

# Introduction to Middle School Biology Syllabus

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Biweekly Classes on Saturdays, 3 PM PST

## Course Description

This course is designed to give passionate middle school students an edge when tackling prestigious science competitions like the Science Olympiad, USA Biology Olympiad, National Science Bowl, etc. With no prior knowledge of this field required, this course starts from ground zero and builds students up to gain essential knowledge to succeed in middle school level competitions and high school biology courses later on. Unlike other courses, this course will focus more on a deep understanding of concepts rather than mass memorization. This course covers fundamental biology topics like genetics, cell biology, cellular respiration, maintaining homeostasis, cell reproduction and much more to prepare students with skills for real-life application of the content learned.

## Meeting Agenda

3/4 Meeting 1: What is considered a living thing?

- Necessities of Life
- Characteristics of Living Things
- Introduction to a cell

3/18 Meeting 2: What is a cell?

- Cell Theory
- Prokaryotic vs. Eukaryotic Cells
- Plant Cells vs. Animal Cells

4/1 Meeting 3: What are organelles?

- Functions of organelles
- Organelles under a microscope!
- Difference of organelles in different cells

4/15 Meeting 4: How are traits expressed in an individual?

- Brief Introduction to DNA
- Genotype vs. Phenotype
- Punnett Squares

4/29 Meeting 5: How do plants and animals obtain energy?

- Photosynthesis
- Digestion
- Organs involved in the digestive system

5/13 Meeting 6: What is cellular respiration?

- Anaerobic Respiration in Humans
- Fermentation
- Aerobic cellular Respiration

5/27 Meeting 7: What are the different modes of transport in a cell?

- Active Transport
- Passive Transport
- Osmosis

6/10 Meeting 8: How does the human body maintain homeostasis?

- Blood sugar regulation in diabetes
- Temperature regulation
- pH maintenance in the body

6/24 Meeting 9: How do cells reproduce in the body?

- Reasons for cellular reproduction
- Mitosis
- Meiosis

7/8 Meeting 10: Moving forward

- Review of full course material
- Application of content to sample competition questions
- Opportunities, competitions, resources