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| 2019 CED SCIENCE PRACTICES | SKILLS |
| Science Practice 1 Concept Explanation Explain biological concepts, processes, and models presented in written format. | 1.A  Describe biological concepts and/or processes.  |
| 1.B  Explain biological concepts and/or processes.  |
| 1.C  Explain biological concepts, processes, and/or models in applied contexts. |
| Science Practice 2Visual RepresentationsAnalyze visual representations of biological concepts and processes | 2.A  Describe characteristics of a biological concept, process, or model represented visually.  |
| 2.B  Explain relationships between different characteristics of biological concepts, processes, or models represented visually a. In theoretical contexts. b. In applied contexts. |
| 2.C  Explain how biological concepts or processes represented visually relate to larger biological principles, concepts, processes, or theories. |
| 2.D  Represent relationships within biological models, including a. Mathematical models. b. Diagrams. c. Flow charts. |
| Science Practice 3 Questions and MethodsDetermine scientific questions and methods. | 3.A  Identify or pose a testable question based on an observation, data, or a model.  |
| 3.B  State the null or alternative hypotheses, or predict the results of an experiment. |
| 3.C  Identify experimental procedures that are aligned to the question, including a. Identifying dependent and independent variables. b. Identifying appropriate controls. c. Justifying appropriate controls. |
| 3.D  Make observations, or collect data from representations of laboratory setups or results. (Lab only; not assessed) |
| 3.E  Propose a new/next investigation based on a. An evaluation of the evidence from an experiment. b. An evaluation of the design/methods. |
| Science Practice 4Representing and Describing Data Argumentation 6  | 4.A  Construct a graph, plot, or chart (X,Y; Log Y; Bar; Histogram; Line, Dual Y; Box and Whisker; Pie). a. Orientation b. Labeling c. Unitsd. Scaling e. Plotting  f. Type g. Trend line  |
| 4.B  Describe data from a table or graph, including a. Identifying specific data points. b. Describing trends and/or patterns in the data. c. Describing relationships between variables |
| Science Practice 5 Statistical Tests and Data Analysis Perform statistical tests and mathematical calculations to analyze and interpret data. | 5.A  Perform mathematical calculations, including a. Mathematical equations in the curriculum. b. Means. c. Rates. d. Ratios. e. Percentages.  |
| 5.B  Use confidence intervals and/ or error bars (both determined using standard errors) to determine whether sample means are statistically different. |
| 5.C  Perform chi-square hypothesis testing. |
| 5.D  Use data to evaluate a hypothesis (or prediction), including a. Rejecting or failing to reject the null hypothesis. b. Supporting or refuting the alternative hypothesis. |
| Science Practice 6 Develop and justify scientific arguments using evidence. Represent and describe data. | 6.A  Make a scientific claim  |
| 6.B  Support a claim with evidence from biological principles, concepts, processes, and/or data. |
|  6.C  Provide reasoning to justify a claim by connecting evidence to biological theories. |
| 6.D  Explain the relationship between experimental results and larger biological concepts, processes, or theories. |
| 6.E  Predict the causes or effects of a change in, or disruption to, one or more components in a biological system based on a. Biological concepts or processes. b. A visual representation of a biological concept, process, or model. c. Data |