

# Course at a Glance

## Plan

The Course at a Glance provides a useful visual organization of the AP Physics 2 curricular components, including the following:

- Sequence of units, along with approximate weighting and suggested pacing. Please note, pacing is based on 45-minute class periods, meeting five days each week for a full academic year.
- Progression of topics within each unit.
- Spiraling of the big ideas and science practices across units.

## Teach

### SCIENCE PRACTICES

Science practices spiral throughout the course.

- |                                 |                               |
|---------------------------------|-------------------------------|
| <b>1</b> Modeling               | <b>4</b> Experimental Methods |
| <b>2</b> Mathematical Routines  | <b>5</b> Data Analysis        |
| <b>3</b> Scientific Questioning | <b>6</b> Argumentation        |
|                                 | <b>7</b> Making Connections   |

**+** Indicates 3 or more science practices for a given topic. The individual topic page will show all the science practices.

### BIG IDEAS

Big ideas spiral across topics and units.

- |                                 |                           |
|---------------------------------|---------------------------|
| <b>SYS</b> 1-Systems            | <b>CON</b> 5-Conservation |
| <b>FLD</b> 2-Fields             | <b>WAV</b> 6-Waves        |
| <b>INT</b> 3-Force Interactions | <b>PRO</b> 7-Probability  |
| <b>CHA</b> 4-Change             |                           |

## Assess

Assign the Personal Progress Checks—either as homework or in class—for each unit. Each Personal Progress Check contains formative multiple-choice and free-response questions. The feedback from these checks shows students the areas where they need to focus.

**UNIT**  
**1**

**Fluids**

**~14–17** Class Periods

**10–12%** AP Exam Weighting

<b>SYS</b> <b>1</b> <b>7</b>	<b>1.1 Fluid Systems</b>
<b>SYS</b> <b>4</b> <b>6</b>	<b>1.2 Density</b>
<b>INT</b> <b>+</b>	<b>1.3 Fluids: Pressure and Forces</b>
<b>INT</b> <b>+</b>	<b>1.4 Fluids and Free-Body Diagrams</b>
<b>INT</b> <b>6</b>	<b>1.5 Buoyancy</b>
<b>CON</b> <b>2</b> <b>6</b>	<b>1.6 Conservation of Energy in Fluid Flow</b>
<b>CON</b> <b>2</b> <b>7</b>	<b>1.7 Conservation of Mass Flow Rate in Fluids</b>

**Personal Progress Check 1**

**Multiple-choice: ~40 questions**

**Free-response: 2 questions**

- Experimental Design
- Paragraph Argument Short Answer

**UNIT**  
**2**

**Thermodynamics**

**~15–20** Class Periods

**12–18%** AP Exam Weighting

<b>SYS</b> <b>1</b> <b>7</b>	<b>2.1 Thermodynamic Systems</b>
<b>PRO</b> <b>+</b>	<b>2.2 Pressure, Thermal Equilibrium, and the Ideal Gas Law</b>
<b>INT</b> <b>+</b>	<b>2.3 Thermodynamics and Forces</b>
<b>INT</b> <b>+</b>	<b>2.4 Thermodynamics and Free-Body Diagrams</b>
<b>INT</b> <b>6</b>	<b>2.5 Thermodynamics and Contact Forces</b>
<b>CHA</b> <b>6</b>	<b>2.6 Heat and Energy Transfer</b>
<b>CON</b> <b>+</b>	<b>2.7 Internal Energy and Energy Transfer</b>
<b>CON</b> <b>+</b>	<b>2.8 Thermodynamics and Elastic Collisions: Conservation of Momentum</b>
<b>CON</b> <b>+</b>	<b>2.9 Thermodynamics and Inelastic Collisions: Conservation of Momentum</b>
<b>SYS</b> <b>4</b> <b>5</b>	<b>2.10 Thermal Conductivity</b>
<b>CON</b> <b>6</b> <b>7</b>	<b>2.11 Probability, Thermal Equilibrium, and Entropy</b>

**Personal Progress Check 2**

**Multiple-choice: ~60 questions**

**Free-response: 2 questions**

- Quantitative/Qualitative Translation
- Short Answer

### UNIT 3

## Electric Force, Field, and Potential

~23–25 Class Periods 18–22% AP Exam Weighting

<b>SYS</b> 1 7	3.1 Electric Systems
<b>SYS</b> 6 7	3.2 Electric Charge
<b>CON</b> +	3.3 Conservation of Electric Charge
<b>CHA</b> +	3.4 Charge Distribution—Friction, Conduction, and Induction
<b>SYS</b>	3.5 Electric Permittivity
<b>INT</b> +	3.6 Introduction to Electric Forces
<b>INT</b> +	3.7 Electric Forces and Free-Body Diagrams
<b>INT</b> +	3.8 Describing Electric Force
<b>INT</b> 7	3.9 Gravitational and Electromagnetic Forces
<b>FLD</b>	3.10 Vector and Scalar Fields
<b>FLD</b> +	3.11 Electric Charges and Fields
<b>FLD</b> +	3.12 Isolines and Electric Fields
<b>CON</b> +	3.13 Conservation of Electric Energy

### Personal Progress Check 3

Multiple-choice: ~75 questions  
Free-response: 2 questions

- Experimental Design
- Paragraph Argument Short Answer

### UNIT 4

## Electric Circuits

~14–16 Class Periods 10–14% AP Exam Weighting

<b>SYS</b> 6 7	4.1 Definition and Conservation of Electric Charge
<b>SYS</b> 4	4.2 Resistivity and Resistance
<b>CHA</b> +	4.3 Resistance and Capacitance
<b>CON</b> +	4.4 Kirchoff's Loop Rule
<b>CON</b> +	4.5 Kirchoff's Junction Rule and the Conservation of Electric Charge

### Personal Progress Check 4

Multiple-choice: ~40 questions  
Free-response: 2 questions

- Quantitative/Qualitative Translation
- Short Answer

### UNIT 5

## Magnetism and Electromagnetic Induction

~13–15 Class Periods 10–12% AP Exam Weighting

<b>SYS</b> 1 7	5.1 Magnetic Systems
<b>SYS</b>	5.2 Magnetic Permeability and Magnetic Dipole Moment
<b>FLD</b>	5.3 Vector and Scalar Fields
<b>FLD</b> +	5.4 Monopole and Dipole Fields
<b>FLD</b> 1 2	5.5 Magnetic Fields and Forces
<b>INT</b> +	5.6 Magnetic Forces
<b>INT</b> +	5.7 Forces Review
<b>CHA</b> +	5.8 Magnetic Flux

### Personal Progress Check 5

Multiple-choice: ~35 questions  
Free-response: 2 questions

- Experimental Design
- Paragraph Argument Short Answer

# UNIT 6

## Geometric and Physical Optics

~15–18 Class Periods

12–14% AP Exam Weighting

WAV  
+

### 6.1 Waves

WAV  
+

### 6.2 Electromagnetic Waves

WAV  
1

### 6.3 Periodic Waves

WAV  
+

### 6.4 Refraction, Reflection, and Absorption

WAV  
+

### 6.5 Images from Lenses and Mirrors

WAV  
+

### 6.6 Interference and Diffraction

# UNIT 7

## Quantum, Atomic, and Nuclear Physics

~13–15 Class Periods

10–12% AP Exam Weighting

SYS  
INT  
1  
7

### 7.1 Systems and Fundamental Forces

CON  
+

### 7.2 Radioactive Decay

CON  
+

### 7.3 Energy in Modern Physics (Energy in Radioactive Decay and $E = mc^2$ )

SYS  
CHA  
+

### 7.4 Mass–Energy Equivalence

SYS  
WAV  
+

### 7.5 Properties of Waves and Particles

WAV  
6  
7

### 7.6 Photoelectric Effect

PRO  
1  
6

### 7.7 Wave Functions and Probability

### Personal Progress Check 6

Multiple-choice: ~50 questions

Free-response: 2 questions

- Experimental Design
- Short Answer

### Personal Progress Check 7

Multiple-choice: ~55 questions

Free-response: 2 questions

- Quantitative/Qualitative Translation
- Paragraph Argument Short Answer