



ISS Course Syllabus

Teacher: Peter
Course Title: Life Science

Grade:

Course Description:

The life science course emphasizes a more complex understanding of change, cycles, patterns and relationships to the living world. Students will build on basic principles related to these concepts by exploring the cellular organization and the classifications of organism, populations, communities and ecosystems and changes as a result of the transmission of genetic information from generation to generation. Inquiry skills at this level include organization and mathematical analysis of data, manipulating variables in experimentation and identifying sources of experimental error.

Course Contents:

Unit 1: Cells: Building Blocks of Life (17hours)

Week	Main topics
1	Scientific method; characteristics of living things; needs of living things
2	Organic compounds – proteins, carbohydrates and lipids, analysis of food and organic compounds
3	Cell structure and function of organelles; difference between plant and animal cells
4	Cell specialisation and levels of organisation; organs and organ systems; processes of diffusion and osmosis; cell division
5	Cell energy – photosynthesis, respiration – aerobic and anaerobic

Unit 2: Human Biology and Health (24 hours)

Week	Main topics
1	Human body and levels of organisation; skeletal system; muscular system; injuries
2	Food and energy; digestive system; digestion of food; absorption of food; maintaining good health
3	Transportation; circulatory system; structure of the heart; components of blood; cardiovascular diseases

4	Respiratory system; structure; gas exchange; lung capacity; breathing
5	Excretory system; nervous system; senses; endocrine system
6	Reproductive system; stages of human development
7	Immune system; defences; immunity; diseases; alcohol, tobacco, drugs

Unit 3: Heredity: The Code of Life (24 hours)

Week	Main topics
1	History of genetics; Principles of genetics; crosses; Punnet squares; dominant; recessive heterozygous; homozygous
2	Genetics and probability; chromosome theory
3	Mutations; DNA molecule and structure
4	How chromosomes produce proteins, transcription and translation; role of ribosomes
5	Inheritance in humans; sex linked traits – colour blindness; haemophilia; human genetic disorders
6	Plant and animal breeding; genetic engineering

Unit 4: Parade of Life: Classification of Living Things (15 hours)

Week	Main topics
1	History of classification; five kingdoms; viruses; monerans; protists; fungi
2	Plants – algae; mosses, ferns; seed plants – reproduction and growth
3	Invertebrates – sponges and cnidarians; worms and molluscs; echinoderms; arthropods
4	Vertebrates – fish, amphibians, reptiles, birds; mammals (egg laying, pouched, placental)

Unit 5: Evolution: Change over Time (20 hours)

Week	Main topics
1	Formation of fossils and rocks; geological time scales
2	Theories of Charles Darwin and the theory of natural selection
3	Development of a new species; survival of the fittest
4	Punctuated equilibrium and modern theories of evolution
5	Ancestors, relatives of humans and theory of human evolution

Unit 6: Ecology: Earths Living Resources (30 hours)

Week	Main topics
1	Living things in relation of their environment; communities and ecosystem
2	Food and energy in an environment; Food chains, webs and pyramids
3	Interaction and evolution; life in the balance; predator – prey, populations
4	Cycles of matter; carbon, nitrogen and water
5	Ecological succession; biogeography
6	Biomes: tundra, forest and grassland
7	Biomes: Desert and water
8	Extinction; wildlife conservation; pollution; impact of (wo)man

Resources:**Prentice Hall Textbooks**

Unit 1: Cells: Building Blocks of Life

Unit 2: Human Biology and Health

Unit 3: Heredity: The Code of Life

Unit 4: Parade of Life: Monerans, Protists and Fungi

Parade of Life: Animals

Unit 5: Ecology – Earths Living Resources

Unit 6: Evolution – Changes over Time

Evaluation System:

Component	%	Comments
Tests		Unit tests
Labs and assignments		<ul style="list-style-type: none"> • Formal Lab reports as well as informal write-ups • Oral Presentations • Projects • Posters
Daily work		Homework, in-class assignments
Notebooks		Neatness, accuracy and completion
Total		A maximum of 100 % is available

Progress marks will be calculated and reported quarterly. Marks do not close until the final exam has been written.

Additional Comments:

Teaching Strategies and Instructional Methods

Direct Teaching Strategies

- Lectures
- Demonstrations
- Directed problem-solving
- Note taking
- Portfolios
- Posters
- Teacher led review
- Work and Task Sheets

Indirect Teaching Strategies

- Science Experiments
- Oral Presentations
- Drawings

Interactive Teaching Strategies

- Small group cooperative group work
- Small group discussions