Shekou International School 国际学校 深圳蛇口

Scope and Sequence: Scope and Sequence Report For Standards / Benchmarks, 2019 – 2020: **College, Career, and Civic Life (C3) & Next Generation Science Standards (NGSS)**

Thursday, June 13, 2019, 9:06AM

Primary Years Programme **Grade 3** **G3 PYP Units (2018-19)** **2019-2020** **Collaboration**	**Primary Years Programme** **Grade 4** **G4 PYP Units (2018-19)** **2019-2020** **Collaboration**	**Primary Years Programme** **Grade 5** **G5 PYP Units (2018-19)** **2019-2020** **Collaboration**
G3 HWOO- Systems in Societies (Week 2 - Week 7) **C3: C3 Framework for Social Studies** **C3: By the End of Grade 5** **Dimension 2 - Civics** **Civic and Political Institutions** D2.Civ.6.3-5. Describe ways in which people benefit from and are challenged by working together, including through government, workplaces, voluntary organizations, and families. D2.Civ.7.3-5. Apply civic virtues and democratic principles in school settings. D2.Civ.8.3-5. Identify core civic virtues and democratic principles that guide government, society, and communities. D2.Civ.9.3-5. Use deliberative processes when making decisions or reaching judgments as a group. D2.Civ.10.3-5. Identify the beliefs, experiences, perspectives, and values that underlie their own and others' points of view about civic issues. **Processes, Rules and Laws** D2.Civ.11.3-5. Compare procedures for making	**G4 WWA - Culture** (Week 4 - Week 7) **C3: C3 Framework for Social Studies** **C3: By the End of Grade 5** **Dimension 2 - Civics** **Civic and Political Institutions** D2.Civ.10.3-5. Identify the beliefs, experiences, perspectives, and values that underlie their own and others' points of view about civic issues. **Dimension 2 - Geography** **Geographic Representations: Spatial Views of the World** D2.Geo.1.3-5. Construct maps and other graphic representations of both familiar and unfamiliar places. **Human-Environment Interaction: Place, Regions, and Culture** D2.Geo.4.3-5. Explain how culture influences the way people modify and adapt to their environments. **Global Interconnections: Changing Spatial Patterns** D2.Geo.10.3-5. Explain why environmental characteristics vary among different world regions.	**G5 WWA-Civilizations** (Week 2 - Week 7) **C3: C3 Framework for Social Studies** **C3: By the End of Grade 5** **Dimension 2 - Civics** **Civic and Political Institutions** D2.Civ.5.3-5. Explain the origins, functions, and structure of different systems of government, including those created by the U.S. and state constitutions. **Dimension 2 - Geography** **Human-Environment Interaction: Place, Regions, and Culture** D2.Geo.4.3-5. Explain how culture influences the way people modify and adapt to their environments. D2.Geo.5.3-5. Explain how the cultural and environmental characteristics of places change over time. D2.Geo.6.3-5. Describe how environmental and cultural characteristics influence population distribution in specific places or regions. **Dimension 2 - History** **Change, Continuity, and Context**

decisions in a variety of settings, including classroom, school, government, and/or society.

D2.Civ.12.3-5. Explain how rules and laws change society and how people change rules and laws.

National Council for the Social Studies (NCSS), The College, Career, and Civic Life (C3) Framework for Social Studies State Standards: Guidance for Enhancing the Rigor of K-12 Civics, Economics, Geography, and History (Silver Spring, MD: NCSS, 2013).

College, Career and Civic Life

G3 WWPT- Climate

(Week 8 - Week 13)

C3: C3 Framework for Social Studies

C3: By the End of Grade 5

Dimension 2 - Geography

Geographic Representations: Spatial Views of the World

D2.Geo.1.3-5. Construct maps and other graphic representations of both familiar and unfamiliar places.

D2.Geo.2.3-5. Use maps, satellite images, photographs, and other representations to explain relationships between the locations of places and regions and their environmental characteristics.

NGSS: Science Performance Expectations (2013)

NGSS: Grade 3

3.Weather and Climate

Performance Expectations

3-ESS2-1. Represent data in tables and

Dimension 2 - History

Perspectives

D2.His.4.3-5. Explain why individuals and groups during the same historical period differed in their perspectives.

D2.His.5.3-5. Explain connections among historical contexts and people's perspectives at the time.

D2.His.6.3-5. Describe how people's perspectives shaped the historical sources they created.

National Council for the Social Studies (NCSS), The College, Career, and Civic Life (C3) Framework for Social Studies State Standards: Guidance for Enhancing the Rigor of K-12 Civics, Economics, Geography, and History (Silver Spring, MD: NCSS, 2013).

College, Career and Civic Life

G4 HTWW - Earth's Features

(Week 8 - Week 13)

C3: C3 Framework for Social Studies

C3: By the End of Grade 5

Dimension 2 - Geography

Global Interconnections: Changing Spatial Patterns

D2.Geo.10.3-5. Explain why environmental characteristics vary among different world regions.

D2.Geo.11.3-5. Describe how the spatial patterns of economic activities in a place change over time because of interactions with nearby and distant places.

D2.Geo.12.3-5. Explain how natural and human-made catastrophic events in one place affect people living in other places.

NGSS: Science Performance Expectations (2013)

D2.His.1.3-5. Create and use a chronological sequence of related events to compare developments that happened at the same time.

D2.His.2.3-5. Compare life in specific historical time periods to life today.

D2.His.3.3-5. Generate questions about individuals and groups who have shaped significant historical changes and continuities.

Perspectives

D2.His.4.3-5. Explain why individuals and groups during the same historical period differed in their perspectives.

D2.His.5.3-5. Explain connections among historical contexts and people's perspectives at the time.

D2.His.6.3-5. Describe how people's perspectives shaped the historical sources they created.

Historical Sources and Evidence

D2.His.9.3-5. Summarize how different kinds of historical sources are used to explain events in the past.

D2.His.10.3-5. Compare information provided by different historical sources about the past.

D2.His.11.3-5. Infer the intended audience and purpose of a historical source from information within the source itself.

D2.His.12.3-5. Generate questions about multiple historical sources and their relationships to particular historical events and developments.

D2.His.13.3-5. Use information about a historical source, including the maker, date, place of origin, intended audience, and

graphical displays to describe typical weather conditions expected during a particular season.

3-ESS2-2. Obtain and combine information to describe climates in different regions of the world.

3-ESS3-1. Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.*

NGSS: Science and Engineering Practices

NGSS: K-2

Practice 7. Engaging in argument from evidence

Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s).

Make a claim about the effectiveness of an object, tool, or solution that is supported by relevant evidence.

Practice 8. Obtaining, evaluating, and communicating information

Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information.

Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons), and other media that will be useful in answering a scientific question and/or supporting a scientific claim.

NGSS: 3-5

Practice 4. Analyzing and interpreting data

Analyzing data in 3–5 builds on K–2

NGSS: Grade 4

4.Earth's Systems: Processes that Shape the Earth

Performance Expectations

4-ESS1-1. Identify evidence from patterns in rock formations and fossils in rock layers for changes in a landscape over time to support an explanation for changes in a landscape over time.

4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features.

4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.*

NGSS: Science and Engineering Practices

NGSS: 3-5

Practice 3. Planning and carrying out investigations

Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.

Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design

purpose to judge the extent to which the source is useful for studying a particular topic.

Causation and Argumentation

D2.His.14.3-5. Explain probable causes and effects of events and developments.

D2.His.16.3-5. Use evidence to develop a claim about the past.

G5 HTWW-Investigators

(Week 8 - Week 12)

C3: C3 Framework for Social Studies

C3: By the End of Grade 5

Dimension 2 - History

Change, Continuity, and Context

D2.His.3.3-5. Generate questions about individuals and groups who have shaped significant historical changes and continuities.

Historical Sources and Evidence

D2.His.9.3-5. Summarize how different kinds of historical sources are used to explain events in the past.

NGSS: Science Performance Expectations (2013)

NGSS: Grade 5

5.Structure and Properties of Matter

Performance Expectations

5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen.

5-PS1-2. Measure and graph quantities to provide evidence that regardless of the type

experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.

Represent data in tables and/or various graphical displays (bar graphs, pictographs and/or pie charts) to reveal patterns that indicate relationships.

Practice 7. Engaging in argument from evidence

Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).

Construct and/or support an argument with evidence, data, and/or a model.

Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem.

Practice 8. Obtaining, evaluating, and communicating information

Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.

Read and comprehend grade-appropriate complex texts and/or other reliable media to summarize and obtain scientific and technical ideas and describe how they are supported by evidence.

Obtain and combine information from books and/or other reliable media to explain solution.

Practice 4. Analyzing and interpreting data

Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.

Analyze and interpret data to make sense of phenomena, using logical reasoning, mathematics, and/or computation.

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

Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.

Identify the evidence that supports particular points in an explanation.

Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.

NGSS: Crosscutting Concepts

NGSS: 3-5

Crosscutting Statements

1. Patterns – Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Patterns can be used as evidence to support an explanation.

2. Cause and Effect: Mechanism and Prediction – Events have causes, sometimes simple, of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conservered.

5-PS1-3. Make observations and measurements to identify materials based on their properties.

5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.

NGSS: Science and Engineering Practices

NGSS: 3-5

Practice 2. Developing and using models

Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

Develop and/or use models to describe and/or predict phenomena.

Practice 3. Planning and carrying out investigations

Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.

Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.

Make observations and/or measurements to

phenomena or solutions to a design problem.

NGSS: Crosscutting Concepts

NGSS: 3-5

Crosscutting Statements

1. Patterns – Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Patterns of change can be used to make predictions.

2. Cause and Effect: Mechanism and Prediction – Events have causes, sometimes simple, sometimes multifaceted. Deciphering causal relationships, and the mechanisms by which they are mediated, is a major activity of science and engineering.

Cause and effect relationships are routinely identified, tested, and used to explain change.

Connections to Engineering, Technology and Applications of Science

Influence of Engineering, Technology, and Science and the Natural World

Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands.

Connections to the Nature of Science: Most Closely Associated with Crosscutting Concepts

Science is a Human Endeavor

Science affects everyday life.

NGSS: Disciplinary Core Ideas

NGSS: Grade 3

ESS2: Earth's Systems

ESS2.D: Weather and Climate

sometimes multifaceted. Deciphering causal relationships, and the mechanisms by which they are mediated, is a major activity of science and engineering.

Cause and effect relationships are routinely identified, tested, and used to explain change.

Connections to Engineering, Technology and Applications of Science

Influence of Engineering, Technology, and Science and the Natural World

Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands.

Connections to the Nature of Science: Most Closely Associated with Crosscutting Concepts

Scientific Knowledge Assumes an Order and Consistency in Natural Systems

Science assumes consistent patterns in natural systems.

NGSS: Disciplinary Core Ideas

NGSS: Grade 4

ESS1: Earth's Place in the Universe

ESS1.C: The History of Planet Earth

Local, regional, and global patterns of rock formations reveal changes overtime due to earth forces, such as earthquakes. The presence and location of certain fossil types indicate the order in which rock layers were formed. (4-ESS1-1)

ESS2: Earth's Systems

ESS2.A: Earth Materials and Systems

Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and

produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.

Practice 5. Using mathematics and computational thinking

Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions.

Describe, measure, estimate, and/or graph quantities (e.g., area, volume, weight, time) to address scientific and engineering questions and problems.

NGSS: Crosscutting Concepts

NGSS: 3-5

Crosscutting Statements

2. Cause and Effect: Mechanism and Prediction – Events have causes, sometimes simple, sometimes multifaceted. Deciphering causal relationships, and the mechanisms by which they are mediated, is a major activity of science and engineering.

Cause and effect relationships are routinely identified, tested, and used to explain change.

3. Scale, Proportion, and Quantity – In considering phenomena, it is critical to recognize what is relevant at different size, time, and energy scales, and to recognize proportional relationships between different quantities as scales change.

Natural objects and/or observable phenomena exist from the very small to the

Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3-ESS2-1)

Climate describes a range of an area'stypical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2)

ESS3: Earth and Human Activity

ESS3.B: Natural Hazards

A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. (3-ESS3-1) (Note: This Disciplinary Core Idea is also addressed by 4-ESS3-2.)

G3 WWA- Communities and Culture

(Week 14 - Week 17)

C3: C3 Framework for Social Studies

C3: By the End of Grade 5

Dimension 2 - Geography

Geographic Representations: Spatial Views of the World

D2.Geo.1.3-5. Construct maps and other graphic representations of both familiar and unfamiliar places.

D2.Geo.2.3-5. Use maps, satellite images, photographs, and other representations to explain relationships between the locations of places and regions and their environmental characteristics.

Dimension 2 - History

Perspectives

D2.His.6.3-5. Describe how people's perspectives shaped the historical sources they

move them around. (4-ESS2-1)

ESS2.B: Plate Tectonics and Large-Scale System Interactions

The locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in patterns. Most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans. Major mountain chains form inside continents or near their edges. Maps can help locate the different land and water features areas of Earth. (4-ESS2-2)

ESS2.E: Biogeology

Living things affect the physicalcharacteristics of their regions. (4-ESS2-1)

ESS3: Earth and Human Activity

ESS3.B: Natural Hazards

A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. (3-ESS3-1) (4-ESS3-2.)

ETS1: Engineering Design

ETS1.B: Developing Possible Solutions

Testing a solution involves investigating how well it performs under a range of likely conditions. (secondary to 4-ESS3-2)

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College, Career and Civic Life

G4 WWAPT-- Migration

immensely large or from very short to very long time periods.

Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume.

Connections to the Nature of Science: Most Closely Associated with Crosscutting Concepts

Scientific Knowledge Assumes an Order and Consistency in Natural Systems

Science assumes consistent patterns in natural systems.

NGSS: Disciplinary Core Ideas

NGSS: Grade 5

PS1: Matter and Its Interactions

PS1.A: Structure and Properties of Matter

Matter of any type can be subdivided intoparticles that are too small to see, but even then the matter still exists and can be detected by other means. A model shows that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon; the effects of air on larger particles or objects. (5-PS1-1)

The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish. (5-PS1-2)

Measurements of a variety of properties canbe used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.) (5-PS1-3)

PS1.B: Chemical Reactions

created.

G3 STP- Ecosystems, Life Cycles & Traits

(Week 18 - Week 27)

NGSS: Science Performance Expectations (2013)

NGSS: Grade 3

3.Interdependent Relationships in Ecosystems

Performance Expectations

3-LS2-1. Construct an argument that some animals form groups that help members survive.

3-LS4-1. Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.

3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.*

3.Inheritance and Variation of Traits: Life Cycles and Traits

Performance Expectations

(Week 14 - Week 18)

C3: C3 Framework for Social Studies

C3: By the End of Grade 5

Dimension 2 - Geography

Geographic Representations: Spatial Views of the World

D2.Geo.3.3-5. Use maps of different scales to describe the locations of cultural and environmental characteristics.

Human Population: Spatial Patterns and Movements

D2.Geo.7.3-5. Explain how cultural and environmental characteristics affect the distribution and movement of people, goods, and ideas.

D2.Geo.8.3-5. Explain how human settlements and movements relate to the locations and use of various natural resources.

D2.Geo.9.3-5. Analyze the effects of catastrophic environmental and technological events on human settlements and migration.

Dimension 2 - History

Change, Continuity, and Context

D2.His.3.3-5. Generate questions about individuals and groups who have shaped significant historical changes and continuities.

Perspectives

D2.His.4.3-5. Explain why individuals and groups during the same historical period differed in their perspectives.

D2.His.5.3-5. Explain connections among historical contexts and people's perspectives at the time.

Causation and Argumentation

D2.His.14.3-5. Explain probable causes and

When two or more different substances are mixed, a new substance with different properties may be formed. (5-PS1-4)

No matter what reaction or change inproperties occurs, the total weight of the substances does not change. (Boundary:Mass and weight are not distinguished at thisgrade level.) (5-PS1-2)

National Council for the Social Studies (NCSS), The College, Career, and Civic Life (C3) Framework for Social Studies State Standards: Guidance for Enhancing the Rigor of K-12 Civics, Economics, Geography, and History (Silver Spring, MD: NCSS, 2013).

College, Career and Civic Life

G5 HWEO-Historical Perspectives

(Week 13 - Week 17)

C3: C3 Framework for Social Studies

C3: By the End of Grade 5

Dimension 2 - History

Perspectives

D2.His.4.3-5. Explain why individuals and groups during the same historical period differed in their perspectives.

D2.His.5.3-5. Explain connections among historical contexts and people's perspectives at the time.

D2.His.6.3-5. Describe how people's perspectives shaped the historical sources they created.

Historical Sources and Evidence

D2.His.9.3-5. Summarize how different kinds of historical sources are used to explain

3-LS1-1. Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

3-LS3-1. Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.

3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment.

3-LS4-2. Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.

NGSS: Science and Engineering Practices

NGSS: 3-5

Practice 2. Developing and using models

Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

Develop and/or use models to describe and/or predict phenomena.

Practice 4. Analyzing and interpreting data

Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative

effects of events and developments.

G4 HWEO-- Life Structures & Senses

(Week 19 - Week 24)

NGSS: Science Performance Expectations (2013)

NGSS: Grade 4

4.Structure, Function, and Information Processing

Performance Expectations

4-PS4-2. Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.

4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

NGSS: Science and Engineering Practices

NGSS: 3-5

Practice 2. Developing and using models

Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

Develop and/or use models to describe and/or predict phenomena.

Use a model to test cause and effect relationships

events in the past.

D2.His.10.3-5. Compare information provided by different historical sources about the past.

D2.His.11.3-5. Infer the intended audience and purpose of a historical source from information within the source itself.

D2.His.12.3-5. Generate questions about multiple historical sources and their relationships to particular historical events and developments.

D2.His.13.3-5. Use information about a historical source, including the maker, date, place of origin, intended audience, and purpose to judge the extent to which the source is useful for studying a particular topic.

Causation and Argumentation

D2.His.14.3-5. Explain probable causes and effects of events and developments.

G5 HWOO-Matter & Energy in Life

(Week 19 - Week 25)

NGSS: Science Performance Expectations (2013)

NGSS: Grade 5

5.Matter and Energy in Organisms and Ecosystems

Performance Expectations

5-PS3-1. Use models to describe that that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.

5-LS1-1. Support an argument that plants get

observations. When possible and feasible, digital tools should be used.

Analyze and interpret data to make sense of phenomena, using logical reasoning, mathematics, and/or computation.

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

Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.

Use evidence (e.g., measurements, observations, patterns) to construct or support an explanation or design a solution to a problem.

Practice 7. Engaging in argument from evidence

Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).

Construct and/or support an argument with evidence, data, and/or a model.

Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem.

NGSS: Crosscutting Concepts

NGSS: 3-5

Crosscutting Statements

1. Patterns – Observed patterns in nature

or interactions concerning the functioning of a natural or designed system.

Practice 7. Engaging in argument from evidence

Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).

Construct and/or support an argument with evidence, data, and/or a model.

NGSS: Crosscutting Concepts

NGSS: 3-5

Crosscutting Statements

2. Cause and Effect: Mechanism and Prediction – Events have causes, sometimes simple, sometimes multifaceted. Deciphering causal relationships, and the mechanisms by which they are mediated, is a major activity of science and engineering.

Cause and effect relationships are routinely identified, tested, and used to explain change.

4. Systems and System Models – A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

A system can be described in terms of its components and their interactions.

NGSS: Disciplinary Core Ideas

NGSS: Grade 4

LS1: From Molecules to Organisms: Structures and Processes

LS1.A: Structure and Function

Plants and animals have both internal and external structures that serve various functions in growth,

the materials they need for growth chiefly from air and water.

5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

NGSS: Science and Engineering Practices

NGSS: 3-5

Practice 2. Developing and using models

Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

Develop and/or use models to describe and/or predict phenomena.

Practice 7. Engaging in argument from evidence

Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).

Construct and/or support an argument with evidence, data, and/or a model.

Connections to the Nature of Science: Most Closely Associated with Practices

Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena

Science explanations describe the mechanisms for natural events.

NGSS: Crosscutting Concepts

NGSS: 3-5

guide organization and classification and prompt questions about relationships and causes underlying them.

Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena and designed products.

Patterns of change can be used to make predictions.

2. Cause and Effect: Mechanism and Prediction – Events have causes, sometimes simple, sometimes multifaceted. Deciphering causal relationships, and the mechanisms by which they are mediated, is a major activity of science and engineering.

Cause and effect relationships are routinely identified, tested, and used to explain change.

3. Scale, Proportion, and Quantity – In considering phenomena, it is critical to recognize what is relevant at different size, time, and energy scales, and to recognize proportional relationships between different quantities as scales change.

Natural objects and/or observable phenomena exist from the very small to the immensely large or from very short to very long time periods.

4. Systems and System Models – A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

A system can be described in terms of its components and their interactions.

Connections to the Nature of Science: Most Closely Associated with Crosscutting Concepts

survival,behavior, and reproduction. (4-LS1-1)

LS1.D: Information Processing

Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain. Animals are able to use their perceptions and memories to guide their actions. (4-LS1-2)

PS4: Waves and Their Applications in Technologies for Information Transfer

PS4.B: Electromagnetic Radiation

An object can be seen when light reflected from its surface enters the eyes. (4-PS4-2)

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G4 - HWOO Economics

(Week 25 - Week 30)

C3: C3 Framework for Social Studies

C3: By the End of Grade 5

Dimension 2 - Civics

Civic and Political Institutions

D2.Civ.6.3-5. Describe ways in which people benefit from and are challenged by working together, including through government, workplaces, voluntary organizations, and families.

Processes, Rules and Laws

D2.Civ.13.3-5. Explain how policies are developed to address public problems.

Dimension 2 - Economics

Economic Decision Making

D2.Eco.1.3-5. Compare the benefits and costs of individual choices.

Crosscutting Statements

4. Systems and System Models – A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

A system can be described in terms of its components and their interactions.

5. Energy and Matter: Flows, Cycles, and Conservation – Tracking energy and matter flows, into, out of, and within systems helps one understand their system's behavior.

Matter flows and cycles can be tracked in terms of the weight of the substances before and after a process occurs. The total weight of the substances does not change. This is what is meant by conservation of matter. Matter is transported into, out of, and within systems.

Energy can be transferred in various ways and between objects.

NGSS: Disciplinary Core Ideas

NGSS: Grade 5

LS1: From Molecules to Organisms: Structures and Processes

LS1.C: Organization for Matter and Energy Flow in Organisms

Food provides animals with thematerials they need for body repair and growth and the energy they need to maintain body warmth and for motion. (secondary to 5-PS3-1)

Plants acquire their material forgrowth chiefly from air and water. (5-LS1-1)

LS2: Ecosystems: Interactions, Energy, and Dynamics

LS2.A: Interdependent Relationships in

Scientific Knowledge Assumes an Order and Consistency in Natural Systems

Science assumes consistent patterns in natural systems.

NGSS: Disciplinary Core Ideas

NGSS: Grade 3

LS1: From Molecules to Organisms: Structures and Processes

LS1.B: Growth and Development of Organisms

Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1)

LS2: Ecosystems: Interactions, Energy, and Dynamics

LS2.C: Ecosystem Dynamics, Functioning, and Resilience

When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce,others move to new locations, yet others move into the transformed environment, and some die.(secondary to 3-LS4-4)

LS2.D: Social Interactions and Group Behavior

Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size (Note: Moved from K–2). (3-LS2-1)

LS3: Heredity: Inheritance and Variation of Traits

LS3.A: Inheritance of Traits

Many characteristics of organisms are inherited

D2.Eco.2.3-5. Identify positive and negative incentives that influence the decisions people make.

Exchange and Markets

D2.Eco.3.3-5. Identify examples of the variety of resources (human capital, physical capital, and natural resources) that are used to produce goods and services.

D2.Eco.4.3-5. Explain why individuals and businesses specialize and trade.

D2.Eco.5.3-5. Explain the role of money in making exchange easier.

D2.Eco.6.3-5. Explain the relationship between investment in human capital, productivity, and future incomes.

D2.Eco.7.3-5. Explain how profits influence sellers in markets.

D2.Eco.8.3-5. Identify examples of external benefits and costs.

D2.Eco.9.3-5. Describe the role of other financial institutions in an economy.

The National Economy

D2.Eco.10.3-5. Explain what interest rates are.

D2.Eco.11.3-5. Explain the meaning of inflation, deflation, and unemployment.

D2.Eco.12.3-5. Explain the ways in which the government pays for the goods and services it provides.

D2.Eco.13.3-5. Describe ways people can increase productivity by using improved capital goods and improving their human capital.

The Global Economy

D2.Eco.14.3-5. Explain how trade leads to

Ecosystems

The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as "decomposers." Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2-1)

LS2.B: Cycles of Matter and Energy Transfer in Ecosystems

Matter cycles between the air and soil and among plants, animals, andmicrobes as these organisms live and die. Organisms obtain gases,and water, from the environment,and release waste matter (gas,liquid, or solid) back into theenvironment. (5-LS2-1)

PS3: Energy

PS3.D: Energy in Chemical Processes and Everyday Life

The energy released [from] food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water). (5-PS3-1)

G5 WWAPT- Space System & Patterns

from their parents. (3-LS3-1)

Other characteristics result from individuals' interactions with

the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3-LS3-2)

LS3.B: Variation of Traits

Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1)

The environment also affects the traits that an organism develops. (3-LS3-2)

LS4: Biological Evolution: Unity and Diversity

LS4.A: Evidence of Common Ancestry and Diversity

Some kinds of plants and animals that once lived on Earth are no longer found anywhere. (Note:moved from K-2) (3-LS4-1)

Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments. (3-LS4-1)

LS4.C: Adaptation

For any particular environment,some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4-3)

LS4.D: Biodiversity and Humans

Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)

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increasing economic interdependence among nations.

D2.Eco.15.3-5. Explain the effects of increasing economic interdependence on different groups within participating nations.

Dimension 2 - Geography

Global Interconnections: Changing Spatial Patterns

D2.Geo.11.3-5. Describe how the spatial patterns of economic activities in a place change over time because of interactions with nearby and distant places.

Dimension 2 - History

Causation and Argumentation

D2.His.14.3-5. Explain probable causes and effects of events and developments.

National Council for the Social Studies (NCSS), The College, Career, and Civic Life (C3) Framework for Social Studies State Standards: Guidance for Enhancing the Rigor of K-12 Civics, Economics, Geography, and History (Silver Spring, MD: NCSS, 2013).

College, Career and Civic Life

G4 - STP Energy & Waves

(Week 31 - Week 36)

NGSS: Science Performance Expectations (2013)

NGSS: Grade 4

4.Waves

Performance Expectations

4-PS4-1. Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.

(Week 26 - Week 30)

NGSS: Science Performance Expectations (2013)

NGSS: Grade 5

5.Earth's Systems

Performance Expectations

5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

5-ESS2-2. Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

5.Space Systems: Stars and the Solar System

Performance Expectations

5-PS2-1. Support an argument that the gravitational force exerted by Earth on objects is directed down.

5-ESS1-1. Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from the Earth.

G3 HTWW- Forces and Interaction

(Week 28 - Week 33)

NGSS: Science Performance Expectations (2013)

NGSS: Grade 3

3.Forces and Interactions

Performance Expectations

3-PS2-1. Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.

3-PS2-2. Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.

3-PS2-3. Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.

3-PS2-4. Define a simple design problem that can be solved by applying scientific ideas about magnets.*

NGSS: Science and Engineering Practices

NGSS: 3-5

Practice 1. Asking questions (for science) and defining problems (for engineering)

Asking questions and defining problems in 3–5 builds on K–2 experiences and progresses to specifying qualitative relationships.

4-PS4-3. Generate and compare multiple solutions that use patterns to transfer information.*

NGSS: Science and Engineering Practices

NGSS: 3-5

Practice 2. Developing and using models

Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

Develop a model using an analogy, example, or abstract representation to describe a scientific principle or design solution.

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

Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.

Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.

NGSS: Crosscutting Concepts

NGSS: 3-5

Crosscutting Statements

1. Patterns – Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple

5-ESS1-2. Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.

NGSS: Science and Engineering Practices

NGSS: 3-5

Practice 2. Developing and using models

Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

Develop a model using an analogy, example, or abstract representation to describe a scientific principle or design solution.

Practice 4. Analyzing and interpreting data

Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.

Represent data in tables and/or various graphical displays (bar graphs, pictographs and/or pie charts) to reveal patterns that indicate relationships.

Practice 5. Using mathematics and computational thinking

Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions.

Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.

Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost.

Practice 2. Developing and using models

Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.

Identify limitations of models.

Collaboratively develop and/or revise a model based on evidence that shows the relationships among variables for frequent and regular occurring events.

Develop a model using an analogy, example, or abstract representation to describe a scientific principle or design solution.

Develop and/or use models to describe and/or predict phenomena.

Develop a diagram or simple physical prototype to convey a proposed object, tool, or process.

Use a model to test cause and effect relationships or interactions concerning the functioning of a natural or designed system.

Practice 3. Planning and carrying out investigations

Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations

rates of change for natural phenomena and designed products.

NGSS: Disciplinary Core Ideas

NGSS: Grade 4

PS4: Waves and Their Applications in Technologies for Information Transfer

PS4.A: Wave Properties

Waves, which are regular patterns of motion, can be made in water by disturbing the surface. When waves move across the surface of deep water,the water goes up and down in place; it does not move in the direction of the wave except when the water meets the beach. (Note: This grade band endpoint was moved from K–2.) (4-PS4-1)

Waves of the same type can differ inamplitude (height of the wave) and wavelength (spacing between wavepeaks). (4-PS4-1)

PS4.C: Information Technologies and Instrumentation

Digitized information transmitted overlong distances without significant degradation. High-tech devices, such as computers or cell phones, can receive and decode information—convert it from digitized form to voice—and viceversa. (4-PS4-3)

ETS1: Engineering Design

ETS1.C: Optimizing the Design Solution

Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5-ETS1-3) (secondary to 4-PS4-3)

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Describe, measure, estimate, and/or graph quantities (e.g., area, volume, weight, time) to address scientific and engineering questions and problems.

Practice 7. Engaging in argument from evidence

Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).

Construct and/or support an argument with evidence, data, and/or a model.

Practice 8. Obtaining, evaluating, and communicating information

Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.

Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem.

NGSS: Crosscutting Concepts

NGSS: 3-5

Crosscutting Statements

1. Patterns – Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena and designed products.

2. Cause and Effect: Mechanism and Prediction – Events have causes,

that control variables and provide evidence to support explanations or design solutions.

Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered.

Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.

Practice 4. Analyzing and interpreting data

Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.

Analyze and interpret data to make sense of phenomena, using logical reasoning, mathematics, and/or computation.

Use data to evaluate and refine design solutions.

Practice 5. Using mathematics and computational thinking

Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions.

Decide if qualitative or quantitative data are best to determine whether a proposed object or tool meets criteria for success.

Organize simple data sets to reveal patterns

sometimes simple, sometimes multifaceted. Deciphering causal relationships, and the mechanisms by which they are mediated, is a major activity of science and engineering.

Cause and effect relationships are routinely identified, tested, and used to explain change.

3. Scale, Proportion, and Quantity – In considering phenomena, it is critical to recognize what is relevant at different size, time, and energy scales, and to recognize proportional relationships between different quantities as scales change.

Natural objects and/or observable phenomena exist from the very small to the immensely large or from very short to very long time periods.

Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume.

4. Systems and System Models – A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

A system can be described in terms of its components and their interactions.

Connections to the Nature of Science: Most Closely Associated with Crosscutting Concepts

Science Addresses Questions About the Natural and Material World.

Science findings are limited to what can be answered with empirical evidence.

NGSS: Disciplinary Core Ideas

that suggest relationships.

Describe, measure, estimate, and/or graph quantities (e.g., area, volume, weight, time) to address scientific and engineering questions and problems.

Create and/or use graphs and/or charts generated from simple algorithms to compare alternative solutions to an engineering problem.

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

Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.

Construct an explanation of observed relationships (e.g., the distribution of plants in the back yard).

Use evidence (e.g., measurements, observations, patterns) to construct or support an explanation or design a solution to a problem.

Identify the evidence that supports particular points in an explanation.

Apply scientific ideas to solve design problems.

Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.

Practice 7. Engaging in argument from evidence

Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing

NGSS: Grade 5

ESS1: Earth's Place in the Universe

ESS1.A: The Universe and Its Stars

The sun is a star that appears larger and brighter than other stars because it is closer. Stars range greatly in their distance from Earth. (5-ESS1-1)

ESS1.B: Earth and the Solar System

The orbits of Earth around the sun andof the moon around Earth, togetherwith the rotation of Earth about an axis between its North and South poles,cause observable patterns. These include day and night; daily changes in the length and direction of shadows; and different positions of the sun,moon, and stars at different times of the day, month, and year. (5-ESS1-2)

ESS2: Earth's Systems

ESS2.A: Earth Materials and Systems

Earth's major systems are the geosphere(solid and molten rock, soil, and sediments),the hydrosphere (water and ice), the atmosphere (air), and the biosphere (livingthings, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (5-ESS2-1)

ESS2.C: The Roles of Water in Earth's Surface Processes

Nearly all of Earth's available water is in the ocean. Most fresh water is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the

relevant evidence about the natural and designed world(s).

Compare and refine arguments based on an evaluation of the evidence presented.

Distinguish among facts, reasoned judgment based on research findings, and speculation in an explanation.

Construct and/or support an argument with evidence, data, and/or a model.

Use data to evaluate claims about cause and effect.

Connections to the Nature of Science: Most Closely Associated with Practices

Scientific Investigations Use a Variety of Methods

Science investigations use a variety of methods, tools, and techniques.

Scientific Knowledge is Based on Empirical Evidence

Science findings are based on recognizing patterns.

NGSS: Crosscutting Concepts

NGSS: 3-5

Crosscutting Statements

1. Patterns – Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Patterns of change can be used to make predictions.

2. Cause and Effect: Mechanism and Prediction – Events have causes, sometimes simple, sometimes multifaceted. Deciphering causal relationships, and the mechanisms by which they are mediated, is

atmosphere. (5-ESS2-2)

ESS3: Earth and Human Activity

ESS3.C: Human Impacts on Earth Systems

Human activities in agriculture, industry,and everyday life have had major effects on the land, vegetation, streams, ocean, air,and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. (5-ESS3-1)

PS2: Motion and Stability: Forces and Interactions

PS2.B: Types of Interactions

The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center. (5-PS2-1)

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G5 STP-PYPX
(Week 30 - Week 37)

a major activity of science and engineering.

Cause and effect relationships are routinely identified, tested, and used to explain change.

NGSS: Disciplinary Core Ideas

NGSS: Grade 3

PS2: Motion and Stability: Forces and Interactions

PS2.A: Forces and Motion

Each force acts on one particular object andhas both strength and a direction. An objectat rest typically has multiple forces acting onit, but they add to give zero net force on theobject. Forces that do not sum to zero cancause changes in the object's speed ordirection of motion. (Boundary: Qualitativeand conceptual, but not quantitative additionof forces are used at this level.) (3-PS2-1)

The patterns of an object's motion in varioussituations can be observed and measured;when that past motion exhibits a regularpattern, future motion can be predicted fromit. (Boundary: Technical terms, such as magnitude, velocity, momentum, and vector quantity, are not introduced at this level, but the concept that some quantities need both size and direction to be described is developed.) (3-PS2-2)

PS2.B: Types of Interactions

Objects in contact exert forces on each other.(3-PS2-1)

Electric, and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other. (3-PS2-3),(3-

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