



BNS Purple Room Science 2017-2018

Earth & Space Science Curriculum

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The BNS middle school science curriculum reflects a three year rotation between the life science, physical science, and earth science. This year we are studying Earth and Space Science. **Space Science includes a brief focus on the study of the universe and Earth's position in it. Earth Science emphasizes the study of the Earth's composition, structure, processes, and history; its atmosphere, fresh water, and oceans; and its environment in space. Examines the interconnections among Earth's many different systems of geosphere, hydrosphere, atmosphere, cryosphere, and biosphere, as well as the anthroposphere. We will also include historical contributions in the development of scientific thought about the Earth and space.**

Students will build on basic principles related to these concepts by exploring:

- Earth, Sun, Moon relationship
- Astronomy
- Weather and Climate
- Fresh Water
- Ocean
- Geology
- Earth's Resources

*See the detailed syllabus on the reverse side, which is subject to change as the year progresses.

The middle school program's underlying framework reflects the National Science Teachers Association's notion that scientific inquiry, or hypothesis testing, is a critical thinking process necessary for students learning science in the 21st century. The content and terminology of the program is based on both Virginia's Standards of Learning (S.O.L.) and the National Science Education requirements for middle school science.

The program's broad goal is to encourage and nurture students' natural curiosity and growth in their understanding of the nature of science. The curriculum emphasizes the scientific method and includes practices such as observation, experimentation, models, evidence collection, logical thinking, systematic processes, journaling, scientific writing, the reading of multiple resources in print and electronic, group discussion/debate, as well as lab and field research. We will learn that the nature of science includes the concept that science can provide explanations about nature, can predict potential consequences of actions, but cannot be used to answer all questions. Also, that the sciences are subject to refinement and change with the addition of new scientific evidence.

WRITING IN SCIENCE

Writing will occur frequently and most comprehensively in lab reports. Students will practice the scientific writing style, which is detailed and thorough, but also succinct. Reports will be required to be in standard MLA format, as is consistent throughout the BNS Middle School program.

EARTH & SPACE SCIENCE GRADING POLICY – HIGH SCHOOL CREDIT

*This is a high school level course for 7th and 8th grade students. When 6th grade students reach 8th grade, they will have the option of taking a graded Earth Science elective with additional information and review. This will prepare them for the Earth Science SOL when they reach high school, provide them with the necessary additional content, and boost the grade which may be transferred to the high school. Transfer of the credit and grade to the high school is optional.

The following shows the break-down used to generate trimester and year-end grades for students:

Organization:		5%
In Class Participation:	-Lab Participation:	10%
	-Discussion and other:	5%
Homework Performance:		15%
Quiz and Minor Project Performance:		20%

EARTH & SPACE SCIENCE PLAN

<p><u>Unit 1a: The Universe</u> September – October:</p> <ul style="list-style-type: none"> • Earth, Moon, & Sun • The Solar System • The Universe • Space Exploration 	<p><u>Unit 2: Weather and Climate</u> October - November:</p> <ul style="list-style-type: none"> • Atmosphere • Weather • Climate
<p><u>Unit 3: Earth’s Waters</u> December - January:</p> <ul style="list-style-type: none"> • Freshwater Resources • Earth’s Oceans 	<p><u>Unit 4: Earth Materials and Processes</u> February:</p> <ul style="list-style-type: none"> • Plate Tectonics • Geologic Features • Minerals and Resources
<p><u>Unit 5: Earth and Changes Through Time</u> April:</p> <ul style="list-style-type: none"> • Earth’s Changing Surface • Geologic Time 	<p><u>Unit 6: Resources and the Environment</u> May (time permitting):</p> <ul style="list-style-type: none"> • Energy from Earth • Resource Management • Protecting our Environment
<p><u>6th & 7th Grade Science Fair: Scientific Inquiry</u></p> <ul style="list-style-type: none"> • Inquiry and research • Experimental design and refinement • Conducting the experiment • Collection and interpretation of data • Final writing of the lab report 	<p><u>8th Grade Science Fair: Engineering design</u></p> <ul style="list-style-type: none"> • Definition of a problem • Research • Design & modeling of a solution • Test and refine prototype • Final writing of engineering design report

SUMMARY OF SKILLS EMPHASIZED & PRACTICED IN PURPLE ROOM SCIENCE

- the scientific method of inquiry or testing hypotheses: observation, inference, then testing
- critical thinking: considering resources, experimental design, and conclusions
- scientific writing: use of the current journal standard, i.e. abstract, introduction, methods, results, discussion
- making connections between prior knowledge and new concepts, as well as fitting new knowledge into the “big picture” of science
- safe lab techniques
- use of scientific instruments, such as microscopes
- familiarity with and recall of important terminology
- quantitative measuring and the metric system
- collaborative inquiry and teamwork
- listening and speaking skills
- test-taking strategies and practice
- short and long term planning for assignments
- presentation techniques
- computer skills such as data entry/graphing (Excel) and presentation of research (Power Point)