

Key Stage 3 & Key Stage 4

## ANIMAL MOVEMENT



### General points about this talk:

Talks generally last 30-40 minutes and take place out in the Park in all weathers; please ensure that your pupils wear suitable clothes for the conditions.

Talks are usually led by the keepers and may vary between different staff members. We will adapt this talk according to the age of students.

We endeavour to keep group sizes fairly small as some of this talk may take place in busy areas of the Park. To this end most groups will be kept below 20 students.

The normal meeting point for this talk will be at our penguin enclosure in the Walled Garden and will finish at the camel enclosure.

### What we will cover in the talk:

Animals across the globe have developed many different forms of movement to adapt to different environments and to overcome different challenges they face. These include running, jumping, swimming, flying and hopping. Animals have evolved into a huge variety of different shapes and sizes that have allowed them to develop these different forms of movement; for example, the long arms of some primates that make them look very strange on the ground allow them to move through the trees with ease, or the streamlined body shape of seals that makes moving on land a real struggle but allows them to glide through the water reaching speeds of up to 15 mph.

In this talk we look at different forms of movement exhibited by some of the animals at the Park and discuss the anatomical adaptations they have in order to move in these ways, as well as the evolution of bipedalism in humans. We will aim to look at a variety of different movements from a selection of different animals and will look at the skeletal adaptations as well as the physical ones we can see.

### Animals we may include:

We cannot guarantee which animals you will see during your talk but you will visit at least four animals which may include some of the following:

Humboldt penguin	Aldabran giant tortoise
Parma wallaby	Bactrian camel



Emu	Siamang gibbon
Black & white colobus	

Areas of the new National Curriculum that this talk addresses:

## KS3

### Biology

The Skeletal and Muscular System:

- The structure and functions of the human skeleton, to include support, protection, movement and making blood cells
- Biomechanics – the interaction between skeleton and muscles, including the measurement of force exerted by different muscles
- The function of muscles and examples of antagonistic muscles

Genetics and Evolution:

- The variation between species and between individuals of the same species meaning some organisms compete more successfully, which can drive natural selection
- Changes in the environment which may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction

### Art

- To use a range of techniques to record their observations in sketchbooks, journals and other media as a basis for exploring their ideas
- to analyse and evaluate their own work, and that of others, in order to strengthen the visual impact or applications of their work
- About the history of art, craft, design and architecture, including periods, styles and major movements from ancient times to present day



# KS4

## Biology

Coordination and Control:

- The principles of nervous coordination and control
- The relationship between the structure and function

Evolution, Inheritance and Variation:

- How the genome, and its interaction with the environment, influence the development of the phenotype of an organism
- The process of natural selection leading to evolution
- The evidence for evolution
- Developments in biology affecting classification

## Art

Knowledge and Understanding:

- GCSE specifications in art and design must require students to know and understand how sources inspire the development of ideas. For example, drawing on:
  - the work and approaches of artists, craftspeople or designers from contemporary and/or historical contexts, periods, societies and cultures
  - the ways in which meanings, ideas and intentions can be communicated through visual and tactile language, using formal elements, including:
    - Colour
    - Line
    - Form
    - Tone
    - Texture
  - the different purposes, intentions and functions of art, craft and design in a variety of contexts and as appropriate to students' own work

Skills:

- All students engaging with GCSE art and design specifications must demonstrate the ability to:
  - develop their ideas through investigations informed by selecting and critically analysing sources
  - apply an understanding of relevant practices in the creative and cultural industries to their work
  - refine their ideas as work progresses through experimenting with media, materials, techniques and processes



- record their ideas, observations, insights and independent judgements, visually and through written annotation, using appropriate specialist vocabulary, as work progresses

## Drama

### Knowledge and Understanding:

- GCSE specifications in drama must require students, whether making, performing or responding to drama, to know and understand the following:
  - Characteristics of performance text(s) and dramatic work(s), including:
    - Structure
    - Character
    - Form and style

### Skills:

- GCSE specifications in drama must require students to acquire, develop and apply skills in:
  - Creating and communicating meaning and realising artistic intention, in a live theatre context for an audience, through:
    - Research
    - Developing ideas



## Areas of GCSE Exam Boards that this talk addresses:

# AQA

## Biology

### 4.6.2.1 Variation:

- Students should be able to describe simply how the genome and its interaction with the environment influence the development of the phenotype of an organism.
- Students should be able to:
  - state that there is usually extensive genetic variation within a population of a species
  - recall that all variants arise from mutations and that: most have no effect on the phenotype; some influence phenotype; very few determine phenotype.

### 4.6.2.2 Evolution:

- Students should be able to describe evolution as a change in the inherited characteristics of a population over time through a process of natural selection which may result in the formation of a new species.
- Students should be able to explain how evolution occurs through natural selection of variants that give rise to phenotypes best suited to their environment.

### 4.6.3.1 Theory of Evolution:

- Charles Darwin, as a result of observations on a round the world expedition, backed by years of experimentation and discussion and linked to developing knowledge of geology and fossils, proposed the theory of evolution by natural selection.
- Individual organisms within a particular species show a wide range of variation for a characteristic
- Individuals with characteristics most suited to the environment are more likely to survive to breed successfully
- The characteristics that have enabled these individuals to survive are then passed on to the next generation.

### 4.6.3.2 Speciation:

- Students should be able to:
  - describe the work of Darwin and Wallace in the development of the theory of evolution by natural selection
  - explain the impact of these ideas on biology
- Students should be able to describe the steps which give rise to new species.



#### 4.6.3.4 Evidence for Evolution:

- Students should be able to describe the evidence for evolution

#### 4.7.1.4 Adaptations:

- Students should be able to explain how organisms are adapted to live in their natural environment, given appropriate information

### Art

#### 3.1 Knowledge and Understanding:

- Students should be introduced to a variety of learning experiences, which encourage the development of skills through the use of appropriate media, processes, techniques and technologies relevant to their chosen title(s) and related area(s) of study.
- Students should show knowledge, understanding and skills in the development of their personal work informed by first-hand experiences and appropriate secondary sources.
- Students should be encouraged to progressively develop their own strengths and interests in the subject and, increasingly, follow their own lines of enquiry.
- Students must develop the knowledge and understanding as specified below through sustained practical application of skills to realise personal intentions.
- Students must learn how sources inspire the development of ideas. For example, drawing on:
  - the work and approaches of artists, craftspeople or designers from contemporary and/or historical contexts, periods, societies and cultures
  - contemporary and/or historical environments, situations or issues
  - other relevant sources researched by the student in the chosen qualification title and area(s) of study
  - the ways in which meanings, ideas and intentions can be communicated through visual and tactile language, using formal elements, including:
    - colour
    - line
    - form
    - shape
    - tone
    - texture
  - the characteristics, properties and effects of using different media, materials, techniques and processes, and the ways in which they can be used in relation to students' own creative intentions and chosen area(s) of study
  - the different purposes, intentions and functions of art, craft and design in a variety of contexts and as appropriate to students' own work.



### 3.2 Skills:

- Students develop and apply the skills listed below to realise personal intentions relevant to their chosen title(s) and related area(s) of study.
- Students must demonstrate the ability to:
  - develop their ideas through investigations informed by selecting and critically analysing sources
  - apply an understanding of relevant practices in the creative and cultural industries to their work
  - refine their ideas as work progresses through experimenting with media, materials, techniques and processes
  - record their ideas, observations, insights and independent judgements, visually and through written annotation, using appropriate specialist vocabulary, as work progresses
  - use visual language critically as appropriate to their own creative intentions and chosen area(s) of study through effective and safe of
    - media
    - materials
    - techniques
    - processes
    - technologies
  - use drawing skills for different needs and purposes, appropriate to context
  - realise personal intentions through sustained application of the creative process

## Drama

### 3.1.1 Knowledge and Understanding:

- Characteristics of performance text(s) and dramatic work(s)
  - Genre
  - Structure
  - Character
  - Form
  - Style
- How meaning is interpreted and communicated
  - Performers' physical interpretation of character such as build, age, height, facial features, movement, posture, gesture, facial expression



# OCR

## Biology

### Gateway

#### Inheritance:

- B5.1C – Describe that the genome, and its interaction with the environment, influence the development of the phenotype of an organism
- B5.1D – Recall that all variants arise from mutations, and that most have no effect on the phenotype, some influence phenotype and a very few determine phenotype

#### Natural Selection and Evolution:

- B5.2B - describe the impact of developments in biology on classification systems
- B5.2C - explain how evolution occurs through the natural selection of variants that have given rise to phenotypes best suited to their environment
- B5.2D - describe evolution as a change in the inherited characteristics of a population over time, through a process of natural selection, which may result in the formation of new species
- B5.2E - describe the evidence for evolution
- B5.2F - describe the work of Darwin and Wallace in the development of the theory of evolution by natural selection and explain the impact of these ideas on modern biology

### Twenty First Century

#### How was the theory of evolution developed?:

- B6.1.2 – Recall that genetic variants arise from mutations, and that most have no effect on the phenotype, some influence phenotype and a very few determine phenotype
- B6.1.3 - Explain how evolution occurs through natural selection of variants that give rise to phenotypes better suited to their environment
- B6.1.5 - Describe evolution as a change in the inherited characteristics of a population over a number of generations through a process of natural selection which may result in the formation of new species
- B6.1.8 - Describe the work of Darwin and Wallace in the development of the theory of evolution by natural selection

#### How does our understanding of biology help us classify the diversity of organisms on Earth?:

- B6.3.1 - Describe the impact of developments in biology on classification systems, including the use of DNA analysis to classify organisms

## Art

#### Core Skills:

- All learners engaging with these specifications must demonstrate the ability to:
  - develop their ideas through investigations informed by selecting and critically analysing sources
  - apply an understanding of relevant practices in the creative and cultural industries to their work



- refine their ideas as work progresses through experimenting with media, materials, techniques and processes
- record their ideas, observations, insights and independent judgements, visually and through written annotation, using appropriate specialist vocabulary, as work progresses
- use visual language critically as appropriate to their own creative intentions and chosen area(s) of study through effective and safe use of:
  - media
  - materials
  - techniques
  - processes
  - technologies
- use drawing skills for different needs and purposes, appropriate to the context in which it is used
- realise personal intentions through the sustained application of the creative process.

Core Knowledge and Understanding:

- Learners are required to show knowledge and understanding through practical skills in the development of ideas. This may include:
  - the work and approaches of artists, craftspeople or designers from contemporary and/or historical contexts, periods, societies and cultures
  - contemporary and/or historical environments, situations or issues
  - other relevant sources researched by the learner in the chosen qualification title and area(s) of study
  - the ways in which meanings, ideas and intentions can be communicated through visual, sensory and tactile language, using formal elements, including:
    - colour
    - line
    - form
    - tone
    - texture
  - the characteristics, properties and effects of using different media, materials, techniques and processes, and the ways in which they can be used in relation to learners' own creative intentions and chosen area(s) of study
  - the different purposes, intentions and functions of art, craft and design in a variety of contexts and as appropriate to learners' own work.



# EDEXCEL

## Biology

Natural Selection and genetic modification:

- 4.2 - Explain Darwin's theory of evolution by natural selection
- 4.4 - Describe the evidence for human evolution, based on fossils

## Art

Knowledge and Understanding:

- Students will be required to know and understand:
  - how sources inspire the development of ideas, drawing on:
    - the work and approaches of artists, craftspeople or designers from contemporary and/or historical contexts, periods, societies and cultures
    - contemporary and/or historical environments, situations or issues
    - other relevant sources researched by the student in the chosen qualification title and area(s) of study
  - the ways in which meanings, ideas and intentions can be communicated through visual and tactile language, using formal elements, including:
    - colour
    - line
    - form
    - tone
    - texture
  - the characteristics, properties and effects of using different media, materials, techniques and processes, and the ways in which they can be used in relation to students' own creative intentions and chosen area(s) of study
  - the different purposes, intentions and functions of art, craft and design in a variety of contexts and as appropriate to students' own work.

Skills:

Students will be required to demonstrate the ability to:

- develop their ideas through investigations informed by selecting and critically analysing sources
- apply an understanding of relevant practices in the creative and cultural industries to their work
- refine their ideas as work progresses through experimenting with media, materials, techniques and processes
- record their ideas, observations, insights and independent judgements, visually and through written annotation, using appropriate specialist vocabulary, as work progresses



- use visual language critically as appropriate to their own creative intentions and chosen area(s) of study through effective and safe use of:
  - media
  - materials
  - techniques
  - processes
  - technologies
- use drawing skills for different needs and purposes, appropriate to the context
- realise personal intentions through the sustained application of the creative process.

## Drama

Component 1 – Devising (Creating and developing a devised piece from stimuli):

- Students are required to know and understand the following:
  - characteristics of dramatic work including genre, structure, character, form, style, and language
  - All students must explore the processes by which devised performance is developed and demonstrate the following skills to create and communicate meaning through:
    - Research
    - developing ideas and intentions
    -

Component 1 – Devising (Group-devised performances/ design realisations):

- Performers must develop skills in:
  - physicality: use of space, gesture, stillness and stance
  - ability to combine and apply vocal and physical skills
  - characterization

Component 1 – Devising (Analysing and evaluating the creative process and group-devised performance):

- Students must analyse and evaluate:
  - ideas explored and research undertaken
  - content, genre, structure, character, form, style, and language
  -

Component 2 – Performance form text (Performance roles):

- Performers must develop skills in:
  - how meaning is communicated and interpreted through:
    - the use of voice, physical and non-verbal techniques (such as facial expression and gesture)
    - Characterisation
    - physicality: use of space, gesture, facial expression, stillness and stance communicating creative intent to audience

