

Planetarium Program at HCPS

A planetarium is an immersive theater that can create a realistic simulation of the daytime or nighttime sky as seen from anywhere on Earth at any hour, day, or during any season. It can illustrate both real and apparent motions of heavenly bodies, showing a day or an entire year in a matter of minutes. With this specialized technology, students can observe things in the planetarium that cannot be shown in the classroom.

The planetaria offer both interactive programs and planetarium labs. The interactive programs are live presentations in which the planetarium instructor and the students typically explore a specific subject. The planetarium labs are astronomy activities which take advantage of the capabilities of the planetarium technology to engage the students in concepts which are difficult to visualize elsewhere. Students are given many opportunities to use science skills to think like a scientist by observing, predicting, measuring, and modeling.

At the elementary level, primary lessons focus on students making safe observations of the sky. The differences between night and day, weather phenomena, , and the apparent motions of celestial objects are observed and discussed. Intermediate students make observations to answer questions about what they observe. Why is it hot in summer? Why do we see some constellations only during certain seasons? Why are some stars brighter than others?

At the secondary level, the planetaria are used as immersive laboratories where students collect data to construct models that they can use to formulate and defend claims about observed phenomena. The planetarium provides a unique, dark environment that allows for demonstrations and observations that cannot be done in a regular classroom. There are numerous lesson options at the secondary level, ranging from the very basics of astronomy to advanced astrochemistry and astrophysics.

Schedule permitting, the planetaria also offer enrichment lesson opportunities to content areas outside of science. Math classes can observe Mercury to construct a scale model of its orbit and then explore the properties of an ellipse. Social studies classes can learn how constellations and their associated mythology are often a primitive “scientific” explanation of observed phenomena. English classes can explore the astronomical connections to Harriette Tubman and the underground railroad through a lesson on the “Drinking Gourd”. Music classes can immerse themselves in Gustav Holst’s *The Planets* and hear how the characteristics of each of the gods the planets represent are expressed in the movements.

The three Planetaria in Harford County are located at **The Swan Creek School** (serving Havre de Grace, Aberdeen, and Darlington area schools), **Edgewood Middle School** (serving Joppatowne and Edgewood area schools), and **Southampton Middle School** (serving Bel Air, Fallston, Dublin, and North Harford area schools). These planetaria provide the most far-reaching astronomy-related instructional opportunities in the mid-Atlantic region. Approximately 10,000 students in grades Kindergarten through twelve visit each of the planetarium facilities every school year. The Planetaria programs are designed to support the Next Generation Science Standards and are aligned to what is being taught in the classroom to meet the needs of students of all ages.

The following is a listing of the main lessons offered by title in sequential grade level order. Some grade levels and subject areas have additional options for enrichment lessons or to cover the wide variety of

content such as for the elective course in Astronomy and are available in detail through contact with the planetarium directors.

Lesson Titles:

Elementary:

Grade K – Weather Observations

Grade 1 – Daily Motions

Grade 3 – Reason for the Seasons

Grade 5 – How Far is That Star and Circumpolar vs. Zodiac Constellations

Middle School:

Grade 6 – Lunar Cycles and Eclipses (plus a wide range of possible enrichment lessons)

Grade 8 – Wave Properties

High School:

IPC – Kepler’s Laws of Planetary Motion and Spectroscopy: Chemistry of Stars

Chemistry – Spectroscopy: Chemistry of Stars

EES – Spectroscopy: Age of the Universe

Physics – Combined Lesson: Kepler’s Laws and Gravity

Astronomy – Dozens of lesson options to explore the universe, its properties, and actions

Marine Science - Tides