Artificial Ecosystem Project Rubric

Formatives

Milestone 1: Choosing a plant for your ecosystem		**Total: (__/4)**
Feedback	Criteria	Highlights
	Group members are listed for this project. Groups must have three members. **(1 pt)**	
	Two native riparian plants are identified to house in artificial ecosystem. **(1 pt)**	
	Evidence that *Plant 1* is native and riparian using iNaturalist. **(1 pt)**	
	Evidence that *Plant 2* is native and riparian using iNaturalist. **(1 pt)**	

Milestone 2: Designing your ecosystem		**Total: (__/3)**
Feedback	Criteria	Highlights
	A two-dimensional schematic is provided depicting upper basin, lower basin, pump, tubing, media, plant, and fish. **(1 pt)**	
	Each of the parts in the schematic are labelled. **(1 pt)**	
	Plant(s) housed in ecosystem are listed. **(1 pt)**	

Milestone 3: Planning investigations		**Total: (__/4)**
Feedback	Criteria	Highlights
	Two methods of measuring ecosystem health are identified.	
	Student explains how two methods of measurement can evaluate ecosystem health. **(1 pt)**	
	A procedure for conducting *Measurement 1* is described. **(1 pt)**	
	A procedure for conducting *Measurement 2* is described. **(1 pt)**	
	A data table including date, *Measurement 1*, and *Measurement 2* are provided. **(1 pt)**	

Milestone 4: Analyzing Data		**Total: (__/3)**
Feedback	Criteria	Highlights
	Student explicitly identifies a pattern from data. **(1 pt)**	
	Student builds a claim from evidence. **(1 pt)**	
	Student proposes an explanation for observed pattern supported by scientific understanding of factors affecting biodiversity and nutrient cycling. **(1 pt)**	

Summative

Category	**N/A** (0 pts)	**Beginning** (1 pt)	**Approaching** (2 pts)	**Meeting** (3 pts)
Abstract*	Abstract is missing all the following: • Background • Results • Methods	Abstract is missing two of the following: • Background • Results • Methods	Abstract is missing one of the following: • Background • Results • Methods	Abstract discusses background, results, and methods.
Methods*	Report does not include discussion of methods.	Methods are vague. Difficult to replicate experiment.	Methods are detailed enough to replicated with some assistance.	Methods are detailed. This experiment could be replicated easily.
Results*	Report does not explicitly describe results.	Results are described but are not explicitly presented.	Results are explicitly described but are incomplete.	Most important findings are completely and explicitly described.
Discussion*	Report does not discuss results.	Results are discussed but is missing two of the following: • Experimental error • Limitation of methods • Connection to scientific principles	Results are discussed but is missing one of the following: • Experimental error • Limitation of methods • Connection to scientific principles	Results are discussed thoroughly with mention of experimental error, limitation of methods, and connection to scientific principles
Language**	Language is informal or has numerous grammar and spelling errors.	Language is occasionally informal or has the occasional grammar and spelling error.	Language is mostly formal or has few grammar and spelling errors.	Language is formal, written in passive voice, and has no grammar spelling issues.
Claim**	Report does not present an accurate central claim.	Report presents an inaccurate central claim.	Report presents an accurate, but incomplete central claim.	Report presents an accurate and complete central claim.
Evidence**	Report does not explicitly identify evidence to support claim.	Report explicitly identifies inappropriate evidence or evidence that does not support the claim.	Report explicitly identifies appropriate, but insufficient evidence. May include some inappropriate evidence.	Report explicitly identifies appropriate and sufficient evidence to support central claim.

Reasoning**	Report does not provide reasoning that links the claim to the evidence.	Report does not provide reasoning is not appropriate.	Report provides reasoning that links claim to evidence. Evidence is repeated or scientific principles are cited, but not sufficient.	Report provides accurate and complete reasoning that links the evidence to the claim. Includes appropriate and sufficient scientific principles.
				Total: (__/24)

*Evidence collected within section.

**Evidence collected throughout report.

Adapted from:

McNeill, K.L. & Krajcik, J. (2008). Assessing middle school students' content knowledge and reasoning through written explanations. In Assessing science learning: Perspectives from research and practice, ed. J. Coffey, R. Douglas, and C. Stearns, 101-116. Arlington, VA: NSTA Press