

# AP PHYSICS 1

## SEMESTER 1

### Unit 1: Measurements

SI Units – Metric	1.1 – 1.3
Unit Analysis and Conversions	1.4 – 1.5
Significant Figures	1.6
Problem Solving	1.7

### LABS

Spaghetti Bridge

### EXAM

### Unit 2: Kinematics

Distance & Speed, Displacement & Velocity (vectors)	2.1 – 2.2
Graphical Analysis – learning LabPro	
Acceleration	2.3
Kinematic Equations	2.4
Free Fall	2.5
Vectors: components and resultants	3.1 – 3.2
Projectile Motion (online video data)	3.3

Constant Motion Cars

Steel Balls Ramp Lab

Free Fall Lab

Punkin' Chunkin'

### Practicum

EXAM (80% new, 20% previous, FRQ)

Hit the Target

### Unit 3: Force and Motion

Forces, types, and representation	4.1
Newton's 1 <sup>st</sup> Law – Inertia	4.2
Newton's 2 <sup>nd</sup> Law – $F = ma$	4.3
Newton's 3 <sup>rd</sup> Law – action/reaction	4.4
Law of Gravitation (contact/noncontact forces)	7.5
Coulomb's Law	15.3
Free-Body Diagrams	4.5
Friction	4.6
Interacting objects: ropes and pulleys	

Laser Demo

Atwood Machines

Dry Ice Demo

Hanging Mass Lab

Hovercrafts

Inverse Square Data

Picket Fence Lab

Friction lab

### Practicum

EXAM (80% new, 20% previous, FRQ)

Balloon Drop

### Unit 4: Work and Energy

Work	5.1
Spring Constant	5.2 – 5.3
Potential Energy (gravitational and elastic)	5.4
Conservation of Energy	5.5
Power	5.6

Hooke's Law Model

Elastic to Kinetic Energy

### Practicum

EXAM (80% new, 20% previous, FRQ)

Kiss the Egg

SEMESTER EXAM – COMPREHENSIVE (20% of Semester Grade)

## SEMESTER 2

### Unit 5: Momentum

Linear Momentum	6.1	Momentum-Impulse demo
Impulse	6.2	Impulse-Force Model Lab
Conservation of Momentum	6.3	Conservation Demo or Lab
Elastic and Inelastic Collisions	6.4	Collision Lab (8 variations)

#### Practicum

**EXAM (80% new, 20% previous, FRQ)**

#### Unknown Mass Collision

### Unit 6: Circular Motion and Rotation

Angular Speed and Velocity	7.1 – 7.2	
Uniform Circular Motion	7.3	Flying Pigs Demo
Rotational Motion	8.1	
Torque	8.2	Balance Meter Stick Lab
Center of Mass, Center of Gravity	6.5	
Rotational Dynamics	8.3	

Moment of Inertia: rod, solid disk, point mass

Angular Momentum Conservation	8.5	Ball, Straw, String Lab
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#### Practicum

**EXAM (80% new, 20% previous, FRQ)**

#### Flying Saucers

### Unit 7: Vibrations and Waves

SHM, Pendulum, Mass/Spring Systems	13.1	Pendulum Lab (swing & spring)
Wave Motion and Properties	13.3 – 13.4	Superposition Demo
Standing Waves and Resonance	13.5	Standing Waves Demo Resonance Demo
Sound Waves	14.1 – 14.2	Bell Jar Demo
Beats	14.3	Beats Demo
Doppler Effect (concept – no math)	14.5	Doppler Demo

#### Practicum

**EXAM (80% new, 20% previous, FRQ)**

#### Pendulum Unknown

### Unit 8: Electrostatics and DC Circuits

Electric Charge and Electrostatics	15.1 – 15.2	Sticky Tape Lab
Electric Charge and Quarks		
Batteries and Direct Current	17.1 – 17.2	Construct a Battery Lab
Resistance and Ohm's Law	17.3	Circuit Boards
Electric Power	17.4	Circuit Boards
Series and Parallel connections	18.1	Circuit Boards
Kirchhoff's Laws (conservation of charge)	18.2	

#### Practicum

**EXAM (80% new, 20% previous, FRQ)**

#### Lightning Bulbs and Power

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# Practice Exams and Study for the AP Exam

AP Physics 1 Exam – Monday, May 6 (afternoon – same day as AP English Lit in the morning)

**Practicum – Rube Goldberg Task**

**SEMESTER EXAM – COMPREHENSIVE (20% of Semester Grade)**