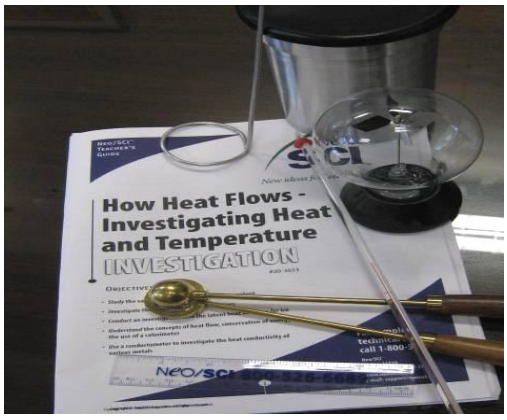
GRU TEACHER RESOURCES



INDEX

Items for Loan:

Free Items:

(We are out of car kits for the 2009-2010 school year. They will be available again in October 2010.)

Loan items may be checked out for a two-week period. All items can be ordered using our on-line request form and will be sent to you through truck mail.

Free items are available on a first come, first served basis.

BOOKS

Small Wonders – Nature Education for Young Children (Pre-K – K/1st)

(Linda Garrett and Hannah Thomas – 2005)

Children today are spending less time outdoors. Increasingly, they are watching TV and playing video games and their outdoor activities are highly structured and scheduled. This leaves little to no time for them to explore the natural world on their own and prevents their developing a curiosity about and a love of nature. They may be less likely to take care of the environment if they are never engaged with it and never understand how we are all connected to the earth. This book is chock full of outdoor and indoor activities that will evoke curiosity and wonder about nature, and hopefully instill a life-long dedication to the care of the environment.

WHY SHOULD I® SERIES: THE ENVIRONMENT (Grades K-2)

(Jen Green – 2001)

These books will help young readers to think about simple environmental issues, and other social and moral dilemmas they may come across in everyday life. The books will help children to understand environmental change and how to recognize it in their own surroundings. Through these books, children will discover how their environment may be improved and sustained. Thinking about these issues will also teach children to consider others and to act unselfishly. Suggested follow-up activities are in the back of each book.

Titles in the series include:

Why Should I Recycle?
Why Should I Save Energy?
Why Should I Save Water?

A TRUE BOOK® SERIES: THE ENVIRONMENT (Grades 3-5)

This series covers a wide range of environmental topics that are highly relevant in today's world. Energy and human impact on the environment are in the forefront of the world's consciousness and we need to help our students prepare to solve the associated problems.

These titles may be borrowed separately or as a set:

Air Pollution (Rhonda Lucas Donald – 2001)

Alternative Energy (Christine Petersen – 2004)

Conservation (Christine Petersen – 2004)

Endangered Animals (R. L. Donald – 2001)

Land Preservation (Christine Petersen – 2004)

Ozone Layer (Rhonda Lucas Donald – 2001)

Recycling (Rhonda Lucas Donald – 2001)

Solar Power (Christine Petersen – 2004)

Water Power (Christine Petersen – 2004)

Wind Power (Christine Petersen – 2004)

ROOKIE READ-ABOUT® SCIENCE SERIES: THE ENVIRONMENT (Grades K-2)

These colorful, fact-filled books describe for very young readers a range of environmental topics from recycling to habitats to pesticides.

These titles may be borrowed separately or as a set:

Lands of Grass
(Allan Fowler – 2000)

Life in a Pond
(Allan Fowler – 1996)

Life in a Wetland
(Allan Fowler – 1998)

Our Living Forests
(Allan Fowler – 1999)

Rachel Carson
(Justine & Ron Fontes – 2005)

Recycle That!
(Fay Robinson – 1995)

Save the Rain Forests
(Allan Fowler – 1996)

RECYCLE EVERY DAY (Grades K-4)

(Nancy Elizabeth Wallace – 2003)

This story featuring an engaging bunny family teaches children about ways to become involved with recycling. Some classroom activities are included at the back of the book.

BE A FRIEND TO TREES (Grades K-4)

(Patricia Lauber – 1994)

The author details the importance of trees and the many roles they play in the Earth's environment.

BIG BOOKS (Grades K-2)

These are guided reading leveled books. Each title comes with:
1 Big Book
6 Student Books
Audio CD
1 Smart Word Card
8 Photo Cards
1 Teachers Guide
List of Correlating Sunshine State Standards

Kids for the Earth (Guided Reading Level F)

Children are introduced to ways to conserve our natural resources—water, trees, and earth—including through recycling.

How We Use Electricity (Guided Reading Level H)

Electricity is observed creating light, heat, sound, and motion. Children also examine batteries, power plants, power lines, plugs, and more.

Energy (Guided Reading Level L)

It takes energy for a car to run. It also takes energy to walk, run, skip, or jump. Discover all the different ways energy makes the world work.

Extreme Ice Now – Vanishing Glaciers & Changing Climate (Grades 7-12)

(James Balog – 2009)

With 27 cameras positioned in remote locations around the world taking pictures every hour, photographer James Balog captures the rapid retreat of our world's glaciers in this ground-breaking project. Both still photography and time-lapse video sequences document the dramatic effects of global warming on Earth *now.* A companion video can be watched on-line at www.pbs.org.

Comes with:
Teacher's Guide

DVD's

ENERGY FOR CHILDREN DVD SERIES (Grades K-5)

(Schlessinger Media – 2000)

This series teaches kids the basics about five forms of energy: heat, mechanical, chemical, electromagnetic and nuclear. Dynamic graphics and visuals help explain scientific concepts like potential and kinetic energy, renewable and nonrenewable resources, work, conduction, convection and radiation. Inquiry-based learning is encouraged by the inclusion of fun, hands-on demonstrations and a stimulating investigation that kids can do in each program.

Each title comes with:
1 DVD (23 min.)
Teacher's Guide
Investigation Data Sheet
List of Correlating Sunshine State Standards

ALL ABOUT HEAT

Concepts taught:
What heat energy is and how we use it
How heat moves through conduction, convection & radiation
Melting point and boiling point

ALL ABOUT THE USES OF ENERGY

Concepts taught:
How electricity transformed the world
How generators create electricity

ALL ABOUT THE CONSERVATION OF ENERGY

Concepts taught:
Fossil fuel supplies are limited, and energy should be conserved
Actions kids & adults can take to reduce energy consumption
Pros and Cons of renewable energy sources

ALL ABOUT THE TRANSFER OF ENERGY

Concepts taught:
Potential and kinetic energy
How energy transfers between potential and kinetic

WHAT IS ENERGY?

Concepts taught:
What energy is and how we use it
How heat energy affects atoms
The sun is the ultimate source of Earth's chemical energy
Electromagnetic and nuclear energy

PHYSICAL SCIENCE FOR CHILDREN DVD Series (Grades K-5)

(Schlessinger Media – 2000) (Other titles in this series will be available in the future.)

This series explores the world of physical science and how it can be seen, touch and understood in everyday life. Simple demonstrations will help children comprehend basic concepts, including the properties of matter, forces and gravity, light, sound, flight, simple machines and more.

ALL ABOUT ELECTRICITY

Concepts taught:
Positive & negative charges
How electrical charges flow
Opposites attract
Like charges repel

Comes with:
1 DVD (23 min.)
Teacher's Guide
Investigation Data Sheet
List of Correlating Sunshine State Standards

EARTH SCIENCE FOR CHILDREN DVD SERIES (Grades K-5)

(Schlessinger Media – 2000)

Children will be fascinated by this hands-on approach to learning about the earth. This series takes young viewers on an introductory tour of the third planet from the sun, exploring its many processes, such as the water cycle and the creation of natural resources.

Each title comes with:
1 DVD (23 min.)
Teacher's Guide
Investigation Data Sheet
List of Correlating Sunshine State Standards

ALL ABOUT NATURAL RESOURCES

Concepts taught:
Renewable vs. non-renewable resources
Alternative forms of energy

ALL ABOUT THE WATER CYCLE

Concepts taught:
Evaporation
Condensation
Precipitation

WATER DVD SERIES (Grades 4-8)

(Schlessinger Media – BBC – 2003)

What happens to water as it moves through the water cycle? Where does our supply of drinking water come from? What are the causes and effects of a flood? Understanding water means learning about all the ways in which it can influence our lives. Water is a precious natural resource that is vital to the survival of all living things. While only a small portion of Earth's water is fresh water, an even smaller amount is available for human needs. Scientific and geographical explanations answer important questions about the role and influence of water on people. This series uses real life examples of people and places that are affected by water in different ways.

Each title comes with:
1 DVD (20 min.)
Teacher's Guide
List of Correlating Sunshine State Standards

FLOODS

Concepts taught:
Floods can be both helpful & harmful
People adapt their lives & homes to cope with floods

WATER'S CYCLE

Water changes form as it circulates through its cycle
Water is treated before & after use to make it safe

WATER SUPPLY

Concepts taught:
How people get clean, fresh water
Water resources are strained & conservation is encouraged

ENERGY IN ACTION DVD SERIES (Grades 5-8)

(Schlessinger Media, 2000)

Through the afterschool exploits of an aspiring young scientist, the Energy in Action series takes students beyond the basics to help them understand the five main forms of energy: mechanical, chemical, heat, electromagnetic and nuclear. Compelling examples show how stored energy is converted to active energy and how energy continually changes from one form to another.

Each title comes with:
1 DVD (23 min.)
Teacher's Guide
Investigation Data Sheet
List of Correlating Sunshine State Standards

ELECTROMAGNETIC ENERGY

Concepts taught:
Electromagnetic spectrum is made up of energy waves
Position in the spectrum and amount of energy in waves is determined by their size

ENERGY: POTENTIAL & KINETIC

Concepts taught:
Kinetic energy is related to objects in motion
Potential energy is stored

ENERGY RESOURCES: USE & CONSERVATION

Concepts taught:
Fossil fuels helped fire the industrial revolution
Fossil fuels are non-renewable & in danger of being used up
Kids can take an active role in energy conservation

HEAT & CHEMICAL ENERGY

Concepts taught:
Heat energy comes from the motion of atoms
Chemical energy is stored in the bonds that link atoms together

MECHANICAL ENERGY

Concepts taught:
Mechanical energy can exist in two states-kinetic & potential
Sound is mechanical energy

NUCLEAR ENERGY

Concepts taught:
Power stored inside atoms
Fission & fusion
Nuclear is clean, reliable energy source, but has safety issues

THE TRANSFER OF ENERGY

Concepts taught:
Energy changes form as it moves through the universe
Heat energy is transferred from the sun to the earth through conduction, convection & radiation

CORE PHYSICS DVD SERIES (Grades 9-12)

(Ambrose Video Publishing – 2007)

The Core Physics series is a unique approach to presenting in a logical way classical and modern physics' core principles relating the nature and property of matter.

Each title comes with:
1DVD (30/35 minutes)
Teacher's guide
Quiz
Timeline
Images

CLASSICAL PHYSICS

Classical Physics presents in a logical way classical physics' core principles relating to the nature and property of matter. This program covers the period that led to the Industrial Revolution and modern technology, and examines the key points in the development of classical physics, beginning with Isaac Newton's investigation of light and continuing with the discovery of light's spectral lines in 1814, the discovery of electromagnetism and the Doppler Effect, the formulation of the laws of thermodynamics, Faraday's and Maxwell's investigations into electromagnetism and ending with the discovery of X-rays in 1896 by Wilhelm Rontgen.

MODERN PHYSICS

Modern Physics presents in a logical way modern physics' core principles relating to the nature and property of matter. This program covers the modern era, which brought us new paradigms of how the universe works and our place in it. The key points in the development of modern physics are examined, beginning with the discovery of the electron in 1897 and following through the principles of quantum physics, the development of chaos theory, Einstein's breakthrough Theory of Relativity, the discovery of wave-particle duality and Heisenberg's uncertainty principle, the first nuclear chain reaction in 1942 and ending with the discovery of quarks 26 years later.

HUMAN IMPACT ON OUR ECOSYSTEMS DVD SERIES (Gr. 7-12)

(New Dimension Films – 2008)

A spectacular portrayal of the negative and positive effects humans have had on the aquifers, springs, streams, rivers, wetlands, and oceans that comprise over 2/3 of our planet. Each program is a case study of these water ecosystems in Florida, showing scientific and social processes that apply to water ecologies in all states and regions of the U.S. and beyond. The films reveal these processes at both the micro and macro levels, taking us from deep within the earth to the heights and breadths that help us see what we have done to damage, and are now doing to heal, the only home we have.

Each title comes with:
1DVD (30 minutes)
Teacher's guide

RESTORING DAMAGED RIVERS

A team of diver/scientists explores Florida's St. John's River, from its source and along its tributaries until it empties into the Atlantic. They go below and above the river to show how humans have damaged watersheds. Agricultural fertilizer runoff often causes algae bloom and species die-off, lawn sprinkling does unrealized damage and government flood-control projects have had disastrous unintended consequences. Now, farmers, citizens and governments are taking corrective action to restore natural processes that are as necessary to human civilization as to wilderness.

SURFACE AND SUBSURFACE WATERS

This program shows the interconnection of surface and subsurface waters. Two expert diver/scientists enter a Florida spring, floating crystal-clear waters over a heart-stopping tunnel drop into the black depths, and then follow an underground river for several miles. The water begins to turn turbid, revealing such detritus as tires, oil barrels and other debris. At the same time, another team tracks them through houses, golf courses, and busy traffic from above, revealing how we unsuspectingly pollute the very water we drink, and what we can do about it.

PBS (Various Programs) (Grades 9-12)

These programs previously aired on PBS on the series Nova, American Experience, Frontline and Scientific American Frontiers. Each covers some aspect of the environment, either from the past, the present or the future. Topics range from pesticides to global warming to solar energy. Each comes with suggested lesson plans.

CAR OF THE FUTURE
(Nova - 2008 – 54 minutes)

Is new technology about to transform the way we drive? Join Tom and Ray Magliozzi (hosts of NPR's Car Talk) as they look at America's four-wheeled future. They explore everything from a Detroit auto show to the homebuilders of Boston's AltWheels Festival, from a hydrogen-powered bus fleet in Iceland to a green think tank in Colorado. They check out hybrids that plug in to a household outlet and an electric sports car that goes from 0-to-60 in four seconds. The hosts meet experts in biofuels and lithium batteries, mixing sharp observation, slapstick and probing interviews. These car guys turn an expert, comic eye on the promise and pitfalls of tomorrow's auto technology.

GLOBAL WARMING: WHAT'S UP WITH THE WEATHER?
(Frontline/Nova - 2000 – 112 minutes)

Man-made carbon dioxide has overloaded the earth's atmosphere. With demand for fossil fuels increasing daily, experts predict emission levels will triple in the next 100 years. But the greenhouse effect remains the subject of heated debate among scientists, climatologists and futurists. Some believe the earth's temperature will rise by nearly 10 degrees, melting arctic ice caps and, paradoxically, bringing about a new Ice Age. Others believe the weather will stay relatively normal. Who's right?

HYDROGEN HOPES
(Scientific American Frontiers – 2004 – 30 minutes)

Will hydrogen ever become the oil-replacement fuel, as many in industry and government believe? Can hydrogen help avert a global warming crisis? How can we create hydrogen from renewable sources like the sun, and how do we store it safely once we have it? Alan Alda meets with hydrogen enthusiasts working toward a future when hydrogen can be made in unlimited quantities from renewable, non-polluting resources.

RACHEL CARSON'S SILENT SPRING
(American Experience – 1993 – 55 minutes)

With a passion for nature instilled in her at an early age, writer and biologist Rachel Carson became a fearless champion for the environment. She had been a biologist for the federal government when she first took note of the effects of the unregulated use of pesticides and herbicides. Carson's great love of the natural world drove her to write an exposé of the

chemical industry, specifically its unregulated use of DDT. Defying her failing health and risking her reputation, Carson published her controversial work, Silent Spring, in 1962. She was viciously attacked but her warning sparked a revolution in environmental policy and created a new ecological consciousness.

SOLAR ENERGY: SAVED BY THE SUN

(Nova – 2007 – 56 minutes)

Can solar power help save the Earth from the ravages of global warming? In the face of steeply rising oil prices and political turmoil in the Middle East, there's new urgency and enthusiasm for finding ways to make solar power more efficient and affordable. From individuals installing solar panels on their roofs to industrial-scale projects in the Mojave Desert featuring massive arrays of mirrors, solar power is gaining ground in the U.S. And in Germany, the world's leading developer of solar power is on track to produce 30 percent of its electricity from renewable sources by 2020. Breakthroughs in nanotechnology could make solar's future even brighter.

GOING TO GREEN: Towards a More Sustainable Community

(2009 – 5 videos – 7 ½ hours)

Going to Green deals with the restoration of America's urban landscape through the creation of sustainable neighborhood ecosystems. Each chapter is devoted to a specific subject, accompanied by a lesson with service extension activities. Besides the science and social studies standards addressed throughout the film, the curriculum highlights various cross-curricular activities, such as literature, math, psychology and art tie-ins.

Disks in this series include:

- Toward a More Sustainable Community (Education in Action, Understanding Sustainability, Building Community, Waste Management)
- Elements of Sustainability (Green Building, Energy, Air Quality, Water Quality)
- Balancing Green Space with the Built Environment (Soil Quality, Parks & Open Spaces, Transportation, Biodiversity)
- Implementing Urban Greening (Urban Agriculture, Community Gardens, Urban Forestry, Urban Planning, Integrated Resource Management)
- Public Policy and Green Collar Opportunities (Environmental Justice, Public Policy & Community Action, Sustainable Commerce, Green Collar Careers)

Disks may be borrowed separately or as a set.

CD ROM

SCIENCE COURT: WATER CYCLE (Grades 3-5)

(Tom Snyder Productions – 1997)

This interactive group software features, in cartoon format, a humorous courtroom drama that provides the vehicle for demonstrations and explanations of the water cycle as lawyers battle over the case of I.M. Richman vs. Pip Peterson's Pipes. The trial is covered by courtroom correspondent Jen Betters. Your students, working in cooperative teams, act as courtside commentators. At various breaks in the trial, Jen leads your students through a review of the facts, a hands-on activity, and a prediction about what will happen next. At the end of the trial, your students predict how the jury will vote.

Comes with Teacher's Guide
& reproducible information sheets
& hands-on activities
Requires QuickTime

KITS

ENERGY TRANSFER KIT (Grades 6-12)

Miniature battery-powered winch handily demonstrates the relationship between gravitational potential energy and electrical energy. By measuring the current and potential of the power source and lifting known masses metrically through a measured distance, it is possible to calculate the electrical energy input, the mechanical work done, and the efficiency of the system.

Contents:

- Assembled motor w/attached spool and battery clip
- Length of nylon thread
- Hook up wires w/alligator clips
- 15 metal washers (same size)
- Paper clip
- Ammeter
- Stop watch
- AA battery
- Instructions

INVESTIGATING HEAT & TEMP LAB (Grades 7-12)

Gain an understanding of heat and heat transfer through this series of hands-on activities. Measure thermal conductivity & thermal expansion of various metals; explore methods of heat transfer, including conduction, convection & radiation. Determine the specific heat of various substances. Using the calorimeter, determine the heat of fusion of ice. Also observe a demonstration of heat transfer using a radiometer, and investigate heat &phase changes of matter. Apply this knowledge to identify substances that conduct heat effectively (conductors) and those that do not (insulators.) Students will use their experiences to relate these characteristics to differences between heat and temperature.

Contents:

- Calorimeter
- Conductometer
- Radiometer
- 6 Thermometers
- Thermal expansion apparatus
- Rulers (10)
- Granulated wax
- Teachers Guide/Student Guide

Materials needed but not included: Beakers (250 mL), Bunsen burner, Hot plate; Wax pencil

SUNPOWER HOUSE (Grades 3-9)

A working model of a basic passive solar-heated house. Demonstrate principles of collecting, storing, and using solar energy. Conduct experiments in a classroom window or outdoors. (Comes with three houses so multiple experiments can be done simultaneously!)

Contents:

- Water storage container
- Thermometer
- Reflector
- Insulation panel
- Instructions
- Teachers Guide

RENEWABLE ENERGY KIT (Grades 3-8)

The components of this kit allow students to explore how the sun, wind and water can supply the power to make things move and work. Through fun, hands-on experiments, students discover the basic principles of energy. The accompanying activity book provides the frameworks for students to record their observation, gathered data, questions and discoveries.

Contents:

- Wind turbine
- Water turbine – 1 inlet/1outlet pipe
- Solar panel
- Universal base
- Universal mast section
- Output dials (power meter, light display [LED], alarm/buzzer, motion display [gears])
- Instructions
- Activity Book/Teacher Guide

WATTS UP? WATT METER DEVICE (Grades 4-12)

The Watts Up? device will help students understand the cost of electricity. Various appliances and electric equipment can be plugged into the meter to find the number of watts being used. Other modes will allow students to determine the voltage and amps of each appliance. The accompanying teachers guide has several different lesson plans that may be used alone or in conjunction with your regular unit on electricity.

Lessons include:

Introduction to Household Electricity
How Electricity Works
Measuring Electricity Consumption
Energy Conservation

Comes with:

Teachers Guide
Student Workbook (which may be copied)

ENERGY CURRICULUM KIT (Grades 3-8)

This curriculum, which GRU created for the Alachua County School system, covers subjects including the importance of renewable resources, where energy comes from, how to save energy at school and home, and how to protect the environment. Games and other interactive activities, such as Energy Bingo and the Pay Me Game, are used to educate students about energy efficiency.

By offering this curriculum to area schools, GRU expects to make learning and practicing energy efficiency fun. All elements necessary to carry out the lessons can be found in the individual game boxes. The games may be played directly from the box without the help of the Teacher's Resource Guide, and the guide provides back-up material and information to enhance each lesson.

Contents:

Box 1: The Pay Me Game
One clear pencil case; Home Energy Tip card (30); 60 envelopes: 30 labeled —Utility" and 30 labeled —Me"; GRU Money: $150 per student, 25 ($1), 13 ($5), 6 ($10)

Box 2: Bingo Save
Bingo Save reusable game cards (30); Dry erase markers; Caller cards

Box 3: Conservation & Plugging Leaks
Tape; Pencils (30); Tissue Paper (30 sheets); Draft-o-meter instructions; Home Draft Checklist; The Blackout Story; Caulking and Weather stripping poster; Historical Perspective on Energy poster; Note pads (30)

Box 4: GRU for Kids
GRU for Kids Magazine; GRU for Kids Teacher's guide; Rubber bands; Two small thermometers; Two clear plastic containers; Table fan; One package of cotton balls Two small cardboard boxes

Box 5: Conserving Energy at School
Student worksheets: Questions for Maintenance Personnel/Custodian; —Is Energy Conserved or Wasted in School?" —What's Wrong with this Picture?" —The School Heat Leak Detective Game" Draft-o-meter; Note pads (30); Tissue Paper (30 sheets); DVD —Simple Things You Can Do to Save Energy in Your School"

Teachers Guide

ENERGY & SOCIETY KIT (Grades PreK-8)

The Energy & Society program provides tools and activities to help students learn about their relationship with energy and investigate the environmental issues related to energy's role in society. Energy & Society helps students develop critical thinking skills to make decisions about their personal energy use. In addition to hands-on activities, Energy & Society integrates music and dance to enhance the study of energy issues.

Most activities are written for grades 3-8, with suggested adaptations for lower grades.

Contents:

Energy & Society Activity Guide
Energy & Me Music CD
Energy & Me Music and Dance Video/DVD
"Where is the Energy" and "What Powers the Move Posters"

The items on this page are available on a first come, first served basis.

FREE STUFF!

Energy for Today and Tomorrow (Grades PK-3)

This colorful book uses activities such as matching, connect the dots and story sequencing to teach young children the following concepts:

What energy is; Types of energy; How energy is produced; How we use energy; How to conserve energy

A teacher's guide is included. Limited to 30 copies per class.

Learning to Save Energy (Grades 3-5)

This book is jam-packed with activities designed to teach older children the following concepts:

What energy is; Types of energy; How energy is produced; How we use energy; How to conserve energy

A teacher's guide is included. Limited to 30 copies per class.

SOLAR CAR KITS (Out of stock until October 2010) (Grades 6-12)

These kits include all parts needed to create a solar racer. Limited to 15 per teacher per year.

Contents:
Solar panel 3v @ 3 watts; Solar motor w/lead wires; Motor mounting bracket w/screws; Gears for motor shaft (3 sizes); Axle shafts (2) Wheels/tires (4)