

# Biology Learning Journey

YEAR  
11

YEAR  
10

YEAR  
9

YEAR  
8

YEAR  
7

welcome

How can biodiversity on our planet be conserved?



How can indicator species be used to assess pollution?



How are water, carbon and nitrogen cycled through ecosystems?

How can biotic and abiotic factors affect communities?

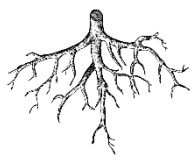


How does the body transport substances into and out of the body?

How does the body control temperature and water content?

What are the roles of the different hormones in the human body?

How do plant roots use diffusion, osmosis and active transport?



How is a leaf adapted for photosynthesis?



Why are antibiotics useful?



How can pathogens be spread?

Which pathogens cause some common diseases?



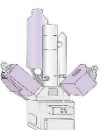
What are the benefits and risks of selective breeding and GMOs?



How are specialised cells adapted to their functions?



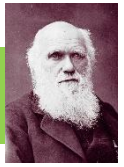
What do the sub-cellular structures in animal and plant cells do?



What have electron microscopes allowed us to do?

What units are used for very small scales?

What is a prokaryotic and a eukaryotic cell?



Why are enzymes important to life?

What is the function of the active site in an enzyme?

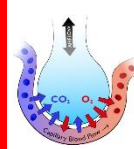
What is the difference between diffusion and osmosis?

Why is cell differentiation important in animals?

What are stem cells and how are they used in medicine?



How are gases exchanged in the lungs? How do we detect it?



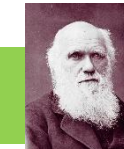
How does training change the body's systems?



How do we use statistics and probability?



What is Darwin's Theory of Evolution?



How do we change numbers from and to standard form?

$4.716 \times 10^3$

Which tests are used to identify the main substances in food?

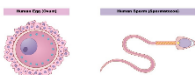


How can mutations cause variation?

How did Gregor Mendel help scientists understand inheritance?



Why is meiosis necessary for sexual reproduction?



How does our nervous system help us to respond to stimuli?



What are the main parts of the brain and what do they do? How do we know?

What is mitosis and why is it important?

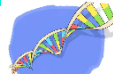
How do plants grow? What specialized cells do plants have?

How do eyes allow us to see? How can we correct eye problems?



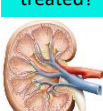
How does a reflex arc help to protect the body?

What is the structure of DNA and what is its function?



How can type 1 and type 2 diabetes be controlled?

How can kidney failure be treated?



What are the components of the circulatory system? How are they adapted to their functions?

What affects the rate of respiration in the body?



What factors affect photosynthesis?

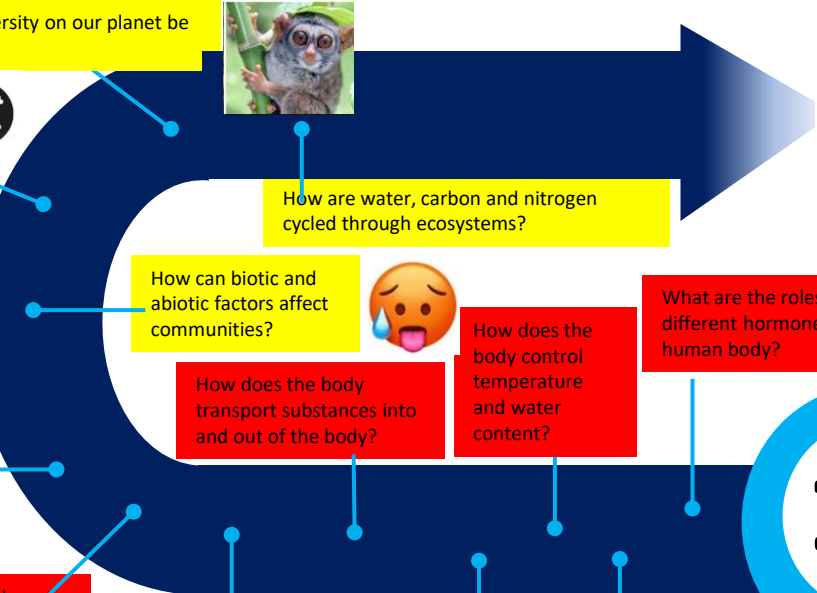


How is Darwin's theory of natural selection supported by evidence?

What are the names of some plant hormones and what is their role in the plant?

How do we use genetic diagrams to explain inheritance?

What is the structure of DNA and what is its function?



'Biology is the most powerful technology ever created.' Arvind Gupta

- Biology Learning Journey in Units from Exploring Science:

#### Year 7

- 7A Cells, Tissues and Organ Systems
- 7B Sexual Reproduction in Animals
- 7C Muscles and Bones
- 7D Ecosystems

#### Year 8

- 8A Food and Nutrition + 8Da Unicellular or Multicellular, 8Db Microscopic Fungi, 8Dd Protocists, 8De Decomposers and Carbon  
(Some of this content will need to be done as recorded lessons to give us time here).
- 8B Plants and Their Reproduction +9Ba Reactions in Plants, 9Bb Plant Adaptations, 9Bc Plant Products
- 8C Breathing and Respiration
- 9A Genetics and Evolution (Leave out 9Ad?)

#### Year 9

- SB1 Key concepts – Cells/ Nutrition/ Enzymes/Osmosis
- SB2 Cells and Control (Growth/ The Brain and Nervous System)

#### Year 10

- SB3 Genetics
- SB4 Natural Selection and Genetic Modification
- SB5 Health Disease and Medicine
- SB6 Plant Structure and Functions

#### Year 11

- SB7 Animal Coordination Control and Homeostasis
- SB8 Exchange and Transport in Animals
- SB9 Animal Coordination Control and Homeostasis.

# Biology – Big Ideas

- **BIG IDEA: THE CELLULAR BASIS OF LIFE** - Organisms are made of one or more cells, which need a supply of energy and molecules to carry out life processes.
- **BIG IDEA: HEREDITY AND LIFE CYCLES** - Genetic information is passed from each generation to the next; this information and the environment affect the features, growth and development of organisms.
- **BIG IDEA: ORGANISMS AND THEIR ENVIRONMENTS** - All organisms, including humans, depend on, interact with and affect the environments in which they live and other organisms that live there.
- **BIG IDEA: VARIATION, ADAPTATION AND EVOLUTION** - Differences between organisms cause species to evolve by natural selection of better adapted individuals. The great diversity of organisms is the result of evolution.
- **BIG IDEA: HEALTH AND DISEASE** - Organisms must stay in good health to survive and thrive; the health of an individual results from interactions between its body, behaviour, environment and other organisms.
- Literacy in Science – developing the skills to be a good communicator of science.
- Working Scientifically- developing the skills necessary to carry out scientific investigations and to understand how scientific ideas are developed.