Centerville-Abington Elementary Curriculum Mapping
Science – 6th Grade
1st Nine Weeks

Unit Chapter Lesson	Indiana Standard(s)	Key Concepts	Resources/Activities	Vocabulary	Assessments
Science and Technology Ch. 1 pp. 1-9 Ch. 2 pp.10-17 Ch. 3 pp. 18-27	SEPS.1 SEPS.3 LST.2.3 LST.5.2 SEPS.4 SEPS.6 SEPS.7	-Pose questions that lead to descriptions and explanations of how the natural and designed world(s) work and see how these questions can be scientifically tested. -Define problems (for engineering) to determine criteria for possible solutions and identify constraints to solve problems about the designed world. -Construct and perform investigations. -Identify variables and the parameters of the investigation to generate quality data, monitor and record progress, and evaluate to make changes to modify and repeat investigation if necessary -Analyze and interpret data -Construct descriptions and explanations -Use reasoning and argument based on evidence to explain and/or find best solutions to a design problem	Online: -Scientific Inquiry Quick Lab -Posing Questions Inquiry Warm-up -The Computer Mouse Quick Lab -Keeping Flowers Fresh lab (S&T) -Stopping on a Dime Lab (F&E) -World in a Bottle Lab (E & E) -Density Graphs Lab -Using Scientific Thinking Quick Lab	process evidence scientific inquiry critical thinking hypothesis (NCA) inference observation prediction science technology variables manipulated variable responding variable controlled experiment data scientific law scientific theory	teacher made tests and/or project based rubric
Science and Technology Ch. 3, L1 pp.68-79	SEPS.2	-Use and construct conceptual models that illustrate ideas and explanations. -Analyze and identify flaws in systems; build and revise scientific explanations and proposed engineered systems; and	Online: -Scale Models Inquiry Warm-up -Making Models quick lab	model description explanation International	teacher made tests and/or project based

Ch. 3, L2 pp. 80-85	SEPS.5 SEPS.8	communicate ideas. -Identify and correctly use tools to construct, obtain, and evaluate questions and problems. -Use Mathematics and Computational thinking -Obtain, evaluate, and communicate ideas	-History of Measurement Inquiry Warm-Up -How many shoes? Quick Lab -How many marbles are there? -Sources of Information Quick lab	System of Units (SI) Significant digits estimate accuracy precision mean median mode range	rubric
	LST.6.1 LST 6.2 LST.7.1-7.3 LST.5.2	-Plan and develop; draft revise using appropriate reference materials -Use technology to produce and publish writing -Research process - build knowledge about the research process and the topic under study by conducting short research -Write scientific procedures	-Science Fair project using Google Slides (option to do an in-class lab to take the place of mandatory science fair projects)	Variables Independent variables Dependent variables Hypothesis (NCA) Data Conclusion	Project based rubric

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Unit Chapter Lesson	Indiana Standard(s)	Key Concepts	Resources/Activities	Vocabulary	Assessments
Science and Technology	LST.1.1 LST 1.2 LST 2.1 LST 2.2	Read and comprehend science and technical texts independently and proficiently and write effectively for a variety of disciplines-specific tasks, purposes, and audiences. Define problems (for engineering) to determine criteria for possible solutions and identify constraints to solve problems about the designed world.	Online: Scientific Inquiry Quick Lab Posing Questions Inquiry Warm-up The Computer Mouse Quick Lab	process evidence scientific inquiry critical thinking hypothesis (NCA) inference observation prediction science scientific law scientific theory technology	teacher made tests and/or project based rubric

Curriculum Mapping
Science – 6th Grade
2nd Nine Weeks

Unit Chapter Lesson	Indiana Standard(s)	Key Concepts	Resources/Activities	Vocabulary	Assessments
Forces & Energy Ch. 1 Lessons 1-2 Motion; Speed and Velocity	LST.4.1 LST.6.2 6.PS.1 6.PS.2	-Distinguish between position, distance, and displacement, speed and velocity. -Describe motion of an object graphically showing the relationship between time and position.	pg. 7, 11 Apply it! pp. 12-13 Online: -What is Motion? Warm up -Identifying Motion quick lab -How Fast and How Far? -Motion Graphs Quick Lab -Graphing Acceleration Quick lab	distance speed (NCA) velocity	teacher made homework, tests, and/or project based rubric
Chapter 4 Energy Lessons 1-3	6.PS.3 6.PS.4	-Describe the interaction between kinetic and potential energy. -Identify the properties of light, sound, kinetic, potential, nuclear, electrical, and thermal energy. -Identify different types of potential energy (motion, nuclear, elastic, gravitational, and chemical). -Identify all energy transformations	pp. 110-115 Online: -How high does a ball bounce? -What makes a Flashlight shine?	electric energy energy kinetic energy (NCA) mechanical energy nuclear energy potential energy (NCA) radiant energy sound energy thermal energy	teacher made homework, tests, and/or project based rubric

Ch. 2 Forces Lessons 1-3	6.ESS.1	from a picture or an exposition. -Describe the role of gravity and inertia in maintaining the regular and predictable motion of celestial bodies.	pp.58-59 Online: -Orbiting Earth quick lab	force (NCA) friction gravity law of conservation of energy inertia	

Curriculum Mapping
Science – 6th Grade
3rd Nine Weeks

Unit Chapter Lesson	Indiana Standard(s)	Key Concepts	Resources/Activities	Vocabulary	Assessments
Astronomy and Space Science Ch. 1, Lessons 1-3	6.ESS.1 LST.3.2	-Describe the role of gravity and inertia in maintaining the regular and predictable motion of celestial bodies. -Analyze structure author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic	pp. 18-21 Demo: Demonstrating inertia Online: -Around and around we go quick lab	equator equinox orbit revolution rotation rotation axis solstice maria phase waning phase	teacher made homework, tests, and/or project based rubric
Ch. 1, Lessons 4-5	6.ESS.2	-Design models to describe how Earth's rotation, revolution, tilt and interaction with the sun and moon cause seasons, tides, changes in daylight hours, eclipses, and phases of the moon..	pp. 11-12, 14-16, 22-27, 29-31 Online: -How does the moon move? warm-up -Eclipses quick lab -Modeling the moon's pull of gravity quick lab	waxing phase lunar eclipse penumbra solar eclipse tide umbra seasons (NCA)	
Ch. 1, Lesson 6	6.ESS.3	-Understand the features of Earth and its moon	pp. 33-35		
Chapter 3 The Solar System: Lessons 1-6	6.ESS.3 6.LST.2.3	-Identify all components of the Solar System, including the Sun, all the planets, a rough estimate of moons, the Asteroid Belt, the Kuiper Belt, and the Oort Cloud.	pp. 33-35; 83-86; 95-101; 102-115	asteroid astronomical unit comet orbit period of	teacher made tests and/or project based rubric

Ch.3 Lessons 1-6	6.ESS.3	-Compare and contrast all planets based upon their size, distance from Sun, composition, cross-section, moons, rings, atmosphere, temperature, and ability to support life. -Compare and contrast the inner and outer planets.	pp. 33-35; 83-86; 95-101; 102-115 Online: How Big are the Planets? inquiry warm-up	revolution (NCA) period of rotation (NCA) Solar System star greenhouse effect terrestrial planet Galilean moons probe impact crater meteor meteorite meteoroid	

Curriculum Mapping
Science – 6th Grade
4th Nine Weeks

Unit Chapter Lesson	Indiana Standard(s)	Key Concepts	Resources/Activities	Vocabulary	Assessments
Diversity of Life SE Ecology and the Environment Chapter 1: Populations and Communities Lessons 1-3 Chapter 2, Lesson 1	6.LS.1 6.LS.4 6.LS.3	-Investigate and describe how homeostasis is maintained as living things seek out their basic needs of food, water, shelter, space, and air. -Investigate and use data to explain how changes in biotic and abiotic components in a given habitat can be beneficial or detrimental to native plants and animals. -Identify and describe relationships between organisms, such as predator/prey, consumer/producer/decomposer, and the many varieties of symbiotic relationships.	SE - Diversity of Life, page 13 pp. 10-17 Online: -Elbow room quick lab -It's all water under the dam STEM activity pp. 21-27, 43-45 Online: -Competition and Predation quick lab -Types of Symbiosis Quick lab	biosphere biotic potential carrying capacity community competition limiting factor population population density birth rate death rate estimate exponential food web migration commensalism consumer habitat mutualism niche parasitism predator producer symbiosis	teacher made homework, tests, and/or project based rubric

Chapter 2 Ecosystems and Biomes: Lessons 1-4	6.LS.2	-Describe the role of photosynthesis in the flow of energy in food chains, energy pyramids, and food webs. -Create diagrams to show how the energy in animals' food used for bodily processes was once energy from the sun. -Identify and describe aspects and organisms of the different land and aquatic biomes of the world.	pp. 43-49 Online: -Ecosystem Food chains quick lab -Performance expectation activity: Matter and energy in organisms and ecosystems pp.58-71	biome desert ecosystem (NCA) grassland taiga temperate tundra wetland estuary neritic zone intertidal zone salinity climax community ecological succession eutrophication	teacher made tests and/or project based rubric
Ch. 3, L5 Biodiversity	6.LS.5	-Research invasive species and discuss their impact on ecosystems	pp.108-115	pioneer species biodiversity extinction endangered species threatened species	

Curriculum Mapping
Science – 6th Grade
4th Nine Weeks

Unit Chapter Lesson	Indiana Standard(s)	Key Concepts	Resources/Activities	Vocabulary	Assessments
	6.3 6.3.5 SEPS.2	Identify the characteristics of life and being alive. Identify and describe the taxonomic system of the classification of life. Identify and describe the major parts of prokaryotic and eukaryotic (plant and animal) cells.		autotroph binomial nomenclature habitat heterotroph key macromolecule taxon unique cytoplasm eukaryotic cell mitochondrion prokaryotic cell	teacher made tests and/or project based rubric
	6.3.4 6.LS.2	Identify the components (reactants and products) of the equation that fuel photosynthesis and cellular respiration. Compare and contrast photosynthesis and cellular respiration. Identify the role of photosynthesis in food chains, food webs, and eco systems. Identify all the -tropisms and plant hormones and describe their effect on		cellular respiration energy molecule photosynthesis (NCA) photoperiodism plant hormone stimulus tropism	teacher made tests and/or project based rubric

		plant growth and development.			

Curriculum Mapping
EXTRA NOTES

Unit Chapter Lesson	Indiana Standard(s)	Key Concepts	Resources/Activities	Vocabulary	Assessments
** Lessons, chapters, and units could take more or less time than indicated here per student need and teacher discretion.	** Revised 2016 Indiana State Standards do not match the adopted textbook as well as the previous state standards. Teachers should be aware and supplement the textbook in these areas, but standards always change, and that should always be the case.	** Teacher should use technology, usually in the form of student projects, to aid in both the teaching of state standards and to investigate topics in-depth. Teacher will often go wide with the curriculum while students go deep with their investigations and projects. Like with AR, students self-select topics within an agreed-upon level or topic list, so that interest and engagement is high.	** Teacher may choose to do some of the labs in the book at their discretion. Some labs are listed here, but this list is neither exhaustive nor required. Teacher may also make up their own labs as needed. ** Teacher may add their own videos from BrainPop and YouTube as the curriculum or time allows. They are not listed here, as they can vary by teacher, by class, or by year.	NCA Vocabulary Words are indicated with (NCA)	** ILEARN prep should be done before whatever date(s) it falls on, at teacher discretion. Teacher may also just integrate ILEARN Prep into the whole curriculum.

Sixth Grade Science Standards

Science and Engineering Process Standards (SEPS)

SEPS.1 Posing questions (for science) and defining problems (for engineering)

A practice of science is posing and refining questions that lead to descriptions and explanations of how the natural and designed world(s) work and these questions can be scientifically tested. Engineering questions clarify problems to determine criteria for possible solutions and identify constraints to solve problems about the designed world.

SEPS.2 Developing and using models and tools

A practice of both science and engineering is to use and construct conceptual models that illustrate ideas and explanations. Models are used to develop questions, predictions and explanations; analyze and identify flaws in systems; build and revise scientific explanations and proposed engineered systems; and communicate ideas. Measurements and observations are used to revise and improve models and designs. Models include, but are not limited to: diagrams, drawings, physical replicas, mathematical representations, analogies, and other technological models.

Another practice of both science and engineering is to identify and correctly use tools to construct, obtain, and evaluate questions and problems. Utilize appropriate tools while identifying their limitations. Tools include, but are not limited to: pencil and paper, models, ruler, a protractor, a calculator, laboratory equipment, safety gear, a spreadsheet, experiment data collection software, and other technological tools.

SEPS.3 Constructing and performing investigations

Scientists and engineers are constructing and performing investigations in the field or laboratory, working collaboratively as well as individually. Researching analogous problems in order to gain insight into possible solutions allows them to make conjectures about the form and meaning of the solution. A plan to a solution pathway is developed prior to constructing and performing investigations. Constructing investigations systematically encompasses identified variables and parameters generating quality data. While performing, scientists and engineers monitor and record progress. After performing, they evaluate to make changes to modify and repeat the investigation if necessary.

SEPS.4 Analyzing and interpreting data

Investigations produce data that must be analyzed in order to derive meaning. Because data patterns and trends are not always obvious, scientists and engineers use a range of tools to identify the significant features in the data. They identify sources of error in the investigations and calculate the degree of certainty in the results. Advances in science and engineering makes analysis of proposed solutions more efficient and effective. They analyze their results by continually asking themselves questions; possible questions may be, but are not limited to: “Does this make sense?” "Could my results be duplicated?" and/or “Does the design solve the problem with the given constraints?”

In both science and engineering, mathematics and computation are fundamental tools for representing physical variables and their

SEPS.5 Using mathematics and computational thinking

relationships. They are used for a range of tasks such as constructing simulations; solving equations exactly or approximately; and recognizing, expressing, and applying quantitative relationships. Mathematical and computational approaches enable scientists and engineers to predict the behavior of systems and test the validity of such predictions. Scientists and engineers understand how mathematical ideas interconnect and build on one another to produce a coherent whole.

SEPS.6 Constructing explanations (for science) and designing solutions (for engineering)

Scientists and engineers use their results from the investigation in constructing descriptions and explanations, citing the interpretation of data, connecting the investigation to how the natural and designed world(s) work. They construct or design logical coherent explanations or solutions of phenomena that incorporate their understanding of science and/or engineering or a model that represents it, and are consistent with the available evidence.

SEPS.7 Engaging in argument from evidence

Scientists and engineers use reasoning and argument based on evidence to identify the best explanation for a natural phenomenon or the best solution to a design problem. Scientists and engineers use argumentation, the process by which evidence-based conclusions and solutions are reached, to listen to, compare, and evaluate competing ideas and methods based on merits. Scientists and engineers engage in argumentation when investigating a phenomenon, testing a design solution, resolving questions about measurements, building data models, and using evidence to evaluate claims.

SEPS.8 Obtaining, evaluating, and communicating information

Scientists and engineers need to be communicating clearly and articulating the ideas and methods they generate. Critiquing and communicating ideas individually and in groups is a critical professional activity. Communicating information and ideas can be done in multiple ways: using tables, diagrams, graphs, models, and equations, as well as, orally, in writing, and through extended discussions. Scientists and engineers employ multiple sources to obtain information that is used to evaluate the merit and validity of claims, methods, and designs.

Sixth Grade Science Standards

LST.1: LEARNING OUTCOME FOR LITERACY IN SCIENCE/TECHNICAL SUBJECTS Read and comprehend science and technical texts independently and proficiently and write effectively for a variety of discipline-specific tasks, purposes, and audiences GRADES 6-8 6-8.LST.1.1: Read and comprehend science and technical texts within a range of complexity appropriate for grades 6-8 independently and proficiently by the end of grade 8.

6-8.LST.1.2: Write routinely over a variety of time frames for a range of discipline- specific tasks, purposes, and audiences.

LST.2: KEY IDEAS AND TEXTUAL SUPPORT (READING) Extract and construct meaning from science and technical texts using a variety of comprehension skills GRADES 6-8 6-8.LST.2.1: Cite specific textual evidence to support analysis of science and technical texts.

6-8.LST.2.2: Determine the central ideas or conclusions of a text; provide an accurate, objective summary of the text.

6-8.LST.2.3: Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

LST.3: STRUCTURAL ELEMENTS AND ORGANIZATION (READING) Build understanding of science and technical texts, using knowledge of structural organization and author's purpose and message GRADES 6-8 6-8.LST.3.1: Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics. 6-8.LST.3.2: Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

6-8.LST.3.3: Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.

Sixth Grade Science Standards

LST.4: SYNTHESIS AND CONNECTION OF IDEAS (READING) Build understanding of science and technical texts by synthesizing and connecting ideas and evaluating specific claims

GRADES 6-8 6-8.LST.4.1: Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). 6-8.LST.4.2: Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

6-8.LST.4.3: Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

LST.5: WRITING GENRES (WRITING) Write for different purposes and to specific audiences or people GRADES 6-8 6-8.LST.5.1: Write arguments focused on discipline-specific content.

6-8.LST.5.2: Write informative texts, including scientific procedures/experiments or technical processes that include precise descriptions and conclusions drawn from data and research.

LST.6: THE WRITING PROCESS (WRITING) Produce coherent and legible documents by planning, drafting, revising, editing, and collaborating with others GRADES 6-8 6-8.LST.6.1: Plan and develop; draft; revise using appropriate reference materials; rewrite; try a new approach; and edit to produce and strengthen writing that is clear and coherent, with some guidance and support from peers and adults. 6-8.LST.6.2: Use technology to produce and publish writing and present the relationships between information and ideas clearly and efficiently.

Sixth Grade Science Standards

LST.7: THE RESEARCH PROCESS (WRITING) Build knowledge about the research process and the topic under study by conducting short or more sustained research GRADES 6-8 6-8.LST.7.1: Conduct short research assignments and tasks to answer a question (including a self- generated question), or test a hypothesis, drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. 6-8.LST.7.2: Gather relevant information from multiple sources, using search terms effectively; annotate sources; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation (e.g., APA or CSE). 6-8.LST.7.3: Draw evidence from informational texts to support analysis, reflection, and research.

Sixth Grade Science Standards

Physical Science (PS)

6.PS.1 Distinguish between the terms position, distance, and displacement, as well as, the terms speed and velocity.

6.PS.2 Describe the motion of an object graphically showing the relationship between time and position.

6.PS.3 Describe how potential and kinetic energy can be transferred from one form to another.

6.PS.4 Investigate the properties of light, sound, and other energy waves and how they are reflected, absorbed, and transmitted through materials and space.

Earth and Space Science (ESS)

6.ESS.1 Describe the role of gravity and inertia in maintaining the regular and predictable motion of celestial bodies.

6.ESS.2 Design models to describe how Earth's rotation, revolution, tilt, and interaction with the sun and moon cause seasons, tides, changes in daylight hours, eclipses, and phases of the moon.

6.ESS.3 Compare and contrast the Earth, its moon, and other planets in the solar system, including comets and asteroids. (Comparisons should be made in regard to size, surface features, atmospheric characteristics, and the ability to support life.)

Life Science (LS)

6.LS.1 Investigate and describe how homeostasis is maintained as living things seek out their basic needs of food, water, shelter, space, and air.

6.LS.2 Describe the role of photosynthesis in the flow of energy in food chains, energy pyramids, and food webs. Create diagrams to show how the energy in animals' food used for bodily processes was once energy from the sun.

6.LS.3 Describe specific relationships (predator/prey, consumer/producer, parasite/host) and symbiotic relationships between organisms. Construct an explanation that predicts why patterns of interactions develop between organisms in an ecosystem.

6.LS.4 Investigate and use data to explain how changes in biotic and abiotic components in a given habitat can be beneficial or detrimental to native plants and animals.

6.LS.5 Research invasive species and discuss their impact on ecosystems.

Sixth Grade Science Standards

Engineering (E)

6-8.E.1 Identify the criteria and constraints of a design to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

6-8.E.2 Evaluate competing design solutions using a systematic process to identify how well they meet the criteria and constraints of the problem.

6-8.E.3 Analyze data from investigations to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

6-8.E.4 Develop a prototype to generate data for repeated investigations and modify a proposed object, tool, or process such that an optimal design can be achieved.