

A Correlation of the
Phoenix USI Science Curriculum Instructional Strands
 and the
Science and Technology for Children™ Curriculum

Prepared by Carolina Biological Supply Company

The following tables are provided to give a quick visual guide to the correlation of the Phoenix USI Science Curriculum Instructional Strands with the Science and Technology for Children™ (STC™) units of study. Since there is some flexibility in grade-level placement with the STC units, we suggest that you give consideration to units recommended for the grade level above and the grade level below the grade being considered. For example, in selecting units for grade four, consider also the units listed for grades three and five.

Key to Abbreviations of STC™ Units

O	Organisms	PGD	Plant Growth and Development	Mw	Microworlds
W	Weather	RM	Rocks and Minerals	E	Ecosystems
SL	Solids and Liquids	CT	Chemical Tests	FC	Food Chemistry
CM	Comparing and Measuring	So	Sound	FS	Floating and Sinking
LCB	The Life Cycle of Butterflies	AS	Animal Studies	EP	Experiments with Plants
S	Soils	LW	Land and Water	MT	Measuring Time
C	Changes	EC	Electric Circuits	MM	Magnets and Motors
BW	Balancing and Weighing	MD	Motion and Design	TP	The Technology of Paper

Recommended Grade Levels for STC™ Units

The National Science Resources Center (NSRC) recommends that an STC unit not be moved up or down more than one grade level from these recommendations. In the following tables, units that meet an objective, but fall outside the recommended grade range, are indicated by an asterisk (*).

1st				2nd				3rd			
O	W	SL	CM	LCB	S	C	BW	PGD	RM	CT	So
4th				5th				6th			
AS	LW	EC	MD	Mw	E	FC	FS	EP	MT	MM	TP

Phoenix USI Science Curriculum
K–4 INSTRUCTIONAL STRANDS

EARTH SCIENCE

IS.K.E

OBJECTS IN THE SKY

4.SM.ES.2 OBJECTS IN THE SKY

4.SM.ES.2.1 The sun, moon, stars, clouds, birds, and airplanes all have properties, locations, and movements that can be observed and described.

W, MD, MT*

IS.1.E

PROPERTIES OF EARTH MATERIALS

4.SM.ES.1 PROPERTIES OF EARTH MATERIALS

4.SM.ES.1.1 Earth materials are solid rocks and soils, water, and the gases of the atmosphere.

W, S, C, RM, LW

4.SM.ES.1.4 Soils have properties of color and texture, capacity to retain water, and ability to support the growth of many kinds of plants, including those in our food supply.

S, LW

IS.2.E

WEATHER

4.SM.ES.2 OBJECTS IN THE SKY

4 SM.ES.2.2 The sun provides the light and heat necessary to maintain the temperature of the earth.

W

4.SM.ES.3 CHANGES IN THE EARTH AND SKY

4.SM.ES.3.4 Weather changes from day to day and over the seasons.

W

4.SM.ES.3.5 Weather can be described by measurable quantities, such as temperature, wind direction and speed, and precipitation.

W

IS.3.E

PROPERTIES AND USES

4.SM.ES.1 PROPERTIES OF EARTH MATERIALS

4.SM.ES.1.2 The varied materials have different physical and chemical properties, which make them useful in different ways.

S, RM

4.SM.ES.1.3 Earth materials provide many of the resources that humans use.

RM

IS.4.E

CHANGES IN EARTH AND SKY

4.SM.ES.1 PROPERTIES OF EARTH MATERIALS

4.SM.ES.1.5 Fossils provide evidence about plants and animals that lived long ago and the nature of the environment at that time.

RM

4.SM.ES.3 CHANGES IN THE EARTH AND SKY

4.SM.ES.3.1 The surface of the Earth changes.

LW

4.SM.ES.3.2 Some changes are due to slow processes, such as erosion and weathering.

RM, LW

4.SM.ES.3.3 Some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.

RM, LW

4.SM.ES.3.6 Objects in the sky have patterns of movement.

MT*

4.SM.ES.3.7 The sun appears to move across the sky in the same way every day, but its path changes slowly over the seasons.

MT*

4.SM.ES.3.8 The moon moves across the sky on a daily basis much like the sun.

MT*

4.SM.ES.3.9 The observable shape of the moon changes from day to day in a cycle that lasts about a month.

MT*

LIFE SCIENCE

IS.K.L

THE CHARACTERISTICS OF ORGANISMS

4.SM.LS.1 THE CHARACTERISTICS OF ORGANISMS

4 SM.LS.1.1 Organisms have basic needs.

O, LCB, PGD, AS

4.SM.LS.1.2 Plants need air, water, nutrients, and light.

PGD

4.SM.LS.1.3 Organisms can survive only in environments in which their needs are met.

O, LCB, PGD, AS

IS.2.L

LIFE CYCLES

4.SM.LS.2 LIFE CYCLES OF ORGANISMS

- 4.SM.LS.1.6 The behavior of individual organisms is influenced by internal cues and by external cues.
LCB, AS
- 4.SM.LS.1.7 Organisms have senses that help them detect internal and external cues.
LCB, AS
- 4.SM.L.3 **ORGANISMS AND THEIR ENVIRONMENTS**
- 4.SM.L.3.1 All animals depend on plants. Some animals eat plants for food. Other animals eat animals that eat the plants.
O, LCB, AS
- 4.SM.L.3.2 An organism's patterns of behavior are related to the nature of that organism's environment, including the kinds and numbers of other organisms present, the availability of food and resources, and the physical characteristics of the environment.
AS
- 4.SM.L.3.3 When the environment changes, some plants and animals survive and reproduce and, others die or move to new locations.
AS
- 4 SM.L.3 4 All organisms cause changes in the environment where they live, some changes are detrimental, others are beneficial.
AS
- 4.SM.L.3 5 Humans depend on their natural and constructed environments and can change these in ways that can be beneficial or detrimental for them and other organisms.
LW, E*

PHYSICAL SCIENCE

- IS.KP **PROPERTIES OF OBJECTS AND MATERIALS**
- 4.SM.PS.1 **PROPERTIES OF OBJECTS AND MATERIALS**
- 4.SM.PS.1.1 Objects have many observable properties including the ability to react with other substances.
SL, CM, C, BW, RM, CT, EC
- 4.SM.PS.1.2 Properties can be measured using tools such as rulers, balances, and thermometers.
SL, CM, C, BW, RM, CT, EC
- 4.SM.PS.1.3 Objects are made of one or more materials and can be described by the properties of the materials from they are made.
RM
- 4.SM.PS.1.4 Properties can be used to sort a group of objects or materials.
SL, CM, BW, RM, CT, EC
- IS.1.P **PROPERTIES OF OBJECTS AND MATERIALS**

- 4.SM.PS.1 **PROPERTIES OF OBJECTS AND MATERIALS**
- 4.SM.PS.1.1 Objects have many observable properties including the ability to react with other substances.
SL, CM, C, BW, RM, CT, EC
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- 4.SM.PS.1.3 Objects are made of one or more materials and can be described by the properties of the materials from they are made.
RM
- 4.SM.PS.1.4 Properties can be used to sort a group of objects or materials.
SL, CM, BW, RM, CT, EC

IS.2.P **POSITION AND MOTION AND STATES OF MATTER**

I SM PS 2 **POSITION AND MOTION OF OBJECTS**

- 4.SM.PS.2.1 The position of an object can be described by locating it relative to another object or the background.
W, SL, BW, MD
- 4.SM.PS.2.2 An object's motion can be described by tracing and measuring its position over time.
MD
- 4.S.A.PS.2.3 The position and motion of objects can be changed by pushing or pulling.
SL, BW, MD
- 4.SM.PS.2.4 The size of change is related to the strength of the push or pull.
SL, BW, MD

IS.3.P **LIGHT AND SOUND**

- 4.SM.PS.3 **LIGHT, HEAT, ELECTRICITY, AND MAGNETISM**
- 4.SM.PS.3.1 Light travels in a straight line until it strikes an object.
Mw*
- 4.SM.PS.3.2 Light can be reflected by a mirror, refracted by a lens, or absorbed by the object.
Mw*
- 4.SM.PS.2 **POSITION AND MOTION OF OBJECTS.**
- 4.SM.PS.2.5 Sound is produced by vibrating objects.
So
- 4.SM.PS.2.6 The pitch of the sound can be varied by changing the rate of vibration.
So

IS.4.P **HEAT, ELECTRICITY, AND MAGNETISM**

- 4.SM.PS.1 **PROPERTIES OF OBJECTS AND MATERIALS**

- 4.SM.PS.1.5 Materials can exist in different states.
W, SL, C, CT, LW
- 4.SM.PS.1.6 Some objects can be changed from one state to another by heating or cooling.
W, C, LW
- 4.SM.PS.3 LIGHT, HEAT, ELECTRICITY, AND MAGNETISM
- 4.SM.PS.3.3 Heat can be produced in many ways, such as burning, rubbing, or mixing one substance with another.
W, C, CT, EC
- 4.SM.PS.3.4 Heat can move from one object to another by conduction.
- 4.SM.PS.3.5 Electricity in circuits can produce light, heat, sound, and, and magnetic effects.
EC, MM*
- 4.SM.PS.3.6 Electrical circuits require a complete or closed loop through which an electrical current can pass.
EC
- 4.SM.PS.3.7 Magnets attract and repel each other and certain kinds of other materials.
SL, RM, MM*

Phoenix USI Science Curriculum

5–8 INSTRUCTIONAL STRANDS

[Note: Since STC ends at grade six, correlation with this section will be less complete than with the preceding.]

EARTH SCIENCE

IS.5.E ROCK CYCLE, MINERALS AND SOIL

8.SM.ES.SES STRUCTURE OF THE EARTH SYSTEM

8.SM.ES.SES.6 Some changes in the solid earth can be described as the “rock cycle.”
RM*

8.SM.ES.SES.7 Old rocks at the Earth’s surface weather, forming sediments that are buried, then compacted, heated and often recrystallized into new rock. Eventually new rocks may be brought to the surface by the forces that drive plate motions, and the rock cycle.
RM*, LW

8.SM.ES.SES.8 Soil consists of weathered rocks and decomposed organic material from dead plants, animals, and bacteria.
S*, LW

8.SM.ES.SES.9 Soil is often found in layers, with each having a different chemical composition and texture.
LW

8.SM.ES.SES.18 Live organisms have played many roles in the Earth system, including affecting the composition of the atmosphere, producing some types of rocks and contributing to the weathering of rocks.
E

8.SM.ES.EH EARTH'S HISTORY

8.SM.ES.EH.2 Fossils provide important evidence of how life and environmental conditions have changed.
RM*

IS.6.E WATER CYCLE, CLIMATE, AND WEATHER

8.SM.ES.SES STRUCTURE OF THE EARTH SYSTEM

8.SM.ES.SES.10 Water, which covers the majority of the Earth's surface, circulates through the crust, oceans, and atmosphere in what is known as the "water cycle."
LW

8.SM.ES.SES.11 Water evaporates from the Earth's surface, rises and cools as it moves to higher elevations, condenses as rain or snow, and falls to the surface where it collects in lakes, oceans, soil, and in rocks underground.
LW, E

8.SM.ES.SES.12 Water is a solvent. As it passes through the water cycle it dissolves minerals and gases and carries them to the oceans.
LW, E

8.SM.ES.SES.13 The atmosphere is a mixture of nitrogen, oxygen, and trace gases that include water vapor.
LW, E (for water vapor only)

8.SM.ES.SES.14 The atmosphere has different properties at different elevations.

8.SM.ES.SES.15 Clouds, formed by the condensation of water vapor, affect weather and climate.
LW

8.SM.ES.SES.16 Global patterns of atmospheric movement influence local weather.

8.SM.ES.SES.17 Oceans have a major effect on climate, because water in the oceans holds a large amount of heat.

15.7.E RESTLESS EARTH

8.SM.ES.SES STRUCTURE OF THE EARTH SYSTEM

8.SM.ES.SES.1 The solid Earth is layered with a lithosphere; hot, convecting mantle; and dense, metallic core.

8.SM.ES.SES.2 Lithospheric plates on the scales of continents and oceans constantly move at rates of centimeters per year in response to movements in the mantle.

8.SM.ES.ScS.3 Major geological events, such as earthquakes, volcanic eruptions, and mountain building, result from these plate motions.

8.SM.ES.SES.4 Land forms are the result of a combination of constructive and destructive forces.
LW

8.SM.ES.SES.5 Constructive forces include crustal deformation, volcanic eruption, and deposition of sediment, while destructive forces include weathering and erosion.
RM, LW

8 SM.ES.EH EARTH'S HISTORY

8.SM.ES.EH.1 The Earth processes we see today, including erosion, movement of Lithospheric plates, and changes in atmospheric composition, are similar to those that occurred in the past. Earth's history is also influenced by occasional catastrophes such as the impact of an asteroid or comet.
RM*, LW

EARTH SCIENCE

IS.8.E EARTH IN THE SOLAR SYSTEM

8.SM.ES.ESS EARTH IN THE SOLAR SYSTEM

8.SM.ES.ESS.1 The Earth is the third planet from the sun in a system that includes the moon, the sun, eight other planets and their moons, and smaller objects, such as asteroids and comets.

8.SM.ES.ESS.2 The sun, an average star, is the central and largest body in the solar system.

8.SM.ES.ESS.3 Most objects in the solar system are in regular and predictable motion.
MT

8.SM.ES.ESS.4 This motion explains such phenomena as the day, the year, phases of the moon, and eclipses.
MT

8.SM.ES.ESS.5 Gravity is the force that keeps planets in orbit around the sun and governs the rest of the motion in the solar system.

8.SM.ES.ESS.6 Gravity alone holds us to the Earth's surface and explains the phenomena of the tides.

8 SM.ES.ESS.7 The sun is the major source of energy for phenomena on the Earth's surface, such as growth of plants, winds, ocean currents, and the water cycle.

LW, E

8.SM.ES.ESS.8 Seasons result from variations in the amount of the sun's energy hitting the surface, due to the tilt of the Earth's rotation on its axis and the length of the day.

LIFE SCIENCE

IS.5.L

CYCLES OF LIFE

8.SM.LS.PE POPULATIONS AND ECOSYSTEMS

8.SM.LS.PE.1 A population consists of all individuals of a species that occur together at a given place and time.

8.SM.LS.PE.2 All populations living together and the physical factors with which they interact compose an ecosystem.

E

8.SM.LS.PE.3 Populations of organisms can be categorized by the function they serve in an ecosystem.

E

8.SM.LS.PE.4 Plants and some microorganisms are producers - they make their own food.

E

8.SM.LS.PE.5 All animals, including humans, are consumers, which obtain food by eating other organisms.

E

8.SM.LS.PE.6 Decomposers, primarily bacteria and fungi, are consumers that use waste materials and dead organisms for food.

E

8.SM.LS.PE.7 Food webs identify the relationships among producers, consumers, and decomposers in an ecosystem.

E

8.SM.LS.DA DIVERSITY AND ADAPTATIONS OF ORGANISMS

8.SM.LS.DA.6 Extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival.

E

8.SM.LS.DA.7 Fossils indicate that many organisms that lived long ago are extinct.

8.SM.LS.DA.8 Extinction of species is common; most of the species that have lived on the Earth no longer exist.

IS.6.L

HUMAN BODY SYSTEMS

8.SM.LS.SF STRUCTURE AND FUNCTION IN LIVING SYSTEMS

8.SM.LS.SF.1 Living systems at all levels of organization demonstrate the complementary nature of structure and function.

E

8.SM.LS.SF.2 Important levels of organization for structure and function include cells, organs, tissues, organ systems, whole organisms, and ecosystems.

Mw, E

8.SM.LS.SF.3 All organisms are composed of cells - the fundamental unit of life.

Mw

8.SM.LS.SF.4 Most organisms are single cell; other organisms, including humans, are multicellular.

Mw

8.SM.LS.SF.5 Cells carry on the many functions needed to sustain life.

Mw

8.SM.LS.SF.6 This requires that they take in nutrients, which they use to provide energy for the work that cells do and to make the materials that a cell or an organism needs.

8.SM.LS.SF.7 Cells grow and divide, thereby producing more cells.

8.SM.LS.SF.8 Specialized cells perform specialized functions in multicellular organisms.

8.SM.LS.SF.g Groups of specialized cells cooperate to form a tissue, such as a muscle.

8.SM.LS.SF.10 Different tissues are in turn grouped together to form larger functional units, called organs.

8.SM.LS.SF.11 Each type of cell, tissue, and organ has a distinct structure and set of functions that serve the organism as a whole.

8.SM.LS.SF.12 The human organism has systems for digestion, respiration, reproduction, circulation, excretion, movement, control and coordination, and for protection from disease.

8.SM.LS.SF.13 These systems interact with one another.

8.SM.LS.SF.14 Disease is a breakdown in structures or functions of an organism.

8.SM.LS.SF.15 Some diseases are the result of intrinsic failures of the system. Others are the result of damage by infection by other organisms.

8.SM.LS.RH REPRODUCTION AND HEREDITY

8.SM.LS.RH.1 Reproduction is a characteristic of all living systems, because no individual organism lives forever. Reproduction is essential to the continuation of every species.
PGD*, E

8.SM.LS.RH.2 Some organisms reproduce asexually, others reproduce sexually.

8.SM.LS.RH.3 In many species, females produce eggs and males produce sperm.
AS

8.SM.LS.RH.4 Plants reproduce sexually - the egg and sperm are produced in the flowers of plants.
PGD*, EP

8.SM.LS.RH.5 An egg and sperm unite to begin development of a new individual ideal [sic].
EP

IS.7.L ENERGY AND BEHAVIOR IN THE ECOSYSTEM

8.SM.LS.RB REGULATION AND BEHAVIOR

8.SM.LS.RB.1 All organisms must be able to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing external environment.
AS, E, EP

8.SM.LS.RB.2 Regulation of an organism's internal environment involves sensing the internal environment and changing physiological activities to keep conditions within the range required to survive.

8.SM.LS.RB.3 Behavior is one kind of response an organism can make to an internal or environmental stimulus.
AS

8.SM.LS.RB.4 Behavioral response is a set of actions determined in part by heredity and in part from experience.
AS

8.SM.LS.RB.5 An organism's behavior evolves through adaptation to its environment.
AS

8.SM.LS.RB.6 How a species moves, obtains food, reproduces, and responds to danger are based in the species' evolutionary history.

8.SM.LS.PE POPULATIONS AND ECOSYSTEMS

8.SM.LS.RH.13 Some traits are inherited and others result from interaction with the environment.

8.SM.LS.DA DIVERSITY AND ADAPTATIONS OF ORGANISMS

8.SM.LS.DA.1 Millions of species of animals, plants, and microorganisms are alive today.

8.SM.LS.DA.2 Although different species might look dissimilar, the unity among organisms becomes apparent from an analysis of internal structures, the similarity of their chemical processes, and the evidence of common ancestry.

8.SM.LS.DA.3 Biological evolution accounts for the diversity of species developed through gradual processes over many generations.

8.SM.LS.DA.4 Species acquire many of their unique characteristics through biological adaptation, which involves the selection of naturally occurring variations in populations.

8.SM.LS.DA.5 Biological adaptations include changes in structures, behaviors, or physiology that enhance survival and reproductive success in a particular environment.

AS

PHYSICAL SCIENCE

IS.5.P

MOTIONS AND FORCES

8.SM.PS.MF MOTIONS AND FORCES

8.SM.PS.MF.1 The motion of an object can be described by its position, direction of motion and speed. That motion can be measured and represented on a graph.

MD

8.SM.PS.MF.2 An object that is not being subjected to a force will continue to move at a constant speed and in a straight line.

MD

8.SM.PS.MF.3 If more than one force acts on an object along a straight line, then the forces will reinforce or cancel one another, depending on their direction and magnitude.

8.SM.PS.MF.4 Unbalanced forces will cause changes in the speed or direction of an object's motion.

MD

IS .6.P

ELECTRICITY

8.SM.PS.TE TRANSFER OF ENERGY

8.SM.PS.TE.3 Electrical circuits provide a means of transferring electrical energy when heat, light, sound, and chemical changes are produced.

EC, MM

IS.7.P

PROPERTIES AND CHANGES OF PROPERTIES IN MATTER

8.SM.PS.PM PROPERTIES AND CHANGES OF PROPERTIES IN MATTER.

8.SM.PS.PM.1 A substance has characteristic properties, such as density, a boiling point, and solubility, all of which are independent of the amount of the sample.
FS

8.SM.PS.PM.2 A mixture of substances often can be separated into the original substances using one or more of the characteristic properties.
C*, CT*, FS

8.SM.PS.PM.3 Substances react chemically in characteristic ways with other substances to form new substances (compounds) with different characteristic properties.

8.SM.PS.PM.4 In chemical reactions, the total mass is conserved.

8.SM.PS.PM.5 Substances often are placed in categories or groups if they react in similar ways (e.g., metals).

8.SM.PS.PM.6 Chemical elements do not break down during normal laboratory reactions involving such treatments as heating, exposure to electric current, or reaction with acids.

8.SM.PS.PM.7 There are more than 100 known elements that combine in a multitude of ways to produce compounds, which account for the living and nonliving substances that we encounter.

IS.8.P

8.SM.PS.TE TRANSFER OF ENERGY

8.SM.PS.TE.1 Energy is a property of many substances and is associated with heat, light, electricity, mechanical motion, sound, nuclei and the nature of a chemical. Energy is transferred in many ways.
EC*, MT, MM

8.SM.PS.TE.2 Heat moves in predictable ways, moving from warmer objects to cooler ones, until both reach the same temperature.

8.SM.PS.TE.4 Light interacts with matter by transmission (including refraction), absorption, or scattering (including reflections).
Mw

8.S~it.PS.TE.5 To see an object, light from that object - emitted by or scattered from it - must enter the eye.

8.SM.PS.TE.6 In most chemical and nuclear reactions, energy is transferred into or out of a system. Heat, light, mechanical motion, or electricity might all be involved in such transfers.

8.SM.PS.TE.7 The sun is a major source of energy for changes on the Earth's surface.

8.SM.PS.TE.8 The sun loses energy by emitting light. A tiny fraction of that light (with a range of wavelengths) reaches the Earth, transferring energy from the sun to the Earth.