



**A Correlation of
Science and Technology for Children®
and Science and Technology Concepts
for Middle Schools™**

to the

**Boston Public Schools
Citywide Learning Standards and
Curriculum Framework for Science**

Prepared by



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Working Together To Be The Most Valued Teammate Of Every Science Educator

A Correlation of Science and Technology for Children® and Science and Technology Concepts for Middle Schools™ to the Boston Public Schools Citywide Learning Standards and Curriculum Framework for Science

This document gives a quick visual guide to the alignment of Science and Technology for Children® (STC®) and Science and Technology Concepts for Middle Schools™ (STC/MS™) units with the Boston Public Schools Citywide Learning Standards and Curriculum Framework for Science. Although each STC and STC/MS unit was developed for use at a specific grade level, there is some flexibility in grade placement—any unit may be used a grade above or below the one for which it was developed. Because of this flexibility, many curriculum planners prefer to think of each unit as covering a three-level band of grades (as indicated in the chart below). In addition, STC/MS units can be used at grade 9 as well.

All fourth-grade through sixth-grade STC unit kits include a Discovery Deck, a set of extensions for the unit. When a Discovery Deck meets or helps to meet a learning standard, the abbreviation “DD” will follow the unit abbreviation.

STC® and STC/MS™ Recommended Grade Levels and Unit Abbreviations

The National Science Resources Center (NSRC), developer of the STC and STC/MS programs, recommends the units be used within the following grade ranges.

	Grades	Life and Earth Science		Physical Science and Technology	
STC	K–2	<i>Organisms</i> (O)	<i>Weather</i> (W)	<i>Solids and Liquids</i> (SL)	<i>Comparing and Measuring</i> (CM)
	1–3	<i>The Life Cycle of Butterflies</i> (LCB)	<i>Soils</i> (S)	<i>Changes</i> (C)	<i>Balancing and Weighing</i> (BW)
	2–4	<i>Plant Growth and Development</i> (PGD)	<i>Rocks and Minerals</i> (RM)	<i>Chemical Tests</i> (CT)	<i>Sound</i> (So)
	3–5	<i>Animal Studies*</i> (AS)	<i>Land and Water*</i> (LW)	<i>Electric Circuits*</i> (EC)	<i>Motion and Design*</i> (MD)
	4–6	<i>Microworlds*</i> (Mw)	<i>Ecosystems*</i> (E)	<i>Food Chemistry*</i> (FC)	<i>Floating and Sinking*</i> (FS)
	5–7	<i>Experiments with Plants*</i> (EP)	<i>Measuring Time*</i> (MT)	<i>Magnets and Motors*</i> (MM)	<i>The Technology of Paper*</i> (TP)
STC/MS	6–8**	<i>Human Body Systems</i> (HBS)	<i>Catastrophic Events</i> (CE)	<i>Properties of Matter</i> (POM)	<i>Energy, Machines, and Motion</i> (EMM)
		<i>Organisms—From Macro to Micro</i> (OMM)	<i>Earth in Space</i> (ES)	<i>Light</i> (L)	<i>Electrical Energy and Circuit Design</i> (EECD)

*Unit kit includes a Discovery Deck (DD).

**STC/MS units may also be used at grade 9.

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Unified Science Kindergarten	
Instructional Objectives	STC Unit(s)
I. Science Process - Students will:	
Ask questions about objects, living things, and events in the natural world.	All STC units
Explore and respond to the questions thoughtfully.	All STC units
II. Domain Knowledge - Students will become knowledgeable about and understand that:	
A. Topic - The Senses:	
The senses are: sight, sound, touch, taste, and smell.	O, W
Senses tell us about the environment both within our bodies and the world around us.	O, W
There is variation among humans in their ability to sense.	
In animals, sense may be more or less sensitive than in humans.	
B. Topic - Water:	
Water is a liquid and can shape itself to fit the container it is in.	SL (water is a liquid only)
Water mixed with other things may be good or bad depending on its use.	SL
C. Topic - Local Environment:	
Our environment changes in terms of weather, day, night, etc.	W
Students will be able to explain these concepts (A.-C.) in simple terms using real-life examples.	Compatible with all STC units
III. Scientific Technology - Students will:	
Employ simple equipment and tools such as a hand lens, ruler, eye dropper, etc.	All STC units
IV. Human and Societal Applications - Students will:	
Appreciate the impact of science on their lives by knowing how it helps to solve some social and personal issues, but not others.	
Unified Science Grade 1	
Instructional Objectives	STC Unit(s)
I. Science Process - Students will:	
Ask questions about objects, living things, and events in the natural world.	All STC units
Communicate their investigations and explanations.	All STC units
II. Domain Knowledge - Students will become knowledgeable about and understand:	
A. Topic - Characteristics of Living Things:	
The characteristic of life.	O, LCB, S
Living things are born, grow, change, and die over time.	O, LCB
Living things have common needs, such as food, water, sunlight, and shelter.	O, LCB, S

Different living things meet their needs differently.	O, LCB, S
Living things require other living and non-living things to meet their needs.	O, LCB, S
B. Topic - Weather:	
Weather changes over time. Seasons tend to have different weather patterns.	W (seasons not included)
C. Topic - Force:	
Force is needed to begin and to stop motion in objects.	
Different amounts of force are needed to move different objects over different surfaces.	
Students will be able to explain these concepts (A.-C.) in simple terms, using real-life examples.	Compatible with all STC units
III. Scientific Technology - Students will:	
Use simple equipment and tools to gather and extend the senses such as a hand lens, rain gauge, ruler, weather vane, and anemometer.	All STC units
IV. Human and Societal Appreciation - Students will:	
Appreciate the impact of science on their lives by knowing how it helps to solve some social and personal issues, but not others.	LCB
Unified Science Grade 2	
Instructional Objectives	STC Unit(s)
I. Science Process - Students will:	
Ask questions about objects, organisms, and events in the natural world.	All STC units
Use evidence to construct a reasonable explanation.	All STC units
Communicate their investigations and explanations.	All STC units
II. Domain Knowledge - Students will become knowledgeable about and understand that:	
A. Topic - Interaction of Living Things:	
Habitats provide for an organism's needs.	O
There is interaction between habitats and their inhabitants.	O
B. Topic - Sun, Moon, and Earth:	
There are objects in the sky visible especially at night.	
Objects in the sky change their position over time.	W
C. Topic - Light and Color:	
Light produces color.	
D. Topic - Balancing and Weighing:	
The weight of one object can be measured by comparing it to another object.	CM, BW
Students will be able to explain these concepts (A.-D.) in simple terms using real-life examples.	Compatible with all STC units

III. Scientific Technology - Students will:	
Employ simple equipment and tools to gather information and extend the senses such as a hand lens, compass, etc.	All STC units
Use game-type software programs that simulate a science investigation.	
Use telecommunications to retrieve information and conduct a conversation on a science topic (i.e., two-way cable program, internet) accessed by their teacher.	All STC units are compatible with this standard; however, STC does not require the use of computers, etc.
IV. Human and Societal Applications - Students will:	
Appreciate the impact of science on their lives by knowing how it helps to solve some social and personal issues, but not others.	LCB, RM
Unified Science Grade 3	
Instructional Objectives	STC Unit(s)
I. Science Processes - Students will:	
Ask questions about objects, organisms, and events in the natural world.	All STC units
Use evidence and models to construct a reasonable explanation.	All STC units
Communicate their investigations and explanations.	All STC units
II. Domain Knowledge - Students will become knowledgeable about and understand:	
A. Topic - Plant and Animal Life Cycles:	
Flowering plant life cycle: flower, fruit, seed, seedling, vegetative plant, flower.	PGD
Structure and function of primary plant: roots, stems, leaves, flowers, and how these differ from plant to plant.	PGD (structure and function only)
The structure of a seed.	S, PGD
Many trees are flowering plants.	
B. Topic - Characteristics of Sound:	
Sounds are vibrations whose waves the human ears can detect.	So
Loudness is a measure of the energy of the vibration.	So
C. Topic - Earth's Water:	
Liquids, such as ocean or pond water, can be a mix of several materials.	
The characteristics of a liquid determine whether and how well an object will float in it.	
Students will be able to explain these concepts (A.-C.) in simple terms, using real-life experiences.	Compatible with all STC units
III. Scientific Technology - Students will understand and use:	
Simple equipment and tools to gather and extend the senses such as a ruler, magnifier, thermometer, stop watch, tuning fork, hydraulic pump, simple balance, and spring scale.	All STC units

Flowering plants have many cultural uses such as for food, sources of drugs and chemicals, building materials, paper, and sources of clothing fibers and dyes.	PGD
Sounds can provide pleasure (music, gently running water), warning (sirens) and communication (school bells, elevator arrival).	So (music only)
To receive information on a science topic via cable or internet.	All STC units are compatible with this standard; however, STC does not require the use of computers, etc.
IV. Human and Societal Applications - Students will:	
Appreciate the impact of science on their lives by knowing how it helps to solve some social and personal issues, but not others.	LCB, RM, AS, LW, EC, MD
Unified Science Grade 4	
Instructional Objectives	STC Unit(s)
I. Science Processes – Students will:	
Ask questions about objects, organisms, and events in the natural world.	All STC units
Use evidence and models to construct a reasonable explanation.	All STC units
Communicate their investigations and explanations.	All STC units
II. Domain Knowledge - Students will become knowledgeable about and understand:	
A. Topic - Skeletal System:	
The structure and function of the major bone groups in the human body.	
The structure and function of different types of teeth.	
Animals have different bone structure which lead to different ways to grow, survive, and reproduce.	
B. Topic - Earth’s Surface:	
Rocks have histories.	RM
Characteristics of rocks: what they are made of, sizes, where they are found, etc.	RM
Fossils provide evidence of the Earth’s history.	RM, Mw DD
C. Topic - Magnetism and Electricity:	
The characteristics of magnetism: attraction, fields, forces, etc.	RM
How magnets are made; how they can lose their magnetism.	
Properties of electricity	EC, EC DD
Electric circuits	EC, EC DD
D. Topic - Characteristics of Animals:	
Kinds of animals	AS, AS DD, E, E DD
Animals breathe in oxygen from air and need food.	AS, E

Students will be able to explain these concepts (A.-D.) in simple terms, using real life examples.	Compatible with all STC units
III. Scientific Technology - Students will understand and use:	
Simple equipment and tools to gather and extend the senses such as a ruler, hand lens, magnet, circuit tester, volt meter, amp meter.	All STC units
Share observations concerning a scientific phenomenon via telecommunications (i.e., Kidnet, Bosnet, Environet)	All STC units are compatible with this standard; however, STC does not require the use of computers, etc.
IV. Human and Societal Applications - Students will:	
Appreciate the impact of science on their lives by knowing how it helps to solve some social and personal issues, but not others.	Mw, E, FS
Unified Science Grade 5	
Instructional Objectives	STC Unit(s)
I. Science Processes - Students will:	
Identify questions that can be answered through scientific investigation.	All STC units
Use appropriate tools and techniques to gather, analyze, and interpret data.	All STC units
Develop descriptions, explanations, predictions, and models using evidence.	All STC units
Recognize and analyze alternative explanations and predictions.	AS, LW, EC, MD, E, FC, FS
Communicate scientific procedures and explanations.	All STC units
Use mathematics in all aspects of scientific inquiry.	AS, LW, MD, Mw, E, FC, FS
II. Domain Knowledge - Students will become knowledgeable about and understand:	
A. Topic - Microorganisms:	
Microscopes make it possible to see that living things are made mostly of cells. Some organisms are made up of many similar cells; some are made up of very different types of cells.	Mw (microscopes make it possible to see that living things are made mostly of cells only)
The ways living and non-living things are similar and different when seen through a microscope.	
B. Topic - Astronomy:	
The arrangement of celestial bodies is called the solar system.	
In our solar system there are nine planets and one large star called the Sun. There are other suns called stars.	
Relative movements of the celestial bodies cause seasons, night and day, phases of the moon, and eclipses.	MT, MT DD (phases of the moon and eclipses only)
Light from celestial bodies is either produced or reflected.	
C. Topic - Chemistry:	
Substances possess characteristic physical and chemical properties.	FC, FS, FS DD, TP
Chemical properties can be identified by chemicals known as indicators.	

D. Topic - Populations and Ecosystems:	
Plants and animals live in a delicate balance with their environment.	AS, AS DD, E, E DD, EP, EP DD
Students will be able to explain these topics (A.-D.) using grade-level terms, citing real-life examples.	Compatible with all STC units
III. Scientific Technology - Students will:	
Understand and use the following: simple compound microscope, simple telescope.	Mw, TP (microscope only)
Study scientific data received through telecommunications, to compare and contrast with their own observations, and to strengthen or revise their conclusions regarding some scientific investigation(s).	All STC units are compatible with this standard; however, STC does not require the use of computers, etc.
IV. Human and Societal Applications - Students will:	
Identify aspects of social and personal issues which can be addressed through scientific study.	E, EP DD
Prudently apply scientific knowledge to those social or personal issues.	E
Understand that useful chemicals can also be hazardous.	FC
Unified Science Middle School 1 Grade 6	
Instructional Objectives	STC and/or STC/MS Unit(s)
I. Science Process - Students will:	
Identify questions that can be answered through scientific investigation.	All STC and STC/MS units
Use appropriate tools and techniques to gather, analyze, and interpret data.	All STC and STC/MS units
Develop descriptions, explanations, predictions, and models using evidence.	All STC and STC/MS units
Recognize and analyze alternative explanations and predictions.	E, FC, FS, EP, MT, TP, all STC/MS units
Communicate scientific procedures and explanations.	All STC and STC/MS units
Use mathematics in all aspects of scientific inquiry.	Mw, E, FC, FS, EP, MT, MM, TP, all STC/MS units
II. Domain Knowledge - Students will become knowledgeable about and understand:	
A. Topic - Human Body Systems:	
The organization of all human systems (i.e., cells, tissue, organ systems)	HBS
The main function of each system: how they are interrelated, and how each interacts with the environment.	HBS
B. Topic - Food Chemistry:	
Food can be described chemically, both in terms of energy content and material composition.	FC, HBS, OMM
Chemical composition of food in relation to the organism's metabolic needs determines its nutritional value.	HBS, OMM

C. Topic - Electromagnets and Motors:	
Electricity and magnetism are closely related forces.	MM, EECD
Electromagnetic power is a function of electric current passing through a wire coil.	MM, MM DD, EECD
Electric (electromagnetic) motors represent technical applications of electromagnetism.	MM DD
D. Topic - Oceanography:	
The water (hydrologic) cycle	CE
The salinity of the ocean	
Students will be able to explain these topics (A.-D.) using grade-level terms, citing real-life examples.	Compatible with all STC units and HBS, CE, OMM, EECD
III. Scientific Technology - Students will:	
Be able to use the following tools: simple compound microscope, ammeter, voltmeter, electric motor, and seismograph printout.	Mw, TP (microscope only), CE, EMM, OMM, EECD
IV. Human and Societal Applications - Students will:	
Evaluate social or personal issues in terms of how science can/cannot contribute to their clarification and resolution.	E, all STC/MS units
Identify aspects of social and personal issues which can be addressed through scientific study.	E, EP DD, all STC/MS units
Prudently apply scientific knowledge to those social or personal issues.	E, all STC/MS units
Understand that electric motors are widely used in society.	MM, MM DD, EMM
Unified Science Middle School 2 Grade 7	
Instructional Objectives	STC and/or STC/MS Unit(s)
I. Science Process - Students will:	
Identify questions that can be answered through scientific investigation.	EP, MT, MM, TP, all STC/MS units
Use appropriate tools and techniques to gather, analyze, and interpret data.	EP, MT, MM, TP, all STC/MS units
Develop descriptions, explanations, predictions, and models using evidence.	EP, MT, MM, TP, all STC/MS units
Recognize and analyze alternative explanations and predictions.	EP, MT, TP, all STC/MS units
Communicate scientific procedures and explanations.	EP, MT, MM, TP, all STC/MS units
Use mathematics in all aspects of scientific inquiry.	EP, MT, MM, TP, all STC/MS units
II. Domain Knowledge - Students will become knowledgeable about and understand:	
A. Topic - Varieties of Life on Earth:	
Species (natural and artificial classification)	OMM
Individual variation	OMM

Organisms as “solutions” to common problems living things encounter.	OMM
Life’s kingdoms: animal, fungus, monera, plant, and protista	OMM
B. Topic - Solids, Liquids, and Gases:	
Characteristics of solids: crystalline, elastic (Hooke’s Law)	POM
Characteristics of liquids: relative incompressibility, surface tension	POM
Characteristics of gases: compressible, expandable	POM
Pressure and density	POM
Gross effects of temperature changes and the three states of matter.	POM
C. Topic - Forces and Motion:	
Characteristics of the four simple machines	EMM
Mechanism of gear ratios	
D. Topic - Geological Events and Disasters:	
The dynamic nature of planet earth.	CE, ES
The forces and movement within the earth.	CE, ES
Students will be able to explain these topics (A.-D.) with grade level terms, citing real-life examples.	Compatible with EP, MT, MM, TP, CE, POM, EMM, OMM, ES
III. Scientific Technology - Students will:	
Be able to use the following tools: microscope, triple beam balance, pH meter, thermometer, computers, and overhead projector.	EP, TP (microscope and thermometer only), compatible with all STC/MS units
Study scientific data received through electronic transmission.	Compatible with all STC/MS units
Use the design process to solve a common societal problem.	TP, CE, EECD
IV. Human and Societal Applications - Students will:	
Evaluate social or personal issues in terms of how science can/cannot contribute to their clarification and resolution.	TP, all STC/MS units
Identify aspects of social/personal issues which can be addressed through scientific study.	TP, all STC/MS units
Prudently apply scientific knowledge to those social or personal issues.	TP, all STC/MS units
Unified Science Middle School 3 Grade 8	
Instructional Objectives	STC/MS Unit(s)
I. Science Process – Students will:	
Identify questions that can be answered through scientific investigation.	All STC/MS units
Use appropriate tools and techniques to gather, analyze, and interpret data.	All STC/MS units
Develop descriptions, explanations, predictions, and models using evidence.	All STC/MS units
Recognize and analyze alternative explanations and predictions.	All STC/MS units
Communicate scientific procedures and explanations.	All STC/MS units

Use mathematics in all aspects of scientific inquiry.	All STC/MS units
II. Domain Knowledge - Students will become knowledgeable about and understand:	
A. Topic - Single Cell Life:	
Cells appear to be the fundamental unit of living things.	HBS, OMM
Cells are bounded by semi-permeable membranes.	HBS, OMM
Cell structure accords with cell function.	OMM
Cells arise from cells.	OMM
B. Topic - Astronomy:	
The scale of the universe	ES
The forces governing motion of celestial bodies.	EMM (gravity only), ES
C. Topic - Optics:	
Light rays bend then they pass from air to glass and back to air again.	L
Image formation and related terms (principal axis, focal length, etc.)	L
Determining size and location of images with ray diagrams.	ES, L
Aberrations and lens defects	L
D. Topic - Chemistry and the Atom:	
All matter is composed of small particles.	POM (extension only)
Atoms can react to form more complex substances.	POM (extension only)
Students will be able to explain these topics (A.-D.) in grade-level terms, citing real-life examples.	Compatible with HBS, POM, EMM, OMM, ES, L
III. Scientific Technology - Students will:	
Be able to use the following: microscope, telescope, mirror, and lenses.	OMM, L
Study scientific data received through electronic transmission.	Compatible with all STC/MS units
Use the design process to solve a common societal problem.	CE, EECD
IV. Human and Societal Applications - Students will:	
Evaluate social or personal issues in terms of how science can/cannot contribute to their clarification and resolution.	All STC/MS units
Identify aspects of social/personal issues which can be addressed through scientific study.	All STC/MS units
Prudently apply scientific knowledge to those social or personal issues.	All STC/MS units