

Week 1: What is Life & Cell Fundamentals

- **Main Lesson:** Students learn the seven characteristics of living things, the fundamentals of Cell Theory, and the key structural differences between prokaryotic and eukaryotic cells.
- **Interactive Activity:** Objects are displayed on screen while students identify and justify their choices using the characteristics of life.

Week 2: Organelles & The Cell Membrane

- **Main Lesson:** Students explore the functions of major cell organelles and learn how the cell membrane regulates transport via diffusion and osmosis.
- **Interactive Activity:** Students do an interactive simulation that shows how cell organelles function to maintain the cell and how membranes facilitate transportation.

Week 3: Cellular Energy (Photosynthesis & Respiration)

- **Main Lesson:** Students examine how autotrophs and heterotrophs obtain energy through the basic inputs and outputs of photosynthesis and cellular respiration.
- **Interactive Activity:** Students use a review game to reinforce how autotrophs and heterotrophs obtain energy through photosynthesis and cellular respiration.

Week 4: DNA Structure & Cell Division

- **Main Lesson:** Students study the double-helix structure of DNA and nitrogen base-pairing rules.
- **Interactive Activity:** Students are presented with half a DNA strand and type the complementary base sequences in the chat.

Week 5: Protein Synthesis (Simplified Central Dogma)

- **Main Lesson:** Students learn the Central Dogma (DNA to RNA to Protein) and discover how genetic codes construct physical traits.
- **Interactive Activity:** Review interactive on the Central Dogma and genetics.

Week 6: Basics of Genetics & Heredity

- **Main Lesson:** Students master dominant and recessive traits, the difference between genotypes and phenotypes, and how to set up simple Punnett squares.
- **Interactive Activity:** Coin flips determine parental alleles, allowing the class to solve 2x2 Punnett squares together to predict and reveal the traits of a custom "class monster."

Week 7: Ecology & Ecosystems

- **Main Lesson:** Students analyze ecosystem roles, food webs, the 10% energy pyramid rule, and how biotic and abiotic factors impact environments.
- **Interactive Activity:** A digital food web is shared on screen, where key organisms are systematically removed to analyze the ripple effects across trophic levels.

Week 8: Adaptation & Evolution

- **Main Lesson:** Students learn about genetic variation within species, natural selection mechanisms, and the difference between structural and behavioral adaptations.

Interactive Activity: Students are presented with extreme environment scenarios and select adapted physical and behavioral traits live on screen to construct an organism capable of survival.

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Week 9: Course Review & Final Exam

- **Main Lesson:** Students participate in a 30-minute review session recapping core concepts from cell biology, genetics, ecology, and evolution.
- **Final Assessment:** Students spend the remaining 30 minutes completing a comprehensive online exam to demonstrate their understanding of the course material.