| **Skill** | **Exceeds Expectations (4)** | **E/M (3.5)** | **Meets Expectations (3)** | **M/D (2.5)** | **Developing (2)** | **D/E****(1.5)**  | **Emerging (1)** | **Not Observed** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Asking Questions and Defining Problems** | Asks questions that arise from careful observation of phenomena and/or organisms, through examining models and theories, in analyzing unexpected results, and/or to seek additional information. Questions can be investigated within the scope of laboratory or field work. |  | Asks questions that arise from careful observation of phenomena and/or organisms, through examining models and theories, in analyzing unexpected results, and/or to seek additional information.  |  | Asks questions that can be investigated but do not arise from careful observation of phenomena and/or organisms or from examining models and theories, or unexpected results. |  | Asks questions that cannot be investigated.  |  |
|  | Makes hypothesis that indicates the relationship between variables and is supported through scientific understanding and/or the use mathematical relationships. |  | Makes hypothesis that specify what happens to a dependent variable when an independent variable is manipulated. |  | Makes hypothesis that is directly related to the question; however the dependent and independent variable is not explicitly indicated. |  | Makes hypothesis that is indirectly related to the question.  |  |
| **Planning and Carrying Out Investigations** | Plans investigation that indicates appropriate sampling and appropriate techniques to collect data. Considerations for safety are explicitly included in the procedures. |  | Plans investigation that indicates appropriate techniques to collect data. Considerations for safety are explicitly included in the procedures. |  | Plans investigation with teacher guidance in selection of appropriate sampling and techniques to collect data. General safety considerations are included in the procedures. |  | Significant teacher support needed in order to plan investigation. |  |
|  | Conducts multiple trials in an investigation in a safe and ethical manner and tools are used appropriately in the collection of data. |  | Conducts investigation in a safe and ethical manner and uses tools appropriately in the collection of data. |  | Conducts investigation or uses tools inappropriately or incorrectly to make measurements needed to collect data. |  | Does not follow procedures in the investigation, uses tools incorrectly, or does not make accurate measurements. |  |
| **Interpret, Analyze and Evaluate Data** | Accurately constructs tables showing independent and dependent variables, repeated trials, and indicates limitations in data analysis |  | Accurately represents data using data tables, charts, and/or graphs and includes supporting details  |  | Partially complete or inaccurate placement of data in data tables, charts, and/or graphs. |  | Inaccurate or missing data tables, charts, and/ or graphs |  |
|  | Accurately analyzes or interprets information using a graph and/or table, identifies patterns in the data, and recognizes unusual or unexpected data. |  | Constructs, analyzes, and interprets graphical displays of data  |  | Analyzes or interprets information using a graph and/or table but makes minor mistakes. |  | Analyzes or interprets information using a graph and/or table but makes major mistakes. |  |
|  | Applies mathematical concepts and processes to scientific questions and predicts future outcomes. |  | Applies mathematical concepts and processes to scientific questions. |  | Applies mathematical concepts and processes to scientific questions with minor errors. |  | Mathematical processes are applied incorrectly. |  |
| **Skill** | **Exceeds Expectations (4)** | **E/M (3.5)** | **Meets Expectations (3)** | **M/D (2.5)** | **Developing (2)** | **D/E****(1.5)**  | **Emerging (1)** | **Not Observed** |
| **Construct and Critique Conclusions and Explanations** | Constructs or evaluates an explanation based on observations or laboratory evidence, relates it to scientific ideas or principles, and applies explanation to new contexts. |  | Constructs or evaluates an explanation based on observations or laboratory evidence and relates it to scientific ideas or principles.  |  | Explanation or evaluation of evidence is supported by laboratory evidence. |  | Constructs or evaluates an explanation that includes an irrelevant claim. |  |
|  | Makes quantitative and/or qualitative claims regarding the relationship between dependent and independent variables and is able to apply these claims to new contexts. |  | Makes quantitative and/or qualitative claims regarding the relationship between dependent and independent variables. |  | Makes claims about the relationship between dependent and independent variables that are not supported with evidence. |  | Claims are not based on the relationship between the dependent and independent variables. |  |
| **Develop and Use Models** | Develops, revises, and/or uses models based on evidence acquired in the laboratory setting to illustrate or predict relationships. Applies models to other scenarios and revises as appropriate. |  | Develops, revises, and/or uses models based on evidence acquired in the laboratory setting to illustrate or predict relationships. |  | Develops, revises, and/or uses models with minor errors using evidence acquired in the laboratory setting to illustrate or predict relationships. |  | Develops, revises, and/or uses model that does not use evidence acquired in the laboratory setting. |  |
| **Obtain, Evaluate, and Communicate Information** | Communicates accurate, clear, and complete scientific information. Uses scientific terms and concepts accurately to support explanations. |  | Communicates scientific information that is accurate and clear. Uses scientific terms and concepts accurately to support explanations.  |  | Communicates partially accurate and/or minimal information in explanations. Use of scientific terms in explanations is limited or partially accurate. |  | Communicates information that reflects inaccurate concepts. Use of scientific terms is inaccurate or absent.  |  |
| **Content** **SOL\_\_\_\_\_\_** | Explains and applies relative and accurate content. |  | Explains or otherwise applies relevant and accurate content. |  | Identifies or otherwise applied relevant content with minor errors or omissions. |  | Identifies or makes connections to irrelevant content OR relevant with major errors or omissions. |  |