# AP Physics 2

**Syllabus Checklist · 大纲自查表**

Tick one box per statement: ☐ not yet ☐ nearly ☐ confident. 每条打一个勾：尚未掌握 / 快会了 / 有把握。

## 9. Thermodynamics 热力学

### 9.1 Kinetic Theory of Temperature and Pressure 温度与压强的分子运动论

☐☐☐ Describe the pressure a gas exerts on its container in terms of atomic motion within that gas.

☐☐☐ Describe the temperature of a system in terms of the atomic motion within that system.

### 9.2 The Ideal Gas Law 理想气体定律

☐☐☐ Describe the properties of an ideal gas.

### 9.3 Thermal Energy Transfer and Equilibrium 热能传递与热平衡

☐☐☐ Describe the transfer of energy between two systems in thermal contact due to temperature differences of those two systems.

### 9.4 The First Law of Thermodynamics 热力学第一定律

☐☐☐ Describe the internal energy of a system.

☐☐☐ Describe the behavior of a system using thermodynamic processes.

### 9.5 Specific Heat and Thermal Conductivity 比热容与热导率

☐☐☐ Describe the energy required to change the temperature of an object by a certain amount.

☐☐☐ Describe the rate at which energy is transferred by conduction through a given material.

### 9.6 Entropy and the Second Law of Thermodynamics 熵与热力学第二定律

☐☐☐ Describe the change in entropy for a given system over time.

## 10. Electric Force, Field, and Potential 电力、电场与电势

### 10.1 Electric Charge and Electric Force 电荷与电力

☐☐☐ Describe the electric force that results from the interactions between charged objects or systems.

☐☐☐ Describe the electric and gravitational forces that result from interactions between charged objects with mass.

☐☐☐ Describe the electric permittivity of a material or medium.

### 10.2 The Process of Charging 起电的过程

☐☐☐ Describe the behavior of a system using conservation of charge.

### 10.3 Electric Fields 电场

☐☐☐ Describe the electric field produced by a charged object or configuration of point charges.

☐☐☐ Describe the electric field generated by charged conductors or insulators.

### 10.4 Electric Potential Energy 电势能

☐☐☐ Describe the electric potential energy of a system.

### 10.5 Electric Potential 电势

☐☐☐ Describe the electric potential due to a configuration of charged objects.
☐☐☐ Describe the relationship between electric potential and electric field.

### 10.6 Capacitors 电容器

☐☐☐ Describe the physical properties of a parallel-plate capacitor.

### 10.7 Conservation of Electric Energy 电能守恒

☐☐☐ Describe changes in energy in a system due to a difference in electric potential between two locations.

## 11. Electric Circuits 电路

### 11.1 Electric Current 电流

☐☐☐ Describe the movement of electric charges through a medium.

### 11.2 Simple Circuits 简单电路

☐☐☐ Describe the behavior of a circuit.

### 11.3 Resistance, Resistivity, and Ohm's Law 电阻、电阻率与欧姆定律

☐☐☐ Describe the resistance of an object using physical properties of that object.
☐☐☐ Describe the electrical characteristics of elements of a circuit.

### 11.4 Electric Power 电功率

☐☐☐ Describe the transfer of energy into, out of, or within an electric circuit, in terms of power.

### 11.5 Compound DC Circuits 复合直流电路

☐☐☐ Describe the equivalent resistance of multiple resistors connected in a circuit.
☐☐☐ Describe a circuit with resistive wires and a battery with internal resistance.
☐☐☐ Describe the measurement of current and potential difference in a circuit.

### 11.6 Kirchhoff's Loop Rule 基尔霍夫电压定律

☐☐☐ Describe a circuit or elements of a circuit by applying Kirchhoff's loop rule.

### 11.7 Kirchhoff's Junction Rule 基尔霍夫电流定律

☐☐☐ Describe a circuit or elements of a circuit by applying Kirchhoff's junction rule.

### 11.8 RC Circuits RC 电路

☐☐☐ Describe the equivalent capacitance of multiple capacitors.
☐☐☐ Describe the behavior of a circuit containing combinations of resistors and capacitors.

## 12. Magnetism and Electromagnetism 磁学与电磁学

### 12.1 Magnetic Fields 磁场

- ☐☐☐ Describe the properties of a magnetic field.
- ☐☐☐ Describe the magnetic behavior of a material as a result of the configuration of magnetic dipoles in the material.
- ☐☐☐ Describe the magnetic permeability of a material.

### 12.2 Magnetism and Moving Charges 磁场与运动电荷

- ☐☐☐ Describe the magnetic field produced by moving charged objects.
- ☐☐☐ Describe the force exerted on moving charged objects by a magnetic field.

### 12.3 Magnetism and Current-Carrying Wires 磁场与载流导线

- ☐☐☐ Describe the magnetic field produced by a current-carrying wire.
- ☐☐☐ Describe the force exerted on a current-carrying wire by a magnetic field.

### 12.4 Electromagnetic Induction and Faraday's Law 电磁感应与法拉第定律

- ☐☐☐ Describe the induced electric potential difference resulting from a change in magnetic flux.

## 13. Geometric Optics 几何光学

### 13.1 Reflection 反射

- ☐☐☐ Describe light as a ray.
- ☐☐☐ Describe the reflection of light from a surface.

### 13.2 Images Formed by Mirrors 镜成像

- ☐☐☐ Describe the image formed by a mirror.

### 13.3 Refraction 折射

- ☐☐☐ Describe the refraction of light between two media.

### 13.4 Images Formed by Lenses 透镜成像

- ☐☐☐ Describe the image formed by a lens.

## 14. Waves, Sound, and Physical Optics 波、声音与物理光学

### 14.1 Properties of Wave Pulses and Waves 波脉冲与波的性质

- ☐☐☐ Describe the physical properties of waves and wave pulses.

### 14.2 Periodic Waves 周期波

- ☐☐☐ Describe the physical properties of a periodic wave.

### 14.3 Boundary Behavior of Waves and Polarization 波的边界行为与偏振

- ☐☐☐ Describe the interaction between a wave and a boundary.

### 14.4 Electromagnetic Waves 电磁波

☐☐☐ Describe the properties of an electromagnetic wave.

### 14.5 The Doppler Effect 多普勒效应

☐☐☐ Describe the properties of a wave based on the relative motion between the source of the wave and the observer of the wave.

### 14.6 Wave Interference and Standing Waves 波的干涉与驻波

☐☐☐ Describe the net disturbance that occurs when two or more wave pulses or waves overlap.

☐☐☐ Describe the properties of a standing wave.

### 14.7 Diffraction 衍射

☐☐☐ Describe the behavior of a wave and the diffraction pattern resulting from a wave passing through a single opening.

### 14.8 Double-Slit Interference and Diffraction Gratings 双缝干涉与衍射光栅

☐☐☐ Describe the behavior of a wave and the diffraction pattern resulting from the wave passing through multiple openings.

### 14.9 Thin-Film Interference 薄膜干涉

☐☐☐ Describe the behavior of light that interacts with a thin film.

## 15. Modern Physics 近代物理

### 15.1 Quantum Theory and Wave-Particle Duality 量子理论与波粒二象性

☐☐☐ Describe the properties and behavior of an object that exhibits both particle-like and wave-like behavior.

### 15.2 The Bohr Model of Atomic Structure 玻尔原子模型

☐☐☐ Describe the properties of an atom.

### 15.3 Emission and Absorption Spectra 发射光谱与吸收光谱

☐☐☐ Describe the emission or absorption of photons by atoms.

### 15.4 Blackbody Radiation 黑体辐射

☐☐☐ Describe the electromagnetic radiation emitted by an object due to its temperature.

### 15.5 The Photoelectric Effect 光电效应

☐☐☐ Describe an interaction between photons and matter using the photoelectric effect.

### 15.6 Compton Scattering 康普顿散射

☐☐☐ Describe the interaction between photons and matter using Compton scattering.

### 15.7 Fission, Fusion, and Nuclear Decay 裂变、聚变与核衰变

☐☐☐ Describe the physical properties that constrain the behavior of interacting nuclei, subatomic particles, and nucleons.

☐☐☐ Describe the radioactive decay of a given sample of material consisting of a finite number of nuclei.

### 15.8 Types of Radioactive Decay 放射性衰变的类型

☐☐☐ Describe the processes by which individual nuclei decay.