

Science Practices for AP Science Courses

Science Practice 1: The student can use representations and models to communicate scientific phenomena and solve scientific problems.

- 1.1 The student can create representations and models of natural or man-made phenomena and systems in the domain
- 1.2 The student can describe representations and models of natural or man-made phenomena and systems in the domain
- 1.3 The student can refine representations and models of natural or man-made phenomena and systems in the domain
- 1.4 The student can use representations and models to analyze situations or solve problems qualitatively and quantitatively
- 1.5 The student can re-express key elements of natural phenomena across multiple representations in the domain.

Science Practice 2: The student can use mathematics appropriately

- 2.1 The student can justify the selection of a mathematical routine to solve problems
- 2.2 The student can apply mathematical routines to quantities that describe natural phenomena
- 2.3 The student can estimate numerically quantities that describe natural phenomena

Science Practice 3: The student can engage in scientific questioning to extend thinking or to guide investigations within the context of the AP course.

- 3.1 The student can pose scientific questions
- 3.2 The student can refine scientific questions
- 3.3 The student can evaluate scientific questions

Science Practice 4: The student can plan and implement data collection strategies in relation to a particular scientific question.

[Note: data can be collected from many different sources, e.g., investigations, scientific observations, the findings of others, historic reconstruction, and/or archived data]

- 4.1 The student can justify the selection of the kind of data needed to answer a particular scientific question.
- 4.2 The student can design a plan for collecting data to answer a particular scientific question
- 4.3 The student can collect data to answer a particular scientific question
- 4.4 The student can evaluate sources of data to answer a particular scientific question.

Science Practice 5: The student can perform data analysis and evaluation of evidence

- 5.1 The student can analyze data to identify patterns or relationships
- 5.2 The student can refine observations and measurements based on data analysis
- 5.3 The student can evaluate the evidence provided by data sets in relation to a particular scientific question

Science Practice 6: The student can work with scientific explanations and theories

- 6.1 The student can justify claims with evidence
- 6.2 The student can construct explanations of phenomena based on evidence produced through scientific practices
- 6.3 The student can articulate the reasons that scientific explanations and theories are refined or replaced
- 6.4 The student can make claims and predictions about natural phenomena based on scientific theories and models.
- 6.5 The student can evaluate alternative scientific explanations

Science Practice 7: The student is able to connect and relate knowledge across various scales, concepts, and representations in and across domains

- 7.1 The student can connect phenomena and models across spatial and temporal scales
- 7.2 The student can connect concepts in and across domain(s) to generalize or extrapolate in and/or across enduring understandings and/or big ideas