

# Purdue Agriculture

Resources for K-12 Educators

## **Indiana Stock Market Program**

Purdue Agricultural Economics

The Indiana Stock Market Program is a widely popular teaching tool used in grades four through twelve. It fits into many different disciplines and activities such as social studies, math, business education, and even language arts. Teachers can organize the program to fit their particular needs. Using actual data from the stock markets, teams of students are given a hypothetical \$100,000 to create and manage a portfolio of stocks and mutual funds. Before they know it, students are learning about financial markets and current events, understanding the basics of personal investing and enhancing skills learned in math, reading, and data literacy.

### **Subjects:**

- Economics
- Math
- Social Studies
- Language Arts
- Business

### **Grades:**

4-12

**Web address:** [www.econed-in.org/indiana-stock-market-program/](http://www.econed-in.org/indiana-stock-market-program/)

### **Contact:**

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Education

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## **Kids Econ Posters**

Purdue Agricultural Economics

KidsEcon Posters teach economic principles. We want to give teachers across the nation every opportunity they deserve to help make finance and economics accessible to students of all ages. At the heart of the KEP curriculum are colorful posters describing concepts. Each set of posters contains a Teacher's Guide containing a one-page lesson on each poster. Each lesson

gives an explanation of the concept, teaching ideas, and a Literature Connection. The posters can also be supplemented by great activities such as KidsEcon Bingo, KidsEcon Activity Cards, and Herschel's World of Economics DVD's.

**Topics:**

- The Basics
- The 6 Core Principles
- Personal Finance
- Interest
- Entrepreneurship
- Financial Literacy

**Subjects:**

- Economics
- Math

**Grades:**

K-6

**Web address:** <http://econed-in.org/kids-econ-posters/?src=&submenu>

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**Plant Science Word Searchers & Crossword Puzzles**

Purdue Agronomy

Word searches and crossword puzzles to encourage understanding and review of plant science vocabulary words.

**Topics:**

- Soil
- Earth
- Erosion
- The Living Environment
- Water
- Scientific Method
- Corn

**Subjects:**

- Science

**Grades:**

High School

**Web address:** <https://ag.purdue.edu/agry/k12/Pages/worksheets.aspx>

**Contact:**

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**Demonstrations in Soil Science Videos and Lab Activities**

Purdue Agronomy

Detailed lab activities including background information. Accompanying YouTube videos featuring a Purdue Agronomy professor.

**Topics:**

- Measuring Soil and Water pH
- Why is Rain Acid?
- Testing Soils for Aluminum Toxicity
- Soil Has a Charge
- Chemical Movement in Soils
- Nitrates or Nitrites in Water or Food
- Exposing a Rainbow of Color: How Chromatography Works!
- Soil Colors
- Clay Properties
- Soil Erosion
- Earthworm Activity and Biology
- Preserving Soil Monoliths and Specimens in Vinyl Plastic
- Germination and Vigor of Seeds (Warm Tests/Cold Tests)
- Quick Test to Determine Seed Viability
- Phosphorus in Plants
- Starch Goes to Sugar as Plants Use Their Stored Energy for Regrowth
- Plant Growth Experiments

**Subjects:**

- Science

**Grades:**

High School

**Materials:** <https://ag.purdue.edu/agry/k12/Documents/demo.pdf>

**Videos:** <https://ag.purdue.edu/agry/k12/Pages/Demonstrations.aspx>

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**Soil, Water, and Forage Educational Coloring Books and Animated Short Videos**

Purdue Agronomy

Animated 4 minute videos with accompanying educational coloring books.

**Topics:**

- Travels of Bob, the Soil Bacterium
- Freddy Forage's Friends
- Peter the Ped of Soil
- Splish Splash the Drop of Water

**Subjects:**

- Science

**Grades:**

K-4

**Web address:** <https://ag.purdue.edu/agry/k12/Pages/books.aspx>

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**Fun with Fungi in the Classroom**

Purdue Botany and Plant Pathology

A simple lesson plan focusing on using reading materials to introduce fungi to preschool and kindergarten level students. Included are a few activities with mushrooms.

**Subjects:**

- Reading
- Math
- Art

- Science

**Grades:**

Preschool- Kindergarten

**Web address:** [https://ag.purdue.edu/btny/Documents/PreschoolK\\_Mushroom.pdf](https://ag.purdue.edu/btny/Documents/PreschoolK_Mushroom.pdf)

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**Fungi: the Good, the Bad, and the Ugly**

Purdue Botany and Plant Pathology

A lesson plan that introduces fungi as beneficial, harmful, and just plain odd looking organisms. There is considerable hands-on time in this curriculum. This unit can be extended for two weeks of study.

**Topics:**

- Yeast
- Dermatophytosis (Ringworm)
- Molds & Spores

**Subjects:**

- Science

**Web address:** [https://ag.purdue.edu/PK12/Documents/Good\\_Bad\\_Ugly\\_Fungus.pdf](https://ag.purdue.edu/PK12/Documents/Good_Bad_Ugly_Fungus.pdf)

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**Growing a Pineapple at Home**

Purdue Botany and Plant Pathology

Instructions on how to propagate and grow a pineapple. Scientific and common name. Plant growth habits and care. History and Cultivation. Recipes.

**Subjects:**

- Science
- History
- Math

**Web address:** [https://ag.purdue.edu/btny/Documents/Growing\\_a\\_Pineapple\\_at\\_Home.pdf](https://ag.purdue.edu/btny/Documents/Growing_a_Pineapple_at_Home.pdf)

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## **Manual of Instructional Materials for Teachers and Naturalists Teaching About Fungi**

Purdue Botany and Plant Pathology

A collection of teaching materials put together by the North American Mycological Association (NAMA). Additional materials include games, outdoor activities, and extracurricular assignments.

**Topics:**

- Math & Science Units
- Mushroom Dissection Lab
- Making Spore Prints
- Charting Mold Growth
- Spring Mushrooms
- Mushroom Cultivation
- Art from Fungi
- Making Yeast Bread

**Subjects:**

- Math
- Science
- Art

**Grades:**

K-12

**Web address:** [http://www.viethmms.com/~nama/manual\\_for\\_teachers\\_and\\_natura.php](http://www.viethmms.com/~nama/manual_for_teachers_and_natura.php)

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## **Arrest the Pest**

Purdue Entomology

A collection of teaching materials put together by the North American Mycological Association (NAMA). Additional materials include games, outdoor activities, and extracurricular assignments.

### **Lessons:**

- Invasive Species Investigator
- Criminal History of the Emerald Ash Borer: Meet the Green Menace
- Scene of the Crime: Learn to Identify Ash Trees
- Looking for Clues: Signs and Symptoms of EAB
- Arrest the Pest: NAAB Your Community's Attention

### **Subjects:**

- Science
- Social Studies
- Math
- Language Arts

**Web address:** <http://extension.entm.purdue.edu/arrestthatpest/index.php>

### **Contact:**

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## **The Nature of Teaching**

Purdue Forestry and Natural Resources

The place to go for teaching resources that focus on nature. On the site teachers can find free lesson plans, printables, posters, a photo library, information on upcoming workshops, and more.

### **Lesson Plans:**

- Animal Diversity & Tracking
- Food Webs
- Reptiles, Amphibians, & the Scientific Method
- Mammals & Ecosystems
- Ashes to Ashes: We All Grow Up

- Eco-collapse
- Coloration Exploration
- Discovering the Watershed
- Common Indiana Mammals

**Subjects:**

- Science
- Math
- Natural Resource Management

**Grades:**

K-12

**Web address:** <https://ag.purdue.edu/extension/nature/Pages/default.aspx>

**Contact:**

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## **4-H Natural Resource Lesson Plans**

Purdue Agricultural Sciences Education and Communication

28 Lesson Plans and Activities were developed from Indiana natural resource 4-H project manuals are intended for classroom use. Other educators can contact their County Extension Youth Educator for manuals and assistance or visit Purdue's The Education Store (Enter project name in search box). The resource pages are given after the grade level and manual order number.

**Topics:**

- Entomology
- Forestry
- Geology
- Soil and Water Conservation
- Weather
- Wildlife

**Subjects:**

- Science
- Technology
- Engineering

**Grades:**

3-8



**Web address:**

[https://www.asec.purdue.edu/natural\\_resources/Resources/Lesson%20Plans/index.html](https://www.asec.purdue.edu/natural_resources/Resources/Lesson%20Plans/index.html)

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**Energy Investigators Facilitator's Guide and Student Handbook**

Purdue Agricultural Sciences Education and Communication

A curriculum developed to help middle-school youth learn about energy conservation and alternative methods of energy generation. Includes information about the 5 hands-on activities in the student handbook as well as academic standards met by this curriculum.

**Activities:**

- Generating Electricity
- Comparing Electricity Options
- Measuring Electricity
- CO2 Production & Absorption
- Carbon Sequestration & Storage

**Subjects:**

- Science
- Technology

**Grades:**

7-8

**Web addresses:****Facilitator's guide:**

<https://www.extension.purdue.edu/extmedia/4H/4-H-1015-W.pdf>

**Student handbook:**

[https://mdc.itap.purdue.edu/item.asp?Item\\_Number=4-H-1014-W#.VIQzs3arSM8](https://mdc.itap.purdue.edu/item.asp?Item_Number=4-H-1014-W#.VIQzs3arSM8)

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**Indiana's Water Riches**

Purdue Agricultural Sciences Education and Communication

Five water education lesson plans incorporating science concepts. Includes creative readings for students, vocabulary, and worksheets.

**Lessons:**

- How We Use It
- Where it Comes From and Where it Goes
- Water Above and Below the Ground
- Making Drinking Water Safe
- Conservation

**Subjects:**

- Science
- Technology

**Grades:**

3-5

**Web address:**

Lesson 1

[http://www.ydae.purdue.edu/natural\\_resources/Resources/WaterRiches/Newsletters/water%20riches%20unit%201.pdf](http://www.ydae.purdue.edu/natural_resources/Resources/WaterRiches/Newsletters/water%20riches%20unit%201.pdf)

Lesson 2

[http://www.ydae.purdue.edu/natural\\_resources/Resources/WaterRiches/Newsletters/water%20riches%20unit%202.pdf](http://www.ydae.purdue.edu/natural_resources/Resources/WaterRiches/Newsletters/water%20riches%20unit%202.pdf)

Lesson 3

[http://www.ydae.purdue.edu/natural\\_resources/Resources/WaterRiches/Newsletters/water%20riches%20unit%203.pdf](http://www.ydae.purdue.edu/natural_resources/Resources/WaterRiches/Newsletters/water%20riches%20unit%203.pdf)

Lesson 4

[http://www.ydae.purdue.edu/natural\\_resources/Resources/WaterRiches/Newsletters/water%20riches%20unit%204.pdf](http://www.ydae.purdue.edu/natural_resources/Resources/WaterRiches/Newsletters/water%20riches%20unit%204.pdf)

Lesson 5

[http://www.ydae.purdue.edu/natural\\_resources/Resources/WaterRiches/Newsletters/water%20riches%20unit%205.pdf](http://www.ydae.purdue.edu/natural_resources/Resources/WaterRiches/Newsletters/water%20riches%20unit%205.pdf)

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**Insects as Bioindicators of Water Quality**

## Purdue Agricultural Sciences Education and Communication

Learners take samples from stream habitats and capture insects, use bioindicator cards to identify the insects, and complete the calculations to determine the stream water quality rating. Includes instructions, data sheets, flashcards, and index table.

### **Subjects:**

- Science
- Math

### **Grades:**

Middle School – High School

### **Web address:**

[http://www.ydae.purdue.edu/natural\\_resources/Resources/BioindicatorWQ/Index.html](http://www.ydae.purdue.edu/natural_resources/Resources/BioindicatorWQ/Index.html)

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## **Junior Master Gardener Curriculum**

Purdue Agricultural Sciences Education and Communication

An international youth gardening program of the university cooperative Extension network. JMG engages children in novel, “hands-on” group and individual learning experiences that provide a love of gardening, develop an appreciation for the environment, and cultivate the mind. Three lessons are available for free, the entire curriculum can be purchased from

<http://jmgkids.us/curriculum/>

### **Lessons:**

- Gas Gobblers
- How Tall is that Tree?
- Secret Smells

### **Subjects:**

- Science
- Math

**Grades:**

3-8

**Web address:**

Gas Gobblers

<http://jmgkids.us/wp-content/uploads/2014/05/gasgobblers.pdf>

How Tall is that Tree?

<http://jmgkids.us/wpcontent/uploads/2014/05/how-tall-is-that-tree.pdf>

Secret Smells

<http://jmgkids.us/wpcontent/uploads/2014/05/secret-smellshandout.pdf>

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**Sensible Disposal of Unwanted Medicines**

Purdue Agricultural Sciences Education and Communication

Five inquiry based lesson plans to help youth understand why chemicals from medicines are found in the environment, the harm chemicals can cause, and what can be done about it. Uses scientific concepts, includes hands-on experiments, diagrams, and worksheets.

**Lessons:**

- So What's the Big Deal?
- What are the Issues?
- What Should I be Concerned About?
- What are my Options?
- How Can I Let Other People Know About the Issues?

**Subjects:**

- Science
- Health
- Technology

**Grades:**

High School

**Web address:**

[http://www.ydae.purdue.edu/natural\\_resources/Resources/ProperDisposalUnwantedMeds/DisposeMeds.pdf](http://www.ydae.purdue.edu/natural_resources/Resources/ProperDisposalUnwantedMeds/DisposeMeds.pdf)

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### **Watershed Connections Facilitator's Guide and Youth Manual**

Purdue Agricultural Sciences Education and Communication

Four lesson plans to help youth understand their local water resources. Includes teacher reference pages with objectives, an introduction for each activity, materials needed and, in some cases, worksheets. Incorporates science concepts, and one activity involves mathematical calculations.

#### **Lessons:**

- Floods, Floodplains, and Flood Probabilities
- Your Drinking Water
- Pollution Sources
- Terminology/Water Resource Terms

#### **Subjects:**

- Science
- Math

#### **Grades:**

Middle School

#### **Web addresses:**

Facilitators Guide:

[http://www.ydae.purdue.edu/natural\\_resources/Resources/WAT-1/TeacherKey.pdf](http://www.ydae.purdue.edu/natural_resources/Resources/WAT-1/TeacherKey.pdf)

Youth Manual:

[http://www.ydae.purdue.edu/natural\\_resources/Resources/WAT-1/WAT-1.pdf](http://www.ydae.purdue.edu/natural_resources/Resources/WAT-1/WAT-1.pdf)

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### **Apple Genomics**

Purdue Youth Development & Agricultural Education

Computer simulations to help students visualize and understand complex genomic processes which take place on a microscopic scale.

**Simulations:**

- What is the Apple Genome?
- DNA Cloning
- Gene Expression- From DNA to RNA
- DNA Cloning
- Isolating Plasmid Bacteria from DNA
- Modeling DNA with LEGOs
- Microarrays and Gene Expression

**Subjects:**

- Science
- Technology

**Grades:**

High School

**Web address:** [https://www.asec.purdue.edu/Apple\\_genomics/](https://www.asec.purdue.edu/Apple_genomics/)

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**The Power of Cooperatives Virtual Field Trip**

CHS Foundation

Take students on a virtual field trip with Cooperative Minds. They are dedicated to empowering students, educators, and communities with no-cost learning resources designed for any learning environment. Give students from every background the skills to collaborate with like minded individuals and accomplish goals together.

**Topics:**

- Cooperatives
- Agronomy
- Technology & Precision Agriculture
- Energy
- Grain
- Processing

**Grades:**

9-12

**Web Address:** <https://cooperative-minds.com/virtual-field-trip/>

**Educator Guide:** <https://cooperative-minds.com/pdfs/CHS-VFT-Guide-V1.0.pdf>