

**NOEO  
SCIENCE  
PHYSICS 2  
LAB MANUAL**



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SCIENCE  
PHYSICS 2  
LAB MANUAL**

Created by Dr. Randy Pritchard

**noeo science**  
MOSCOW, IDAHO

# Noeo Science Packages

## **GRADES 1-3 /**

### **AGES 5-8**

Biology 1

Physics 1

Chemistry 1

## **GRADES 4-6 /**

### **AGES 9-12**

Biology 2

Physics 2

Chemistry 2

## **GRADES 7-8 /**

### **AGES 12-15**

Physics 3

Chemistry 3

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# unit 1: ENERGY

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# Week 1: What Makes Things Change

## Day 1 Worksheet

### SCHEDULE

|   | DAY 1              | DAY 2  | DAY 3   | DAY 4                                       |
|---|--------------------|--|---|---|
| <i>The Usborne Science Encyclopedia</i> |                    | pp. 106–107<br>Optional:<br>internet<br>links on p.<br>107 | pp. 108–109<br>Optional:<br>internet links<br>on p. 109 |   |
| <i>Explanatorium of Science</i>         | pp.<br>126–127     |  |   | pp.<br>111–117                              |
| <i>Gizmos and Gadgets</i>               | Circular<br>Motion | Matchbox<br>Boat   |   | Merry-Go-<br>Round;<br>Rubber<br>Band Racer |

### OVERVIEW

Physics is the science of how things move and change. If you drop a piece of paper and a block, one of them will hit the ground first. Why does that happen? What makes a bike stop when you press on the brake? Why does fire light up and what

makes it die out? All of these questions are physics questions. So to begin to understand how things move, explain what energy is to your child. Whenever something is moving or changing, it needs energy to be able to do so. As you go through this week, your child will learn about how energy works, how we measure it, and how it changes.

## READING QUESTIONS

1. What energy does a rollercoaster carriage have stored at the top of a loop?

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2. Where is gravitational energy stored?

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3. Where is elastic energy stored?

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**EXPERIMENT QUESTIONS: CIRCULAR MOTION**

1. What type of energy did you harness when you twisted the rubber bands?

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2. What type of energy did you harness when you released the rubber bands, and your contraption rolled away?

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# Week 1: What Makes Things Change

## Day 2 Worksheet

### READING QUESTIONS

1. What are the four forms of energy you learned about in today's reading?

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2. Sketch an example of something that uses one of these forms of energy, and label which form of energy it uses.

3. What is the law of the conservation of energy?

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## EXPERIMENT QUESTIONS: MATCHBOX BOAT

1. What type of energy did the twisted rubber band represent?

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2. What type of energy did the turning rubber band represent?

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# Week 1: What Makes Things Change

## Day 3 Worksheet

### READING QUESTIONS

1. Use the Usborne Science Encyclopedia glossary to define fossil fuels.

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2. Define joules.

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3. Define power.

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4. Define watts.

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# Week 1: What Makes Things Change

## Day 4 Worksheet

### READING QUESTIONS

1. What is potential energy?

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2. What is one of the examples from the reading of something with potential energy? Why does that thing have potential energy?

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3. Define kinetic energy.

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## Week 2: How We Use Energy

### Day 1 Worksheet

#### SCHEDULE

|                           | DAY 1           | DAY 2       | DAY 3         | DAY 4          |
|---------------------------|-----------------|-------------|---------------|----------------|
| <i>Gizmos and Gadgets</i> | pp. 118–123     | pp. 124–127 | pp. 128–131   | pp. 132–136    |
| <i>Experiment Guide</i>   | Scary Surprises |             | Knock It Off! | Pinwheel Power |

#### OVERVIEW

As we learn about energy, it is easy to think of energy as something in books instead of something that we are using all the time. I am using it as I type these words, and you are using it as you turn the pages of this book. This week we will learn about some interesting discoveries about energy and we will do some experiments.

## READING QUESTIONS

1. What discovery got scientists started on the track to invent batteries?

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2. Who invented the first battery?

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3. How does a trampoline bounce you so high?

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## Week 2: How We Use Energy

### Day 2 Worksheet

#### READING QUESTIONS

1. What is an everyday example of a pendulum?

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2. Why does a swing eventually stop swinging if you don't pump your legs?

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3. What was Galileo's discovery?

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# Week 2: How We Use Energy

## Day 3 Worksheet

### READING QUESTIONS

1. Energy can change forms and be transferred, but what about it can never change?

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2. Why would a marble bumping into a line of marbles cause the marble at the front of the line to roll away?

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# Week 2: How We Use Energy

## Day 4 Worksheet

### READING QUESTIONS

1. What prevented Thomas Edison initially from inventing the lightbulb?

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2. Why wasn't Edison discouraged when he had tested 300 fibers with no success?

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