Machines mAGic Kit
Table of Lessons

Math

LESSON #1 CHANGES IN FARMING

1. Use a chart to find information and do calculations.
2. Identify the changes in farming methods and their implications.

LESSON #2 MACHINES LOGIC PUZZLE

1. Determine the machine chosen by each student using logical thinking and charts to aid in their findings.

LESSON #3 ESTIMATING FARM MACHINERY COSTS

1. Determine the costs involved in owning and operating farm machinery.
2. Use tables to calculate answers to math problems.
3. Identify various costs in farming.
4. Use problem solving methods in practical situations.

LESSON #4 TINKERING OUTSIDE OF THE BOX*

1. Use measuring devices, i.e. rulers, to determine sizes for a scale drawing.
2. Create a scale drawing.
3. Graph results of class activity.

LESSON #5 PRECISION FARMING

1. Determine the benefits and adoption of precision farming components by farmers.
2. Identify the various components of precision farming.
3. Express their thoughts concerning precision farming.

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English Language Arts

LESSON #1 TECHNOLOGY'S TANGLED WEBS

1. Create a writing web to identify the characteristics and usages of modern farm equipment.
2. Prepare a timeline, using all webs, to form a comprehensive view of the role of agricultural equipment in food and fiber production.

LESSON #2 POETIC MOTION

1. List specific uses of one piece of agricultural equipment.
2. Compose original poetry based on research of a particular piece of agricultural equipment.

LESSON #3 SIMPLE MACHINES, COMPLEX INVENTIONS

1. Apply the principles of Rube Goldberg to create a cartoon depicting 10 steps to accomplish a given task.
2. Illustrate cartoon, using focus, organization and coherence.
3. Explain orally how the task will be accomplished.

LESSON #4 TINKERING OUTSIDE OF THE BOX*

1. Identify simple machines and their characteristics.
2. Design a product that possesses upward or horizontal mobility, using common items.
3. Write step by step instructions on how to build a machine.

LESSON #5 SHOW WHAT YOU KNOW

1. Identify common agricultural equipment.
2. Identify technological advances in today's agriculture.

LESSON #6 MACHINE SAFETY SPECIALISTS

1. Identify specific safety hazards associated with various farm machines and structures.

** The Machines mAGic Kit has a series of lessons that will allow students to "Tinker Outside of the Box". These "Tinker" lessons utilize all four disciplines and enable your students to use common everyday products to construct a machine that possesses mobility. By utilizing all four "Tinker" lessons, students will take a project from design development, through machine construction and prototype testing, to learning about scale drawings and even applying for a patent. "Tinkering Outside of the Box" lessons are Lesson #4 for all disciplines.*

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Social Studies

LESSON #1 INVENTORS JOHN DEERE & CYRUS MCCORMICK

1. Identify the impacts the inventors John Deere and Cyrus McCormick had on farmers and agriculture.
2. Identify the impacts the inventors John Deere and Cyrus McCormick had on the people of the United States and the world.
3. Describe the risks John Deere and Cyrus McCormick took in their businesses.
4. Explain how John Deere and Cyrus McCormick were competitors in their businesses.
5. Answer questions about the life and times of John Deere and Cyrus McCormick.

LESSON #2 TIMELINE OF FARM MACHINERY & TECHNOLOGY

1. Assess where our nation's food supply comes from.
2. Summarize how American farmers are able to produce so much food.
3. Describe trends occurring in farming over the last 200 years.
4. Explain what changes have occurred on U.S. farms over the last 200 years and the effects of those changes on the U.S. and farmers.
5. Answer questions and graph information by gathering facts from a timeline.

LESSON #3 MODERN MARVELS: FARMING TECHNOLOGY

1. Contrast the differences between farming today and farming in the past.
2. Describe major innovations and changes in agriculture.
3. Define the following terms and understand the impact that they have in agriculture: plow, drill, tractor, fertilizer, combine, hybrid seed, herbicide, pesticide, organic farming, and precision farming.

LESSON #4 TINKERING OUTSIDE OF THE BOX WITH PATENTS*

1. Define patent, trademark, and copyright and be able to explain the major differences between the three.
2. Describe the process a person would have to go through to get a U.S. Patent.
3. Explain why patents are an important part of the U.S. government.

4. Describe individuals who have received patents and explain how the patent helped them become successful in their business.
5. Explain how patents have been an important part of agriculture.

LESSON #5 MYSTERY TOOLS

1. Observe pictures of tools and hypothesize their use.
2. Explain why some tools are not used in today's society.

Science

LESSON #1 SIMPLE & COMPLEX MACHINES

1. Define and identify simple machines.
2. Identify simple machines that make up complex machines.
3. Describe the application of simple and complex machines in agriculture.

LESSON #2 COMPELLING CAREERS IN AGRICULTURE

1. Recognize that our safe and abundant food supply is dependant on equipment that is undergoing constant technological advancement.
2. Name at least one farm equipment-related career in each of six categories: Marketing, Merchandising, and Sales; Science, Research, and Engineering; Management and Finance; Communication and Education; Social Services; Agricultural Production.
3. Describe one agricultural career in detail, including important aspects of the profession and education, skills and background needed to prepare for this occupation.

LESSON #3 LUBRICANTS, VISCOSITY AND MACHINES

1. Define friction and explain its effects.
2. Define viscosity and explore what affects it.

LESSON #4 TINKERING OUTSIDE OF THE BOX*

1. Complete an experiment following the Scientific Method.

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