



Darwin, Evolution and Inheritance

BIOLOGY



Overview and rationale:

Extracts and summaries of Darwin's Theory of Evolution provides the backbone to another fascinating primary science topic. It looks at how animals have evolved through inherited characteristics and how the fittest have thrived and survived as they've adapted to the ever-changing environments on Earth. The children are reminded of the learning they did in Year 3 on fossils and revisit and build on their understanding of how fossils provide us with evidence of living things that lived millions of years ago and support the theory of evolution. Again, Suzanne Collins', 'The Hunger Games' provides a contextual backdrop to look at how animals adapt to their environment and why Darwin deemed it to be a case of 'survival of the fittest'!

SCIENCE LEARNING STATEMENTS

| Area of Learning | Knowledge and Skills |
|--|--|
| Scientific Enquiry and applying knowledge in context | I can use my science experience to explore ideas and raise relevant questions of different kinds. |
| | I talk about how different scientific ideas have developed over time giving specific examples. |
| | I select and plan the most appropriate type of scientific enquiry I might use to answer questions and give justifications. |
| | I recognise when and how to set up comparative and fair tests. I explain which variables need to be controlled and why. |
| | I use and develop more complex keys and other information records to identify, classify and describe living things and materials. Identify patterns that might be found in natural environments |
| | I can recognise which secondary sources will be most useful to research my ideas; separate opinion from fact and give justifications for their reasoning |
| | I make their own decisions about what observations to make, what measurements to use and how long to make them for. |
| | I can look for causal relationships in my data and identify evidence that refutes or supports my ideas. |
| | I choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately. I can take repeat measurements where appropriate and give justifications for their choice. |
| | I can decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs, use multiple methods where appropriate. |
| I can identify scientific evidence that has been used to support or refute ideas or arguments, begin to form opinions about validity of these. | |

MATHS AND SCIENCE ACROSS THE CURRICULUM – Data Handling and Statistics

Science NC: recording data and results of increasing complexity using scientific diagrams and labels, carrol and venn diagrams and classification keys

KEY VOCABULARY

offspring, sexual reproduction, reproduce, vary, characteristics, suited, adapted/adaptation, environment, evolve, species, inherited/inheritance, species, fossils, Charles Darwin, 'The Theory of Evolution'

NATIONAL CURRICULUM OBJECTIVES

1. recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
2. recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
3. identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

Possible Enrichment activities

Smarties experiment to show DNA passing and why plants animals look different but have the same genetic makeup

| 'CORE' KNOWLEDGE | | 'ADDITIONAL' KNOWLEDGE | |
|---|--|------------------------|--|
| 1) I know that all living things reproduce and that their offspring are of the same kind (features inherited from parents). | a) I understand offspring are not identical to their parents | | |
| | b) I can identify and discuss family similarities and differences over time - twins in families, hair colour, face shapes, height (recessive genes). | | |
| | c) I know that dominant genes can have positive and negative implications on offspring (e.g speed or medical conditions). | | |
| 2) I know that plants and animals have characteristics suited to their environment. | a) I can list examples of how specific plants and animals are suited to their environment. | | |
| | b) I understand when the environment changes, species change with it for survival. | | |
| | c) I understand that over time, inherited characteristics become more dominant within populations. | | |
| 3) I understand the term evolution and that it means species evolve over time to create new species adapted to their current environment. REVIEW: EVALUATE: Egg strength | a) I can design a new plant or animal to live in a particular environment or habitat. | | |
| | b) I understand fossils give us evidence that different plant and animals lived on our planet. | | |
| | c) I know that new species can be created by artificial cross-breeding in plants and animals. | | |
| 4) I know that Fossils give us evidence of animals and plants that lived on Earth millions of years ago. REVIEW: EVALUATE: Fossil habitats | a) I know that fossils provide first-hand evidence of the evolution process. | | |
| | b) I know that Charles Darwin and Alfred Wallace used this evidence to produce theories based on animal and plant evolution. | | |
| | c) I know that enhancements in DNA testing have enabled further evidence of links between species. | | |
| 5) I know that studies of animals and plants have shown changes, within recent history. | a) I know that Peppered Moths were studied, by RS Edleston, during the Industrial Revolution – a time of huge change towards large factories, burning coal for power and creating thick, black smoke. | | |
| | b) I know that in 1848 a single sighting of a dark peppered moth was recorded by Edleston in central Manchester. Before that he recorded that they were all light grey. | | |
| | c) I know that by 1900 (just 50 years later) the dark moth population was as high as 98% in <u>a number of</u> cities. It was found that this genetic change was passed from adults to young, as they were camouflaged in the dark smoke, and lasted longer than the light grey moths. | | |
| 6) I know that human beings have a massive impact on the planet, our environments and plant and animal species could become extinct if something isn't done about it. | a) I know that carbon dioxide is released by burning fossil fuels, and by animals used in mass farming. Plants absorb and store carbon dioxide across our planet. Increasing CO2 and cutting down rainforests mean an increase in climate change and the planet is warming over time. | | |
| | b) I know that changes in average temperature, wind patterns, and ocean currents mean that some parts of the world will get hotter and some will get colder. Many areas will suffer colder lows and hotter highs. | | |
| | c) I know that changes in climate will affect the habitats where plants and animals live. Many species of plants and animals will not be able to adapt in time and will become extinct. | | |

MUSIC

Controlling sounds through Singing

| National Curriculum | Additional Skills | Knowledge | Key Vocabulary |
|---|---|---|---|
| <ul style="list-style-type: none"> -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 - Maintain harmony in a song, singing confidently and accurately. | <ul style="list-style-type: none"> - Sing an individual role in a group performance, from memory or by reading notation, singing solos, accompaniments or directing a group. - Evaluate different types of singing from different cultures and heritages and discuss their preferences. - Sing in unison. - Demonstrate a good singing posture. - Follow a leader when singing. - Experience rapping and solo singing. - Listen to each other and be aware of how you fit into the group. - Sing with awareness of being 'in tune'. | <ul style="list-style-type: none"> - Know and confidently sing 5 songs (over the year) and their parts from memory, and to sing them with a strong internal pulse. - Know about the style of the songs so you can represent the feeling and context to your audience - Choose a song and be able to talk about: <ul style="list-style-type: none"> *Its main features *Singing in unison, the solo, lead vocal, backing vocals or rapping taking place *What the song is about and the meaning of the lyrics - Know and explain the importance of warming up your voice | Notation, clear diction, pulse, vocals, posture, conductor, rounds, clarity of projection |

Controlling sounds by Playing (and Performing)

| National Curriculum | Additional Skills | Knowledge | Key Vocabulary |
|---|--|---|--|
| <ul style="list-style-type: none"> - Play and perform in solo and ensemble contexts, playing musical instruments with increasing accuracy, fluency, control and expression. Keyboards -Play and perform music across a range of historical periods, genres, styles and traditions, including the works of the great composers and musicians - Play parts from memory - Take the lead in a performance | <ul style="list-style-type: none"> - Play a musical instrument with the correct technique within the context of the song. - Rehearse and perform their part within the context of the song. - Listen to and follow musical instructions from a leader. - Lead a rehearsal session. - Communicate the meaning of the words and clearly articulate them. - Record the performance and compare it to a previous performance. - Discuss and talk musically about it – "What went well?" and "It would have been even better if...?" - Maintain own accurately with awareness of what others are playing. - Improvise using 5 notes of the pentatonic scale. | <ul style="list-style-type: none"> - Know and be able to talk about: <ul style="list-style-type: none"> *Different ways of writing music down – e.g. staff notation, symbols *The notes C, D, E, F, G, A, B + C on the treble stave *The instruments they might play or be played in a band or orchestra or by their friends *Performing is sharing music with an audience *Everything that will be performed must be planned and learned and is different for each occasion *How you must sing or rap the words clearly and play with confidence *How a performance can be a special occasion and involve an audience including of people you don't know *A performance involves communicating ideas, thoughts and feelings about the song/music | Names of notes being played, names of instruments being played, quaver, minim, semibreve, rest, appraise |

Creating and developing musical ideas (Improvisation and Composing)

| National Curriculum | Additional Skills | Knowledge | Key Vocabulary |
|---|--|---|---|
| <ul style="list-style-type: none"> - Use musical notations. - Use a variety of different musical devices in composition (including melody, rhythms and chords). | <ul style="list-style-type: none"> - Create simple melodies using up to five different notes and simple rhythms that work musically with the style of the song. - Listen to and reflect upon the developing composition and make musical decisions about how the melody connects with the song. - Record the composition in any way appropriate that recognises the connection between sound and symbol (e.g. graphic/pictorial notation). - Compose and perform melodies using five or more notes. - Show confidence, thoughtfulness and imagination in selecting sounds and structures to convey an idea. | <ul style="list-style-type: none"> Know and be able to talk about: <ul style="list-style-type: none"> *Improvisation - is making up your own tunes on the spot. When someone improvises, they make up their own tune that has never been heard before. It is not written down and belongs to them. - Know that using one, two or three notes confidently is better than using five - Know and be able to talk about: <ul style="list-style-type: none"> *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. *A composition has pulse, rhythm and pitch that work together and are shaped by tempo, dynamics, texture and structure -Notation: recognise the connection between sound and symbol - Create music reflecting given intentions and record using standard notation. | Names of notes being played, names of instruments being played, quaver, minim, semibreve, rest, improvisation, composition, tempo, dynamics, timbre, texture, pulse, rhythm, combinations, pitch, layering sounds, musical elements, interrelated dimensions of music, Notation: pause, rest symbol, pentatonic scale, five notes, C,D,E,F,G,A,B, group of notes |

Responding and reviewing (Appraising)

| National Curriculum | Additional Skills | Knowledge | Key Vocabulary |
|---|---|--|---|
| <ul style="list-style-type: none"> - Appreciate and understand a wide range of high-quality live and recorded music drawn from different traditions and from great composers and musicians - Accurately recall a part of the music listened to. - The historical context of the songs. What else was going on at this time, musically and historically? - Evaluate how the venue, occasion and purpose affects the way a piece of music is created. | <ul style="list-style-type: none"> - Identify and move to the pulse with ease. - Think about the message of songs. - Compare two songs in the same style, talking about what stands out musically in each of them, their similarities and differences. - Listen carefully and respectfully to other people's thoughts about the music. - Use musical vocabulary confidently to describe music. - Talk about the musical dimensions working together in the songs. - Talk about the music and how it makes you feel, using musical language to describe the music. - Work out how harmonies are used. - Use the knowledge of how lyrics reflect cultural context and have social meaning to enhance own compositions. - Refine and improve own/others' work. | <ul style="list-style-type: none"> - Know five songs from memory (over the year), who sang or wrote them, when they were written and why? - Know the style of the songs and name other songs in those styles. - Choose three or four other songs and be able to talk about: <ul style="list-style-type: none"> *The style indicators of the songs (musical characteristics that give the songs their style) *The lyrics: what the songs are about *Any musical dimensions featured in the songs and where they are used (texture, dynamics, tempo, rhythm, pitch and timbre) *Identify the structure of the songs (intro, verse, chorus etc.) *Name some of the instruments used in the songs - Know and talk about that fact that we each have a musical Identity - Know how the other musical dimensions are sprinkled through songs and pieces of music. | Musical dimensions, duration, timbre, pitch, dynamics, tempo, texture, structure, rhythm, melody, harmony, staccato, legato, crescendo, diminuendo, musical arrangements, percussion, repeating refrain |

Listening and applying knowledge and understanding (Theory)

| National Curriculum | Additional Skills | Knowledge | Key Vocabulary |
|---|---|---|---|
| <ul style="list-style-type: none"> - Use and understand musical notations - Develop an understanding of the history of music - Listen to, review and evaluate music across a range of historical periods, genres, styles and traditions, including the works of the great composers and musicians - Compare and contrast the impact that different composers from different times have had on people of that time. - Analyse features within different pieces of music | <ul style="list-style-type: none"> - Copy back rhythms based on the words of the main song, that include syncopation/off beat -Lead the class by inventing rhythms for others to copy back - Use increased aural memory to recall sounds accurately. | <ul style="list-style-type: none"> - Know and be able to talk about: <ul style="list-style-type: none"> *How pulse, rhythm, pitch, tempo, dynamics, texture and structure work together to create a song or music *How to keep the internal pulse - Musical Leadership: create musical ideas for the group to copy or respond to - Use knowledge of musical dimensions to know how to best combine them. - Describe different purposes of music in history/other cultures. | Compare contrast names of famous composers, respond, analyse, notation, musical dimensions, duration, timbre, pitch, dynamics, tempo, texture, structure, rhythm, melody, harmony, staccato, legato, crescendo, diminuendo, musical arrangements, percussion, repeating refrain |

Composers/Musicians/Artists/Styles

Evolution - <https://www.youtube.com/watch?v=KEh65ckUvD4>

Genre of the half term – Musical Theatre

| Possible 'higher order' questioning | | School Value | Topic relevance: How/when/where/why is it needed? |
|---|--|-----------------------|---|
| Remember | When were the earliest human beings on the planet and how were they different to us now? | Resilience | - Living organisms throughout history have shown incredible resilience as they've adapted and evolved to survive, as is illustrated through Darwin's Survival of the Fittest. |
| Understand | How has the penguin evolved over time? Why are penguins suited to their environment? | | |
| Apply | Name an animal you have learnt about. How has it adapted to its environment? | Respect | - Environments and habitats can change greatly, some naturally and some due to human impact...we must respect our world and raise awareness of the need to look after it, preserving the many life forms that have adapted and evolved through millions of years. |
| Analyse | The Dodo became extinct many years ago. What does this tell us about its evolution? | | |
| Evaluate | What effect has 'survival of the fittest' had on the human race? | Responsibility | - It is our responsibility to look after the world and thus its countless varied species, and UPS do so by supporting the WWF through sponsoring an Amur Leopard. |
| Create | Think of an animal alive today. Can you give it some added characteristics that will enable it to climb the food chain and become more dominant in its surroundings? How will this affect its further evolution? | | |
| Pride | | | |
| - We should be proud of our beautiful world and do everything we can to look after every one of its inhabitants and their habitats. | | | |

ART AND DESIGN

Exploring and Developing

| | |
|---------------------------------------|---|
| Exploring and developing ideas | Select and record from first-hand observation, experience and imagination and explore ideas for different purposes, including the use of ICT. |
| | Question and make thoughtful observations about starting points and select ideas to use in their work. |
| | Explore the roles and purposes of artists, craftspeople and designers working in different times and cultures. |
| Evaluating and developing work | Compare ideas, methods and approaches in their own and others' work and say what they think and feel about them. |
| | Adapt their work according to their views and describe how they might develop it further. |
| | Annotate work in sketchbook. |

3d Form

| National Curriculum | Additional Skills | Knowledge | Key Vocabulary |
|--|--|--|---|
| <i>-Plan, design, make and adapt models. (clay/papier Mache/woodwork/choice for purpose)</i> | <ul style="list-style-type: none"> -Use a sketchbook to plan how to join parts of the sculpture. -Recognise sculptural forms in the environment: furniture, buildings -Create models on a range of scales | <ul style="list-style-type: none"> -Know that a sketchbook can be used to collect and record visual information from different sources. -Know that work can be finished in different ways: glaze, paint, polish -Know that work can be constructed around armatures (wire frame) or over constructed foundations using materials such as Modroc. -Know how to work in a safe and organised way | Modroc, man-made material, plaster, bandage, smoother, better finish, smoothing, joining, finishing, manipulate, form irreversible, texture, detail, twisting, rolling, combine, combination, armature, foundation, glaze, polish |

Artist/Style/Activities

Will Kurtz: Animal art – adaptation (Modroc/plaster of paris)