In Fascinating Biology, you will learn the basic principles of biology, including the components of life: cell membranes, taking in nutrients, creating chemical energy, growing and repairing, reproducing, maintaining a stable internal environment, and adapting to a changing external environment.

**Lesson 1: What is Life?**
- Creation of life
- Recognizing something living

**Lesson 2: Chemistry Review**
- Chemical bonding
- Intermolecular bonding
- Polar and non-polar molecules
- High-energy molecules
- Long-chain molecules

**Lesson 3: The Cell Membrane**
- Chemical structure: phospholipids and glycerol
- Lipid bilayer

**Lesson 4: Take in Nutrients**
- Brownian Movement
- Diffusion
- The Law of Entropy
- Concentration gradients
- Diffusing across cell membranes
- Movement of water
- Osmosis
- Facilitated diffusion
- Active transport
- Equilibrium
- Hypertonic and hypotonic solutions
- Reverse osmosis
- Osmotic pressure
- Pinocytosis

**Lesson 5: Take in Energy, Part 1**
- ATP (adenosine triphosphate)
- Classification of organisms by energy intake
- Photosynthesis
- Electron transport chain
- NADPH
- Glucose synthesis: The Calvin Cycle
- Before photosynthesis
Lesson 6: Take in Energy, Part 2
- Glycolysis
- The Krebs Cycle
- Oxidative phosphorylation
- Mitochondria

Lesson 7: Take in Energy, Part 3
- Energy storage
- Glycogen
- Fat
- Starch

Lesson 8: Take in Energy, Part 4
- Anerobic metabolism
- Fermentation
- Aerobic metabolism
- Aerobic and anerobic muscles

Lesson 9: Grow
- Proteins
- DNA
- Nucleotides
- RNA synthesis
- Messenger RNA
- Ribosomes
- Transfer RNA
- Exons and introns

Lesson 10: Reproduce, Part 1
- Chromosomes
- Cell life cycle
- Chromatids
- P53 Protein
- DNA replication
- DNA primers
- Leading and lagging strands
- Okazaki fragments
- Telomeres

Lesson 11: Reproduce, Part 2
- Human chromosomes
- Mitosis
- Meiosis
- Synapsis
- Genetic diversity
- Asexual reproduction

Lesson 12: Reproduce, Part 3
- Alleles
- Mutations
- Dominant and recessive genes
- Wild-type traits
- X-linked mutations
- Barr Body
- Karyotypes
- Genotypes and phenotypes
- Homozygous and heterozygous
- Pedigrees
- Punnett squares
- Hemophilia
- Codominance
- Blood types
- Mitochondrial DNA
Lesson 13: Homeostasis, Part 1

- What to keep constant
- Temperature
- Hypothalamus
- Hypothermia and hyperthermia
- Antidiuretic hormone

Lesson 14: Homeostasis, Part 2

- Blood pressure
- Glucose
- Oxygen
- Carbon dioxide
- pH

Lesson 15: Adapt, Part 1

- Theory of Evolution
- Dinosaurs and birds
- Hearing
- Pangea
- Yanoconodon
- Aquatic mammals
- Vestigial structures
- Dating fossils with carbon dating

Lesson 16: Adapt, Part 2

- The Changing Environment
- Theory of Natural Selection
- Sickle Cell Anemia
- Improving in an Unchanging Environment
- Countercurrent Circulation
- Genetic Diversity
- Genetic Diversity in Prokaryotes
- Genetic Drift
- Speciation
- Symbiosis
- Predators, Prey, Scavengers

Lesson 17: Prokaryotes, Protists, Animals and Fungi

- Domains
- Prokaryotes
- Bacteria and Archae Bacteria
- Cyanobacteria
- Eukaryote energy production
- Protists
- Animal Phyla
- Porifera
- Cnidaria
- Platyhelminths and Annelids
- Nematodes and annelids
- Protosomes and Deuterostomes
- Molluscs
- Arthropods
- Echinoderms and chordates
- Fungi
- Lichens, rusts, and mycorrhiza

Lesson 18: Plants

- Algae
- Charales
- Bryophytes
- Spores
- Gametophytes
- True plants
- Tracheophytes
- Spores
- Vascular structures
- Gymnosperms
- Wood
- Water transport
- Roots
- Angiosperms
- Endoderm
- Fruit

Lesson 19: Hypothesis Testing

Fascinating Biology is a program developed by Fascinating Education, LLC – Dr. Sheldon Margulies. Other curricula currently available include Fascinating Chemistry and Fascinating Physics.

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