INTRODUCTION

The Hinsdale School District PreK-12 science curriculum is a coordinated program built around science education and the expectations of the New Hampshire Curriculum Frameworks. It proceeds sequentially; introducing, expanding, and further exploring content at appropriate grade levels with increasing degrees of depth and complexity. The Common Core State Standards for English Language Arts include standards pertaining to all content areas. **Teachers are responsible for incorporating the Common Core State Standards into their science instruction.**

IMPORTANT NOTE TO ALL TEACHERS

It is important for teachers to follow the curriculum for each grade level or class as described in this guide; the integrity of the PreK-12 sequence has been carefully considered in its creation. Grade levels and individual classes have some degree of flexibility in designing the sequence of topics through the year, but *addressing the provided scope is required*. At the elementary level, the topics for each grade level have been carefully planned so as to address necessary content without redundancy or omission to meet the expectations of the NH frameworks and high stakes testing. At the middle school and high school levels the curricula are also constructed to fully meet the expectations of the NH frameworks and high stakes testing. The guiding questions in each section make clear the topics of inquiry (scope) for each grade. These topics change and build on each other through the grades (sequence), making it imperative that each teacher use the guiding questions to plan instruction.

SCIENCE INQUIRY

Capture student interest and motivate continued learning!

Inquiry involves QUESTIONING. Inquiry requires being able to identify assumptions, to use critical and logical thinking, and the ability to consider alternative explanations. Inquiry might be highly structured where known outcomes are clear, or students may be free to explore with unanticipated results!

Students engaged in Inquiry:

- make observations
- pose questions
- propose answers
- examine what they may already know
- review already researched information
- explain / communicate results
- use tools to
    - gather
    - analyze
    - interpret data

Students use journals to record observations, thoughts, ideas, and models, create diagrams, and represent data and observations with plots and tables. Students present their work to others with models, graphs, reports, posters, etc.
Asking students questions to guide continued exploration provides opportunities for discussion, further reflection, and student decision-making.
Appropriate activities are safe, developmentally appropriate, and directly related to the curriculum. Sufficient tools and materials must be available and science inquiry vocabulary (provided in guide) used.

Essential Understandings

The Science Curriculum for Hinsdale Elementary, Middle and High School is built around the standards listed in the New Hampshire Curriculum Framework. Science is divided into three content domains (Earth Space Science, Life Science, and Physical Science) and one Science Process Skills domain. The three content domains should encompass the Scientific Process Skills of Inquiry and Critical Thinking Skills. The following list of Essential Understandings or Enduring Knowledge Statements are used across all grade levels.

Essential Understandings
Earth Space Science

Strand (Enduring Knowledge Statements)	Stem (rows) in GSEs
ESS1– The Earth and Earth materials, as we know them today, have developed over long periods of time, through constant change processes.	1. Atmosphere, Climate, and Weather
	2. Composition and Features
	3. Fossils
	4. Observation Of The Earth From Space
	5. Processes and Rates Of Change
	6. Rock Cycle
	7. Water
ESS2– The Earth is part of a solar system, made up of distinct parts, which have temporal and spatial interrelationships.	1. Earth, Sun And Moon
	2. Energy
	3. Solar System
	4. View From Earth
ESS3– The origin and evolution of galaxies and the universe demonstrate fundamental principles of physical science across vast distances and time.	1. Size And Scale
	2. Stars And Galaxies
	3. Universe
ESS4– The growth of scientific knowledge in Earth Space Science has been advanced through the development of technology and is used (alone or in combination with other sciences) to identify, understand and solve local and global issues.	1. Design Technology
	2. Tools
	3. Local And Global Environmental Issues
	4. Career and Technical Education

(NH Department of Education- NH Curriculum Framework 2006)

Essential Understandings
Life Science

Strand (Enduring Knowledge Statements)	Stem (rows) in GSEs
LS1– All living organisms have identifiable structures and characteristics that allow for survival (organisms, populations, and species).	1. Classification
	2. Living Things And Organization
	3. Reproduction
LS2– Energy flows and matter recycles through an ecosystem.	1. Environment
	2. Flow Of Energy
	3. Recycling Of Materials
LS3– Groups of organisms show evidence of change over time (e.g. evolution, natural selection, structures, behaviors, and biochemistry).	1. Change
	2. Evolution
	3. Natural Selection
LS4– Humans are similar to other species in many ways, and yet are unique among Earth's life forms.	1. Behavior
	2. Disease
	3. Human Identity
LS5– The growth of scientific knowledge in Life Science has been advanced through the development of technology and is used (alone or in combination with other sciences) to identify, understand and solve local and global issues.	1. Design Technology
	2. Tools
	3. Social Issues (Local And Global) Medical Technology and Biotechnology
	4. Career Technical Education Connections

(NH Department of Education- NH Curriculum Framework 2006)

Essential Understandings
Physical Science

Strand (Enduring Knowledge Statements)	Stem (rows) in GSEs
PS1– All living and nonliving things are composed of matter having characteristic properties that distinguish one substance from another (independent of size/amount of substance).	1. Composition
	2. Properties
PS2– Energy is necessary for change to occur in matter. Energy can be stored, transferred and transformed, but cannot be destroyed.	1. Change
	2. Conservation
	3. Energy
PS3– The motion of an object is affected by force.	1. Forces
	2. Motion
PS4– The growth of scientific knowledge in Physical Science has been advanced through the development of technology and is used (alone or in combination with other sciences) to identify, understand and solve local and global issues.	1. Design Technology
	2. Tools
	3. Social Issues (Local and Global) Energy, Power, and Transportation Manufacturing
	4. Career Technical Education Connections

(NH Department of Education- NH Curriculum Framework 2006)

Essential Understandings
Science Process Skills

Strand (Enduring Knowledge Statements)	Stem (rows) in GSEs
SPS1– Scientific Inquiry and Critical Thinking Skills	1. Making observations and asking questions
	2. Designing scientific investigations
	3. Conducting scientific investigations
	4. Representing and Understanding results of Investigations
	5. Evaluating Scientific Investigations
	NECAP Science Assessment Targets for Inquiry (INQ) *May subject of performance component*
SPS2– Unifying Concepts of Science (including NECAP Science Assessment Targets by Big Idea)	1. Nature of Science (NOS)
	2. Systems and Energy (SAE)
	3. Models and Scale (MAS)
	4. Patterns of Change (POC)
	5. Form and Function (FAF)
SPS3– Personal, Social, and Technological Perspectives	1. Collaboration in Scientific Endeavors
	2. Environment, Natural Resources, and Conservation
	3. Science, Technology, and Design
SPS4– Science Skills for Information, Communication and Media Literacy	1. Information and Media Literacy
	2. Communication Skills
	3. Critical Thinking and Systems Thinking
	4. Problem Identification, Formulation, and Solution
	5. Creativity and Intellectual Curiosity
	6. Interpersonal and Collaborative Skills
	7. Self Direction
	8. Accountability and Adaptability
	9. Social Responsibility

(NH Department of Education- NH Curriculum Framework 2006)

GRADE: 2

Earth Science

	Standards	Guiding Questions
ESSI	S: ESSI: 2:1.1 Recognize that weather conditions change frequently, and that weather patterns change over the seasons. S: ESS1:2:1.2 Describe and compare weather using observation and measurement of local weather conditions. S: ESS1:2:2.1 Recognize that solid rocks, soils, and water in liquid and solid states can be found on the Earth's surface.	How do weather patterns change over the seasons? How can you classify and organize observable properties of rocks and minerals? Can we observe all of the Earth's changes? Why or why not? How do people use rocks and soil?
ESS2	S: ESS2:2:1.1 Recognize the basic patterns of the Sun, including its appearance during the daytime and how its position in the sky changes through the seasons. S: ESS2:2:1.2 Recognize the basic patterns of the Moon, including its appearance at night and sometimes during the day; and how it appears to change shape through the month. S: ESS2:2:2.1 Recognize that the light and heat the Sun provides the Earth is necessary for life. .	What causes night and day? How does the Moon move and change? What are stars and planets?
ESS3	None at this grade level	None at this grade level

GRADE: 2

Earth Science

ESS4	S: ESS4:2:2.1 Recognize and with assistance, safely demonstrate the use of tools to gather data and extend the senses, such as thermometers, hand lenses, and balances. S: ESS4:2:3.1 Differentiate between natural and man-made materials. S:ESS4:2:3.2 Identify environments that are natural, such as a forest, meadow or mountains and those that have been built or modified by people, including cities, roads, farms, and houses. S: ESS4:2:3.3 Describe actions that can help the environment, such as recycling and proper disposal of waste materials.	How do we measure weather conditions? What are man-made materials?

GRADE: 2

Earth Science

Essential Vocabulary

CONTENT	INQUIRY
Weather	Identify
Seasons	Describe
Liquid	Explain
Solid	Demonstrate
Properties	Compare
Mass	Contrast
Data	Predict
Environment	Categorize
Stars	Sequence
Sun	Differentiate
Moon	Measure
Recycling	Record
Disposal	Graph

GRADE: 2

Earth Science

Suggested Resources/ Activities

http://cp.astate.edu/neapartnership/Framework%20lessons.grade2earth.htm

http://beyondpenguins.ehe.osu.edu/issue/earths-changing-surface/hands-on-science-and-literacy activities-about-erosion-volcanoes-and-earthquakes.

http:www.internet4classrooms.com/earthspace.htm

http://www.teacherfilebox.com/Unit/List.aspy?L=4&A=23&T=51

http://www.geosociety.org/educate/LessonPlans/E_space.htm
http:www.metroparks.cc/education-documents/its_easy_being_green.pdf

http://www.classroomzoom.com/free-lessons/?&sid=30&queryType=2

http:www.enchantedlearning.com/categories/science/3plus.shtml

http:www.spacegrant.hawaii.edu/class-acts

Bibliography/Science Trade Books
Harcourt Science Teacher's Edition
www.harcourtschool.com

http://www.education.nh.gov/instruction/curriculum/science/index.htm
(Science Curriculum Website)

http://www.education.nh.gov/instruction/assessment/necap/released/index.htm
(Science NECAP- Released items)

GRADE: 2

Life Science

	Standards	Guiding Questions
LS1	**S: LS1:2:1.1** Differentiate between living and non-living things; and categorize objects in each group as using significant observable characteristics they share, such as color, shape and size. **S: LS1:2:1.2** Recognize plants and animals as living things and describe how they are alike and different. **S: LS1:2:2.1** Recognize that plants and animals have features that help them survive in different environments. **S: LS1:2:3.2** Recognize that living things have a life cycle, during which they are born, grow, and die.	What are the identifiable structures and characteristics of organisms, populations, and species that allow for survival?
LS2	**S: LS2:2:2.1** Identify the resources that plant and animals need for growth and energy, and describe how their habitat provides these basic needs.	How do habitats provide for plants and animals need for growth and energy?
LS3	**S: LS23:2:1.1** Recognize that some living things, which lived on Earth long ago, are now extinct, such as, dinosaurs, mammoths, giant tree ferns, and horse-tail trees.	How do organisms show change over time?

GRADE: 2

Life Science

LS4	**S: LS4L2L1.1** Recognize and describe how living things respond when exposed to helpful and harmful situations. **S: LS4:2:2.1** Recognize that proper nutrition, exercise and rest are all important factors in maintaining good health. **S: LS4:2:3:1** Recognize similarities and differences among people, and that children closely resemble their parents. **S: LS4:2:3.2** Identify sense organs, including eyes, ears, nose, mouth, and skin; and describe how each can warn an individual about danger.	In what ways are humans similar to and different from Earth's other life forms?
LS5	**S:LS5:4:1.1** Recognize that man uses various mechanical devices to record and describe living organisms. **S:LS5:4:2.1** Demonstrate the use of appropriate tools and simple equipment, such as thermometers, magnifiers and microscopes to gather data and extend the senses.	How has technology advanced the growth of scientific knowledge to understand and solve issues?

GRADE: 2

Life Science

Essential Vocabulary	
CONTENT	**INQUIRY**
Organisms Species Characteristics Environment Life cycle Energy Matter Eco-system Resources Habitat Evolution Natural selection Extinct Unique Proximity Nutrition Differentiate Personal hygiene Reproduction Scientific knowledge Natural Technology	Differentiate Categorize Identify Describe Graph Demonstrate Explain Measure Sequence Predict Compare Contrast

GRADE: 2

Life Science

Suggested Resources/ Activities

http://www.thutong.doe.gov.za/lifesciences/

http://www.ed.gov.nl.ca/edu/k12/curriculum/guides/science/primary/gr2outcomes.pdf

http://www.sciencea-z.com/scienceweb/domain/life?domainId=1

http://www.pbs.org/wgbh/nova/teachers/resources/subj_06_03.html

http://lhsgems.org/gemsguides.html

Biography/Science Trade Books
Harcourt Science Teacher's Edition
www.harcourtschool.com

http://www.education.nh.gov/instruction/curriculum/science/index.htm
(Science Curriculum Website)

http://www.education.nh.gov/instruction/assessment/necap/released/index.htm
(Science NECAP- Released items)

GRADE: 2

Physical Science

	Standards	Guiding Questions
PS1	**S: PS1:2:2.1** Identify the observable properties of different objects, such as color, size, shape, weight, and texture.	What are observable properties of objects?
PS2	**SPS2:2:1.1** Describe how the properties of certain materials can change when specific actions are applied to them, such as freezing, mixing, heating, cutting, dissolving and bending. **SPS2:2:2.2** Recognize that sound is produced by vibrating objects and that the pitch of the sound can be varied by changing the rate of vibration. **SPS2:2:3.2** Explain that the Sun provides the Earth with heat and light. **S: PS2:2:3.**3 Recognize that energy comes from different sources, such as electricity and water, and is utilized in many common objects.	How is sound produced? What provides the Earth with heat and light? How does this happen? What is energy? How is it produced?
PS3	**S: PS3:2:2.2** Describe the properties of magnetism and demonstrate how magnets can be used to move things without touching them. **S;PS3:2:2.2** Describe and demonstrate how the position and motion of an object can be changed by applying force, such as pushing and pulling; explain that the greater the force, the greater the change.	What is magnetism? What is gravity? What is inertia?

GRADE: 2

Physical Science

PS4	**S: PS4:2:2.2** Demonstrate how to use tools, such as rulers, scales, balances, magnifiers and thermometers to measure properties of objects, such as size, weight, and temperature. **S:PS4:2:3.1** Provide examples of how man uses energy in everyday life, such as providing light, warmth in winter, cooling in summer, TV's, computers, telephones, transportation, and factories.	How can we use simple tools to measure the properties of objects? How do people use energy in everyday life?

GRADE: 2

Physical Science

Essential Vocabulary	
CONTENT	**INQUIRY**
Weight	Graph
Texture	Describe
Vibrate	Identify
Pitch	Categorize
Energy	Differentiate
Magnetism	Demonstrate
Force	Explain
Gravity	Record
Properties	Measure
Inertia	Sequence
Source	Predict
	Compare
	Contrast
	Hypothesize

GRADE: 2

Physical Science

Suggested Resources/ Activities

http://www.bbc.co.uk/schools/scienceclips/ages/7_8/characteristics_materials.shtml.

http://www.bced.gov.bc.ca/irp/welcome.php.

http://www.olc.spsd.sk.ca/de/resources/sciencelinks/grade2.html

http://resources.scienceworld.ca/component/taxonomy/grade%203

http://education.jlab.org/vocabhangman/

Bibliography/Science Trade books
Harcourt Science Teacher's Edition
www.harcourtschool.com

http://www.education.nh.gov/instruction/curriculum/science/index.htm
(Science Curriculum Website)

http://www.education.nh.gov/instruction/assessment/necap/released/index.htm
(Science NECAP- Released items)