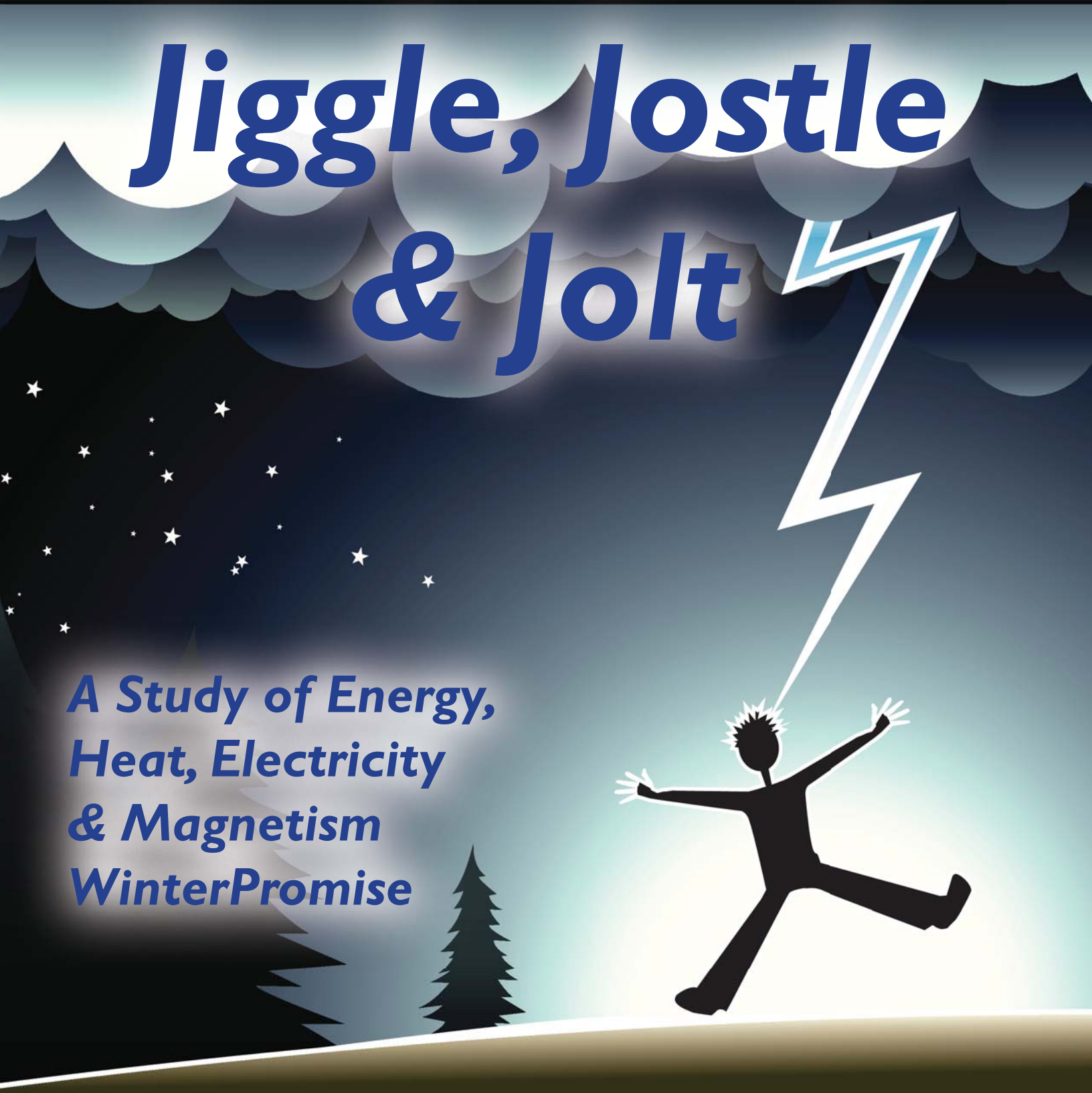
Jiggle, Jostle & Jolt



A Study of Energy, Heat, Electricity & Magnetism

WinterPromise

Jiggle, Jostle & Jolt!

Science for 4th to 7th Grade

Welcome to Energy Science!

Your student this year will be study a lot of different topics -- Heat, Energy, Light, Electricity & Magnetism. Each week your student will work through several resources. These resources can be completed orally together with the parent, or can be done independently if the student is older and accustomed to working on their own, though he will need parental supervision for some of the activities.

Each week there are suggested activities, some of which should be completed. There is a lot of content in the activities, so we encourage you to try to do a few of them each week. Many of them are very simple to complete and require limited supplies. Any needed supplies beyond common items such as art supplies or household supplies are listed underneath the listed activity.

This program has been deliberately designed to be a program whose content is a good complement to the breadth of our themed programs for middler students.

Book List:

Jiggle, Jostle & Jolt: Energy Science Program Guide
Jolt! Lab Book
Heat & Energy
Energy for Every Kid
Exploring the Science of Light

Other Supplies:

Various other supplies are needed for the experiments this year. Each week, your student should complete as many of the experiments as you can fit in. A list of the supplies needed appears in the back of this guide along with more information about the experiments.

IMPORTANT NOTE!

Whenever using anything that is connected to an electrical outlet or contains any sort of electricity be careful! Complete all experiments using electricity under parental supervision. Experiments that use electricity will be marked in the guide with the symbol below.

Parent Note: Exploring the Science of Light

This resource requires many items you will already have at home. We don't list the supplies needed for this resouce as most are supplies you'll have around the home or in your craft cupboard. We do recommend that you read pages 6-7 of this resource as it shows what unusual supplies you'll need to complete a few activities. Most of the experiments scheduled won't use the supplies listed on page 7. If you'd like to know what the experiments are optional look at page 95 of this guide.

Jiggle, Jostle & Jolt!

Science for 4th to 7th Grade

Weekly Overview of Topics

FORMS OF ENERGY

Week 1: Introduction to Energy
Week 2: Mechanical Energy
Week 3: Chemical Energy
Week 4: Nuclear Energy
Week 5: Nuclear Weapons

THERMAL ENERGY

Week 6: Thermal Energy
Week 7: Conduction
Week 8: Convection
Week 9: Radiation
Week 10: Solar & Geothermal Energy

ELECTRICITY

Week 11: Introducing Electricity
Week 12: Discovering Static Electricity
Week 13: All Charged Up
Week 14: Lightning Lights Up the Sky
Week 15: Current
Week 16: Voltage & Power
Week 17: Circuits

MAGNETISM

Week 18: Magnetic Fields
Week 19: Magnetic Materials
Week 20: The Earth's Magnetic Field
Week 21: Electromagnetism
Week 22: Generators & Motors

WAVES & SOUND

Week 23: Waves
Week 24: Electromagnetic Spectrum
Week 25: Sound Waves
Week 26: Characteristics of Sound
Week 27: Behavior of Sound
Week 28: Musical Instruments

LIGHT

Week 29: Introducing Light!
Week 30: Color
Week 31: Reflection
Week 32: Mirrors
Week 33: Refraction
Week 34: Lenses
Week 35: Using Energy -- Final Project
Week 36: Energy Science Review

COMPLETE WITH PARENTAL OVERSIGHT ONLY!

You will find this symbol next to many experiments this year. We feel these need parental oversight, as you are working with electricity and need to be careful in attaching certain wires correctly, etc.

Forms of Energy Study
Introduction to Energy
Week 1

ONE-DAY SCHEDULE - Complete All
TWO-DAY SCHEDULE - Divide as Shown

DAY 1	*DAY 2*
READ & COMPLETE: **Heat & Energy** Forms of Energy Read - Pages 8-10 Go Over: ***Read Parent Note Below*** What Did We Learn? Taking It Further	***READ & COMPLETE:*** **Energy for Every Kid** Introduction Read Pages 1-3 Moving Stuff: Energy and Work Read Pages 5-7 Basic: Kinetic and Potential Energy Read Pages 19-20
ACTIVITIES: **Energy Science Lingo** Review and discuss this week's list, for tomorrow's reading. Lingo Lists in back of this guide. Use the glossary at the back of "Energy for Every Kid" for answers.	***JOLT! LAB BOOK:*** **Jolt! Lab Book** Complete "Energy & Work Exercises" - Page 9 Record Results for "Activity: Uphill" - Page 9 Complete "Kinetic & Potential Energy Exercises" - Page 10 Record Results for "Activity: Hopper" - Page 10
ACTIVITY OR EXPERIMENT: **Heat & Energy** Conversion of Energy - Page 10 Supplies: 1 copy of "Energy Conversion" worksheet in the back of this guide. **Heat & Energy** Energy Chains - Page 11 Supplies: 1 copy of "Energy Chains" worksheet in the back of this guide	***ACTIVITY OR EXPERIMENT:*** **Energy for Every Kid** ***Read Parent Note Below*** ***OPTIONAL*** - "Activity: Uphill" - Page 9-12 Supplies: Rubberband, scissors, paper clip, paper hole punch, metric ruler, 4 by 10 inch piece of corrugated cardboard, 4 tbsp. of dirt(sand or salt), empty soda can, 24 inch piece of string, and 4 books Complete "Activity: Hopper" - Pages 22-26 Supplies: Piece of paper (8 x 8 inches) and other items found at home
NOTES	

Day 1 - Parent Note:
In the back of this guide you will find answer keys for the following:
What Did We Learn? Taking It Further Student Worksheets Quizzes & Tests
Day 2 - Parent Note for "Activity: Uphill":
This experiment requires unusual supplies that are only used once. The items required for this activity isn't listed in the necessary supplies as the items needed are only used once.

Forms of Energy Study
Mechanical Energy
Week 2

ONE-DAY SCHEDULE - Complete All
TWO-DAY SCHEDULE - Divide as Shown

DAY 1	*DAY 2*
READ & COMPLETE: **Heat & Energy** Mechanical Energy Read Pages 11-14 Go Over: What Did We Learn? Taking It Further	***READ & COMPLETE:*** **Energy for Every Kid** On the Move: Kinetic Energy Read Pages 35-37 Sum It Up: The Law of Conservation of Mechanical Energy Read - Pages 41-42
ACTIVITIES: **Energy Science Lingo** Review and discuss this week's list, for tomorrow's reading. Lingo Lists in back of this guide. Use the glossary at the back of "Energy for Every Kid" for answers.	***JOLT! LAB BOOK:*** **Jolt! Lab Book** Complete "Kinetic Energy Exercises" - Page 11 Complete "Activity: Swinger" - Page 11 Complete "The Law of Conservation of Mechanical Energy Exercises 1 & 2" - Page 12 ***OPTIONAL*** - "Activity: Magic Can" - Page 12
ACTIVITY OR EXPERIMENT: **Heat & Energy** Observing Mechanical Energy Page 12 Supplies: 2 pennies **Heat & Energy** Harnessing Wind Energy Page 13 Supplies: Piece of paper, straight pin, soda straw and a photocopy of the pattern on page 14. **Heat & Energy** Potential Energy Page 14 Supplies: Marble, books, cardboard or wood, "Potential Energy" worksheet	***ACTIVITY OR EXPERIMENT:*** **Energy for Every Kid** Complete "Activity: Swinger" - Pages 37-40 Supplies: Dry rice, sock, 3 foot piece of string, paper, tape, unopened can of food, and pencil. ***Read Parent Note Below*** ***OPTIONAL*** - "Activity: Magic Can" - Pages 44-47 Supplies: Masking tape, 10 pennies, 2 paper clips, 3 to 4 inch long rubberband, 13 oz. coffee can, and 2 plastic coffee can lids.
NOTES	

Parent Note for "Activity: Magic Can":
This experiment requires unusual supplies that are only used once. The items required for this activity isn't listed in the necessary supplies as the items needed are only used once.

Jolt! Lab Book

WinterPromise

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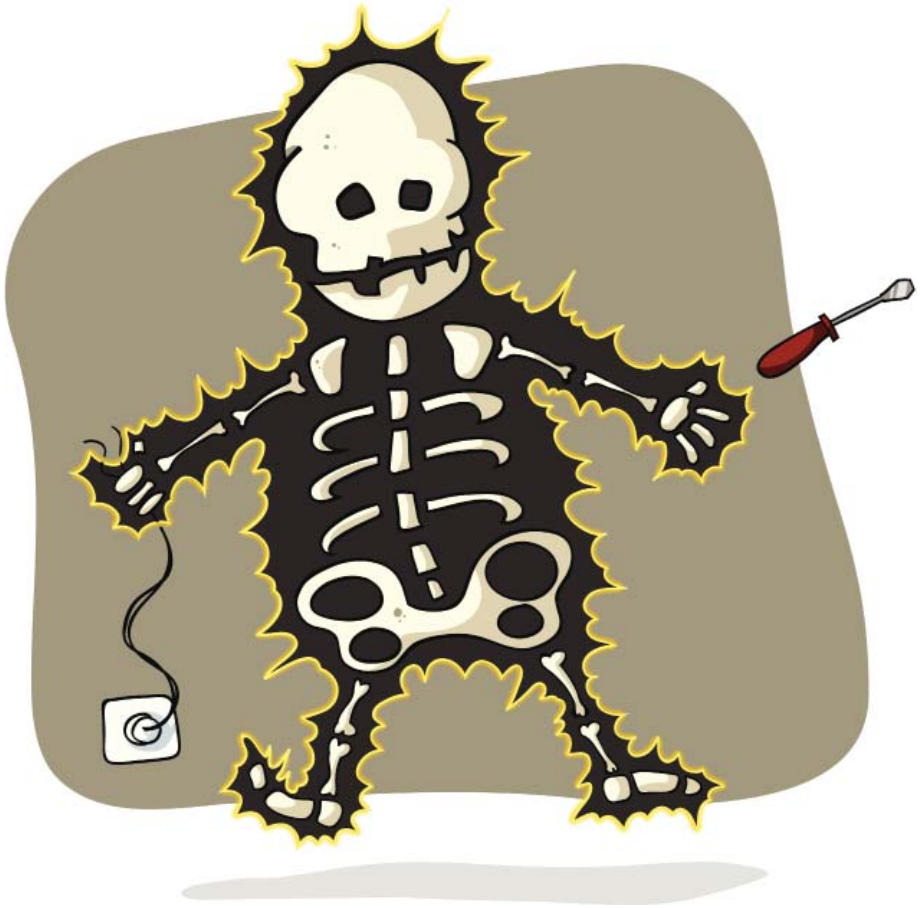
Jolt!
Lab Book



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Jolt Lab Book
Safety First

As we begin to complete the experiments in this resource be sure to follow the instructions and any safety notes as outlined in the experiments. Wear safety goggles during all the experiments to protect your eyes. These can be easily found at a hardware store. When completing these experiments make sure you are supervised by your parent or adult. Have your parent complete any steps that have you use a flame, sharp point, wall outlet, or cutting edge. Anything that may be dangerous ask a parent for help. Have fun exploring and learning how electricity and magnetism works safely.

Important Note:
The Answer Key for this resource is the in the back of the Jiggle, Jostle, & Jolt! Program Guide.

Jolt! Lab Book
Gather Your Supplies

Before you begin, you will need to gather the supplies listed below to complete the experiments for this study of electricity and magnetism. Many of these you'll have around the house but there will be some that you'll need to purchase. This checklist is repeated in the back of the teacher's guide. Confirm that you have everything you need to complete the experiments in this study.

In your guide we have a complete supply for the items needed to complete every activity scheduled in this program. For this resource though we have only listed what you need to complete the experiments from "Janice Vancleave's Energy for Every Kid" book and the electricity and magnetism experiment shown in this resource. Don't add this supply list to the list in the teacher's guide.

Supplies Needed for Experiments from Energy for Every Kid Book (Weeks 1-10/23-36)

Items You Are Likely to Have (underline items you don't have on hand):

KITCHEN ITEMS
2 c. dry rice
2 coffee can lids
1 13 oz. coffee can
Metal cookie sheet
Drinking straw - 1
Red food coloring
Garbage bag - 1
Metal spoon
Aluminum foil
Vinegar
Baking soda
1 qt. jar
Lg. bowl
Plastic water bottle
Cooking oil
Large-mouthed jar with plastic lid
Dish washing soap

HOUSEHOLD ITEMS
sock - 1
Masking tape
Cardboard box
Paper towel
Newspaper - 1
Flashlight
Desk lamp
Wool scarf
Clothespin - 1
Potting soil - 1 cup

OFFICE SUPPLIES
Scissors
Ruler
Clear Tape
Metric ruler
Pen & pencil
White paper
Red & Yellow Construction Paper -1 page of each
Small box of paper clips
Yellow Highlighter
Index Card - 1
Paper hole punch
Liquid Glue

OTHER
12 inch length of string - 2
24 inch length of string
3 ft. piece of string
18 inch length of string
10 pennies

List for this resource continued on following page.

Gather Your Supplies Continued. . .

Supplies Needed for Experiments from Energy for Every Kid Book (Weeks 1-10/23-36)

Items You'll Likely Need to Purchase (essential to completing many experiments):

4 by 10 inch piece of corrugated cardboard
Food scale or bathroom scale
3 oz. paper cups (2)
9 oz. clear plastic cups - 4
116 oz. plastic cup
1 tbsp. Epsom salts
Large Rubber bands (5-10)
Metal slinky
Incandescent lamp
6 by 6 inch piece of white posterboard
plastic spoon - 1
Balloons - 4
Screwbase flashlight bulb
"D" cell battery - 2
Bar magnet
thermometer
Alka-Seltzer tablet - 1

Supplies Needed for Electricity & Magnetism Study (Weeks 11-22)

Items You Are Likely to Have (underline items you don't have on hand):

KITCHEN ITEMS
2-3 plastic grocery bags
Aluminum foil

HOUSEHOLD ITEMS
Masking tape
Thread
A plastic comb
Clothes pins - 2
Sewing needles - 12
Video cassette tape
Audio CD
Stack of heavy books

OFFICE SUPPLIES
Metal paper clips - several
Ruler (either plastic or wooden)
Two brass paper fasteners
Metal thumbtacks - at least 6
Small magnets such as those used on a refrigerator or magnetic board

OTHER
A piece of nylon (like a piece cut from a stocking)
Nylon stocking
A large solid, smooth piece of cardboard (such as a drawing pad) or a piece of wood
Compass (directional)

Items You'll Likely Need to Purchase (essential to completing many experiments):

Flashlight bulbs - 3
Spool of electrical wire
Copper wire - 2 long wires
Several round Balloons
A piece of wool or felt
Bar magnet
4 "D" cell
batteries
3 small blocks of wood to serve as part of switches -- thin pieces of wood about the size of a light switch cover

Energy and Work Exercises

Write your answers to today's exercises from "Energy for Every Kid" below.

1.

2.

Energy for Every Kid Activity: Uphill

Write down what you think will happen in this experiment before you do it.

Record the results of your experiment below.

What did you learn from this experiment?

Kinetic and Potential Energy Exercises

Write your answers to today's exercises from "Energy for Every Kid" below.

1.

2.

Energy for Every Kid Activity: Hopper

Write down what you think will happen in this experiment before you do it.

Record the results of your experiment below.

What did you learn from this experiment?

Kinetic Energy Exercises

Write your answers to today's exercises from "Energy for Every Kid" below.

1.

2.

Energy for Every Kid Activity: Swinger

Write down what you think will happen in this experiment before you do it.

Record the results of your experiment below.

What did you learn from this experiment?

The Law of Conservation of Mechanical Energy Exercises

Write your answers to today's exercises from "Energy for Every Kid" below.

1.

2.

Energy for Every Kid Activity: Magic Can

Write down what you think will happen in this experiment before you do it.

Record the results of your experiment below.

What did you learn from this experiment?