

8th Grade NH State Science Frameworks		Pre - Aquatic Biologist	Aquatic Biologist	Post - Aquatic Biologist	Pre - NE Forester	New England Forester	Post - NE Forester	Pre - Geologist	Geologist	Post - Geologist	Astronomer
Use tools, quantitative and qualitative data	8:1:1		X			X					
Collect real-time data to add to existing information	8:1:2					X					
Use tools to draw conclusions and implications based on investigation	8:1:3		X	X		X	X				
Construct and use dicotomous key	8:1:4	X									
Rephrase questions to be answered by scientific inquiry	8:1:6		X			X					
Relationships among variables	8:1:7										
Identify flaws in experiment	8:2:3										
Use tools to gather data	8:3:2		X			X					
Follow teacher instructions (safety and procedure)	8:3:3	X	X	x	x	X	X	x	X	x	X
Use tools to collect, organize, represent, analyze, explain data	8:4:1		x			X	X				
Identify sources of error	8:4:2										
Draw conclusions	8:4:3		X	X		X	X				
Determine if results support or refute scientific idea	8:5:1		X			X					
Evaluate relivance of data collected	8:5:2		X	X		X	X				
Determine addition information/observations needed	8:5:3		X			X					
Make and record observations using a predetermined format	8:6:1		X	X		X	X		X		
Scientific investigations = logic, relivent evidence	8:1:1		X	X		X	X				
Knowledge based on science is subject to modification	8:1:3										
Some very old scientific knowledge is still applicable	8:1:4										
Some things can not be tested scientifically (morality issues)	8:1:5										
Science can predict results of actions for ethical discision making	8:1:6										
Systems are connected (system has subsystems)	8:2:1		X			X			X		X
Output from one system is input to another	8:2:2		X			X			X		
Describe how objects can store energy (battery or food)	8:2:5										
As complexity increase, use summeries and examples to understand	8:3:4		X			X			X		X
Describe cyles (day/night, body temp)	8:4:5		X			X			X		X
Cooperate in group, set, accept, exucute roles and responsibilities	8:1:1	X	X	x	x	X	X	x	X	x	X
Work towards common goal	8:1:2	X	X	X	X	X	X	X	X	x	X
Respect others abilities and contributions to group	8:1:3		X	X	X	X	X	X	X	x	X
Demonstrate understanding of ethics in scientific inquiry	8:1:4										
Collect real-time data to add to existing information	8:1:2					X					
Use charts and diagrams to analyse data	8:1:3		X			X					
Make sketches, graphs, diagrams to explain ideas	8:3:3		X			X					
Articulate understanding of content though interacting with peers	8:6:3		X			X			X		X
Develop plan, execute, collect, analyze to answer question/problem	8:8:1		X			X					

6th - 8th Grade MA State Science and Technology/Engineering Learning Standards		Pre - Aquatic Biologist	Aquatic Biologist	Post - Aquatic Biologist	Pre - NE Forester	New England Forester	Post - NE Forester	Pre - Geologist	Geologist	Post - Geologist	Astronomer
Earth and Space Science											
Earth's common physical features can be represented with models and maps.	1		X						X		
Layers of the earth include the lithosphere, mantle, and core.	2										
Radiation, conduction, and convection transfer heat through the earth's system.	3										
Energy provided by the sun, global patterns of atmospheric movement, and temperature differences among water, land, and atmosphere are related.	4		X			X					
Movement of the earth's crustal plates causes both slow and rapid changes in the earth's surface.	5							X			
Earth's surface is built up and torn down by natural processes.	6		X			X		X	X		
Physical evidence supports theories that the earth has evolved over geologic time.	7								X		
Gravity pulls things toward the center of earth and influences formation/movement of planets, stars, and S.S.	8										
Lunar/solar eclipses, moon phases, tides are related to relative positions of earth, moon, and sun.	9										X
Properties and conditions of objects in the solar system and those on Earth.	10										
Earth's tilt and its revolution around the sun result in uneven heating, causing the seasons.	11										X
The universe contains many billions of galaxies and each galaxy contains many billions of stars.	12										X
Life Science (Biology)											
Organisms are classified into kingdoms.	1	X	X			X					
Organisms are composed of cells, and many organisms are single-celled.	2										
Plant and animal cells have similarities and differences in their major organelles	3										
Basic functions of living organisms are carried out in cells.	4										
Multicellular organisms can be hierarchically organized.	5		X								
General functions of the major systems of the human body, and the interactions of these systems.	7										
Give examples in which genetic variation/environmental factors are causes of evolution and organism diversity.	8										
Sexual reproduction and asexual reproduction.	9		X			X					
Genetic variation and environmental factors are causes of evolution and diversity of organisms.	10										
Evidence drawn from multiple sources provides the basis of the theory of evolution.	11										
Extinction of species is related to a mismatch of adaptation and environment.	12										
Organisms interact and have different functions within an ecosystem that enable it's survival.	13	X	X			X					
Roles & relationships among producers, consumers, and decomposers, energy transfer in food web.	14		X			X					
Dead plants and animals are broken down by other living organisms	15		X			X					
Producers use energy from sunlight to make sugars through photosynthesis.	16					X					
Ecosystems have changed through geologic time in response to various influences.	17								X		
Biological evolution accounts for species diversity developed over generations.	18										
Physical Science (Chemistry and Physics)											
Weight is the amount of gravitational pull on an object and is distinct from mass.	1										
Volume and mass are distinct components of density.	2										
Appropriate tools and use of significant digits are needed to measure volume and mass.	3										
Mass is conserved in a closed system.	4										
Elements combine in many ways to produce compounds that make up living and nonliving things.	5										
Differences between mixtures and pure substances.	8		X								
Differentiate between physical changes and chemical changes.	10								X		
An object's motion can be described by its position, direction of motion, and speed.	11										
Distance vs. time graphs for constant speed.	12										
Differentiate between potential and kinetic energy.	13										
Temperature change results from adding or taking away heat energy from a system.	14		X			X					
Heat moves in predictable ways, moving from warmer to cooler objects until reaching equilibrium.	16		X			X					

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Technology/Engineering											
Appropriate materials for design tasks based on specific properties and characteristics.	1.1										
Appropriate tools used to hold, lift, carry, fasten, and separate, and their safe and proper uses.	1.2										
Safe and proper use of tools and machines needed to construct a prototype.	1.3										
Methods of representing solutions to a design problem.	2.2										
Describe and explain the purpose of a given prototype.	2.3										
Appropriate materials, tools, and machines to construct a prototype.	2.4										
Design features and cost limitations affect the construction of a prototype.	2.5										
Skills of Inquiry, Experimentation and Design											
Formulate a testable hypothesis .			X	X		X	X				
Design and conduct an experiment, specifying variables to be changed, controlled and measured.			X			X					
Select appropriate tools and technology and make quantitative observations.			X			X					
Present and explain data and findings using multiple representations and demonstrations.			X	X		X	X				
Draw conclusions from data/evidence presented in tables/graphs, make inferences based on data.			X	X		X	X				
Communicate procedures and results using appropriate science and technology terminology.			X			X					
Offer explanations of procedures and critique and revise them.			X			X					
Mathematics Learning Standards											
Construct and interpret stem-and-leaf plots , line plots, and circle graphs.	6.D.2						X				
Solve problems involving proportional relationships and units of measurement.	6.M.3										
Select, convert, and use appropriate units of measurement and scale	8.M.1				X						
Describe the characteristics and limitations of a data sample.	8.D.1						X				
Select, create, interpret and utilize various tabular and graphical representations of data.	8.D.2										
Find, describe, and interpret appropriate measures of central tendency and spread for a set of data.	8.D.3						X				
Exploratory Concepts and Skills											
Generate and group data, record the data using frequency tables and interpret the table.			X	X		X	X				
Select, create and use appropriate graphical representations of data.			X				X				
History & Geography Learning Standards											
Use geographic terms correctly. Grade 5.	1								X	X	
Compare informatino shown on modern and historical maps of the same region. Grade 7	1									X	
Interdisciplinary Connection - Art Learning Standards											
Apply knowledge of the arts to the study of science and technology and engineering.	10		X			X			X		X