**Michigan DNR: Lessons and Activities**

**Grades K-6**

**Energy Works Michigan: Educational Resources**
Energy Works Michigan provides free lesson plans, laboratory equipment, and teacher professional development to schools participating in the Michigan Renewable Schools Program. The lesson plans are hands-on, engaging, and aligned with Michigan educational state standards. They are also targeted at three grade levels: Upper Elementary (3rd -5th grades), Middle School (6th - 8th grades), and High School (9th - 12th grades). For each grade level, three units are provided: Energy Efficiency, Solar Energy, and Wind Energy. A user account is required to view or download the lessons. There is no charge for creating a user account, and viewing or downloading lessons are free at the Energy Works Michigan: Educational Resources website.

**Crafting the Green Life**
Crafting the Green Life is a website designed to help children learn about recycling by reusing items which often end up in the trash. The website provides many fun and creative step-by-step projects which can be made from items such as shoe boxes, pop bottles, and CDs. The projects are perfect for in the classroom and at home. There are endless possibilities for the ways in which an item can be reused. Please visit the Crafting the Green Life Website website.

**Project FLOW (Fisheries Learning on the Web)**
Curriculum on the Great Lakes fisheries is now available online via Michigan Sea Grant¹s web site, Fisheries Learning on the Web (FLOW). Four new and revised classroom lessons and hands-on activities help educators and students observe and identify Great Lakes fish, understand the fundamentals of fish habitat and life cycles, and learn how scientists monitor the movement of fish populations. The new FLOW lessons were developed in collaboration with fisheries experts at the University of Michigan and reviewed by Michigan science teachers. All lessons meet state and national science education standards and benchmarks and are designed for educators and students in grades 4 through 8.

**Environmental Resource Guide**
This series of 15 lessons is designed to increase critical thinking skills such as observation, comparison, analysis and problem-solving. Written and tested by teachers, these lessons are technically accurate and include objectives and activities. Fact sheets and free lesson plans are available for download.

**HippoWorks Helps Teach Kids about Global Warming**
HippoWorks has recently introduced a 12-part cartoon series that was designed to help children learn what they can do to stop Global Warming. “One by One, Ton by Ton, Let’s Stop Global Warming” was formed to give kids an idea of how important environmental issues are. This is a great teaching tool for teachers and can be used to help promote energy conservation, awareness about endangered animals and other important environmental issues.

**Walden Media Supplemental Lesson Material**
Walden Media is offering supplementary material to their video and visual publications. They are offering lesson plans to assist teachers that seek to bring the classroom experience to a new and exciting level. All of the lesson plans comply with national standards and are composed by fellow educators to ensure that teachers are receiving the best material available.

**ABC’s of Ecology**
The Ferry Beach Ecology School has set out to provide this fantastic supplement to traditional classroom learning. This program seeks to educate children about how they fit into the ecological structure around them. Educators are provided with over 230 illustrated pages of hand-on activities to use in their

classroom.

**Dr. Seuss “Horton Hears a Who”**
The EPA has joined forces with 20th Century Fox to help kids understand the importance of energy efficiency. Using their new movie, Dr. Seuss’ “Horton Hears a Who” children can learn about energy star ratings and how they can make a difference in their homes. All of the resources are available free online or can be ordered if a hard copy is preferred.

**Free Insect Teaching Kit:**
The first 500 educators to respond to a survey that the Entomological Foundation is conducting will receive a free copy of the science education kit once it is developed. The survey is intended to help determine the needs of K-12 educators regarding the use of insects in teaching science.

**Rain Bird - The Intelligent Use of Water - Teaching Curriculum**
Rain Bird has teamed up with Stefanie Saccoman, Ph.D. at California State Polytechnic University, Pomona, to design an elementary school curriculum that presents students with the opportunity to explore the critical role water plays on Earth in the same manner that scientists and engineers do in the field, through research and experimentation. Geared for use by students in grades 3-6, the Explorations Into Water teaching curriculum is ideal for educators and/or parents to use as an engaging resource to teach students about the properties of water and the importance of water conservation in an easy-to-understand, educational, fun and interactive way. The curriculum is well organized, self-explanatory and easy for teachers, parents and students to use for related course work, projects or research in natural history, ecology, biology, physics and chemistry.

**New Board Game Teaches Energy Conservation**
Engineers at Clarkston University in New York recently designed a new board game that teaches middle school children how their energy choices directly impact energy conservation. The game, called Energy Choices, was developed to motivate the next generation of consumers to think about how energy choices are made, the role economics play in such decisions and how to identify acceptable trade-offs. The game was developed as a result of the university's award-winning National Science Foundation-funded K-12 Project-Based Learning Partnership Program.

**Edheads - Activate Your Mind!**
This site offers a variety of flash learning programs and lesson plans designed to meet state and national learning standards.

**Go Wild in New York City**
(National Geographic, 2005) is an action-packed, kid-focused introduction to the ecology of cities. The book combines basic science with mind-bending city-specific facts and photos (including child-pleasing spreads on cockroaches, rats and squirrels; and sidebars on topics like horse manure, trash and worms) and junior citizen scientist projects. Extensive online and offline resources are provided in the end pages, and the book's Web site features chapter-specific teaching plans created for GO WILD by the Urban Science Education Center at Teachers College.

**Kids Gardening Thematic Explorations**
A garden or habitat is a living laboratory for learning real-world skills, and the Thematic Explorations Library opens the door to a green curriculum. Looking to boost skills in measuring, calculating and problem solving? Check out Honing Math Skills in the Garden. If it's social studies that needs a hands-on component, how about Growing Cultural Understanding? Other topics include Gardening for a Sustainable Future, Cultivating Literacy in the Garden, and the newest topic Linking Gardens and Nutrition.

**Operation: Monster Storms:**
This free, online curriculum is designed to better teach students (grades 5-8) how powerful storms form and how advancing technology is used to understand and forecast weather. The five to nine-week core science unit covers key middle school National Science Education Standards, and can be aligned to state standards as well.

**Grades 6-12**

**Energy Works Michigan: Educational Resources**
Energy Works Michigan provides free lesson plans, laboratory equipment, and teacher professional development to schools participating in the Michigan Renewable Schools Program. The lesson plans are hands-on, engaging, and aligned with Michigan educational state standards. They are also targeted at three grade levels: Upper Elementary (3rd -5th grades), Middle School (6th - 8th grades), and High School (9th - 12th grades). For each grade level, three units are provided: Energy Efficiency, Solar Energy, and Wind Energy. A user account is required to view or download the lessons. There is no

charge for creating a user account, and viewing or downloading lessons are free at the Energy Works Michigan: Educational Resources website.

**Kid's Connection**

This site uses NPR's weekly "Talk of the Nation: Science Friday" program to formulate curriculum supplements. Each week, program material is translated into a summary of the radio program, discussion ideas, activities, links to the audio, selected resources, related science standards, and then posted on the Web for convenient teacher or student access. Kid's Connection covers a wide range of subject material and can be used to facilitate further learning and create an enjoyable educational atmosphere for both teachers and students

**Climate Change Education Program**
Climate Change: A Wisconsin Activity Guide
is a resource for teachers to help students develop the knowledge and skills needed to become informed and active participants in society's climate change discussions. It touches on both the scientific aspects of climate change and social issues. There are twelve different activities available that can be taught individually or as a whole. These activities cover a wide range of subjects, including sciences, math, art, social studies, and language arts.

**GOT ENERGY HOGS**:
The Alliance to Save Energy's Energy Hog campaign is providing energy education tools to the people who influence the lives of the next generation: teachers. Why? Saving energy lessens our dependence on foreign oil, improves our air and water quality, and reduces our energy bills. To help spread the word about energy efficiency, educators can print out our Student and Teacher Guides and energy Scavenger Hunts from the Web site, or request activity worksheets, bookmarks, and tattoos via email. Contact: Erin O'Sullivan at eosullivan@ase.org

**EPA Climate Change Kit**
This is an Excel-based kit that teaches high school students about the science, drivers, and impacts of climate change. It also provides them with knowledge, tools, and resources to increase climate-change awareness and to help them reduce greenhouse gas emissions at their schools. Students will estimate greenhouse gas emissions using built-in calculators and school-specific "activity data" and develop and implement a mitigation action plan.

**National Institution Health Curriculum Supplements**
These interactive teaching units combine cutting-edge science research discoveries from the National Institutes of Health with state-of-the-art instructional materials. Each supplement is a teacher's guide to two weeks' of lessons on science and human health.

**First Measured Century: The History and Use of Sampling Methods**
This lesson for high school students examines statistical sampling by tracing improvements in sampling procedures over the 20th century and by taking a critical look at scientific inquiries involving flawed sampling.

**NOAA Lesson Plans Library**
These comprehensive lessons plan for chemistry, Earth science, geography, life science, math, and physical science. They are correlated to National Science Education Standards and designed to supplement existing curricula at the middle and high school levels present National Oceanic and Atmospheric Administration (NOAA) science through activities using online data from NOAA websites. Lessons are available at http://oceanservice.noaa.gov/education/lesson_plans.html

**Diverse Reasons for Biodiversity**
This helpful lesson plan is designed to teach students the importance and meaning of biodiversity. Through the use to internet resources and good old-fashioned discussion, students are exposed to endangered spies and a myriad of reasons why a biodiverse world is necessary for the future or our planet.

**Eco-Cycle: Finding the Parts of an Ecosystem**
Students have the opportunity to learn how plants and animals interact with their environment, thus creating ecosystems. Using the Eco-Cycle Station, students will identify key plants and animals while reading about the Hawaiian ecosystem.

**Barbaloot Suits: Preserving Biodiversity**
Dr. Seuss's children's story *The Lorax* connects the lovable characters and themes to the work of scientist Mark Olson. With a concentration in the area of dry tropical habitat biodiversity, Olson's work

allows students to see a real life application of the tragedy illustrated by the Lorax, while educating them on the effects mankind has on his surroundings.

**Global Warming Expedition with Will Steger**
The National Education Association in collaboration with National Geographic's Will Steger has put together a great educational tool for middle school and high school aged students. Will Steger brings students along on his High Arctic dogsled expedition and addresses how the climate shift is affecting the regions he visits. Additionally this site provides free lesson plans as well as discussion starters to challenge the students

**Environmental Literacy Council EE Write-Up**
Its tools will give students a fundamental understanding of the systems of the world, both living and non-living, along with the analytical skills needed to weigh scientific evidence and policy choices. There is also an extensive Teaching Resources page which lists labs, activities, and lesson plans.

**Environmental Jeopardy**
Designed after the game show, Environmental Jeopardy is available in two different editions, each focusing on a specific environmental theme with in-depth answers and suggestions for how to conduct further research. Both editions can be downloaded for free by registering on the Teachers Corner of the EDN website. Obtain hard copies here.

**Exploring Climate Change Impacts,**
This is a new curriculum guide, now available from the Union of Concerned scientists (UCS). It contains a set of teaching materials geared towards students and teachers in grades 9-12. Individual exercises are adaptable to different grade levels and engage students in an exploration of the impacts of global climate change on ecosystems and natural resources.

**NASA Classroom Modules**
The NASA educational product series consists of five classroom problem-based modules for studying clouds, energy, precipitation, weather and wind. Learning activities, assessment rubrics and prerequisite knowledge are included in these downloadable booklets, correlated to national academic standards for grades 5-12

**The Science Spot Site**
This website provides a variety of activities and lesson plans for the classroom and the curious, geared toward middle school teachers and students. The Idea Factory contains ideas, words of advice and wisdom from teachers for teachers. Sign up to receive the Lesson or Science Experiment-of-the-week. The Junk-Box and Junk-Yard challenges are designed to teach students how to build a science project from discarded objects.

**Terrain for Schools**
Education program contains science, social studies, and language arts lessons for the high school level. Each lesson relates to an article in Terrain magazine, which covers relevant environmental issues, and fulfills at least one of California state standards. Archived lesson plans also available.

**Water Science Experiments & Projects**
This site offers many useful classroom tools for conducting water-related science experiments. Included are many tips for teachers and opportunities to purchase cost effective and educational equipment. Project ideas include water testing for pollution and water treatment for drinking purposes.

**Students Guide To Composting** Composting in the Classroom: A Scientific Inquiry for High School Students, by Nancy Trautmann and Marianne Krasny, is a comprehensive guide for teachers interested in guiding composting research projects by high school students. Downloadable in pdf format.

**College Level and Adult**

**EcoTipping Points**
The EcoTipping Points website offers an array over environmental success stories that are premier examples of how a community can rally around change. The success stories transcend every continent and truly show how environmental progress is a global issue. EcoTipping Points is looking for progressive educators that are interested in integrating these concepts into their classroom experiences. Any educator that is interested in this opportunity will receive assistance from an EcoTipping Points staff member.

**CAPCO Aerosol Adventure**
The CAPCO classroom aerosol adventure kit comes complete with all the tools necessary to educate a classroom about the composition of the Earth's atmospheric layers. The kit includes a teachers guide, classroom experiments, homework assignments and a DVD. Best of all, all of the resources in this kit are FREE to interested educators

**Teach English, Teach About the Environment**
The EPA has introduced a new curriculum for Teachers of English for Speakers of Other Languages. The objective of this program is to teach adult students about the basic concepts of recycling and the environment. As adult students learn about their new community they can also learn about how we can make out global community more sustainable for future generations.

**NSTA Science Alliance**
This program is designed to integrate environmental and science related programs into the classroom. The National Science Teachers Association has formed a program the enables educators to have a multitude of relative resources right at their fingertips. For $100 an entire school can register for a year long membership to this program. The Science Alliance program is focused on elementary educational development and looks to further enhance the education of today's youth. Educators that are enrolled in the program will also receive a 20% discount on textbook purchases for their classrooms.

**Hakim's Story of Science Series**
For educators looking to add some excitement to their classroom activities are invited to view the Hakim's Story of Science Series. Currently the series is focusing on Albert Einstein and the contributions he has made to modern science. This is truly a resource that teachers do not want to miss and is a great opportunity to spark their classrooms excitement about these science related issues.

**Web School of Science**
The Web School of Science is a fantastic tool for educators looking to integrate environmental issues into their classroom activities. This website is a set of 14 online laboratories that are designed to enhance the traditional lecture course. Educators have unlimited access to all of the labs and teaching materials. This program is a fantastic addition to any environmental education program.

**Environmental Education Station**
This newly updated site provides an abundance of teaching materials geared toward environmental and resource economics, a photo library, and links to hot environmental topics.

**Teacher's Environmental Quiz**
This quiz is from the Forest Resource Environmental Education program at the University of Minnesota. This free environmental quiz for teachers was developed in 1991 and is still used today as a tool for generating discussion.

**Avian Index**
The recently updated “Avian Index” is brimming with interesting information for avian enthusiasts everywhere. Teachers, ornithologists and enthusiasts will find this website to be informative on everything there is to know about birds. This website has everything from educational programs and publications to avian festivals across the nation. There is even a section designed especially for children interested in avian topics. This data-base is now even easier to search, see for yourself by visiting www.birdiq.com/learn/Resource_Dir.

**All Ages**

**Earth Adventure – Environmental programs at school**
Earth Adventure brings environmental programs to schools featuring the Earth Balloon, a 20' diameter inflatable model of the earth. Earth Adventure teachers facilitate all programs and take students on an adventure around and inside the earth to learn about eco-systems, rain forests, climate change, water resources, conservation, and more.

**Innovative Ways to Teach Systems**
ScienceScope, National Science Teachers Association (NSTA) peer-reviewed journal for middle school science teachers, July 2008 issue, offers teachers strategies for using a systems-view of the world in the classroom.

**ACTION BIOSCIENCE:**
The American Institute of Biological Sciences hosts Actionbioscience.org, a Web site that promotes bioscience education and literacy. Features include teacher-written lesson plans and peer-reviewed articles that focus on important current issues in areas such as biodiversity, the environment, genomics, biotechnology, and evolution. Select articles are translated into Spanish, suitable for ESL students. See why Scientific American named Actionbioscience.org one of the top five biology websites.

**Art and Nature-**
North Carolina Museum of Art online educational resource, featuring nature and science activities that can be used in environmental education. Includes K-12 lesson plans and activities searchable by region, subject, and grade.

**The Center for Improved Engineering and Science Education (CIESE)**
CIESE sponsors and designs interdisciplinary projects that teachers can use to enhance their curriculum through use of the internet. The focus is on projects that utilize real time data from the internet, and on collaborative projects that reach peers and experts around the world via the internet.

**Take Action: Steward Our Land**
This Web site from National Geographic lists ways to become more aware of the environment around us. Highlighting the necessity of public lands, hints and guidelines are outlined informing readers of ways they become a steward for Mother Earth.

**Cool Fuel Road Trip**
This show is the story of a man and his dog, on a journey across the country in a variety of exciting alternative fuel vehicles. Examples include a battery powered sports car that accelerates 0-60mph in 4.1 seconds and a stretch Hummer H1 limo that runs on anything from cow pies to crawdads! This site also features lesson plans for teachers who wish to utilize this information in the classroom. 9AM. All 18 episodes in are also available for purchase from the website in the form of 4 DVDs. Or send questions via email to: info@coolfuelroadtrip.com

**The Electronic Naturalist-**
This site provides new teaching materials each week for 30 weeks during the school year covering a wide variety of information on animals and plants, interdisciplinary activities, various reading levels, and access to a professional naturalist via email.

**EPA Drinking Water and Ground Water**
This website provides classroom lesson plans, games and activities geared for grades K-12.

**Fish of the Great Lakes-**
Website from the University of Wisconsin Sea Grant Institute provides a wide variety of teaching materials and information on the fish of the Great Lakes. Features a kids' page with a database of fish profiles, updates on current Great Lakes initiatives and research news, and publications, including the full text of George C. Becker's book "Fishes of Wisconsin"

**The Gateway to Educational Materials**
This is the perfect resource for educators searching for lessons, in class activities, or literature on any topic. The site includes a broad range of environmental topics, broken down by appropriate grade level. A great search engine provides educators with quick and easy access to thousands of educational resources!

**KidWind Project**
Tons of information and activities to teach kids about wind power! The website includes materials and curricula to introduce your students to wind energy, wind energy workshops, and kits to build turbines!

**Learning Science Interactive**
Free, high-quality web activities for the classroom in various areas of science studies listed by learning standards for grades K-4 and 5-12. Included are links to long and short interactive lesson plans, data collection, imaging, and more.

**Learning With the Tree of Life**
Tree of Life (ToL) learning pages for teachers and students provides information on using the Tree of Life Web Project as a tool for learning and teaching about biodiversity. The ToL Treehouses are Web pages linked to scientist created core content about the world's organisms.

**Michigan Reach Out! Mentoring Program offers Science How-To's** - Science experiments, how-to's, and lesson plans for every age. Activities in the fields of astronomy, biology, chemistry, earth science, physical science, and technology are included.
Early Elementary Level
Later Elementary Level
Middle School Level
High School Level

**NASA Earth Explorers**
Monthly National Aeronautics and Space Administration (NASA) series introduces a variety of learning adventures and lesson plans designed for K-12 educators and students. Current issue has students investigating the migration of land and marine animals such as eagles, turtles, dolphins, swans, and harp seals.

**PBS Borders Environmental Project**
Through the Point-of-View (POV) Borders Environmental project, PBS offers lesson plans for K-12 teachers that are designed to enhance online story telling and sharing. Each separate lesson plan focuses on earth, water or air, and is downloadable in pdf or html format. Students can

explore how human activity and industrialization is altering air quality, the social impact of land use and how water is used in their own communities.

**Project FLOW**
The Fisheries Learning on the Web program provides fifteen free and easy to use online lesson plans for teachers with modules covering the Food Web, Water, and Fish. The focus is specifically on the Great Lakes and also includes information and hands-on activities involving such topics as invasive species, water quality and quantity, and Great Lakes and marine science careers. The lessons are aligned with State of Michigan and National standards and benchmarks for science and social studies. For more information: Phone (734) 764-1118 or Email msgpubs@umich.edu

**Project Learning Tree**
Project Learning Tree (PLT) has developed new secondary EE materials to give students an awareness of the environmental, social, and economic impacts of decisions connected to community growth and change. Exploring Environmental Issues: Places We Live gets students exploring their own neighborhoods, learning about their community's development through time, and involved in local community action projects.

**Rocky Mountain National Park Photo Gallery**
William C. Gladish, of A Critical Decision, and author of Saving Our Life-Support System: Understanding One's Decision Footprint delivers another gorgeous photo gallery of his recent trip to Rocky Mountain National Park.

**Tsunami Teaching Materials-**
K-12 teacher's resource site from Asia Society provides background essays, lesson plans, learning activities, maps, annotated links, and more. Lesson plans cover the events leading up to and the hours following the earthquake off the shores of Sumatra and the use of history to learn ways to avert a similar crisis in the future.

**Water Educational Training (WET) Science Project**
Designed by the Eastern Michigan University, has eleven lesson plans pulling together biology, earth science, physics, and teacher education. This project trains the k-12 teachers to implement monthly WET science lessons and establish after school science clubs in ten school districts in the metro-Detroit area. WET helps maintain the curiosity of the children in the sciences along with developing greater skills in writing and long-term concepts.

**Wetland Education-**
Ducks Unlimited site provides a variety of resources on wetland education. Three new units developed for grade levels 4-6, 7-8, and 9-12, in wetland ecosystems series consists of an educator's guide and accompanying student journal, experiments, and activities.

**Wyland Ocean Challenge**
Exploring the natural world through Art and Imagination, the Wyland Ocean Challenge "Clean Water for the 21st Century" is a nationwide classroom program that uses an art-based, interdisciplinary approach to environmental education and conservation.

**ClimateClassroom.Org**:
National Wildlife Federation's new ClimateClassroom.org website is designed to help parents and teachers talk to students of differing ages about global warming. Its features include guidelines for parents, proposed new national global warming educator guidelines, age-adapted sources of useful curricula, a downloadable slide presentation for kids, presenter's guide, and more.

**Environmental Education Resource Guides**
Air and Waste Management Association (A&WMA) has eleven print volumes of environmental education lessons/activities called the Environmental Resource Guides (ERGs). There are four

Air Quality ERGs and four Nonpoint Source Pollution Prevention ERGs in English. They are divided by class level using common U.S. classifications: grades K-2, 3-5, 6-8, and 9-12. In addition, the Air Quality grade 6-8 and Nonpoint Source grade 6-8 ERGs have been translated into Spanish, and the Air Quality grade 6-8 ERG has been translated into French. The oldest lessons found in the Air Quality ERG for grades 6-8 are being revised and updated. This curriculum is the core of A&WMA's award-winning Teacher-Training Program and environmental education efforts. Download 4 free lessons today!

**Go Green 2007: Education for the Ecosystem**

The October 10, 2007 issue of Edutopia "Go Green 2007: Education for the Ecosystem" is devoted to environmental education. Search the "Go Green" resource database by topic for activities such as field trips or lesson plans by grade-level. Learn about schools involved in innovative learning projects on cool schools and sustainable schoolyard design. Read the articles on environmental education activities happening in and out of the classroom.