**Overview**: The following rubrics can be used to assess the individual project: the aquaponics system instruction manual. Each rubric is aligned to one section of the *Individual Project Criteria for Success*, located on your Culminating Project Student Instructions. Use these rubrics to see if you are doing your best work on your individual project.

**Rubric 1**: Student develops a model to describe the process of cellular respiration that occurs within an animal in their aquaponics system, including all matter and energy involved.

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| **Emerging (1)** | **Developing (2)** | **Proficient (3)** | **Advanced (4)** |
| Student develops an **incomplete** model to describe the process of cellular respiration that occurs within an animal in their aquaponics system.  OR  Student develops **a partial written explanation** to describe the process of cellular respiration that occurs within an animal in their aquaponics system. | Student develops a **partial** model to describe the process of cellular respiration that occurs within an animal in their aquaponics system.  OR  Student develops **a complete written explanation** to describe the process of cellular respiration that occurs within an animal in their aquaponics system, including all matter and energy involved. | Student develops a **complete** model to describe the process of cellular respiration that occurs within an animal in their aquaponics system, including all matter and energy involved. | Student develops a **complete** model to describe **in detail** the process of cellular respiration that occurs within an animal in their aquaponics system, including all matter and energy involved. |

**Rubric 2**: Student describes that matter is conserved, specifically within the context of the cellular respiration chemical reaction.

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| **Emerging (1)** | **Developing (2)** | **Proficient (3)** | **Advanced (4)** |
| Student uses a model to describe that matter is **not** conserved within the context of the cellular respiration chemical reaction. | Student **explicitly** describes that matter is conserved, **but not** specificallywithin the context of the cellular respiration chemical reaction. | Student **implicitly** describes that matter is conserved, specifically **within the context** of the cellular respiration chemical reaction. | Student **explicitly** describes that matter is conserved, specifically **within the context** of the cellular respiration chemical reaction. |

**Rubric 3**: Student describes photosynthesis, explaining how energy drives the cycling of matter and supporting the explanation with evidence from the tasks.

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| **Emerging (1)** | **Developing (2)** | **Proficient (3)** | **Advanced (4)** |
| Student **partially** describes photosynthesis, but **does not** support the explanation with evidence from the tasks. | Student **partially** describes photosynthesis, supporting the explanation with evidence from the tasks. | Student **completely** describes photosynthesis, **implicitly** explaining how energy drives the cycling of matter and supporting the explanation with evidence from the tasks. | Student **completely** describes photosynthesis, **explicitly** explaining how energy drives the cycling of matter and supporting the explanation with evidence from the tasks. |

**Rubric 4**: Student develops a model to show the cycling of Earth’s materials in the aquaponics system and describes the flow of energy that drives this process.

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| **Emerging (1)** | **Developing (2)** | **Proficient (3)** | **Advanced (4)** |
| Student develops a **partial** model to show the cycling of Earth’s materials in the aquaponics system with no descriptions. | Student develops a **partial** model to show the cycling of Earth’s materials in the aquaponics system and **partially** describes the flow of energy that drives this process. | Student develops an **accurate** model to show the cycling of Earth’s materials in the aquaponics system and **partially** describes the flow of energy that drives this process. | Student develops an **accurate** model to show the cycling of Earth’s materials in the aquaponics system and **completely** describes the flow of energy that drives this process. |

**Rubric 5**: Student explains why some rock cycle processes will not occur in their aquaponics system by examining each process at different time scales.

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| **Emerging (1)** | **Developing (2)** | **Proficient (3)** | **Advanced (4)** |
| Student **inaccurately** explains why some rock cycle processes will not occur in their aquaponics system. | Student explains why some rock cycle processes will not occur in their aquaponics system **but does not** examine each process at different time scales. | Student **partially** explains why some rock cycle processes will not occur in their aquaponics system by examining each process at different time scales. | Student **completely** explains why some rock cycle processes will not occur in their aquaponics system by examining each process at different time scales. |

**Rubric 6**: Student identifies a physical and chemical change that occurs in their aquaponics system, supporting identifications with an explanation of how macroscopic patterns allow them to determine the microscopic structure for each change.

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| **Emerging (1)** | **Developing (2)** | **Proficient (3)** | **Advanced (4)** |
| Student identifies **at least one accurate** physical and/or chemical change that occurs in their aquaponics system, **with no explanation**. | Student identifies **at least one accurate** physical and/or chemical change that occurs in their aquaponics system, supporting identifications with an explanation of macroscopic patterns **OR** microscopic patterns. | Student **accurately** identifies a physical and chemical change that occurs in their aquaponics system, supporting identifications with an **implicit** explanation of how macroscopic patterns allow them to determine the microscopic structure for each change. | Student **accurately** identifies a physical and chemical change that occurs in their aquaponics system, supporting identifications with an **explicit** explanation of how macroscopic patterns allow them to determine the microscopic structure for each change. |

**Rubric 7**: Student shows and explains how their design uses a chemical reaction to release heat and describes their design process.

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| **Emerging (1)** | **Developing (2)** | **Proficient (3)** | **Advanced (4)** |
| Student **partially** shows and explains how their design uses a chemical reaction to release heat and **partially** describes their design process.  OR  Student **accurately** shows and explains how their design uses a chemical reaction to release heat and **does not** describe their design process. | Student **accurately** shows and explains how their design uses a chemical reaction to release heat and **partially** describes their design process. | Student **accurately** shows and explains how their design uses a chemical reaction to release heat and **mostly** describes their design process. | Student **accurately** shows and explains how their design uses a chemical reaction to release heat and **completely** describes their design process. |