

NGSS Standards/MA Curriculum Frameworks for Physics

Except where denoted with (MA), these standards are the same as the Next Generation Science (NGSS) Standards. Standards that are crossed out (like this) are covered in the Physics 1 notes. Note that both sets of notes may be necessary in order to cover all of the standards.

| Standard | Topics | Chapters |
|---------------|---|-----------|
| HS-PS1-8 | fission, fusion & radioactive decay: α , β & γ ; energy released/absorbed | 9 |
| HS-PS2-1 | Newton's 2nd ($F_{\text{net}} = ma$), motion graphs, ramps, friction, normal force, gravity, magnetic force | Physics 1 |
| HS-PS2-2 | conservation of momentum | 7 |
| HS-PS2-3 | lab: reduce impulse in a collision | — |
| HS-PS2-4 | gravitation & coulomb's law including relative changes | 6 |
| HS-PS2-5 | electromagnetism: current produces magnetic field & vice-versa, including examples | 8 |
| HS-PS2-9(MA) | Ohm's Law, circuit diagrams, evaluate series & parallel circuits for ΔV , I or R. | 7 |
| HS-PS2-10(MA) | free body diagrams, algebraic expressions & Newton's laws to predict acceleration for 1-D motion, including motion graphs | Physics 1 |
| HS-PS3-1 | conservation of energy including thermal, kinetic, gravitational, magnetic or electrical including gravitational & electric fields | 5 |
| HS-PS3-2 | energy can be motion of particles or stored in fields. kinetic \rightarrow thermal, evaporation/condensation, gravitational potential energy , electric fields | 4, 6 |
| HS-PS3-3 | lab: build a device that converts energy from one form to another. | Physics 1 |
| HS-PS3-4a | zero law of thermodynamics (heat flow & thermal equilibrium) | 5 |
| HS-PS3-5 | behavior of charges or magnets attracting & repelling | 6, 8 |
| HS-PS4-1 | waves: $v = f\lambda$ & $T = 1/f$, EM waves traveling through space or a medium vs. mechanical waves in a medium | 9, 10 |
| HS-PS4-3 | EM radiation is both wave & particle. Qualitative behavior of resonance, interference, diffraction, refraction, photoelectric effect and wave vs. particle model for both | 10, 11 |
| HS-PS4-5 | Devices use waves and wave interactions with matter, such as solar cells, medical imaging, cell phones, wi-fi | 10 |

MA Science Practices

| Practice | Description |
|-----------------|--|
| SP1 | Asking questions. |
| SP2 | Developing & using models. |
| SP3 | Planning & carrying out investigations. |
| SP4 | Analyzing & interpreting data. |
| SP5 | Using mathematics & computational thinking. |
| SP6 | Constructing explanations. |
| SP7 | Engaging in argument from evidence. |
| SP8 | Obtaining, evaluating and communicating information. |

