**NGSS High School Biology - Rubric for Asking Questions in an Ecosystem Framework**

| Dimension Element | 1<br>Students can… | 2<br>Students can… | 3<br>Students can… | 4<br>Students can… |
|---|---|---|---|---|
| **Create a testable question** | With guidance, create a scientific question that meaningfully relates to water pollution. | Create a scientific question about water pollution in the local watershed;<br>Collaboratively determine whether it could be tested in class. | Create a scientific question that is testable by the student in the classroom and justify that testability;<br>Create a question about chemical pollutants in a local watershed, and link it to human impacts. | Create a scientific question that is testable by the student in class and justify that testability;<br>Create a question that quantitatively links to chemical pollutants in a local watershed;<br>Connect their question to human and ecosystem-based causes and effects, differentiating cause from correlation. |
| **Use data and research to formulate a question** | With guidance, develop a question that relates to provided data and research. | Develop a question based on provided information and then relate that question to their observations. | Determine which of the provided water quality data is useful and use it along with their observations to develop a question. | Create a scientific question based on personal, careful analysis of data related to the phenomenon, noting gaps or limitations in that data;<br>Create a question that has the potential to deepen current, scientific understanding of the phenomenon (watershed dynamics/pollution). |
| **Frame a question with a lens of systems and system models** | With guidance, can see some ways the question relates to the natural system (and the parts that work together). | Frame a question in connection to the lake watershed (system) at a particular level, not necessarily the most relevant or most important aspect of it. | Frame the question with an understanding of the local watershed *system*, particularly showing understanding of the important human and natural inputs and outputs related to that system or relevant subsystem. | Frame the question in light of their created ecosystem model, justifying using or not using particular elements of the subsystem being focused on and building from the relationships between those elements;<br>Frame a question that shows a quantitative understanding of the system and/or subsystem. |

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