



LEARNING JOURNEY

Biology

9.1 Ecology and our world

The Variety of Life

Variation

Why do individuals of the same species have different characteristics?

Species and Communities

How do living and non-living factors affect a community of organisms?

Biodiversity

Why is it important to have many different species, and how are humans affecting this?

This module continues your learning journey from previous learning in Biology about the natural world and links it to future content needed in GCSE.

You will develop a much greater understanding of Biodiversity which is the variety of living organisms around us but also at the variation found within humans and what causes this. This will then lead into looking at evolution.

You will continue to develop and understanding of adaptation and competition between living organisms.

Food Chains and Biomass

How much "living material" is transferred between levels in a food chain?

Interdependence

What happens to a food web when one part of it changes?

Quadrat Sampling

How can we use scientific sampling to measure the biodiversity of an area?

Fungi and bacteria

How do the microscopic structures and sizes of fungi and bacteria compare?

KEY VOCABULARY

Characteristic, Abiotic, Biotic, Biodiversity, Biomass, Species Interdependence, Decay, Deforestation, Bioaccumulation, Accuracy, Evolution, Evidence, Peer review, Extinction

Our world

The Carbon Cycle

How does carbon move between the atmosphere, plants, and animals?

Water and Air Pollution

How do human activities like smog and acid rain impact our environment?

Evolution and Natural Selection

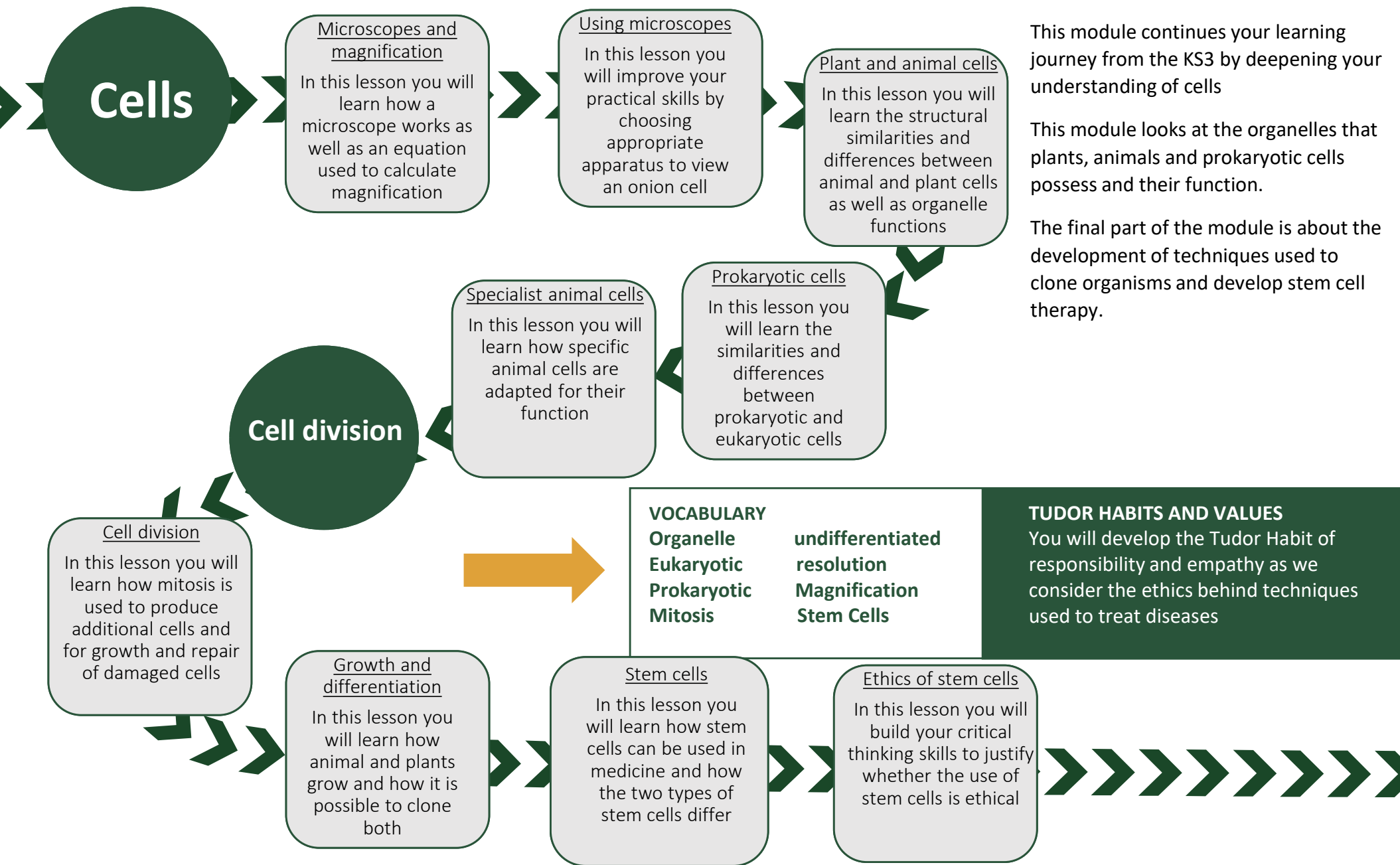
How did Charles Darwin's theory explain how species change over time?

Extinction

Why do species go extinct, and what can we do to save endangered animals?



B1 – Cell Biology



Cells

Microscopes and magnification

In this lesson you will learn how a microscope works as well as an equation used to calculate magnification

Using microscopes

In this lesson you will improve your practical skills by choosing appropriate apparatus to view an onion cell

Plant and animal cells

In this lesson you will learn the structural similarities and differences between animal and plant cells as well as organelle functions

This module continues your learning journey from the KS3 by deepening your understanding of cells

This module looks at the organelles that plants, animals and prokaryotic cells possess and their function.

The final part of the module is about the development of techniques used to clone organisms and develop stem cell therapy.

Cell division

Cell division

In this lesson you will learn how mitosis is used to produce additional cells and for growth and repair of damaged cells

VOCABULARY

Organelle
Eukaryotic
Prokaryotic
Mitosis

undifferentiated
resolution
Magnification
Stem Cells

TUDOR HABITS AND VALUES

You will develop the Tudor Habit of responsibility and empathy as we consider the ethics behind techniques used to treat diseases

Growth and differentiation

In this lesson you will learn how animal and plants grow and how it is possible to clone both

Stem cells

In this lesson you will learn how stem cells can be used in medicine and how the two types of stem cells differ

Ethics of stem cells

In this lesson you will build your critical thinking skills to justify whether the use of stem cells is ethical



B2 Organisation 1 - How our body works

How our body works

Organisation

You will learn how specialised cells become organised into tissues and how different tissues work together to form organs.

Diffusion

You will learn how diffusion takes place and why it is important in living organisms. You will also study what affects the rate of diffusion

Breathing System

You will learn the structure of the human gas exchange system and how gases are exchanged in the alveoli of the lungs

SA: Volume ratio

You will learn how to calculate surface area to volume ratio and how this can vary depending on the size of an organism

Active transport

You will learn how active transport takes place and how important it is in plant and animal cells

Digestive System

You will learn all of the organs of the digestive system and their functions and summarise the process of digestion

What's in our food?

You will learn the method for testing food groups and recognise the positive test results. You will also learn the risks of the chemicals used in the food tests.

Chemistry of Food

You will learn to identify the positive results of testing food groups with food test chemicals.

Catalysts and Enzymes

You will learn how enzymes work as biological catalysts and use the lock and key hypothesis to describe this

Factors affecting Enzyme Action

You will learn how temperature and pH affect enzyme action.

Enzymes practical

You will learn how to calculate the rate of an enzyme reaction from a proportional relationship on a graph

Digestion and Enzymes

You will learn how the liver produces bile and how the bile aids digestion of lipids

VOCABULARY

Ventilated	Specialised
Catalysts	Active Transport
Enzymes (Biological Catalysts)	
Active site	Lipids
Substrate	
Denature	

TUDOR HABITS

You will develop the Tudor Habits of Positive Self Regulation and Resilience in planning and carrying out longer practicals during this topic.

This module continues your learning journey from previous learning from year 8 Respiration and Digestion Modules to build your understanding of the structure and functions of these systems.

This module builds on your understanding of breathing, respiration and digestion from Key Stage 3 to develop your understanding of gas exchange systems in organisms, the movement of molecules, digestive system and enzymes.