

SCIENCE

At BB&N, the science program instills a deep curiosity about how the world works and how scientific content and skills can be applied in context. Emphasizing collaboration and hands-on, inquiry-based learning, the curriculum focuses on scientific problem-solving, critical thinking, and the development of essential scientific skills. Across all three campuses, students are encouraged to transition from concrete to abstract thinking, which builds confidence, independence, and a systematic approach to scientific exploration. The program encourages students to engage meaningfully with the world and to think critically about their role in it, including themes such as sustainable development, climate change, and other global challenges.

We recognize that, developmentally, the seventh and eighth grade are years when students are transitioning from concrete to more abstract thinking, and each student is doing this at their own pace. Our classes are designed with this in mind, and we develop our curriculum to address multiple styles of learning. We hope that students leaving the Middle School science program are positive, proactive, productive, confident, and competent learners; we expect that students will gain confidence in approaching problems creatively, collaborating effectively, and working independently.

The science program at the Middle School familiarizes students with laboratory science skills and emphasizes the importance of mastering the processes, skills, and vocabulary of the physical sciences. Through our work together, students develop strong study and collaboration skills as well as a framework for approaching novel ideas and experiences. Academic and science skills that are introduced and then assessed throughout the year in science include: effective class engagement, thoughtful and thorough assignment completion, processing and following directions, working independently and in group settings, quiz/test preparation and performance, and thorough record keeping in logbooks.

GRADE 7

In Science 7, students explore a variety of topics related to physics, energy, and the scientific method. Each unit incorporates hands-on experiences, whereby students are able to investigate new topics as well as to apply the skills and concepts learned. The first unit serves as the foundation for the study of science in the Middle School. Students study measurements, scientific methods, graphing, and data analysis through a variety of short experiments. Students then make use of the skills learned in this first unit to explore topics in energy as well as forces and motion, with an emphasis on understanding the science and how it relates to their lives through the exploration of various applications. Design challenges are incorporated into each unit to provide students with an opportunity for creative and collaborative problem-solving, and, where appropriate, students are introduced to problem-solving using mathematical equations. At various points throughout the year, students will engage in cross-curriculum work that seeks to broaden their experience and understanding of the world around them; for example, through the Penguin Palace project, students learn about building methods and resources available in the country they study for their Latin America project in history class and then build an insulated structure with the goal of minimizing loss of mass in an ice penguin. The year culminates with the Roller Coaster project, a creative design challenge, which capitalizes on the seventh graders'

newly developed understanding and knowledge of energy, forces, and motion, to create a gravity-assisted marble run, complete with exciting embellishments such as jumps, loop-de-loops, and switchbacks.

Resource Materials

- Science 7 Unit Packets, created and distributed by the Middle School Science Department
- Science pages on Canvas
- CK-12 Physical Science for Middle School, a supplemental online textbook
- Assorted readings from e-books accessible via BB&N Middle School Library website

GRADE 8

Science 8 serves as an introduction to topics in chemistry: classification of matter, atomic structure, periodic table, chemical bonding, chemical reactions, and acids and bases. It is a lab-centered program in which the experiments are designed to further develop laboratory skills and techniques. Accompanying each unit is an investigation or series of activities designed to showcase an application of chemistry and a round table discussion on additional topics to expose students to a wider variety of applications. Past explorations have included: polymers, forensics, color and pyrotechnics, toxins/poisons/venoms, water filtration, art & minerals, food science, and ocean acidification. In the spring, students will study one of the application topics in greater depth, exploring a topic of their own choosing. At Science Knight on Friday, May 9 at 6:30 pm, the eighth graders will present their research along with interactive demonstrations, hands-on activities, and prototypes of “inventions for the future” designed to help further one of the UN’s sustainable development goals. This evening event is required for all eighth graders, and the entire BB&N community is welcome to attend.

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