

Grade Level Expectations (Grade 6) Environments

DRAFT

FOSS Investigations	Essential Learning Indicators Targeted
<p>Investigation 1: Terrestrial Environments Part 1 – Setting Up the Terrariums Part 2 – Recording the Changes</p> <p>Investigation 2: Bugs and Beetles Part 1 – Making Animal Runways Part 2 – Responding to Moisture Part 3 – Responding to Light Part 4 – Designing an Animal Investigation</p> <p>Investigation 3: Water Tolerance Part 1 – Setting Up the Experiment Part 2 – Observing Plants Part 3 – Observing Plants at 11 or More Days</p> <p>Investigation 4: Aquatic Environments Part 1 – Goldfish Aquariums Part 2 – Acid in Water Part 3 – New Organisms</p>	<p>*1.1.6 Understand how to classify organisms by their external and internal structures. W</p> <ul style="list-style-type: none"> • Describe how organisms can be classified using similarities and differences in physical and functional characteristics (both external and internal) <p>*1.2.1 Analyze how the parts of a system interconnect and influence each other. W</p> <ul style="list-style-type: none"> • Explain how the parts of a system interconnect and influence each other. • Describe the flow of matter and energy through a system (i.e. energy and matter inputs, outputs, transfers, transformations) <p>1.3.8 Understand how individual organisms, including cells, obtain matter and energy for life processes. W</p> <ul style="list-style-type: none"> • Describe the different sources of matter and energy required for life processes in plants and animals. • Describe how organisms acquire materials needed for life processes. • Describe how systems interact to distribute materials and eliminate waste produced by life processes. • Describe that both plants and animals extract energy from food, but plants produce their own food from light, air, water, and mineral nutrients, while animals consume energy-rich foods. <p>*1.3.10 Understand how organisms in ecosystems interact with and respond to their environment and other organisms. W</p> <ul style="list-style-type: none"> • Describe how energy flows through a food chain or web. • Describe how substances such as air, water, and mineral nutrients are continually cycled in ecosystems. • Explain the role of an organism in an ecosystem (e.g. predator, prey, consumer, producer, decomposer, scavenger, carnivore, herbivore, omnivore). • Describe how a population of an organism responds to a change in its environment. <p>*2.1.1 Understand how to generate a question that can be answered through scientific investigation. W</p> <ul style="list-style-type: none"> • Generate multiple questions based on observations. • Generate a question that can be investigated scientifically. • Generate a new question that can be investigated with the same materials and/or data as a given investigation. <p>*2.1.2 Understand how to plan and conduct scientific investigations. W</p> <ul style="list-style-type: none"> • Make predictions (hypothesize) and give reasons. • Generate a logical plan for, and conduct, a scientific controlled investigation with the following attributes: prediction (hypothesis); appropriate materials, tools, and available computer technology; controlled variables; one manipulated variable; responding (dependent) variable; gather, record, and organize data using appropriate units, charts, and/or graphs; multiple trials. • Identify and explain safety requirements that would be needed in the investigation. <p>*2.1.3 Apply understanding of how to construct a scientific explanation using evidence and inferential logic. W</p> <ul style="list-style-type: none"> • Generate a scientific conclusion including supporting data from an investigation using inferential logic. • Describe a reason for a given conclusion using evidence from an investigation. • Generate a scientific explanation of an observed phenomenon using given data. • Predict what logically might occur if an investigation lasted longer or changed. • Describe the difference between evidence (data) and conclusions. <p>*2.1.4 Analyze how models are used to investigate objects, events, systems, and processes. W</p> <ul style="list-style-type: none"> • Compare models to the actual phenomena. • Explain the advantages and limitations of investigating with a model. <p>*2.1.5 Apply understanding of how to report investigations and explanations of objects, events, systems, and processes. W</p> <ul style="list-style-type: none"> • Report observations of scientific investigations without making inferences. • Summarize an investigation by describing: reasons for selecting the investigative plan; materials used in the investigation;

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<p>Investigation 5: Brine Shrimp Hatching Part 1 – Setting Up the Experiment Part 2 – Determining Range of Tolerance Part 3 – Determining Viability</p> <p>Investigation 6: Salt of the Earth Part 1 – Setting Up the Experiment Part 2 – Observing Plants Part 3 – Choosing Your Own Investigation</p>	<p>observations, data, results; explanations and conclusions in written, mathematical, oral, and information technology presentation formats; ramifications of investigations; safety procedures used.</p> <ul style="list-style-type: none"> • Describe the difference between an objective summary of data and an inference made from data. <p>*2.2.1 Apply curiosity, honesty, skepticism, and openness when considering explanations and conducting investigations.</p> <ul style="list-style-type: none"> • Explain why an honest response to questionable results, conclusions, or explanations is important to the scientific enterprise. • Describe a flaw in a claim or a conclusion (e.g. limited data, flawed procedure, or overgeneralization) • Describe how scientists accurately and honestly record, report, and share observations and measurements without bias. • Explain why honest acknowledgement of the contributions of others and information sources are necessary <p>*2.2.3 Analyze inconsistent results from scientific investigations to determine how the results can be explained. <i>W</i></p> <ul style="list-style-type: none"> • Compare two or more similar investigations and explain why different results were produced. • Explain whether sufficient information has been obtained to make a conclusion. • Explain why the results from a single investigation or demonstration are not sufficient to describe a phenomenon. <p>*2.2.4 Understand how to make the results of scientific investigations reliable and how to make the methods of investigation valid.</p> <ul style="list-style-type: none"> • Describe how the method of an investigation ensures reliable results. • Describe how to increase the reliability of the results of an investigation. • Describe how the method of investigation is valid. • Describe the purpose of the steps and materials of an investigation's procedure in terms of validity of the investigation. • Modify an investigation to improve the validity of the investigation and explain how the modifications improved the reliability. <p>2.2.5 <i>Understand that increased comprehension of systems leads to new inquiry. W</i></p> <ul style="list-style-type: none"> • <i>Describe how scientific inquiry results in new facts, evidence, unexpected findings, ideas, and explanations.</i> • <i>Describe how results of scientific inquiry may change our understanding of the systems of the natural and constructed world.</i> • <i>Describe how increased understanding of systems leads to new questions to be investigated.</i> <p>*3.2.4 Analyze how human societies' use of natural resources affects the quality of life and the health of ecosystems.</p> <ul style="list-style-type: none"> • Explain the effects of various human activities on the health of an ecosystem and/or ability of organisms to survive in that ecosystem.

*GLEs assessed in formative assessments found in WA Assessment Folio.

GLEs in italics are not currently in the investigations but could be addressed with extension activities, FOSS Science Stories, and other resources.