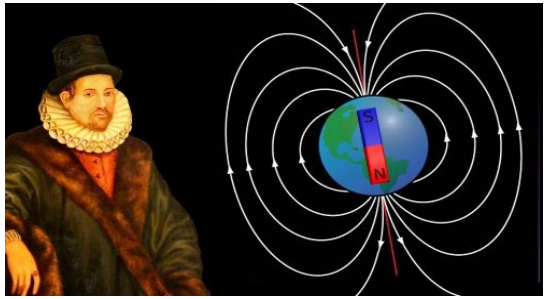


William Gilbert: the world is a magnet!?

PHYSICS

Overview and rationale:

The concept of forces is taught throughout KS2 and it largely begins here with the fascinating topic of magnetism. In 1600, Physician William Gilbert discovered that the Earth was one huge magnet and this provides the back-drop to our children developing a combination of skills and knowledge in investigating how magnets work; this further evokes an awe about how the world works and, indeed, the universe! Developing independence in becoming young scientists is an increasing focal point in KS2 and the children both consolidate and enhance their ability to think critically, observe, predict and carry out experiments, so that they become armed with the expertise to ask questions about the world and then investigate any subject they like. Although it all begins narrowly with attracting and repelling magnetic poles, it is far more reaching than that and a little knowledge is even taught about how magnetism and forces work in space...setting up our young professors for looking at Space in Year 5.

SCIENCE LEARNING STATEMENTS

Area of Learning	Skills and Knowledge
Scientific Enquiry and applying knowledge in context	I can raise my own relevant questions about the world around me.
	I can be given a range of scientific experiences including different types of scientific enquiry.
	I can start to make my own decisions about the most appropriate type of scientific enquiry I might use to answer questions.
	I can set up simple practical enquiries, comparative and fair tests. I can recognise when a simple fair test is necessary and help decide how to set it up.
	I can talk about criteria for grouping, sorting and classifying; use simple keys, with some help.
	I can recognise when and how secondary sources might help me to answer questions that cannot be answered through practical investigations.
	I can make systematic and careful observations. I can help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used.
	I can begin to look for naturally occurring patterns and relationships; begin to decide what data to collect to identify them.
	With help, I can take accurate measurements using standard units, learn how to use a range of equipment, such as data loggers and thermometers, appropriately.
	I can collect and record data from my own observations and measurements in a variety of ways: notes, bar charts, tables. I can use standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse the data.
	With help, I can look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions.
	I can use relevant scientific language to discuss my ideas and communicate my findings in ways that are appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusions.
	With support, I can identify new questions arising from their data, making predictions for new values within or beyond the data they have already collected and finding ways of improving what I have already done.

KEY VOCABULARY

force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole, William Gilbert, physician

NATIONAL CURRICULUM OBJECTIVES

1. compare how things move on different surfaces
2. notice that some forces need contact between two objects, but magnetic forces can act at a distance
3. observe how magnets attract or repel each other and attract some materials and not others
4. compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials
5. describe magnets as having two poles
6. predict whether two magnets will attract or repel each other, depending on which poles are facing

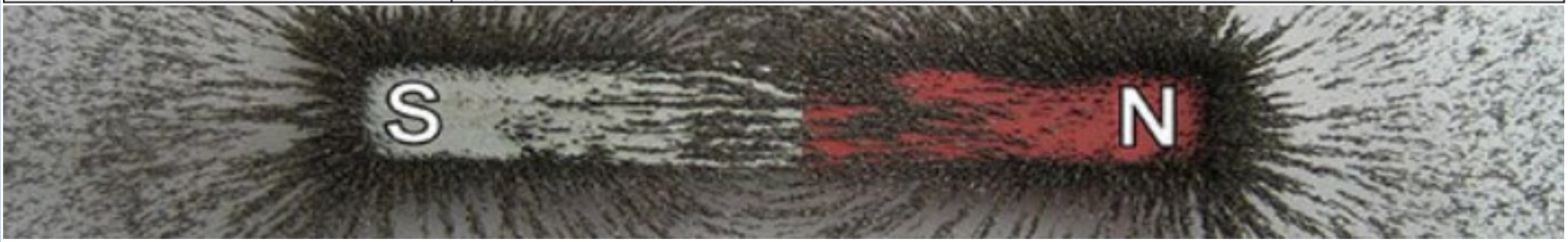
Possible 'higher order' questioning

Remember	What types of magnets do you know about and how do they work?
Understand	Why do magnets attract and repel?
Apply	How are magnets used on Earth to help human beings?
Analyse	Can you compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials?
Evaluate	What would happen if there was no magnetism? What would be the effect on our planet?
Create	Can you invent a new way to use a magnet? Plan and create an experiment to check its effectiveness.

MATHS AND SCIENCE ACROSS THE CURRICULUM – Data Handling and Statistics

Science NC: recording findings using simple scientific language; bar charts and tables

‘CORE’ KNOWLEDGE	‘ADDITIONAL’ KNOWLEDGE
1) I know that William Gilbert was a physician.	a) I know that he discovered that the Earth is one big magnet.
	b) I know that he found this out in 1600.
	c) I know that he invented the electroscope, which can detect an electric charge.
2) I know what a magnetic field is.	a) I know that a magnet can be a piece of metal, ore or stone.
	b) I know that we use magnets in everyday life (fridge, whiteboard, clasp).
	c) I know there are different types of magnets (bar, horseshoe).
3) I know that magnets have a relationship with the North Pole.	a) I know that a magnet has a North and South pole.
	b) I know the Earth is a giant magnet and has a magnetic force field.
	c) I know magnetic North is different to True North (North Pole).
4) I know that magnets can attract and repel.	a) I know that magnets exert a force on other magnets or magnetic materials (push and pull).
	b) I know that the two similar ends of a magnet will repel.
	c) I know that two different ends of a magnet will attract.
5) I know that objects can be magnetic or not magnetic **PLAN/DO: SET UP ENQUIRY: MAGNET TESTS**	a) I know that not all metals are magnetic.
	b) I know other metals such as copper and gold are not magnetic.
	c) I know that certain metals such as iron and steel are magnetic.
6) I know there are different types of forces acting on an object (push, pull)	a) I know magnets exert a force called magnetism, this can be weak or strong.
	b) I know a force is a push or pull acting on an object because of the object's interaction with another object (pushing open a door, push and pull on a swing).
	c) I know that gravity is a type of force that pulls.
7) I know that friction is a force that acts between two surfaces.	a) I know that different surfaces create different amounts of friction.
	b) I know that the amount of friction created by an object moving over the surface depends on the roughness of the surface and the object, and the force between them.
	c) I know forces change the motion of an object. They make it move, speed it up, slow it down or make it stop.



MUSIC

Controlling sounds through Singing

National Curriculum	Additional Skills	Knowledge	Key Vocabulary
- Pupils should be taught to play and perform in solo and ensemble contexts, using their voices and playing musical instruments with increasing, fluency, control and expression - Sing in unison	-Sing with an awareness of being in tune and with expression -Have an awareness of pulse internally when singing/keeping in time)	- Know that singing in a group can be called a choir - Know that a person who the choir or group follow is called a conductor - Know that songs can make you feel different things e.g happy, energetic or sad - Know that singing as part of an ensemble is fun, but that you must listen to each other	Choir, conductor, ensemble, pulse, diaphragm

Controlling sounds by Playing (and Performing)

National Curriculum	Additional Skills	Knowledge	Key Vocabulary
- Play musically with increasing confidence and control: Boom whackers - Play notes on instruments clearly, including steps/leaps in pitch.	- Treat instruments carefully and with respect. - Rehearse and perform their part within the context of the song. - Listen to and follow musical instructions from a leader. - Communicate the meaning of the words and clearly articulate them. - Talk about the best place to be when performing and how to stand or sit. - Record the performance and say how they were feeling, what they were pleased with what they would change and why.	- Know and be able to talk about the instruments used in class - Know and be able to talk about: *How performing is sharing music with other people, an audience - it can be to one person or to each other. *how you need to know and have planned everything that will be performed. *How lyrics must be sung or rapped clearly and with confidence *How a performance can be a special occasion and involve an audience including of people you don't know *How a performance is planned and different for each occasion *How it involves communicating feelings, thoughts and ideas about the song/music	names of instruments being played, audience, performance, composition, appraise, polish, refine, feedback

Creating and developing musical ideas (Improvisation and Composing)

National Curriculum	Additional Skills	Knowledge	Key Vocabulary
- Develop an understanding of musical composition, organising and manipulating ideas within musical structures and reproducing sounds from aural memory.	- Plan and create a section of music that can be performed within the context of the song. - Talk about how it was created. - Listen to and reflect upon the developing composition and make musical decisions about pulse, rhythm, dynamics and tempo. - Record the composition in any way appropriate that recognises the connection between sound and symbol (e.g. graphic/pictorial notation).	- Know and be able to talk about: *A composition: music that is created by you and kept in some way. It's like writing a story. It can be played or performed again to your friends. *Different ways of recording compositions (letter names, symbols, audio etc.)	names of instruments being played, audience, performance, composition, pulse, rhythm, texture, dynamics, compose, beats, louder, softer, boom whackers Notation: tap a beat, rhythm, tap a rhythm, pause, rest symbol

Responding and reviewing (Appraising)

National Curriculum	Additional Skills	Knowledge	Key Vocabulary
- Listen with attention to detail. - Listen carefully and recognise high and low phrases. - Use musical words to describe a piece of music and compositions. - Use musical words to describe what they like and don't like about a musical piece. - Use these words to identify where music works well/needs improving.	- Confidently identify and move to the pulse. - Think about what the words of a song mean. - Discuss how the song makes them feel. - Listen carefully and respectfully to other people's thoughts about the music. - Copy Back – Listen and sing back - Using instruments, listen and play your own answer using one note. - Internalise the pulse in music. - Begin to use musical dimensions vocabulary to describe music – duration, timbre, pitch, dynamics, tempo, texture, structure.	- Know 4 songs from memory and who sang them or wrote them (across the year) - Know the style of the 4 songs. - Choose one song and be able to talk about: *Its lyrics: what the song is about *Any musical dimensions featured in the song, and where they are used (texture, dynamics, tempo, rhythm and pitch) *Identify the main sections of the song (introduction, verse, chorus etc.) *Name some of the instruments they heard in the song	Lyrics, chorus, verse, musical dimensions – duration, timbre, pitch, dynamics, tempo, texture, structure, rhythm, phrase, pulse, emotions, feelings, reasons, describe, instrument families e.g. woodwind, brass, strings, sections, dance music, electronic

Listening and applying knowledge and understanding (Theory)

National Curriculum	Additional Skills	Knowledge	Key Vocabulary
- Listen with attention to detail and recall sounds with increasing aural memory - Create repeated patterns with different instruments. - Improve work, explaining how it has been improved. - Recognise the work of at least one famous composer.	-Play with a sound-then symbol approach. -Use silence for effect and know symbol for a rest (duration).	- Know how to find and demonstrate the pulse. - Know the difference between pulse and rhythm. - Know how pulse, rhythm and pitch work together to create a song. - Know that every piece of music has a pulse/steady beat. - Know the difference between a musical question and an answer. - Know number of beats in a minim, crotchet, quaver and semibreve and recognise symbols (duration). - Describe different purposes of music in history/other cultures.	Repeated patterns, composer, steady beat, lyrics, chorus, verse, musical dimensions – duration, timbre, pitch, dynamics, tempo, texture, structure, rhythm, phrase, pulse, emotions, feelings, reasons, describe, instrument families e.g woodwind, brass, strings, sections

Stimulus - Composers/Musicians/Artists/Styles | ***Magic Magnetism (You Tube)*** | **Genre of the half term – *Dance and electronic***