



Year 10 Combined Science - Biology

Learning Journey Map

Homeostasis and response – Working scientifically:

- Evaluate information around the relationship between obesity and diabetes, and make recommendations taking into account social and ethical issues.
- Show why issues around contraception cannot be answered by science alone.
- Explain everyday and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments.
- Developments of microscopy techniques have enabled IVF treatments to develop.
- Understand social and ethical issues associated with IVF treatments.
- Evaluate from the perspective of patients and doctors the methods of treating infertility.
- Interpret and explain simple diagrams of negative feedback control.

Homeostasis and response - Maths Skills:

- Construct and interpret frequency tables and diagrams, bar charts and histograms
- Translate information between graphical and numeric form

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Feedback systems p.67

The use of hormones to treat infertility p.66

Hormones in human reproduction p.64

Human endocrine system p. 62

Contraception p. 65

Control of blood glucose concentration p. 63

HOMEOSTASIS & RESPONSE

Homeostasis p.58

Organisation of the nervous system p.59

Reflexes and RP7 p.60-61

Land use and deforestation p.93

Biodiversity and waste management p.91

Climate change and maintaining biodiversity p.94

ECOLOGY

Communities p.83

Adaptations p.85

Material cycles p.89-90

Abiotic/ Biotic factors p.84

Levels of organization and RP9 p.86-88

Impact of environmental change p.92

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

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.

INFECTION AND RESPONSE

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Discovery and development of drugs p.48-49

The Immune System p.46

Pathogens and communicable disease p.43-45

Vaccination p.47

Human defence systems p. 45

Disease and Health/ Infection and Response Working Scientifically:

- Evaluate methods of treatment bearing in mind the benefits and risks associated with the treatment.
- discuss the human and financial cost of these non-communicable diseases to an individual, a local community, a nation or globally
- explain the effect of lifestyle factors including diet, alcohol and smoking on the incidence of non-communicable diseases at local, national and global levels.
- Interpret data about risk factors for specified diseases
- Evaluate the global use of vaccination in the prevention of disease.
- Understand that the results of testing and trials are published only after scrutiny by peer review.
- Appreciate the power of monoclonal antibodies and consider any ethical issues.
- Evaluate the advantages and disadvantages of monoclonal antibodies.
- The everyday application of scientific knowledge to detect and identify plant disease.
- The understanding of ion deficiencies allows horticulturists to provide optimum conditions for plants

Disease and Health/ Infection and Response Maths Skills:

- translate disease incidence information between graphical and numerical forms, construct and interpret frequency tables and diagrams, bar charts and histograms, and use a scatter diagram to identify a correlation between two variables.
- understand the principles of sampling as applied to scientific data, including epidemiological data
- understand the principles of sampling as applied to scientific data in terms of risk factors.
- translate information between graphical and numerical forms; and extract and interpret information from charts, graphs and tables in terms of risk factors.
- use a scatter diagram to identify a correlation between two variables in terms of risk factors.