

Labs and Science Practices

Science Practices

Science Practice 1. I can use representations and models to communicate scientific phenomena and solve scientific problems.

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

Science Practice 2. I can use mathematics appropriately.

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

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

- 3.1 I can pose scientific questions.
- 3.2 I can refine scientific questions.
- 3.3 I can evaluate scientific questions.

Science Practice 4. I can plan and implement data collection strategies appropriate to a particular scientific question.

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

Science Practice 5. I can perform data analysis and evaluation of evidence.

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

Science Practice 6. I can work with scientific explanations and theories.

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

Science Practice 7. I am able to connect and relate knowledge across various scales, concepts, and representations in and across domains.

7.1 I can connect phenomena and models across spatial and temporal scales.

7.2 I can connect concepts in and across domain(s) to generalize or extrapolate in and/or across enduring understandings and/or big ideas.

Labs

Fluids

Fluids Paradigm Lab*: **1.1, 1.2, 1.3; 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4**

Hydrometer Activity: 1.4, 6.1, 6.2

Archimedes Lab*: 1.4, **2.1, 2.2**

Bernoulli's Activities: 1.4, 2.1, 2.2, 6.1, 6.2, 6.4

Projectile Motion of a Fluid Lab Practicum*: 1.3, 1.4, 2.1, 2.2, 2.3, **6.3, 6.4, 6.5, 7.1, 7.2**

Thermodynamics

Atomic Model of an Ideal Gas Computational Model: 1.2, 7.1, 7.2

Temperature and Kinetic Theory Activities: 1.4, 6.1, 6.2, 6.4, 7.1, 7.2

Heat Transfer Lab: 1.4, 3.2, 3.3, 5.1, 5.3, 6.1, 6.2, 6.4

Heat Engine Lab*: 4.3, 4.4, **5.1, 5.3**

Entropy Activity: 1.4, 1.5

Electrostatics

Coulomb's Law Computational Model: 1.1

Mapping Electric Potential*: 1.5, **5.1, 5.3, 7.2**

Capacitor Paradigm Lab: 1.1, 1.2, 1.3, 4.1, 4.2, 4.3, 4.4

Circuits

Resistivity Activity: 1.1, 1.2, 1.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4

Constant Current Circuit Activity: 1.4, 4.1, 4.2, 4.3, 4.4

~~RC Circuit Activity: 1.1, 1.2, 1.3, 4.1, 4.2, 4.3, 4.4~~

Capacitor Circuit Activity: 1.1, 1.2, 1.3, 4.1, 4.2, 4.3, 4.4

Magnetostatics and Electromagnetism

Magnetic Field of a Permanent Magnet Activities: 1.1, 1.2, 6.1, 6.2, 6.4

Mass of the Electron Lab: 1.4, 2.1, 2.2, 7.2

Faraday's Law Moving Magnet Lab* (required for Science Practice 1): **1.1, 1.2, 1.3, 1.4, 1.5**, 5.1, 5.2, 5.3

Electric Motor Lab* (required for Science Practice 6): 1.2, 1.4, 1.5, **6.1, 6.2, 6.3, 6.4, 6.5**, 7.2

Physical and Geometric Optics

Diffraction and Interference Paradigm Lab* (required for Science Practice 3): 1.1, 1.2, 1.3, **3.1, 3.2, 3.3**, 4.1, 4.2, 4.3, 4.4

Thin-Film Interference Lab: 1.4, 2.1, 2.2, 2.3

* Portfolio Required

Diffraction and Interference Lab Practicum: 1.4, 2.1, 2.2, 2.3

Reflection of Light Activities: 1.1, 1.2, 1.3, 6.1, 6.2, 6.4

Spherical Mirror Investigation* (required for Science Practice 4): 1.1, 1.2, 1.3, **4.1, 4.2, 4.3, 4.4**

Refraction Activities: 1.1, 1.2, 1.3, 6.1, 6.2, 6.4

Lens Investigation: 1.1, 1.2, 1.3, 4.1, 4.2, 4.3, 4.4

Determining the Thickness and Index of Refraction of a Mirror Lab* (required for Science Practice 2): 1.4, **2.1, 2.2, 2.3**

Quantum, Atomic, Nuclear

Photoelectric Effect Graphical Analysis Lab* (required for Science Practice 5): 1.4, 1.5, **5.1, 5.2, 5.3**

Photoelectric Effect Paragraph-Length Response* (required for Science Practice 7): 6.1, 6.2, 6.3, 6.4, 6.5, **7.1, 7.2**

Hydrogen Spectrum Activity: 5.1, 5.3, 6.2, 6.4

Probability and Half Life Activity: 1.1, 1.2, 1.5, 5.1, 5.3, 7.1, 7.2

Stochastic Nature of Radiation Activity: 1.1, 1.2, 5.1, 5.3, 7.1, 7.2