



# Scope and Sequence

Physics

**GRADE LEVEL:**  
Elementary level

## COURSE OVERVIEW:

In this new Investigate the Possibilities series for 3rd through 6th grade, elementary physical science comes alive! This amazing full-color book is filled with 20 hands-on activities that ignite a sense of curiosity about the wonderful world God has made. Concepts are introduced in an engaging way by highlighting the science behind kids at play like roller skating, skateboarding, and even running. By guiding students through these easy to understand investigations, they learn to explain, apply, expand, and assess what they have personally observed! Learn how to determine the speed and motion of favorite toys, create a catapult and experience the mechanics of pulleys, set up a floating pencil race, discover why friction creates heat, 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: Wind-up walking toys

*Concepts for discussion:*

- How can we determine the speed and motion of a wind-up walking toy?

### Chapter 2: Which way did it go?

*Concepts for discussion:*

- Do we always have enough information to tell in what direction and at what speed an object is moving?

### Chapter 3: Investigating friction

*Concepts for discussion:*

- Does the degree of smoothness of surfaces affect the amount of friction?

### Chapter 4: Friction – Does it rub you the wrong way?

*Concepts for discussion:*

- What is inertia?

### Chapter 5: That's heavy, dude

*Concepts for discussion:*

- What are balanced and unbalanced forces?

### Chapter 6: Floating pencil race

*Concepts for discussion:*

- What are some ways that a pencil can be made to fall at a slower speed?

### Chapter 7: What floats your boat?

*Concepts for discussion:*

- What is buoyant force?

### Chapter 8: Giving airplanes a lift

*Concepts for discussion:*

- What forces act on an airplane in the air?

### Chapter 9: Crash test dummies

*Concepts for discussion:*

- Why is it hard to get things to start moving?

### Chapter 10: Cars and ramps

*Concepts for discussion:*

- Do objects accelerate as they fall or roll down a ramp?

### Chapter 11: The mighty conquering catapults

*Concepts for discussion:*

- How does a catapult work?

### Chapter 12: Round and round without stopping

*Concepts for discussion:*

- Why does the moon stay in motion around the earth when there is nothing pushing it?

### Chapter 13: Roller derby with flour

*Concepts for discussion:*

- How can a student on a pair of skates illustrate Newton's second and third laws of motion?



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### Chapter 14: Balloon jet propulsion

*Concepts for discussion:*

- Why will a pencil move in the same direction with a force that is exerted on it?

### Chapter 15: Balancing act with a stick

*Concepts for discussion:*

- What is the center of gravity of an object?

### Chapter 16: Spinning tops

*Concepts for discussion:*

- Can you balance a toy top when it is not moving?

### Chapter 17: He ain't heavy, he's just my load, brother

*Concepts for discussion:*

- How can you use levers to your advantage?

### Chapter 18: How do you like your pulleys – fixed, moving, or combined?

*Concepts for discussion:*

- What is a fixed and what is a moving pulley?

### Chapter 19: And the wheel goes round

*Concepts for discussion:*

- Does a wheel and axle move things faster or easier?

### Chapter 20: If it doesn't move, how can it be a machine?

*Concepts for discussion:*

- Is it easier to lift a heavy object by pulling it up a ramp or by picking it straight up?

## 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.

