Classroom Assessment Design

Design Guidelines	What is it?	How does NGSS help me think about it?	How do I use it?
Performance Expectations	• States what students should know and be able to do.	Reminds me that PEs integrate the three dimensions: SEPs, DCIs, CCCs	Tool 1
Evidence of Learning Specifications	• Specifications for the evidence that students have achieved and/or surpassed the PE. The evidence is obtained through observations of students and/or student work products.	Helps me ***<u>describe</u>*** an assessment(s) that integrates the three dimensions within the PE(s).	Tool 2
Assessment Task and Rubric	• The Assessment Task requires students to demonstrate that they have achieved and/or surpassed the PEs by performing or producing student work aligned to the Evidence of Learning Specifications		Tool 5

(Tool 1 and Tool 2: Provide the foundation for the assessment task)

Tool 1 Template Example – Unit Blueprint for MS-LS2 (Ecosystems: Interactions, Energy, and Dynamics)

Instructional Sequence 1	Instructional Sequence 2	Instructional Sequence 3	Instructional Sequence 4	Instructional Sequence 5
Performance Expectation MS-LS2-2 ***Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems*** *Clarification Statement:* Emphasis is on predicting consistent patterns of interactions in different ecosystems in terms of the relationships among and between organisms and abiotic components of ecosystems. Examples of types of interactions could include competitive, predatory, and mutually beneficial.	**Performance Expectation MS-LS2-3** ***Develop a model to describe the cycling of matter and flow of energy among living and non-living parts of an ecosystem.*** *Clarification Statement:* Emphasis is on describing the conservation of matter and flow of energy into and out of various ecosystems and on defining the boundaries of the system. *Assessment Boundary:* Assessment does not include the use of chemical reactions to describe the processes.	**Performance Expectation MS-LS2-1** ***Analyze and interpret data to provide evidence for the effects of resources availability on organisms and populations of organisms in an ecosystem.*** *Clarification Statement:* Emphasis is on cause and effect relationships between resources and the growth of individual organisms and the numbers of organisms in ecosystems during periods of abundant and scarce resources.	**Performance Expectation MS-LS2-4** ***Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.*** *Clarification Statement:* Emphasis is on recognizing patterns in data and making warranted inferences about changes in populations and on evaluating empirical evidence supporting arguments about changes to ecosystems.	**Performance Expectation MS-LS2-5** ***Evaluate competing design solutions for maintaining biodiversity and ecosystems services.**** *Clarification Statement*: Examples of ecosystem services could include water purification, nutrient recycling, and prevention of soil erosion. Examples of design solution constraints could include scientific, economic, and social considerations. *This performance expectation integrates traditional science content with engineering through a practice or disciplinary core idea.
Performance Expectation MS-ESS3-4 ***Construct an argument supported by evidence for how increases in human population ~~and per-capita consumption of natural resources~~ impact Earth's systems.*** *Clarification Statement*: ~~Examples of evidence include grade-appropriate databases on human populations and the rates of consumption of food and natural resources (such as freshwater, mineral, and energy). Examples of impacts can include changes to the appearance, composition, and structure of Earth's systems as well as the rates at which they change.~~ The consequences of increases in human populations ~~and consumption of natural resources~~ are described by science, but science does not make the decisions for the actions society takes.	**Performance Expectation MS-PS1-5** ***Develop and use a model to describe how ~~the total number of atoms does not change in a chemical reaction and thus~~ mass is conserved.*** *Clarification Statement*: Emphasis is on law of conservation of matter ~~and on physical models or drawings, including digital forms that represent atoms~~. *Assessment Boundary*: Assessment does not include the use of atomic masses, balancing symbolic equations, or intermolecular forces.	**Performance Expectation MS-ESS3-4** ***Construct an argument supported by evidence for how increases in human population ~~and per-capita consumption of natural resources~~ impact Earth's systems.*** *Clarification Statement*: ~~Examples of evidence include grade-appropriate databases on human populations and the rates of consumption of food and natural resources (such as freshwater, mineral, and energy). Examples of impacts can include changes to the appearance, composition, and structure of Earth's systems as well as the rates at which they change.~~ The consequences of increases in human populations and consumption of natural resources are described by science, but science does not make the decisions for the actions society takes.	**Performance Expectation MS-LS2-1** ***Analyze and interpret data to provide evidence for the effects of resources availability on organisms and populations of organisms in an ecosystem.*** *Clarification Statement:* Emphasis is on cause and effect relationships between resources and the growth of individual organisms and the numbers of organisms in ecosystems during periods of abundant and scarce resources.	**Performance Expectation MS-ESS3-3** ***Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.**** *Clarification Statement:* Examples of the design process include examining human environmental impacts, assessing the kinds of solutions that are feasible, and designing and evaluating solutions that could reduce that impact. Examples of human impacts can include water usage (such as the withdrawal of water from streams and aquifers or the construction of dams and levees), land usage (such as urban development, agriculture, or the removal of wetlands), and pollution (such as of the air, water, or land). *This performance expectation integrates traditional science content with engineering through a practice or disciplinary core idea.
	Performance Expectation MS-ESS2-1 ***Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.*** *Clarification Statement*: ~~Emphasis is on the processes of melting, crystallization, weathering, deformation, and sedimentation, which act together to form minerals and rocks through the~~ cycling of Earth's materials. *Assessment Boundary*: Assessment does not include the identification and naming of minerals.			**Performance Expectation MS-ESS3-4** ***Construct an argument supported by evidence for how increases in human population ~~and per-capita consumption of natural resources~~ impact Earth's systems.*** *Clarification Statement*: ~~Examples of evidence include grade-appropriate databases on human populations and the rates of consumption of food and natural resources (such as freshwater, mineral, and energy). Examples of impacts can include changes to the appearance, composition, and structure of Earth's systems as well as the rates at which they change.~~ The consequences of increases in human populations and consumption of natural resources are described by science, but science does not make the decisions for the actions society takes.

Instructional Sequence 1	Instructional Sequence 2	Instructional Sequence 3	Instructional Sequence 4	Instructional Sequence 5
MS LS2: Ecosystems: Interactions, Energy, and Dynamics LS2.A: Interdependent Relationships in Ecosystems *Predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. Although the species involved in these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environments, both living and nonliving, are shared. (MS-LS2-2)*	**MS LS2: Ecosystems: Interactions, Energy, and Dynamics** LS2.B: Cycle of Matter and Energy Transfer in Ecosystems *Food webs are models that demonstrate how matter and energy are transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem. Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and non-living parts of the ecosystem. (MS-LS2-3)*	**MS LS2: Ecosystems: Interactions, Energy, and Dynamics** LS2.A: Interdependent Relationships in Ecosystems *Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with non-living factors. (MS-LS2-1)*	**MS LS2: Ecosystems: Interactions, Energy, and Dynamics** LS2.C: Ecosystem Dynamics, Functioning, and Resilience *Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations. (MS-LS2-4)*	**MS LS2: Ecosystems: Interactions, Energy, and Dynamics** LS2.C: Ecosystem Dynamics, Functioning, and Resilience *Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health. (MS-LS2-5)*
MS ESS3: Earth and Human Activity ESS3.C: Human Impacts on Earth Systems *Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth, unless the activities and technologies involved are engineered otherwise. (connection DCI to MS-LS2-1, MS-LS2-4 and MS-LS2-5)*	**MS ESS2: Earth's Systems** ESS2.A: Earth's Materials and Systems *All Earth processes are the result of energy flowing and matter recycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and living organisms. (connection DCI to MS-LS2-3 and MS-LS2-4)*	**MS LS2: Ecosystems: Interactions, Energy, and Dynamics** LS2.A: Interdependent Relationships in Ecosystems *In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constraints their growth and reproduction. (MS-LS2-1)*	**MS LS2: Ecosystems: Interactions, Energy, and Dynamics** LS2.A: Interdependent Relationships in Ecosystems *Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with non-living factors. (MS-LS2-1)*	**MS LS2: Ecosystems: Interactions, Energy, and Dynamics** LS4.D: Biodiversity and Humans *Changes in biodiversity can influence humans' resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling. (MS-LS2-5)*
	MS PS1: Matter and Its Interactions PS1.B: Chemical Reactions *Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants. The total number of each type of atom is conserved, and thus the mass does not change. (connection DCI to MS-PS1-5)*	**MS LS2: Ecosystems: Interactions, Energy, and Dynamics** LS2.A: Interdependent Relationships in Ecosystems *Growth of organisms and population increases are limited by access to resources. (MS-LS2-1)*	**MS LS2: Ecosystems: Interactions, Energy, and Dynamics** LS2.A: Interdependent Relationships in Ecosystems *In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constraints their growth and reproduction. (MS-LS2-1)*	**MS ESS3: Earth and Human Activity** ESS3.C: Human Impacts on Earth Systems *Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise. (connection DCI to MS-LS2-1, MS-LS2-4 and MS-LS2-5)*
		MS ESS3: Earth and Human Activity ESS3.C: Human Impacts on Earth Systems *Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth, unless the activities and technologies involved are engineered otherwise. (connection DCI to MS-LS2-1)*	**MS LS2: Ecosystems: Interactions, Energy, and Dynamics** LS4.D: Ecosystem Dynamics, Functioning, and Resilience *Changes in biodiversity can influence humans' resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling. (MS-LS2-5)*	**MS ESS3: Earth and Human Activity** ESS3.C: Human Impacts on Earth Systems *Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things. (connection DCI to MS-LS2-1 and MS-LS2-4)*

Instructional Sequence 1	Instructional Sequence 2	Instructional Sequence 3	Instructional Sequence 4	Instructional Sequence 5
				MS LS2: Ecosystems: Interactions, Energy, and Dynamics ETS1.B: Developing Possible Solutions *There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (secondary to MS-LS2-5)*
Science and Engineering Practices Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 6-8 builds on K-5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. ***Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena.*** *(MS-LS2-2)*	**Science and Engineering Practices** Developing and Using Models Modeling in 6-8 builds on K-5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. ***Develop a model to describe phenomena.*** *(MS-LS2-3)*	**Science and Engineering Practices** Analyzing and Interpreting Data Analyzing data in 6-8 builds on K-5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. ***Analyze and interpret data to provide evidence for phenomena.*** *(MS-LS2-1)*	**Science and Engineering Practices** Engaging in Argument from Evidence Engaging in argument from evidence in 6-8 builds on K-5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed worlds. ***Construct an oral or written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.*** *(MS-LS2-4)*	**Science and Engineering Practices** Engaging in Argument from Evidence Engaging in argument from evidence in 6-8 builds on K-5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed worlds. ***Evaluate competing design solutions based on jointly developed and agreed-upon design criteria.*** *(MS-LS2-5)*
Science and Engineering Practices Engaging in Argument from Evidence Engaging in argument from evidence in 6-8 builds on K-5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed worlds. ***Construct an oral or written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.*** *(MS-ESS3-4)*	**Science and Engineering Practices** Developing and Using Models Modeling in 6-8 builds on K-5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. ***Develop a model to a model to describe unobservable mechanisms.*** *(MS-PS1-5)*	**Science and Engineering Practices** Engaging in Argument from Evidence Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s). ***Construct an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.*** *(MS-ESS3-4)*	**Science and Engineering Practices** Analyzing and Interpreting Data Analyzing data in 6-8 builds on K-5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. ***Analyze and interpret data to provide evidence for phenomena.*** *(MS-LS2-1)*	**Science and Engineering Practices** Engaging in Argument from Evidence Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s). ***Construct an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.*** *(MS-ESS3-4)*
				Science and Engineering Practices Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 6-8 builds on K-5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. ***Apply scientific principles to design an object, tool, process or system.*** *(MS-ESS3-3)*

Instructional Sequence 1	Instructional Sequence 2	Instructional Sequence 3	Instructional Sequence 4	Instructional Sequence 5
Crosscutting Concepts Patterns **Patterns can be used to identify cause and effect relationships.** *(MS-LS2-2)*	**Crosscutting Concepts** Energy and Matter ***The transfer of energy can be tracked as energy flows through a natural system.*** *(MS-LS2-3)*	**Crosscutting Concepts** Cause and Effect ***Cause and effect relationships may be used to predict phenomena in natural or designed systems.*** *(MS-LS2-1)*	**Crosscutting Concepts** Stability and Change **Small changes in one part of a system might cause large changes in another part.** *(MS-LS2-4)*	**Crosscutting Concepts** Stability and Change **Small changes in one part of a system might cause large changes in another part.** *(MS-LS2-5)*
Crosscutting Concepts Cause and Effect ***Cause and effect relationships may be used to predict phenomena in natural or designed systems.*** *(MS-ESS3-4)*	**Crosscutting Concepts** Energy and Matter ***Matter is conserved because atoms are conserved in physical and chemical processes.*** *(MS-PS1-5)*		**Crosscutting Concepts** Cause and Effect ***Cause and effect relationships may be used to predict phenomena in natural or designed systems.*** *(MS-LS2-1)*	**Crosscutting Concepts** Cause and Effect ***Cause and effect relationships may be used to predict phenomena in natural or designed systems.*** *(MS-ESS3-4)*
Connections of Nature of Science Science Addresses Questions About the Natural and Material World ***Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes.*** *(MS-ESS3-4)*	**Crosscutting Concepts** Stability and Change ***Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and processes at different scales, including the atomic scale.*** *(MS-ESS2-1)*	**Connections of Nature of Science** Science Addresses Questions About the Natural and Material World ***Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes.*** *(MS-ESS3-4)*	**Connections to Nature of Science** Scientific Knowledge Is Based on Empirical Evidence ***Science disciplines share common rules of obtaining and evaluating empirical evidence.*** *(MS-LS2-4)*	**Connections of Nature of Science** Science Addresses Questions About the Natural and Material World ***Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes.*** *(MS-LS2-5) (MS-ESS3-4)*
Connections to Engineering, Technology and Applications of Science Influence of Science, Engineering, and Technology on Society and the Natural World ***All human activity draws on natural resources and has both short- and long-term consequences, positive as well as negative, for the health of people and the natural environment.*** *(MS-ESS3-4)*	**Connections to Nature of Science** Scientific Knowledge Assumes an Order and Consistency in Natural Systems ***Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation***. *(MS-LS2-3)*	**Connections to Engineering, Technology and Applications of Science** Influence of Science, Engineering, and Technology on Society and the Natural World ***All human activity draws on natural resources and has both short- and long-term consequences, positive as well as negative, for the health of people and the natural environment.*** *(MS-ESS3-4)*		**Connections to Engineering, Technology and Applications of Science** Influence of Science, Engineering, and Technology on Society and the Natural World ***The use of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; and by differences in such factors as climate, natural resources, and economic conditions. Thus, technology use varies from region to region and over time.*** *(MS-LS2-5) (MS-ESS3-3)*
Big Ideas Sequence 1	**Big Ideas Sequence 2**	**Big Ideas Sequence 3**	**Big Ideas Sequence 4**	**Big Ideas Sequence 5**
Students develop food webs to show the patterns of interactions in ecosystems. They construct explanations about community relationships such as predation, competition and symbiosis. They engage in argument about the impact of humans on ecosystems.	Students develop and use models of ecosystems to describe the transfer of energy and cycling of matter.	Students analyze and interpret data to explain the effect of limited resources on organisms and populations. They engage in argument about the impact of humans on populations in ecosystems.	Students analyze and interpret data to explore the impact of introducing a new species into an ecosystem and engage in argument about the positive and negative impact of the invasive species on the stability of the ecosystem.	Students design a process for reducing the impact humans have caused on the environment. Using criteria for sustainability, they evaluate different solutions to environmental problems.

General Features of the Practices
Adapted from the NGSS Evidence Statements

Some bullets may be added when necessary (e.g., for refining an explanation). Under each category, bullets should be contextualized under a stem. For example, "Communication includes:"

Asking Questions:
- Addressing phenomena of the natural world or scientific theories
- Empirical testability

Defining Problems:
- Identifying the problem to be solved
- Defining the process or system boundaries, and the components of the process or system
- Defining the criteria and constraints

Developing and Using Models:
- Components of the model: Models includes specific variables or factors within the system under study.
- Relationships: Models need to represent the relationship among components in order to provide an account of why the phenomenon occurs.
- Connections: Models needs to be connected to causal phenomena or scientific theory that students are expected to explain or predict.

Planning and Carrying Out Investigations:
- Identification of the question to be answered or phenomenon to be investigated
- Evidence to answer this question [including a description of how the evidence collected will be relevant to determining]
- Planning for the Investigation
- Collection of the data
- Refinement of the design

Analyzing and interpreting data:
- Organizing data: using graphical display (e.g., table, chart, or graph)
- Identification of relationships: describing observations that show a connection or relationship within a set of data.
- Interpreting data: making a statement to make a claim using the pattern -- showing "what does the pattern really mean"

Using Mathematics and Computational Thinking:
- Representation
- Mathematical/Computational Modeling – can be used for prediction
- Analysis – includes computational thinking

Constructing Explanations:

- Explanation of phenomena
- Evidence : scientific data that supports the student's claim. This data can come from an investigation that students complete or from another source, such as observations, reading material, archived data, or other sources of information. The data needs to be both *appropriate* and *sufficient* to support the claim.
- Reasoning : - Using the evidence to construct the explanation:
  - a justification that shows why the data counts as evidence to support the claim and includes appropriate scientific principles. The reasoning ties in the scientific background knowledge or scientific theory that justifies making the claim and choosing the appropriate evidence.
- Revision (as necessary)

Designing Solutions:

- Designing Solutions - uses scientific information to generate a number of possible solutions
- Description of criteria and constraints, including quantification when appropriate
- Evaluating potential solutions
- Refining and/or optimizing the design solution

Engaging in Argument from Evidence

- Supported claims: any ideas or designs that students are supporting
- Identifying scientific evidence: identification of multiple lines of scientific evidence that is relevant to a particular scientific question or engineering design problem.
- Evaluation and critique : Identification of strength of the evidence used to support an argument or a particular design solution
- Reasoning and Synthesis: synthesizing the evidence logically and connecting to phenomena

  Evaluation template (the evaluation will require that the student brings content knowledge to bear in order to evaluate the claims and evidence presented in the given document being evaluated.)
- Identifying the claims, scientific evidence, and reasoning behind the explanation(s)
- Identifying additional evidence that is relevant to the evaluation.
- Evaluation and critique : identification of strength of the evidence and reasoning used to support a claim or explanation
- Reasoning and Synthesis: synthesizing the evidence logically and connecting to phenomena

Obtaining, Evaluating, and Communicating Information:

- Obtaining
- Evaluating
- Communicating
  - Communication style and format
  - Connecting the DCI and the CCC

Evidence of Learning Specifications

Initial example

Construct an explanation that:

1. shows patterns of interactions between living and non-living parts of ecosystems
2. includes different types of interactions among organisms

Tool 2 Template Example – Evidence of Learning Specifications

Middle School Ecology Unit **MS-LS2 Ecosystems: Interactions, Energy and Dynamics**

Instructional Sequence 1
Performance Expectation MS-LS2-2 ***Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems*** *Clarification Statement:* Emphasis is on predicting consistent patterns of interactions in different ecosystems in terms of the relationships among and between organisms and abiotic components of ecosystems. Examples of types of interactions could include competitive, predatory, and mutually beneficial. **Performance Expectation MS-ESS3-4** ***Construct an argument supported by evidence for how increases in human population ~~and per-capita consumption of natural resources~~ impact Earth's systems.*** *Clarification Statement*: ~~Examples of evidence include grade-appropriate databases on human populations and the rates of consumption of food and natural resources (such as freshwater, mineral, and energy). Examples of impacts can include changes to the appearance, composition, and structure of Earth's systems as well as the rates at which they change.~~ The consequences of increases in human populations ~~and consumption of natural resources~~ are described by science, but science does not make the decisions for the actions society takes.
Evidence of Learning Specifications Construct an explanation that predicts: 1. consistent patterns of interactions between living and non-living parts of ecosystems 2. consistent patterns of types of interactions including competitive, predatory, and mutually beneficial Construct an argument that: 1. is supported by empirical evidence of interactions within the ecosystem (a type of Earth system) and scientific reasoning 2. supports or refutes how increases in human population cause negative impacts on the Earth

Guide to Developing Evidence of Learning Specifications

Example from MSLS2 Instructional Sequence 1

Construct an explanation that predicts:

1. consistent patterns of interactions between living and non-living parts of ecosystems
2. consistent patterns of types of interactions including competitive, predatory, and mutually beneficial

Construct an argument that:

1. is supported by evidence of interactions within the ecosystem (a type of Earth system) and scientific reasoning
2. supports or refutes how increases in human population cause negative impacts on the Earth

Part 1: Review Your Tool 1 Unit Blueprint

- What will students know and be able to do at the end of the entire unit?
- Select the instructional sequence that will be the focus of your Tool 2 work.

Part 2: Determine the number of sets of Evidence of Learning Specifications you'll need to develop

- Rule of thumb:
  - If you included one PE in your sequence, then you will develop one set of EoL Specs
  - If you included two or more bundled PEs in your sequence
    - If all bundled PEs involve the same SEP, then you will develop one set of EoL Specs.
    - If bundled PEs involve different SEPs, then you will develop multiple sets of EoL Specs.
- Create a foreground/background chart for each set of EoL Specifications you will write
  - Tape PE cards to the top of the chart.
  - Identify the SEP that will be the basis of the sentence stem for the EoL Specifications and record it in the appropriate space on the chart.
  - Review the Assessment Boundary for each PE to identify what will NOT be assessed. Record these ideas in the appropriate space on the chart.

Chart Setup:

EoLS for Instructional Sequence # __________	
Tape PE Card here	
SEP: ________________________________	
Foreground	Background
Not Assessed:	

Part 3: Determine the SEPs, CCCs, DCIs, and Connections that will be in the foreground or background

- Write your ideas on the appropriate color sticky note (orange=DCI, blue = SEP, green = CCC, purple = Connection)
- Post your sticky notes on the chart and negotiate with your group which ideas should be in the foreground for achieving the PE and which ideas should be in the background.

Part 4: Brainstorm Evidence of Learning Specifications

- Determine the sentence stem that focuses on the practice through which students will demonstrate their learning
- Brainstorm EoL Specs for the assessment task based on “foreground” ideas.
- Clump EoL Specs if possible.

Part 5: Finalize the Evidence of Learning Specifications

- Color-code each specification to the three dimensions.
- Refine the specifications by re-visiting the precise language in the DCIs, CCCs, PEs.
- Refine the SEP sentence stem using the General Features of the Practices handout.
- Revise specifications to make sure that the complete sentence for each specification includes at least 2 dimensions (DCI, SEP, CCC).

Part 6: Reflect on the Process

- What did you learn through the development of Evidence of Learning Specifications?