Graphing and other measuring skills are also taught through mathematics.

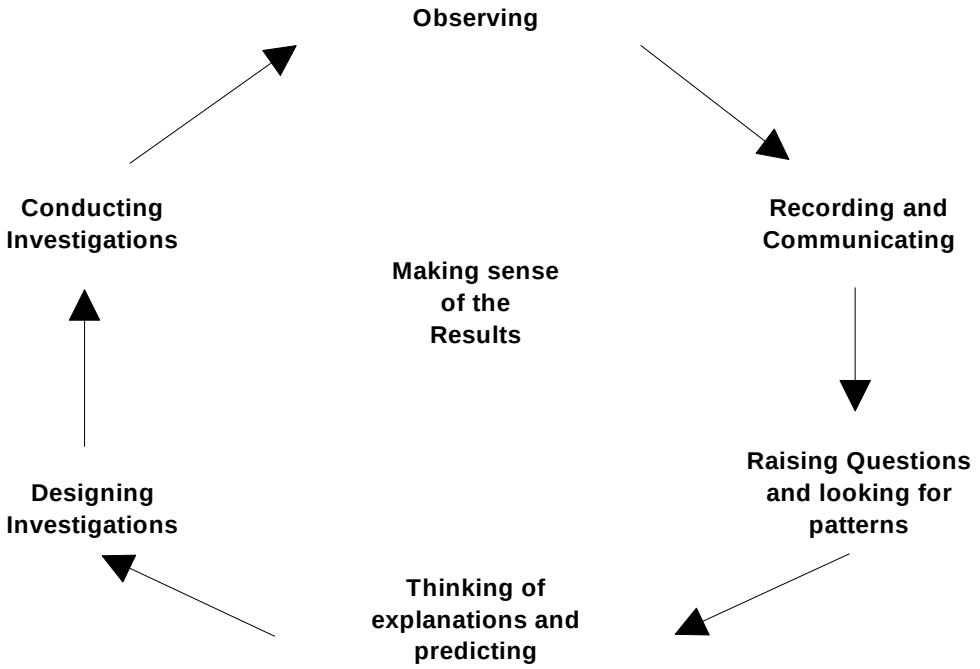
The scheme encourages:

- A strong focus on developing knowledge alongside scientific skills across biology, chemistry and physics.
- Curiosity and excitement about familiar and unknown observations.
- Challenging misconceptions and demystifying truths.
- Continuous progression by building on practical and investigative skills across all units.
- Critical thinking, with the ability to ask perceptive questions and explain and analyse evidence.
- Development of scientific literacy using wide-ranging, specialist vocabulary.

LEARNING IN SCIENCE

Scientific investigation is a cyclical process, which helps the child to make sense of their world (Skills in the Primary School).

It is the whole process that is important to a child's scientific understanding.



Making sense of the results is central to the development of all of the skills. A variety of teaching and learning strategies is employed at St. Bede's in order to aid progression, stimulate and sustain children's interest and to meet individual needs. The class teacher is responsible for deciding on the appropriateness of class, group or individual teaching situations.

Visible Learning in school emphasises the importance of making learning explicit and measurable in every curriculum subject. By focusing on evidence-based teaching strategies, Visible Learning encourages staff to highlight learning intentions, set clear success criteria, and regularly assess student progress. This approach helps pupils become more aware of their own learning journey, fosters a deeper understanding of the content, and empowers them to take ownership of their learning. Through Visible Learning in science both teachers and students can track growth and identify areas for improvement, ultimately enhancing outcomes in the subject.

SCIENTIFIC ENQUIRY

Where appropriate, the content of the Programme of Study is delivered through investigative study, but it is recognised that children have to be taught the skill in order to do this. Generally, lessons have some element of scientific enquiry where skills are practised. Each half-term children are given the opportunity to be involved in 'Fair Testing'.

Feedback to pupils about their progress is given by:-

- verbal response, through comment, discussion and advice from the teacher and other children
- through marking of work (see Marking Policy) – may also result in feedforward tasks.
- through assessing pupil progress through using either the 'end of unit' assessments from Switched on Science and/or topic test from Headstart Science.

- through staff moderation of work (subject scrutiny)
- through report grades for attainment and effort, which is shared with parents/carers
- At times some year groups – mainly Years 4 and 6 – take part in external award schemes (The Crest Award and Discovery Award) which largely rely on 'working scientifically'.

There is a positive ethos towards assessment, which respects the needs of the individual child and strives to develop each child to the best of his / her ability. It also fosters self-esteem, values and respects the child as an individual and gives worth to the effort he / she has made.

It allows each child to appreciate the gifts they have been given by God and provides opportunities for them to respect themselves and the wonders of the universe that God has created.

RECORDING (See Assessment, Recording and Reporting Policy)

Records for science kept for each child include:-

- lesson evaluations against learning outcomes included in general planning
- start and end of topic tests kept in the child's science workbook
- Excel assessments data – tracking pupils' start and end test score.
- working scientifically objectives moderated from workbooks (GAP examples)
- N.C. 2014 objectives highlight on class proformas to show where pupils are at in terms of their Age Related Expectations (ARE).

Pupils are taught about ideas and evidence in science.

Pupils are taught investigative skills by planning, obtaining and presenting evidence and considering and evaluating evidence.

A series of positive strategies are used to ensure that effective science learning takes place (see Appendix I).

ASSESSMENT (See Assessment, Recording and Reporting Policy and Effective Feedback Policy)

Assessment is carried out following the guidelines in the school's Assessment Policy.

Teachers assess children continually in all areas of the subject by:-

- monitoring the child's work and investigations e.g., written observations and comments, answers to questions, drawings, diagrams, tables, charts, graphs and sketches
- the use of prior learning assessments and tasks (e.g. Switched on Science,
- Headstart science, Concept cartoons) at the beginning of units to assess prior knowledge
- the use of feedforward tasks (may include concept cartoons) to challenge any and eradicate any misconceptions
- the use of specific assessment tasks at the beginning and end of each topic, which are placed in the child's workbooks
- measuring a child's performance against the N.C. 2014 objectives – whereby each child is highlighted as working at, above or working towards using the objectives for each unit

- teacher questions through marking and pupils responses provided using the purple pen of progress (may include feedforward and/or sticky learning tasks)
- verbal questioning as part of a lesson, communicating with individual or groups in enquiry-based session to assess dialogue being used and any observations noted by the pupils
- using the working scientifically objectives to observe and assess who is working towards their ARE.
- inputting their overall science assessment for the end of the year into reports, ready for their new teacher.
- Children are encouraged to comment on their own progress and evaluate their own work (See Appendix II).

REPORTING (See Assessment, Recording and Reporting Policy)

Reporting to parents is carried out on a termly basis, through parent/teacher meetings and annually, through a written report.

INCLUSION

We cater and support children with additional requirements by:-

- grouping children appropriately;
- giving a variety of tasks related to a topic and providing more concrete experience and discussion for children with additional requirements;
- supporting language development where appropriate;
- effectively utilising teaching assistants where they are available;
- providing writing templates for enquiry plans for the less able pupils;
- using lead learners for science to encourage the less able learners;
- key vocabulary banks for less able pupils

EQUAL OPPORTUNITIES

At St. Bede's all children are equally valued. We address this issue by utilising a range of strategies.

It is regarded as each child's entitlement to participate fully in the science curriculum.

CONTINUITY AND PROGRESSION

We facilitate continuity and progression by ensuring that:

- any information from KS1 is considered when planning science lessons in Year 3.
- children revisit the objectives during KS2.
- Science is part of the whole process of planning at St. Bede's

CROSS-CURRICULAR LINKS

Scientific attitudes, concepts and skills are applicable throughout the curriculum – linking, where possible, to maths when constructing graphs and collating data; and ensuring the children are encouraged to present their ideas in a variety of written forms (utilizing their English writing skills).

PSHE and RSE also link to many areas of science. For example, human development in Year 6; healthy lifestyles; sustainability and our environment. Also work linked to conservation, through our Chester Zoo and the Ignite project, brings all areas of the curriculum together. Focussing, also, on days such as 'International Day of Women in Science' links science with PSHE (e.g. Y6 work on stereotypes).

ICT

ICT is utilised to achieve the teaching and learning objective in science.

ICT enables children to utilise appropriate sources such as the Internet. Children are encouraged to judge the accuracy of the information and credibility of its source.

ICT supports the development of science through the use of computer programs that develop and reinforce the use of mathematical language.

ICT enables children to store data, interpret and present information from investigative work.

EXTRA-CURRICULAR ACTIVITIES

Children take part in activities during 'Science Week.'

Children are encouraged to participate in visits of scientific interest during and after school such as Chemistry with Cabbage, Catalyst and Mad Science Club.

Visitors from outside agencies are used to enhance the delivery of the science curriculum, such as the sessions completed with STEM ambassadors, Knowsley Safari, Chester Zoo and Catalyst outreach teams (e.g. Ogden Trust).

Visitors from our link high schools and colleges, at times, deliver workshops to enhance our 'working scientifically' skills, with the use of specialised apparatus.

RESOURCES

The majority of resources are stored centrally in the science cupboards.

Children are shown by their teacher where the science equipment is stored to that they can, when appropriate, locate and select their own equipment.

Teachers often select science monitors who help to get out and return equipment required for the lesson.

The Science Subject Leader is responsible for ordering stock when needed throughout the academic year.

Staff notify the Subject Leader of any extra resources required, or of any breakages or losses which occur.

New materials, books, video clips, Internet sites/subscriptions, etc., are recommended by staff when appropriate.

Resources are labelled and checked in/out of the central cupboard when required.

STAFF DEVELOPMENT

Meetings / training for Subject Leaders at the STEM and Ogden Trust and Ignite Cluster meetings.

All staff are responsible for teaching science. The Science Subject Leader informs staff of up-to-date developments of the science curriculum. In-house training is delivered when required. Training needs are identified through performance management (see Performance Management Policy) and at the beginning of every academic year. Teachers share expertise by networking with other schools.

Teachers are advised on areas of particular strength and any further developments to their teaching of science through the subject scrutiny of work which is then shared through the report to the governors.

REMOTE LEARNING

In the event of school closures/partial closures then teachers will provide the equivalent of 1 hour of science activities per week.

The remote learning lessons may comprise of PowerPoints – created by the teacher - or links to online resources or videos provided by reputable sites such as BBC, STEM, ASE, Explorify.

Lessons will aim to be varied – comprising, for example, of an appropriate mix of research, new learning, revision, quizzes and experiments/investigations.

Children will be encouraged to work scientifically whilst at home, with any practical experiments ensuring that the children can source materials from regular household products. Where appropriate, teachers will also try to provide an online simulation of an experiment – for those children who cannot access the appropriate resources.

Children will be given the opportunity to record their learning in a variety of ways – written work, PowerPoints, video presentations/recordings and/or photographs.

Teachers will aim to deliver assessment type activities – for example, continuing to set feedforward/sticky learning tasks and possibly pre-topic and post-topic tests through online quizzes.

Where necessary, links will be made to any national or local science events – including live lessons/workshops (for example, live lessons delivered by STEM ambassadors such as Dr Chips; workshops provided by Daresbury laboratories; The Great Science Share; International Day of Women in Science). The subject leader will also share information about such events via recorded assemblies/PowerPoints and/or the school website.

POLICY REVIEW

The Science Policy will be reviewed by the Science Subject Leader in the light of guidance, training, changes in legislation or at the request of a member of the school community. Any amendments will be agreed by the staff and Governing Body.

APPENDIX I

For effective science learning to take place, evidence of the following is found in our classrooms:-

- an active learning environment
- children working co-operatively
- children using scientific language to discuss their ideas, including written and oral explanations, displays or presentations
- children working from first-hand experience
- children encouraged to ask their own questions which can be investigated
- children actively involved in scientific enquiry and understand which enquiry is the most appropriate to answer their question
- children devising their own plans for an investigation
- children devising and conducting their own investigations
- children selecting their own equipment
- children taking action to control risks
- take accurate measurements using standard units
- children making systematic observations and measurements
- children being observed being actively involved in scientific enquiry
- children repeating tests
- look for changes, patterns, similarities and differences in their data
- children recording in a variety of ways, including ICT
- children communicating data
- children drawing conclusions from their findings
- children evaluating their work, finding new questions which arise from the data, making predictions for new values within or beyond the data they have collected
- children and teachers showing enjoyment and enthusiasm in the activities they are undertaking.

APPENDIX II

Evaluation Questions

- Did you enjoy it?
- Could you have tested it another way?
- Did it work out as you expected?
- Could you improve on your test?
- Was it a fair test?
- Did you record it in the best way?
- Did you learn anything?
- Did your group work well together?