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**Physical Sciences includes ten labs:**

- ! Chemical Reactions
- ! Heat Transfer
- ! Newton’s Laws
- ! Linear Momentum
- ! Kinetics
- ! Waves
- ! Energy
- ! Gravity & Freefall
- ! Friction
- ! Rockets

The labs are aligned to the NGSS and other state science standards and can be used with any textbook curriculum. Labs can be accessed on any internet-capable device and can be completed in 30-45 minutes.!

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## **Heat Transfer**

### **Performance Expectations**

MS-PS3-3: Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.

### **Science and Engineering Practices**

Asking questions and defining problems

Planning and carrying out investigations

Analyzing and Interpreting Data

Constructing Explanations

### **Crosscutting Concepts**

Energy and Matter

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## **Newton's Laws**

### **Performance Expectations**

MS-PS2-2: Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

### **Science and Engineering Practices**

Planning and carrying out investigations

Analyzing and interpreting data

Using mathematics and computational thinking

Constructing explanations

### **Crosscutting Concepts**

Cause and Effects

Systems and system models

Stability and change

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## **Chemical Reactions**

### **Performance Expectations**

MS-PS1-2: Analyze and interpret data on the properties of substances before and after substances interact to determine if a chemical reaction has occurred.

### **Science and Engineering Practices**

Analyzing and Interpreting Data

Constructing Explanations

### **Crosscutting Concepts**

Patterns

Energy and Matter

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## **Linear Momentum**

### **Performance Expectations**

MS-PS2-1: Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.

### **Science and Engineering Practices**

Asking questions and defining problems

Analyzing and interpreting data

Using mathematics and computational thinking

### **Crosscutting Concepts**

Cause and effect

Systems and system models

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## **Kinetics**

MS-PS1-2: Analyze and interpret data on the properties of substances before and after substances interact to determine if a chemical reaction has occurred.

### **Science and Engineering Practices**

Analyzing and Interpreting Data

Constructing Explanations

### **Crosscutting Concepts**

Patterns

Cause and effect

Energy and Matter

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## **Waves**

### **Performance Expectations**

MS-PS4-2: Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.

### **Science and Engineering Practices**

Developing and Using Models

Obtaining, Evaluating and Communicating Information

### **Crosscutting concepts**

Patterns

Structure and Function

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## **Energy**

### **Performance Expectations**

MS-PS3-5 Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.

### **Science and Engineering Practices**

Analyzing and interpreting data  
Engaging in Argument from Evidence  
Constructing Explanations  
Developing and Using Models

### **Crosscutting Concepts**

Systems and system models  
Energy and matter

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## **Gravity and Free Fall**

### **Performance Expectations**

MS-PS2-4: Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.

### **Science and Engineering Practices**

Analyzing and interpreting data  
Engaging in Argument from Evidence  
Constructing Explanations  
Developing and Using Models

### **Crosscutting Concepts**

Systems and System Models  
Energy and Matter

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## **Friction**

### **Performance Expectations**

MS-PS2-2: Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

### **Science and Engineering Practices**

Planning and carrying out investigations

Analyzing and interpreting data

Using mathematics and computational thinking

Constructing explanations

### **Crosscutting Concepts**

Cause and Effects

Systems and system models

Stability and change

Structure and Function

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## **Rockets**

### **Performance Expectations**

MS-PS1-2: Analyze and interpret data on the properties of substances before and after substances interact to determine if a chemical reaction has occurred.

### **Science and Engineering Practices**

Analyzing and Interpreting Data

Constructing Explanations

### **Crosscutting Concepts**

Patterns

Energy and Matter

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