

SCIENCE CLASSES 2022-2023

INTEGRATED SCIENCE

In this course students will explore the natural sciences through various projects that introduce Physics, Chemistry, Biology, Earth Science and Environmental Science. We will use the conceptual approach, which relates science to everyday life, and it will emphasize ideas rather than the details. Each project is based on one or more unifying concepts; these concepts are the framework of this course and form a coherent science curriculum. Students discover the underlying structure of science and the relationships between the different science disciplines.

Unifying concepts (concepts that play an important role in all science disciplines) are for example:

- Systems, order, and organization
- Evidence, models, and explanation
- Change, constancy, and measurement
- Evolution and equilibrium
- Form and Function

The concepts will be taught through reading, videos, and hands-on projects.

BIOLOGY

In this course students will explore life and living organisms. We will do many hands-on projects, experiments, have discussions and watch video clips about various concepts of living things. Concepts we will explore are for example:

Characteristics of life

Evolution of life

Cells and organisms

Biological diversity

Ecosystems and environment

PHYSICS

This physics course emphasizes **applied** physics; this means that physics concepts will be studied and explored through many hands-on activities and relate to everyday life. The course will have a conceptual approach with little focus on mathematical problem solving. Concepts include:

Physics of motion

Physics of waves

Physics of Energy, work, and power

Physics of Electricity and Electronics

Physics of Climate and Weather

Physics of the Earth (Earth Science)

AP PHYSICS C (Mechanics)

This is a rigorous physics course where students must study independently with the teacher as a guide and tutor, not as a lecturer. The course will be taught by Thinkwell professors and will prepare the students for the AP physics C exam. This course is ideal for students who are enthusiastic about physics. With a high enough score, they will earn a college credit.

The Physics C AP exam is about Mechanics and involves the following units:

1- Kinematics

2-Newton's Laws of Motion

3-Work, Energy and Power

4- Systems of Particles and Linear Momentum

5- Rotation

6- Oscillations

7- Gravitation

See also:

[AP Physics C: Mechanics Course and Exam Description, Effective Fall 2020 \(collegeboard.org\)](https://collegeboard.org/ap-physics-c-mechanics-course-and-exam-description-effective-fall-2020)

ELECTIVES 2022-2023

STEAM

This is a semester-long course

In this course you will learn about the following concepts by engaging in hands-on projects and concept-based learning: you will be learning

Science, Technology, Engineering Art, and Math concepts such as:

Energy, Environment, Tools and techniques, Problem solving and Designing, Elements of Art, Measuring, Scale and using Geometric tools

We will work on 6 (or more) projects (3 of your choice) such as:

-Model house

-Birchbark items

-Boomerang

-Automaton

-Artistic Architecture

-Pottery and clay sculptures



PRE-ENGINEERING (prerequisite STEAM)

In this course, students will work on Industrial Design projects that are based on Science, Math, Technology and Engineering.

Only students who have passed a STEAM course are allowed to participate.

This is a semester-long course, where students will make three assigned projects and three projects of choice.

A few examples of projects relate to robotics, roller coasters, gears, automatons, generators and more



INDUSTRIAL ARTS (shop)

In this semester course students will learn about basic wood-working skills, metal-working skills and the skills involved with processing other materials. In addition, students will learn about material science.



There will be a follow up-class during the second semester, where students can participate in a boatbuilding, or a furniture-making class.

