



# Year 11 Biology (SS) Learning Journey Map

**YEAR  
12**

### Ecology Continued – Working scientifically:

- Explain why evidence is uncertain or incomplete in a complex context.
- Evaluate given information about methods that can be used to tackle problems caused by human impacts on the environment.
- Explain and evaluate the conflicting pressures on maintaining biodiversity given appropriate information.
- Interpret population and food production statistics to evaluate food security
- Understand that some people have ethical objections to some modern intensive farming methods and evaluate the advantages and disadvantages
- Understand how application of different fishing techniques promotes recovery of fish stocks.

❑ **Biotechnology**  
p.124

❑ **Farming techniques and sustainable fisheries** p.123

RETEACH OF CONCEPTS IDENTIFIED BY YOUR TEACHER

❑ **Trophic levels and biomass** p.120

❑ **Land use and deforestation** p.118

❑ **Biodiversity and waste management** p.116

❑ **Factors affecting food security** p.123

❑ **Climate change and maintaining biodiversity** p.117,119

❑ **Impact of environmental change** p.112

❑ **Communities** p.106

❑ **Abiotic/ Biotic factors** p.107

❑ **Material cycles** p.112-113

**TOPIC 7  
ECOLOGY**

❑ **Adaptations** p.108

❑ **Levels of organization and RP9** p.109-111

❑ **Decomposition and RP10** p.114-115

### Ecology - Maths Skills:

- Extract and interpret information from charts, graphs and tables.
- In relation to abundance of organisms students should be able to:
  - understand the terms mean, mode and median
  - calculate arithmetic means
  - plot and draw appropriate graphs selecting appropriate scales for the axes
- Interpret graphs used to model predator-prey cycles.
- Students should be able to:
  - calculate rate changes in the decay of biological material
  - translate information between numerical and graphical form
  - plot and draw appropriate graphs selecting appropriate scales for the axes.
- Students should be able to construct accurate pyramids of biomass from appropriate data.
- Calculate the efficiency of biomass transfer between trophic levels.

### Ecology – Working scientifically:

- Recording firsthand observations of organisms
- Interpret graphs used to model predator-prey cycles.
- Interpret and explain the processes in diagrams of the carbon cycle, the water cycle.
- Evaluate the impact of environmental changes on the distribution of species in an ecosystem given appropriate information.
- Explain how waste, deforestation and global warming have an impact on biodiversity
- Understand the conflict between the need for cheap available compost to increase food production and the need to conserve peat bogs and peatlands as habitats for biodiversity and to reduce carbon dioxide emissions.
- Evaluate the environmental implications of deforestation.
- Understand that the scientific consensus about global warming and climate change is based on systematic reviews of thousands of peer reviewed

### Variation and Evolution - Maths Skills:

- extract and interpret information from charts, graphs and tables
- Be able to interpret diagrams such as evolutionary trees.

❑ **Classification** p.104

❑ **Resistant Bacteria** p.103

❑ **Fossils and extinction** p.101

❑ **Speciation** p.102

**TOPIC 6b VARIATION AND EVOLUTION**

❑ **Genetic inheritance and work of Mendel** p.91-94

❑ **Variation** p.95

❑ **Theory of evolution and evidence for evolution** p.96-97

### Inheritance - Maths Skills:

- Students should be able to carry out a genetic cross to show sex inheritance.
- understand the concept of probability in predicting the results of a single gene cross and complete a Punnett square diagram and extract and interpret information from genetic crosses and family trees
- Students should understand and use direct proportion and simple ratios in genetic crosses.
- (HT only) Students should be able to construct a genetic cross by Punnett square diagram and use it to make predictions using the theory of probability.

❑ **Genetic inheritance and work of Mendel** p.91-94

❑ **Variation** p.95

❑ **Theory of evolution and evidence for evolution** p.96-97

❑ **Cloning** p.100

❑ **Mutations** p.86

❑ **Inherited disorders and sex determination** p.90,93

❑ **Selective Breeding** p.98

❑ **Genetic Engineering** p.99

❑ **DNA and the genome** p.84

❑ **Asexual and sexual Reproduction** p.87,89

**YEAR  
10**

❑ **Protein Synthesis** p.85

❑ **DNA Structure** p.85

❑ **Meiosis** p.88

**TOPIC 6a INHERITANCE**

### Variation and Evolution - Working Scientifically:

- Use the theory of evolution by natural selection in an explanation.
- Explain the benefits and risks of selective breeding given appropriate information and consider related ethical issues.
- Explain the potential benefits and risks of genetic engineering in agriculture and in medicine and that some people have objections
- HT Only: Interpret information about genetic engineering techniques and to make informed judgements about issues concerning cloning and genetic engineering, including GM crops.
- Explain the potential benefits and risks of cloning in agriculture and in medicine and that some people have ethical objections.
- appreciate that the theory of evolution by natural selection developed over time and from information gathered by many scientists.
- The theory of genetics and speciation has developed over time. Data is now available to support the theory of evolution.
- Appreciate why the fossil record is incomplete and interpret fossil records
- Understand how scientific methods and theories develop over time.
- Interpret evolutionary trees.

### Inheritance - Working Scientifically:

- Modelling behaviour of chromosomes during meiosis.
- Historical developments of our understanding of the causes and prevention of malaria.
- discuss the importance of understanding the human genome.
- Interpret a diagram of DNA structure but will not be required to reproduce it.
- Modelling insertions and deletions in chromosomes to illustrate mutations.