Year 11 Learning Journey

Autumn Term

The Human Nervous System

Core knowledge
1. State the function of the nervous system and name its important components
2. Describe how information passes through the nervous system
3. Describe what happens in a reflex action and why reflex actions are important.
4. Explain how features of the nervous system are adapted to their function, including a reflex arc (inc. all types of neurone and the synapse).
5. **Required practical:** plan and carry out an investigation into the effect of a factor on human reaction time

Learning Checkpoints

Learning Checkpoint Title	Attempt 1		Attempt 2 / Extend	
	Mark	RAG	Mark	RAG
Structure of the Nervous System				
Reflex actions				

Key Vocabulary
Tier 2- Plan, nervous, adapted, measure, investigate
Tier 3- Neurone, Stimulus, Receptor, Effector, Synapse, Neurotransmitter, Reflex action, reflex arc, motor, sensory

Year 11 Learning Journey

Autumn Term

Hormones and Reproduction

Core knowledge
1. Describe the endocrine system, including the location of the pituitary, pancreas, thyroid, adrenal gland, ovary and testis and the role of hormones
2. State that blood glucose concentration is monitored and controlled by the pancreas
3. Describe the body's response when blood glucose concentration is too high
4. Explain what type 1 and type 2 diabetes are and how they are treated
5. **HT ONLY**: Describe the body's response when blood glucose concentration is too low
6. **HT ONLY**: Explain how glucagon interacts with insulin to control blood glucose levels in the body
7. Describe what happens at puberty in males and females, inc. knowledge of reproductive hormones
8. Describe the roles of the hormones involved in the menstrual cycle (FSH, LH and oestrogen)
9. **HT ONLY**: Explain how the different hormones interact to control the menstrual cycle and ovulation
10. Describe how fertility can be controlled by hormonal and non-hormonal methods of contraception (giving specific examples from the spec)
11. **HT ONLY**: Explain how hormones are used to treat infertility, inc the steps in IVF
12. **HT ONLY**: Evaluate the risks and benefits of fertility treatments
13. **HT ONLY**: Describe the functions of adrenaline and thyroxine in the body, and recall where they are produced
14. **HT ONLY**: Explain the roles of thyroxine and adrenaline in the body as negative feedback systems

Learning Checkpoints

Learning Checkpoint Title	Attempt 1		Attempt 2 / Extend	
	Mark	RAG	Mark	RAG
Blood glucose and diabetes				
Hormones in the Menstrual Cycle				

Key Vocabulary
Tier 2- Concentration, period, interact, explain, suggest
Tier 3- Hormone, Homeostasis, Insulin, Menstrual cycle, Ovulation, Oestrogen, Progesterone, glycogen, glucagon, diabetes

Year 11 Learning Journey

Autumn Term

DNA and Genetics

Core knowledge
1. Describe features of sexual and asexual reproduction
2. Describe what happens during meiosis and compare to mitosis
3. Describe what happens at fertilisation
4. Describe the structure of DNA and its role in storing genetic information inside the cell
5. Explain the term 'genome' and the importance of the human genome (specific examples from spec only)
6. Describe how characteristics are controlled by one or more genes, including examples
7. Explain important genetic terms: gamete, chromosome, gene, allele, genotype, phenotype, dominant, recessive, homozygous and heterozygous
8. Explain and use Punnet square diagrams, genetic crosses and family trees
9. HT ONLY: Construct Punnet square diagrams to predict the outcomes of a monohybrid cross
10. Describe cystic fibrosis and polydactyly as examples of inherited disorders
11. Evaluate social, economic and ethical issues concerning embryo screening when given appropriate information
12. Describe how the chromosomes are arranged in human body cells, including the function of the sex chromosomes
13. Explain how sex is determined and carry out a genetic cross to show sex inheritance

Learning Checkpoints

Learning Checkpoint Title	Attempt 1		Attempt 2 / Extend	
	Mark	RAG	Mark	RAG
Reproduction and Meiosis				
Inheritance				

Key Vocabulary
Tier 2- Dominant, compare, evaluate, predict, ethics
Tier 3- Chromosomes, Gametes, Fertilisation, Embryo, Meiosis, Gene, Allele, Dominant, Recessive, Homozygous, Heterozygous, Genotype, Phenotype.

Year 11 Learning Journey

Spring Term

Variation, Evolution and Genetic Technologies

Core knowledge
1. Describe what variation is and how it can be caused within a population.
2. Describe mutations and explain their influence on phenotype and changes in a species
3. Explain the theory of evolution by natural selection
4. Describe how new species can be formed
5. Describe what selective breeding is
6. Explain the process of selective breeding, including examples of desired characteristics and risks associated with selective breeding
7. Describe what genetic engineering is, including examples, and how it is carried out
8. Explain some benefits, risks and concerns related to genetic engineering
9. **HT ONLY**: Explain the process of genetic engineering, to include knowledge of enzymes and vectors

Learning Checkpoints

Learning Checkpoint Title	Attempt 1		Attempt 2 / Extend	
	Mark	RAG	Mark	RAG
Variation and Evolution				
Selective Breeding and Genetic Engineering				

Key Vocabulary
Tier 2- Mutation, theory, explain, cause, describe
Tier 3- Variation, Species, Evolution, Natural Selection, Selective breeding, Genetic engineering, Genes, Plasmid

Year 11 Learning Journey

Spring Term

Organisms and their environment

Core knowledge
1. State what an ecosystem is, including different levels of organisation in ecosystems
2. Explain the terms 'interdependence' and 'stable community'.
3. Name the abiotic and biotic factors that affect communities.
4. Explain how a change in an abiotic or biotic factor might affect a community
5. Represent the feeding relationships within a community using a food chain and describe these relationships
6. Explain how and why ecologists use quadrats and transects
7. **Required practical:** measure the population size of a common species in a habitat. Use sampling techniques to investigate the effect of a factor on the distribution of this species.
8. Describe which resources animals and plants compete for, and why they do this.
9. Describe structural, behavioural and functional adaptations of organisms.
10. Describe what an extremophile is and give an example.
11. Explain what is meant by a producer, secondary consumer and tertiary consumer in a food chain.
12. Understand and interpret predator-prey cycles.
13. Describe the processes involved in the carbon cycle.
14. Explain the role of microorganisms in cycling materials through an ecosystem.
15. Describe the processes involved in the water cycle.

Learning Checkpoints

Learning Checkpoint Title	Attempt 1		Attempt 2 / Extend	
	Mark	RAG	Mark	RAG
Ecosystems				
Biodiversity				
Water and Carbon cycles				

Key Vocabulary
Tier 2- Measure, represent, organisation, cycle, competition
Tier 3- Ecosystem, Interdependence, Abiotic, Biotic, Quadrat, Extremophile, Producer, Predator, Prey, transect

Year 11 Learning Journey

Spring Term

Evolution and Extinction

Core knowledge
1. Describe some sources of evidence for evolution.
2. Describe what fossils are.
3. Describe three ways in which fossils may be formed.
4. Explain why there are few traces of the early life forms, and the consequences of this in terms of our understanding of how life began.
5. Describe what we can learn from fossils.
6. Explain what is meant by 'extinction' and describe some of the causes of extinction.
7. Explain why bacteria can evolve rapidly.
8. Describe how antibiotic-resistant strains of bacteria can arise and spread.
9. Give a named example of an antibiotic-resistant strain of bacteria.
10. Describe how the rate of development of antibiotic-resistant bacteria can be reduced and controlled.
11. Describe how organisms are classified in the Linnaean system.
12. Describe how organisms are named by the binomial system.
13. Explain how scientific advances have led to the proposal of new models of classification, including knowledge of the three-domain system
14. Describe how organisms are classified in the 'three-domain' system and name the scientist who developed it.
15. Describe and interpret what evolutionary trees show.

Learning Checkpoints

Learning Checkpoint Title	Attempt 1		Attempt 2 / Extend	
	Mark	RAG	Mark	RAG
Fossils and Extinction				
Classification				

Key Vocabulary
Tier 2- Interpret, classify, name, conclude, research
Tier 3- Fossils, Extinction, Antibiotic, Classification, Species, Binomial, Domain, Evolution, Resistance