Byfleet Primary School - Science Policy

Governors' Committee Responsible: Full Governing Board	**Governor Lead**: John Dangerfield	**Nominated Lead Member of Staff**: Richard Bowman
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A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science.

National Curriculum 2014

There is significant evidence to show that children's interest in and identity with science is shaped before they leave primary school (PSTT) therefore at Byfleet Primary School we aim to ensure that Science is taught in a fun yet stimulating, thought-provoking and challenging way.

Aims:

The national curriculum for science aims to ensure that all pupils:

- develop **scientific knowledge and conceptual understanding** through the specific disciplines of biology, chemistry and physics
- develop understanding of the **nature, processes and methods of science** through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the **uses and implications of science**, today and for the **future**.

Our teaching aims at Byfleet Primary School:

- Teach Science with an emphasis on real-life, practical activities to engage children and make Science purposeful.
- Children understand and can use key vocabulary specific to the learning as well as making links with prior learning
- To prepare children for Secondary education in both the knowledge they possess and the skills they can achieve.
- Offer Scientific enrichment opportunities both within lessons and across the school year

Implementation

At Byfleet, we are committed to raising the standards of children's scientific knowledge to ensure that all children are progressing and achieving at least in line with national expectations. The curriculum will be monitored by the Science Subject Leader and Deputy Head Teacher and also with SLT, to ensure that it is being used effectively to provide challenge, stimulation and practical enquiry in Science from Reception to Year 6. While not all children will follow a career in science or related disciplines, science literacy will influence their lives daily: for example, in managing their health, and understanding issues such as climate change. Science taught in primary schools is therefore of vital importance both to individuals' and nations' well-being (PSTT)

Teaching

The teaching of Science at Byfleet Primary School is separated into units, based on the 2014 updated National Curriculum. Elements of Science are delivered to the Reception children, throughout the Early Years Statutory Framework in particular: Understanding the World; Personal, Social and Emotional; Physical; Expressive Arts and Design and Communication and Language. In Key Stage 1 and 2 Science is taught as a separate subject each week for 90 minutes. Lessons have been designed to be relevant and purposeful, with the substantive and disciplinary knowledge clearly mapped out to avoid overlap in learning and where appropriate planned to be taught at a time of year that allows for high quality results, for example, shadows in Autumn 1 when we still have many sunny days. The lessons build on the seven key enquiry skills needed in order to carry out a scientific enquiry.

Here is an overview of the science units for both Key Stage 1 and Key Stage 2 and when they are taught.

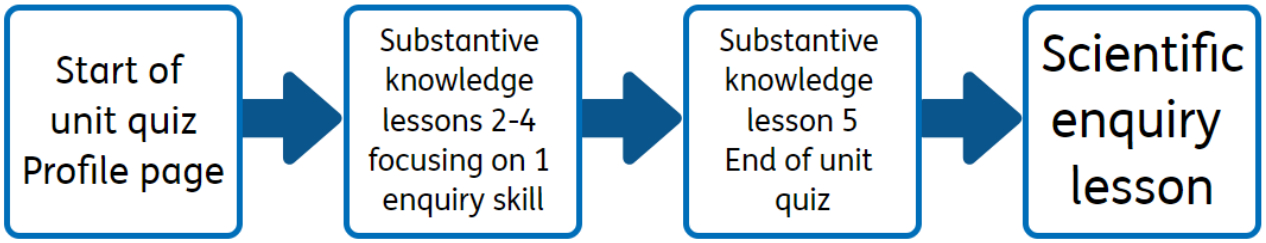
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals inc. Humans	Autumn 1 Autumn 2	Autumn 1 Autumn 2	Summer 2	Spring 1	Summer 2	Autumn 1
Materials	Spring 1 Spring 2	Summer 2			Spring 1 Spring 2	
Plants	Summer 1	Spring 1	Spring 1 Spring 2			
Living things and their habitats		Spring 2 Summer 1		Summer 1	Autumn 1	Spring 2
Sound		Autumn 2		Spring 2		
Light			Autumn 1			Autumn 2
Rocks and Soils			Autumn 2			
Forces and Magnets			Summer 1		Summer 1 (just forces)	
Electricity				Autumn 1 Autumn 2		Spring 1
States of matter				Summer 2		
Seasons	Summer 2 although seasonal walks to happen throughout the year					
Earth and Space					Autumn 2	
Evolution and Inheritance						Summer 1 Summer 2

Scientific Enquiry

At the start of each unit, an enquiry question will be presented. Over the course of four lessons children will be taught substantive knowledge as well as an enquiry skill. In Key Stage one, will be taught the first five and Key Stage 2 all seven skills. At the start of each lesson, the focus skill is to be discussed and children circle it on top of their task strip.

A more detailed curriculum map showing the unit content and the enquiry questions and skills can be found here

Sequence of Lessons



At the start of each lesson, children will be introduced to key vocabulary which will be included in the task strip (Appendix 1). The vocabulary will be used by the children throughout the lesson and they will demonstrate their understanding by underlining in yellow and will receive V points, similar to the way they do in Topic lessons. Each book is to have a "widgit" bookmark attached which shows all of the key vocabulary to be used during the unit. (See Appendix 2)

Vocabulary Progression Document can be found here

Monitoring and Assessment:

Monitoring

Science is now being included in our whole school monitoring cycle and involves the monitoring of planning, book scrutiny, lesson observations and the learning environment. Feedback from monitoring is used to inform the next steps for development.

Assessment

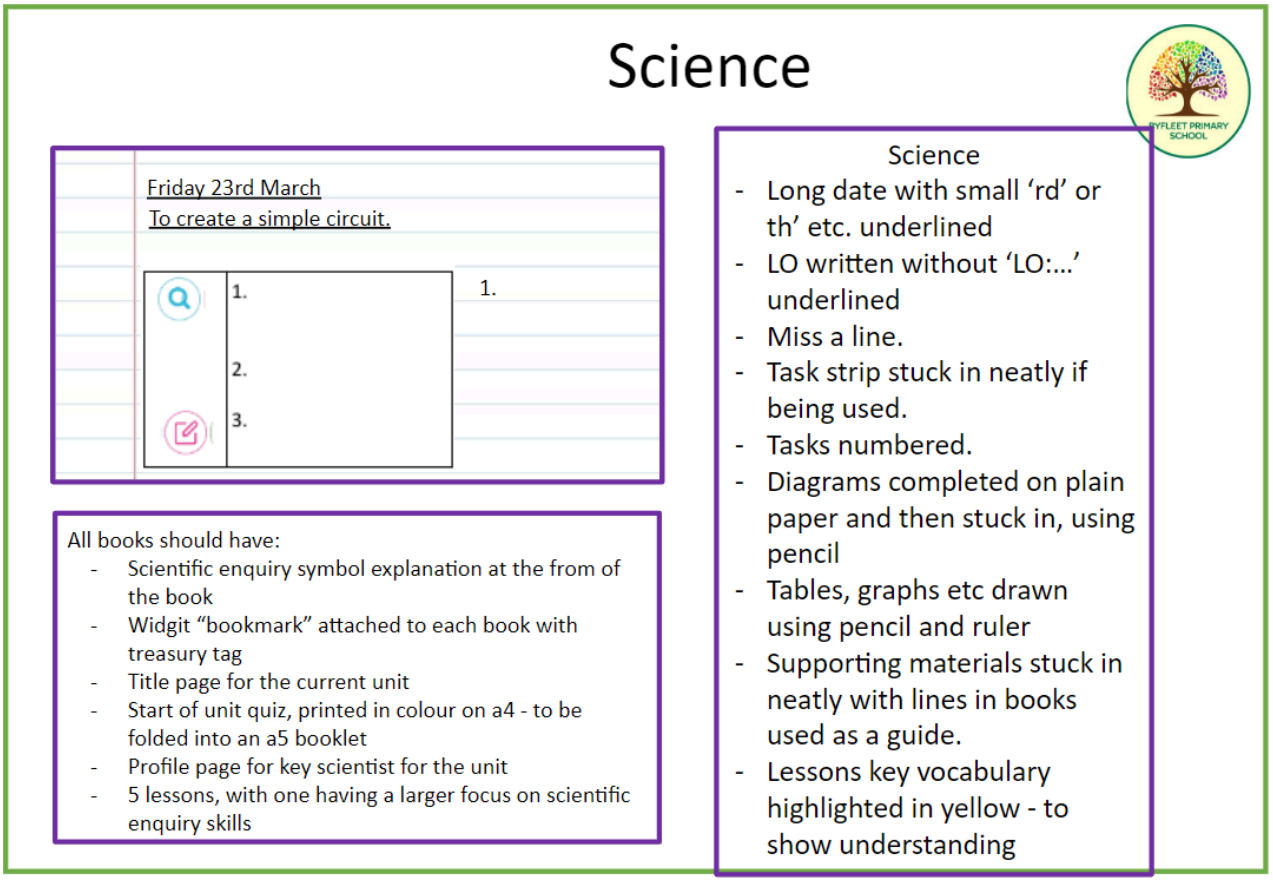
All units start with a quiz that covers all of the learning objectives required for that unit. Teachers mark the quiz before continuing lessons to ensure relevant and purposeful learning takes place in the next four lessons. The same quiz is then completed before the scientific enquiry lesson which is marked by the children and they are given an opportunity to reflect on their learning.

All lessons include a clear learning objective.

Science Non-negotiables:

KS1 & KS2 Science Expectations at Byfleet Primary School

Book expectations



- Clear evidence of lesson overviews being followed to allow for all National Curriculum objectives being met for Science.
- Evidence of scientific enquiry skills being taught and recorded
- Marking to follow whole school marking policy

- Teachers have high standards for every child in relation to the spelling of scientific vocabulary.
- Purple pens are used for children to edit, improve and evaluate their learning.
- Limit the amount of worksheets and cutting and sticking activities
- Scaffolding resources to support differentiation, specifically for SEND and PP pupils to be used where appropriate.

Handwriting:

- Handwriting is a focus throughout Byfleet Primary School and as such it will be encouraged throughout all subjects, including Science. Children in all classes use a sharp pencil or a black handwriting pen. All classes from Year 1 to Year 6 use the Nelson Handwriting scheme to develop consistent and fluent handwriting styles.

Subject Leadership:

- The Science subject leader has to maintain high standards of subject knowledge by attending available courses, conferences and subject leaders' update meetings where appropriate and then disseminating this information to the SLT and then onto teaching staff during staff CPD meetings.
- They can meet with subject leaders from neighbouring schools to moderate science work and share ideas, where possible.
- They are responsible for supporting colleagues in the teaching of science by informing them of current developments in the subject and by providing a strategic lead and direction for the subject in school.
- They are also responsible for evaluating strengths and weaknesses in the subject and identifying areas for improvement and development.
- Provide external enrichment activities for children such as visiting groups or organising visitors to come to the school.
- Purchase and organise all Science resources
- Update and present to the governing body annually

Subject leader release time, enables them to fulfil their role by reviewing planning, carrying out lesson observations and/or learning walks, monitoring children's work and displays and setting out an action plan for the whole school to work on. The action plan is evaluated at the end of the academic year and a new one implemented, as a result of targets highlighted from the previous year. This can depend on staff needs/training/new initiatives and challenging learning and teaching.

Resources:

Resources for Science are kept in the locked Science cupboard. They are labelled and they include books, equipment, apparatus, models and posters. Also kept in the science cupboard are resources used for both maths and science, such as measuring equipment. It is everyone's responsibility to inform the science subject leader when equipment is broken and needs replacing and when equipment is needed for teaching and has to be ordered.

Health and Safety Guidelines:

For Science lessons in class, the class teacher will carry out risk assessments where it is deemed appropriate. The Risk Assessment is completed using the school's proforma, which requires the signature of the Head teacher. Resources available to support this include: CLEAPSS bulletins and newsletter, and other publications as well as the "Be Safe" booklet.
When planning trips all teachers are required to gain permission from the head teacher before confirming a booking. The teachers must also complete a risk assessment, even if it is a site they have visited previously. Teachers should refer to the school's Health and Safety Policy and the safety procedures recommended in the
DfES 'Health & Safety of Pupils on Education Visits' guidelines. Please see The School's Guidance and Health and Safety Policies for more details on planning a trip.

Equal Opportunities and SEN:

At Byfleet we have a due regard for our duties under the Equality Act 2010. Through the delivery of the science curriculum, we will ensure that we; eliminate discrimination, advance equality of opportunity and foster good relations. A balance of interest must be provided for both boys and girls. Activities should be carefully planned by the class teacher and be differentiated where appropriate for children with SEN and equally children that show a greater depth of understanding.

Advancing Equality of Opportunity:

This involves:

- Removing or minimising disadvantages
- Taking steps to meet people's needs
- Encouraging participation in any activity in which participation by such people is disproportionately low.

LInks to other policies at Byfleet Primary School:

Science and the updated RSE (Relationship and Sex Education) Policy are linked closely together. We must ensure that in Science the physical aspects of RSE are taught so that children are aware of the physical changes which will occur and at the same time, these are taught age-appropriately. Children also need to be aware of themselves physically and know what is deemed as acceptable behaviour so therefore to avoid any opportunities for exploitation or abuse from others. This is of course extremely important in the lives of the children we teach. These direct links between Science and RSE are outlined in the details below and are quoted from the RSE Policy. The relevant sections to Science are highlighted in bold.

AIMS AND OUTCOMES OF RSE IN THE CURRICULUM:

At Byfleet Primary, the overall aim of RSE is to foster a positive notion of lifelong learning about **physical**, moral and emotional development, including how to look after **physical** and mental health. It aims to support the development of self-respect and empathy for others and promotes the development of skills and understanding necessary to manage conflict peaceably and **learn how to recognise and avoid exploitation and abuse**.

RSE provides opportunities for pupils to:

- have a better understanding of the nature of human relationships
- learn about relationships, the importance of communication and assertiveness skills including the importance of values such as respect (for self and others), equality, responsibility, care and compassion
- reflect upon the importance of stable and loving relationships for family life, including the bringing up of children, this also includes marriage and civil partnerships
- **consider and understand the changes that occur to their bodies, minds and emotions as a consequence of growth from childhood to adulthood**
- **reflect upon how to make good, informed and safe choices** concerning relationships and **healthy lifestyles.**

The aims of Relationship and Sex Education (RSE) at Byfleet Primary are to:

- Provide a framework in which sensitive discussions can take place
- **Prepare pupils for puberty, and give them an understanding of sexual development and the importance of health and hygiene**
- Help pupils develop feelings of self-respect, confidence and empathy
- Create a positive culture around issues of sexuality and relationships
- **Teach pupils the correct vocabulary to describe themselves and their bodies**

The Biological aspects of RSE are taught within the Science curriculum, and other aspects are included in Religious education (RE).

Pupils in Upper Key Stage Two, currently receive stand-alone Sex Education sessions once a year delivered by a trained health professional fron the Surrey Nurses Team. They work alongside the class teachers to deliver the required objectives from the Science NC. The context is delivered in mixed gender groups other than when it is deemed more appropriate for topics to be covered in single sex groups.

In line with the statutory guidance for governing bodies, proprietors, head teachers, principals, senior leadership teams, teachers, using the ' Relationships Education, Relationships and Sex Education (RSE) and Health Education', here at Byfleet Priumary School: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/908013/Relationships_Education__Relationships_and_Sex_Education__RSE__and_Health_Education.pdf it states that the following knowledge is to be taught at Primary School level:

Sex Education (Primary)

65-The Relationships Education, RSE, and Health Education (England) Regulations 2019 have made Relationships Education compulsory in all primary schools. Sex education is not compulsory in primary schools and the content set out in this guidance therefore focuses on Relationships Education.

66-The content set out in this guidance covers everything that primary schools should teach about relationships and health, including puberty. The national curriculum for science also includes subject content in related areas, such as the main external body parts, the human body as it grows from birth to old age (including puberty) and reproduction in some plants and animals. It will be for primary schools to determine whether they need to cover any additional content on sex education to meet the needs of their pupils. Many primary schools already choose to teach some aspects of sex education and will continue to do so, although it is not a requirement.

67-It is important that the transition phase before moving to secondary school supports pupils' ongoing emotional and physical development effectively. The Department continues to recommend therefore that all primary schools should have a sex education programme tailored to the age and the physical and emotional maturity of the pupils. It should ensure that both boys and girls are prepared for the changes that adolescence brings and – drawing on knowledge of the human life cycle set out in the national curriculum for science - how a baby is conceived and born. As well as consulting parents more generally about the school's overall policy, primary schools should consult parents before the final year of primary school about the detailed content of what will be taught. This process should include offering parents support in talking to their children about sex education and how to link this with what is being taught in school. Meeting these objectives will require a graduated, age-appropriate programme of sex education. Teaching needs to take account of the developmental differences of children.

68-Where a maintained primary school chooses to teach aspects of sex education (which go beyond the national curriculum for science), the school must set this out in their policy and all schools should consult with parents on what is to be covered. Primary schools that choose to teach sex education must allow parents a right to withdraw their children. Unlike sex education in RSE at secondary, in primary schools, head teachers must comply with a parent's wish to withdraw their child from sex education beyond the national curriculum for science. Schools will want to draw on the good practice for conversations with parents around the right to withdraw as set out in paragraphs 45 and 46. Schools must also ensure that their teaching and materials are appropriate having regard to the age and religious backgrounds of their pupils. Schools will also want to recognise the significance of other factors, such as any special educational needs or disabilities of their pupils."

Physical health and mental wellbeing

83-The aim of teaching pupils about physical health and mental wellbeing is to give them the information that they need to make good decisions about their own health and wellbeing. It should enable them to recognise what is normal and what is an issue in themselves and others and, when issues arise, know how to seek support as early as possible from appropriate sources.

84-Physical health and mental wellbeing are interlinked, and it is important that pupils understand that good physical health contributes to good mental wellbeing, and vice versa.

85-It is important for schools to promote pupils' self-control and ability to self-regulate, and strategies for doing so. This will enable them to become confident in their ability to achieve well and persevere even when they encounter setbacks or when their goals are distant, and to respond calmly and rationally to setbacks and challenges. This integrated, whole-school approach to the teaching and promotion of health and wellbeing has a potential positive impact on behaviour and attainment.

86-Effective teaching should aim to reduce stigma attached to health issues, in particular those to do with mental wellbeing. Schools should engender an atmosphere that encourages openness. This will mean that pupils feel they can check their understanding and seek any necessary help and advice as they gain knowledge about how to promote good health and wellbeing.

87-Schools have flexibility to design and plan age-appropriate subject content, but this guidance sets out core areas for health

and wellbeing that are appropriate for primary aged pupils.

88-Puberty including menstruation should be covered in Health Education and should, as far as possible, be addressed before onset. This should ensure male and female pupils are prepared for changes they and their peers will experience.

Menstruation:

89-The onset of menstruation can be confusing or even alarming for girls if they are not prepared. Pupils should be taught key facts about the menstrual cycle including what is an average period, range of menstrual products and the implications for emotional and physical health. In addition to curriculum content, schools should also make adequate and sensitive arrangements to help girls prepare for and manage menstruation including with requests for menstrual products. Schools will need to consider the needs of their cohort of pupils in designing this content.

Physical health and mental wellbeing: Primary

90-The focus in primary school should be on teaching the characteristics of good physical health and mental wellbeing. Teachers should be clear that mental wellbeing is a normal part of daily life, in the same way as physical health.

91-This starts with pupils being taught about the benefits and importance of daily exercise, good nutrition and sufficient sleep, and giving pupils the language and knowledge to understand the normal range of emotions that everyone experiences. This should enable pupils to articulate how they are feeling, develop the language to talk about their bodies, health and emotions and judge whether what they are feeling and how they are behaving is appropriate and proportionate for the situations that they experience.

92-Teachers should go on to talk about the steps pupils can take to protect and support their own and others' health and wellbeing, including simple self-care techniques, personal hygiene, prevention of health and wellbeing problems and basic first aid.

93-Emphasis should be given to the positive two-way relationship between good physical health and good mental wellbeing, and the benefits to mental wellbeing of physical exercise and time spent outdoors.

94-Pupils should also be taught the benefits of hobbies, interests and participation in their own communities. This teaching should make clear that people are social beings and that spending time with others, taking opportunities to consider the needs of others and practising service to others, including in organised and structured activities and groups (for example the scouts or girl guide movements), are beneficial for health and wellbeing.

95-Pupils should be taught about the benefits of rationing time spent online and the risks of excessive use of electronic devices. In later primary school, pupils should be taught why social media, computer games and online gaming have age restrictions and should be equipped to manage common difficulties encountered online.

96-A firm foundation in the benefits and characteristics of good health and wellbeing will enable teachers to talk about isolation, loneliness, unhappiness, bullying and the negative impact of poor health and wellbeing.

By the end of Primary School: (specific scientific knowledge objectives highlighted)

Mental Wellbeing	Pupils should know • that mental wellbeing is a normal part of daily life, in the same way as physical health. • that there is a normal range of emotions (e.g. happiness, sadness, anger, fear, surprise, nervousness) and scale of emotions that all humans experience in relation to different experiences and situations.

	• how to recognise and talk about their emotions, including having a varied vocabulary of words to use when talking about their own and others' feelings. • how to judge whether what they are feeling and how they are behaving is appropriate and proportionate. • the benefits of physical exercise, time outdoors, community participation, voluntary and service-based activity on mental wellbeing and happiness. • simple self-care techniques, including the importance of rest, time spent with friends and family and the benefits of hobbies and interests. • isolation and loneliness can affect children and that it is very important for children to discuss their feelings with an adult and seek support. • that bullying (including cyberbullying) has a negative and often lasting impact on mental wellbeing. • where and how to seek support (including recognising the triggers for seeking support), including whom in school they should speak to if they are worried about their own or someone else's mental wellbeing or ability to control their emotions (including issues arising online). • it is common for people to experience mental ill health. For many people who do, the problems can be resolved if the right support is made available, especially if accessed early enough.
Internet safety and harms	Pupils should know • that for most people the internet is an integral part of life and has many benefits. • about the benefits of rationing time spent online, the risks of excessive time spent on electronic devices and the impact of positive and negative content online on their own and others' mental and physical wellbeing. • how to consider the effect of their online actions on others and know how to recognise and display respectful behaviour online and the importance of keeping personal information private. • why social media, some computer games and online gaming, for example, are age restricted. • that the internet can also be a negative place where online abuse, trolling, bullying and harassment can take place, which can have a negative impact on mental health. • how to be a discerning consumer of information online including understanding that information, including that from search engines, is ranked, selected and targeted. • where and how to report concerns and get support with issues online
Physical health and fitness	Pupils should know • the characteristics and mental and physical benefits of an active lifestyle. • the importance of building regular exercise into daily and weekly routines and how to achieve this; for example walking or cycling to school, a daily active mile or other forms of regular, vigorous exercise. • the risks associated with an inactive lifestyle (including obesity). • how and when to seek support including which adults to speak to in school if they are worried about their health.
Healthy eating	Pupils should know • what constitutes a healthy diet (including understanding calories and other nutritional content). • the principles of planning and preparing a range of healthy meals. • the characteristics of a poor diet and risks associated with unhealthy eating (including, for example, obesity and tooth decay) and other behaviours (e.g. the impact of alcohol on diet or health).
Drugs, alcohol and tobacco	Pupils should know • the facts about legal and illegal harmful substances and associated risks, including smoking, alcohol use and drug-taking.
Health and prevention	Pupils should know • how to recognise early signs of physical illness, such as weight loss, or unexplained changes to the body. • about safe and unsafe exposure to the sun, and how to reduce the risk of sun damage, including skin cancer. • the importance of sufficient good quality sleep for good health and that a lack of sleep can affect weight, mood and ability to learn. • about dental health and the benefits of good oral hygiene and dental flossing, including regular

	check-ups at the dentist. • about personal hygiene and germs including bacteria, viruses, how they are spread and treated, and the importance of handwashing. • the facts and science relating to allergies, immunisation and vaccination.
Basic first aid	Pupils should know: • how to make a clear and efficient call to emergency services if necessary. • concepts of basic first-aid, for example dealing with common injuries, including head injuries.
Changing adolescent body	Pupils should know: • key facts about puberty and the changing adolescent body, particularly from age 9 through to age 11, including physical and emotional changes. • about menstrual wellbeing including the key facts about the menstrual cycle.

Delivery and teaching strategies National Curriculum subjects: Citizenship, Science, Computing and PE:

106. At Key Stages 1 and 2, the National Curriculum for Science includes teaching about the main external parts of the body and changes to the human body as it grows from birth to old age, including puberty."

Appendix 1: Examples of task strips

1. What is an appliance?

2. How can appliances be powered?

3. Make a list of all the appliances you can see around the classroom and The Hive.

4. Using a Venn diagram, sort your appliances

Scientific Vocabulary		
Anchor 1V	Precision 2V	Boost 3V
Electricity Appliance	Mains powered Battery powered	Device

Appendix 2: Widgit bookmarks