



Physics

GRADE LEVEL:

Elementary level

Scope and Sequence

COURSE OVERVIEW:

In this new Investigate the Possibilities series for 3rd-6th grades, elementary physics is made easy and fun! This remarkable full-color book is filled with experiments and hands-on activities helping students learn how and why magnets work, different kinds of energy from wind to waves, and concepts from nuclear power to solar energy. Science comes alive as students are guided through simplified key concepts of elementary physics and through hands-on applications. You will discover what happens to light waves when we see different colors, how you can see an invisible magnetic field, the essential parts of an electric circuit, how solar energy can be changed into electrical energy, and more.

FEATURES:

This title is an integral part of the Investigate the Possibilities Series. Each book includes instructions for 20 hands-on science experiments using simple household items, with additional guidance provided through the teacher's guides. All four titles are available in a discounted package, with subjects covering physical science, chemistry, physics, and earth science.

CONTENT FOCUS:

Chapter 1: Where exactly does energy go?

Concepts for discussion:

- What are examples of energy?

Chapter 2: Stored or active?

Concepts for discussion:

- Does energy exist in potential and kinetic forms?

Chapter 3: Light: Reflected and absorbed

Concepts for discussion:

- What happens to light when it hits an object if it doesn't go through an object?

Chapter 4: Light and lenses

Concepts for discussion:

- What happens to light when it goes through a convex lens?

Chapter 5: Waving the red, green, and blue

Concepts for discussion:

- What kind of waves are light waves?

Chapter 6: Did you hear that?

Concepts for discussion:

- How do sounds travel from one place to another?

Chapter 7: When things get hot

Concepts for discussion:

- What observations make us think that particles move faster and farther when heat energy is added?

Chapter 8: Feeling the heat

Concepts for discussion:

- Is heat transferred from warmer things to cooler things?

Chapter 9: Magnets are very attractive

Concepts for discussion:

- Do electromagnets behave like other magnets?

Chapter 10: Magnetism is pretty special

Concepts for discussion:

- What special properties does a magnet have?

Chapter 11: How do magnets become magnets?

Concepts for discussion:

- What happens when an object becomes magnetized?

Chapter 12: If it's invisible, how can you see it?

Concepts for discussion:

- How can we see what a magnetic field looks like?

Chapter 13: Static electricity

Concepts for discussion:

- How do some objects acquire a static charge?



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Energy

Chapter 14: A place where electrons get pushed around

Concepts for discussion:

- How can I make an electroscope?

Chapter 15: Switching on a series circuit

Concepts for discussion:

- What is a series circuit?

Chapter 16: Is a parallel circuit better than a series circuit?

Concepts for discussion:

- Why can you turn off one light in your house while the other lights stay on?

Chapter 17: The dishwashing liquid and electric current

Concepts for discussion:

- How are current, voltage, and resistance in a circuit related?

Chapter 18: Solar energy makes a change

Concepts for discussion:

- How can solar energy be changed into electric energy?

Chapter 19: Wind or water energy

Concepts for discussion:

- How can windmills and water mills be built?

Chapter 20: Nuclear energy

Concepts for discussion:

- What do these symbols stand for and how do they impact science today?

HOW TO USE THIS SERIES:

The learning progression recommended for this book is: engage, investigate, explain, apply, expand, and assess. In each lesson, students will be introduced to something that is interesting, they will do an investigation, they will find a scientific explanation for what happened, they will be able to apply this knowledge to other situations and ideas, they will have opportunities to expand what they learned, and there will be multiple assessments.

Think about This (Engage) — Students should make a note of what they know or have experienced about the topic. If this is a new topic, they could write some questions about what they would like to learn.

The Investigative Problem(s) — Students should be sure to read this so they will know what to be looking for during the investigation.

Gather These Things — Having everything ready before starting the investigation will help students be more organized and ready to begin.

Procedures and Observations (Investigate) — Students should first follow the instructions given and make observations of what happens. There will usually be opportunities for students to be more creative later.

The Science Stuff (Explain) — This section will help students understand the science behind what they observed in the investigation. The explanations will make more sense if they do the investigation first.

Making Connections (Apply) — Knowledge becomes more permanent and meaningful when it is related to other situations and ideas.

Dig Deeper (Expand) — This is an opportunity for students to expand what they have learned. Since different students will have different interests, having choices in topics and learning styles is very motivating. All students should aim to complete one “Dig Deeper” project each week, but the teacher may want older students to do more. Generally, students will do at least one project from each lesson, but this is not essential. It is all right for students to do more than one project from one lesson and none from another.

What Did You Learn? (Assessment) — The questions, the investigations, and the projects are all different types of assessments. For “What Did You Learn?” questions, students should first look for answers on their own, but they should be sure to correct answers that might not be accurate.

