HS Environmental Science-Interdependent Relationships in Ecosystems

Environmental Science Interdependent Relationships in Ecosystems	Links
Standard: **HS-LS2-1.** Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. **HS-LS2-2**. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales. **HS-LS2-6**. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem **HS-LS4-6**. Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.* [Clarification Statement: Emphasis is on designing solutions for a proposed problem related to threatened or endangered species, or to genetic variation of organisms for multiple species.]	HS-LS2-1 HS-LS2-2 HS-LS2-6 HS-LS2-7 HS-LS4-6
21st Century Learning Expectations: • Hinsdale students will communicate through various means • Hinsdale student	Link for 21st Century Learning Expectations

<table>
<tr><td colspan="2">Enduring Understandings (cross cutting concepts):

• Ecosystems are complex systems that include living and non-living factors. Communities and Populations are the living parts of an ecosystem.
• Ecosystems change over time.
• Ecosystems can only sustain a set number of organisms based on available resources. This is called Carrying Capacity.</td></tr>
<tr><td>Learning Competencies (engineering practices)

Students will be able to: (NGSS Science and Engineering Practices)

• Develop and use models of how interdependent factors including boundaries, resources, climate and competition affect ecosystems.
• Use mathematical comparisons including graphs, charts, histograms, and population changes gathered from simulations or historical data sets.

(Examples of changes in ecosystem conditions could include biological succession, or physical changes, such as moderate hunting or a seasonal flood; and extreme changes, such as volcanic eruption or sea level rise)</td><td>Essential Questions (core ideas)

What are the biotic and abiotic factors in an ecosystem?

How many organisms can an ecosystem sustain?

How do ecosystems change over time?</td></tr>
<tr><td>Students will be able to: (NGSS Science and Engineering practices)

• Develop and use models to predict and illustrate the relationship among variables and components of an ecosystem.

• Construct explanations and design solutions supported by multiple and independent student generated sources of evidence consistent with scientific ideas.</td><td>• How do organisms obtain and use energy from the environment?
• What form of energy do living things use?</td></tr>
</table>

Performance Task Sample: *Defined Stem Ecologist Define Stem Task* *population growth activity*	