

How Many Seeds?



Common Core State Standards: This lesson is correlated to the following CCSS, as well as the Arizona Additions to the CCSS.

- 1. Operations and Algebraic Thinking (OA):** Understand and apply properties of operations and the relationship between addition and subtraction; represent and solve problems involving multiplication and division; solve problems involving the four operations, and identify and explain patterns in arithmetic; gain familiarity with factors and multiples; generate and analyze patterns; write and interpret numerical expressions; and understand ratio concepts and use ratio reasoning to solve problems.
- 2. Number and Operations in Base Ten (NBT):** Understand place value; extend counting sequences; use place value understanding and properties of operations to perform multi-digit arithmetic; and perform operations with multi-digit whole numbers and with decimals to hundredths

First Grade:	1.OA.1, 1.OA.4
Second Grade:	2.NBT.5, 2.OA.2
Third Grade:	3.OA.3
Fourth Grade:	4.NBT.4, 4.NBT.5

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Demonstrate computation skills to find cotton seeds.
2. Estimation and timing skills will be used.

Materials needed:

- ✓ Math Lesson 1 Student Worksheet – How Many Seeds
- ✓ Cotton Bolls (1 for every pair of students)

Terms:

Cotton Boll- the rounded seed or pod or capsule of the cotton plant

Cotton Gin- a machine that separates the fiber of cotton to remove the cottonseed, invented by Eli Whitney

Teaching Strategies: Have the students complete *Math Lesson #1 Student Worksheet – How Many Seeds*. Have students gin cotton by hand and count the actual number of seeds. Have students create a classroom graph with number of seeds in each boll. Have students count their seeds in groups of five, tens, etc. Have students guess how long it will take them to gin their cotton. Have them time themselves. Talk about how the Cotton Gin has played a crucial role in the cotton industry.

Review/Summary: Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which

objectives need to be reviewed or taught from a different angle. Use observations as the basis for reattaching areas where student mastery may need improvement.

Evaluation: Focus the evaluation of student achievement on mastery of the objectives as stated in the lesson. A written test can also be used to assess student achievement of the objectives.

Cotton King

Derived from Texas Ag in the Classroom



Common Core State Standards: This lesson is correlated to the following CCSS, as well as the Arizona Additions to the CCSS.

- Mathematical Practices:** Problem solving, reasoning and proof, communication, representation, and connections; adaptive reasoning, strategic competence, conceptual understanding, procedural fluency, and productive disposition.

Fourth Grade: 4.MP.1, 4.MP.4, 4.MP.5

Fifth Grade: 5.MP.1, 5.MP.1, 5.MP.5

Sixth Grade: 6.MP.1, 6.MP.4, 6.MP.5

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

- Demonstrate computation skills to find cotton products.

Materials needed:

- ✓ Math Lesson 2 Student Worksheet – Cotton King

Terms:

Acre- a unit of measurement for land; approximately the size of a football field

Cotton Bale- weighs approx 480 pounds

Harvested- the gathering of ripened crops

Teaching Strategies: Have the students complete *Math Lesson #2 Student Worksheet – Cotton King*. Have students use the chart to make a bar graph. Use map colors for your bar graph. Then answer questions about Cotton King.

Review/Summary: Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Use observations as the basis for reteaching areas where student mastery may need improvement.

Evaluation: Focus the evaluation of student achievement on mastery of the objectives as stated in the lesson. A written test can also be used to assess student achievement of the objectives.

Word Problems



Common Core State Standards: This lesson is correlated to the following CCSS, as well as the Arizona Additions to the CCSS.

- 1. Mathematical Practices (MP):** Problem solving, reasoning and proof, communication, representation, and connections; adaptive reasoning, strategic competence, conceptual understanding, procedural fluency, and productive disposition.
- 2. Operations and Algebraic Thinking (OA):** Understand and apply properties of operations and the relationship between addition and subtraction; represent and solve problems involving multiplication and division; solve problems involving the four operations, and identify and explain patterns in arithmetic; gain familiarity with factors and multiples; generate and analyze patterns; write and interpret numerical expressions; and understand ratio concepts and use ratio reasoning to solve problems.

Fourth Grade: 4.MP.2, 4.MP.7, 4.OA.4

Fifth Grade: 5.MP.1

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Student will use grade appropriate operations to solve word problems.
2. Student will understand a variety of facts about Arizona's Five C's.

Materials needed:

- ✓ Student Worksheet
- ✓ Calculator
- ✓ Pencil

Terms:

Acres- a unit of measurement for land; approximately the size of a football field

Harvest- the gathering a ripened or ready crop

Produce- create; grow; cultivate by growing

Teaching Strategies: Discuss the Arizona Five C's and how important they are to Arizona's Economy. Have students complete the Student Worksheet.

Review/Summary: Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Use observations as the basis for reteaching areas where student mastery may need improvement.

Arizona Elevation & Temperature Conversions



Common Core State Standards: This lesson is correlated to the following CCSS, as well as the Arizona Additions to the CCSS.

1. **Number and Operations in Base Ten (NBT):** Understand place value; extend counting sequences; use place value understanding and properties of operations to perform multi-digit arithmetic; and perform operations with multi-digit whole numbers and with decimals to hundredths.

Fourth Grade: 4.NBT.4, 4.NBT.5

Fifth Grade: 5.NBT.6

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Understand and apply numerical operations and their relationships to another.
2. Perform conversions to find meters from feet given and feet from meters given.
3. Perform conversions to find Degrees Celsius from Degrees Fahrenheit given and vice versa.

Materials needed:

- ✓ Student Worksheet
- ✓ Calculator
- ✓ Pencil

Terms:

Elevation: a height above sea level

Temperature: the physical property of a system that underlines the common notions of hot and cold.

Teaching Strategies: Have students use the maps and city statistics to convert between degrees Celsius and degrees Fahrenheit and feet and meters.

Review/Summary: Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Use observations as the basis for reteaching areas where student mastery may need improvement.

Evaluation: Focus the evaluation of student achievement on mastery of the objectives as stated in the lesson. A written test can also be used to assess student achievement of the objectives.

Feedlots, Dairies, and Ranches



Common Core State Standards: This lesson is correlated to the following CCSS, as well as the Arizona Additions to the CCSS.

1. **Mathematical Practices (MP):** Problem solving, reasoning and proof, communication, representation, and connections; adaptive reasoning, strategic competence, conceptual understanding, procedural fluency, and productive disposition.
2. **Measurement and Data (MD):** Describe and compare measurable attributes; classify objects and count the number of objects in categories; measure and estimate lengths indirectly and by iterating length units; tell and write time; represent and interpret data; work with money; Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects; understand concepts of area and relate area to multiplication and to addition; recognize perimeter as an attribute of plane figures and distinguish between linear and area measures; solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit; and understand concepts of angle and measure angles.

Fourth Grade: 4.MP.1, 4.MD.1

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

Materials needed:

- ✓ Student Worksheet
- ✓ Calculator
- ✓ pencil

Terms:

Dairy- a cow used primarily for milk production

Feedlot- a fenced area where cattle are fed concentrated feed from the time they arrive at the feedlot at 300 pounds until slaughter at about 800 pounds.

Grazing- the act of eating grass or feeding on growing herbage

Ranch- an area of landscape, including various structures, given primarily to the practice of raising grazing livestock such as cattle or sheep

Teaching Strategies: Go over the qualities/properties of feedlots, dairies, and ranches by reading about some Arizona Producers. Have the students complete the Venn diagram showing the difference and similarities between the three operations.

Review/Summary: Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Use observations as the basis for reteaching areas where student mastery may need improvement.

Evaluation: Focus the evaluation of student achievement on mastery of the objectives as stated in the lesson. A written test can also be used to assess student achievement of the objectives.

Arizona Five C's



Common Core State Standards: This lesson is correlated to the following CCSS, as well as the Arizona Additions to the CCSS.

1. Measurement and Data (MD): Describe and compare measurable attributes; classify objects and count the number of objects in categories; measure and estimate lengths indirectly and by iterating length units; tell and write time; represent and interpret data; work with money; Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects; understand concepts of area and relate area to multiplication and to addition; recognize perimeter as an attribute of plane figures and distinguish between linear and area measures; solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit; and understand concepts of angle and measure angles.

2. Number and Operations in Base Ten (NBT): Understand place value; extend counting sequences; use place value understanding and properties of operations to perform multi-digit arithmetic; and perform operations with multi-digit whole numbers and with decimals to hundredths.

3. Number and Operations—Fractions (NF): Extend understanding of fraction equivalence and ordering; build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers; and understand decimal notation for fractions, and compare decimal fractions.

Fourth Grade: 4.MD.4, 4.MD.2, 4.NF.3, 4.NBT.5

Fifth Grade: 5.NBT.6, 5.NF.6, 5.NF.7

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

Materials needed:

- ✓ Student Worksheet
- ✓ pencil

Terms:

No terms were identified for this lesson

Teaching Strategies: Have students list the Arizona Five Cs. Ask the students if they think that other students in their school know what the Arizona Five Cs are. Have students work in groups or individually. Have students survey other students in the school (varying grade levels) and see if they can name all of the Arizona Five Cs. Have students graph the knowledge of the Arizona Five Cs as a group, by grade level, and gender using an appropriate graph.

Review/Summary: Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Use observations as the basis for reteaching areas where student mastery may need improvement.

Evaluation: Focus the evaluation of student achievement on mastery of the objectives as stated in the lesson. A written test can also be used to assess student achievement of the objectives.

Show What You Know - Beef



Common Core State Standards: This lesson is correlated to the following CCSS, as well as the Arizona Additions to the CCSS.

- 1. Reading Standards: Foundational Skills (RF):** Students will demonstrate an understanding and working knowledge of concepts of print, the alphabetic principle, and other basic conventions of the English writing system.
- 2. Reading Standards for Literature (RL):** Students gain adequate exposure to a range of texts and tasks.

Fourth Grade: 4.RF.1, 4.RL.1

Fifth Grade: 5.RF.1, 5.RL.1

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Identify cattle's importance to people.
2. Identify cattle terms.
3. Students will use reading strategies to identify information found in the text to answer questions.

Materials needed:

- ✓ American Farm Bureau Beef Ag Mag
- ✓ www.agintheclassroom.org
- ✓ English language arts Lesson #1 student worksheet pre and post test
- ✓ Pencil

Terms:

Heifer- young female from the time she is born to just before she has had a calf

Cow- female cow after she has had a calf

Bull- unneutered male

Steer- neutered male

Polled- without horns

Feedlot- a fenced-in area where cattle are fed concentrated feed for the last 300-400 pounds of their growth

Cud- cattle graze or eat quickly and then bring up a small amount of food to chew into very tiny pieces. They spend many hours chewing this food, which is the cud

Cloven Hooves- hooves split in the center or a two-toed hoof

Wean- the process of removing a mammal from nursing on milk

Teaching Strategies: Have students complete ELA Lesson #1 Student Worksheet to ascertain their knowledge of beef cattle. Students will then read the Beef AgMag to help them answer the remaining questions.

Review/Summary: Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Use observations as the basis for reteaching areas where student mastery may need improvement.

Evaluation: Focus the evaluation of student achievement on mastery of the objectives as stated in the lesson. A written test can also be used to assess student achievement of the objectives. The post-test will evaluate students' gained knowledge.

Show What You Know - Dairy



Common Core State Standards: This lesson is correlated to the following CCSS, as well as the Arizona Additions to the CCSS.

- 1. Reading Standards: Foundational Skills (RF):** Students will demonstrate an understanding and working knowledge of concepts of print, the alphabetic principle, and other basic conventions of the English writing system.
- 2. Reading Standards for Literature (RL):** Students gain adequate exposure to a range of texts and tasks.

Fourth Grade: 4.RF.1, 4.RL.1

Fifth Grade: 5.RF.1, 5.RL.1

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Identify cattle's importance to people.
2. Identify cattle terms.
3. Students will use reading strategies to identify information found in the text to answer questions.

Materials needed:

- ✓ Student Worksheet
- ✓ Pencil
- ✓ Dairy Ag Mag

Terms:

Bull- an unneutered male bovine

Calcium- a mineral necessary for healthy bone development

Calf- a young animal

Cheese- a dairy product made from curdled milk

Curds- the thickened or soiled parts that form in soured milk and are the beginning of cheese

Enzyme- the catalyst that speeds up the digestive process

Heifer- female bovine which has no given birth

Holstein- a breed of dairy cows that are black and white and the most popular because they give the most milk

Homogenization- large fat globules are broken into smaller ones which reduce the natural tendency of fat or cream to rise to the top; breaking up fat globules so they won't separate from milk

Pasteurization- process by which a controlled heat is used to eliminate all bacteria

Ruminant- a four-footed, even-toed, cud-chewing mammal with four compartments to its stomach

Silage- chopped plant material that has been allowed to ferment

Whey- the watery part of milk that separates after the milk has soured and thickened; water byproduct of the cheese making process.

Teaching Strategies: Have the students take the pre-test Show What You Know Dairy to ascertain their knowledge of dairy production and dairy products. After the pre-test is graded, students will read the “Dairy AgMag” to help them answer questions on the student post-test.

Review/Summary: Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Use observations as the basis for reteaching areas where student mastery may need improvement.

Evaluation: Focus the evaluation of student achievement on mastery of the objectives as stated in the lesson. A written test can also be used to assess student achievement of the objectives.

Show What You Know - Citrus



Common Core State Standards: This lesson is correlated to the following CCSS, as well as the Arizona Additions to the CCSS.

- 1. Reading Standards: Foundational Skills (RF):** Students will demonstrate an understanding and working knowledge of concepts of print, the alphabetic principle, and other basic conventions of the English writing system.
- 2. Reading Standards for Literature (RL):** Students gain adequate exposure to a range of texts and tasks.

Fourth Grade: 4.RF.1, 4.RL.1

Fifth Grade: 5.RF.1, 5.RL.1

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Identify citrus' importance to people and Arizona.
2. Identify citrus terms.
3. Students will use reading strategies to identify information found in the text to answer questions.

Materials needed:

- ✓ Student Worksheet
- ✓ Pencil
- ✓ Greetings from Arizona Booklet
- ✓ 2008 Arizona Agricultural Statistics Bulletin

Terms:

Citrus- acidic fruits, which contain healthy nutrition content that works wonders for the body

Exports- commodities moving from one country or region to another for purpose of trade

Harvest- the gathering of ripened or finished crops

Vitamin- an organic compound required as a nutrient in tiny amounts

Teaching Strategies: Have the students take the pre-test Show What You Know Citrus to ascertain their knowledge of citrus production and citrus products. After the pre-test is graded, students will read the "Greetings from Arizona" pamphlet and search the 2008 Arizona Agricultural Statistics Bulletin to help them answer questions on the student post-test.

Review/Summary: Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Use observations as the basis for reteaching areas where student mastery may need improvement.

Show What You Know - Copper



Common Core State Standards: This lesson is correlated to the following CCSS, as well as the Arizona Additions to the CCSS.

1. **Reading Standards: Foundational Skills (RF):** Students will demonstrate an understanding and working knowledge of concepts of print, the alphabetic principle, and other basic conventions of the English writing system.
2. **Reading Standards for Literature (RL):** Students gain adequate exposure to a range of texts and tasks.

Fourth Grade: 4.RF.1, 4.RL.1

Fifth Grade: 5.RF.1, 5.RL.1

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Identify copper's importance to people.
2. Identify copper terms.
3. Students will use reading strategies to identify information found in the text to answer questions.

Materials needed:

- ✓ Student Worksheet
- ✓ Pencil
- ✓ Copper More Than Metal Newspaper

Terms:

Reclamation- the restoration of mined land to a condition that protects human health, the environment, and where possible, returns land to beneficial use.

Teaching Strategies: Have the students take the pre-test Show What You Know Copper to ascertain their knowledge of copper production and copper products. After the pre-test is graded, students will read the "Copper More Than Metal" newspaper to help them answer questions on the student post-test.

Review/Summary: Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Use observations as the basis for reteaching areas where student mastery may need improvement.

Show What You Know - Climate



Common Core State Standards: This lesson is correlated to the following CCSS, as well as the Arizona Additions to the CCSS.

1. **Reading Standards: Foundational Skills (RF):** Students will demonstrate an understanding and working knowledge of concepts of print, the alphabetic principle, and other basic conventions of the English writing system.
2. **Reading Standards for Literature (RL):** Students gain adequate exposure to a range of texts and tasks.

Fourth Grade: 4.RF.1, 4.RL.1

Fifth Grade: 5.RF.1, 5.RL.1

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Identify copper's importance to people.
2. Identify copper terms.
3. Students will use reading strategies to identify information found in the text to answer questions.

Materials needed:

- ✓ Student Worksheet
- ✓ Pencil
- ✓ Arizona Greetings Pamphlet
- ✓ Discover the Waters of Arizona Activity Book

Terms:

Climate- the temperature, humidity, atmospheric pressure, winds, and rainfall in a given region over long periods of time

Elevation- a height above sea level

Monsoon- a seasonal wind that lasts for several months bringing with it lightning and rain

Produce- create; grow; cultivate by growing

Virga- rain that evaporates before it hits the ground

Teaching Strategies: Have the students take the pre-test Show What You Know Climate to ascertain their knowledge of climate. After the pre-test is graded, students will read the Arizona Greetings and Discover the Waters of Arizona, to help them answer questions on the student post-test.

Who Grew Your Lunch

derived from Copper in the Classroom



Arizona State Learning Standards. This lesson is correlated to the following State Learning Standard.

1. **American History-** students recognize the relationships of events and people and interpret significant patterns, themes, ideas, beliefs, and turning points in Arizona and American History.
2. **Geography-** provides an understanding of the human and physical characteristics of the Earth's places and regions and how people of different cultural backgrounds interact with their environment.

Arizona State Objectives: This lesson addresses the following objectives: (Strand, Concept, Performance objective)

Fourth Grade: 1.1.3, 1.7.1, 4.1.1, 4.1.3

Fifth Grade: 1.1.3, 1.1.1, 4.1.6

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Create a map and a key
2. Read a map to identify where products are grown
3. Research which states grow what products
4. Discover who grew their lunch
5. Identify the crops that are grown in Arizona

Materials needed:

- ✓ Student Worksheet
- ✓ Internet
- ✓ Arizona Agricultural Statistics 2006
- ✓ Crayons, colored pencils, or markers

Terms:

No terms were identified for this lesson

Teaching Strategies: Have students write a list of what they had for lunch or dinner. Have students look at the Arizona Products map and identify which of their food products came from Arizona. For the products not grown in Arizona have the students research online and identify the states that are most known for growing those products. Have students create a map and key that identifies where all of the

products from their meal are grown. You can either have them identify the states that are the leading producer in their products or have them identify all the products grown for their meal in Arizona and then look up the remaining products for the top producing states.

Extension Activity: Have students create a food production timeline. Have groups of students research food production of the Egyptians, Greeks, Romans, and the Middle Ages and present to the class.

Review/Summary: Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Use observations as the basis for reteaching areas where student mastery may need improvement.

Evaluation: Focus the evaluation of student achievement on mastery of the objectives as stated in the lesson. A written test can also be used to assess the student achievement of the objectives.

A City Built from Cotton



Arizona State Learning Standards. This lesson is correlated to the following State Learning Standard.

1. **Geography-** provides an understanding of the human and physical characteristic's of the Earth's places and regions and how people of different cultural backgrounds interact with their environment

Arizona State Objectives: This lesson addresses the following objectives: (Strand, Concept, Performance objective)

Fourth Grade: 4.1.1, 4.4.1, 4.4.5, 4.5.1, 4.6.1

Fifth Grade: 4.1.6

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Identify the changes of the Arizona Cotton Industry through the years
2. Understand how Goodyear came about
3. Create a timeline
4. Discover the many byproducts of cotton

Materials needed:

- ✓ Student Worksheets
- ✓ Cotton boll
- ✓ Piece of rubber tire
- ✓ Internet
- ✓ Encyclopedia
- ✓ Arizona Agricultural Statistics 2006

Terms:

Cotton- a soft fiber that grows around the seeds of a cotton plant

Long Staple- cotton with relatively long fibers; cotton fibers are typically ½ inch to 2 inches long. The longest staple fibers, longer than 1 ½ inch, including the Pima and Egyptian varieties produce the highest quality cotton fabrics.

Short Staple- cotton with relatively short fibers

Teaching Strategies: Have your students read the Background information. Students should use primary and secondary resources to locate information regarding Goodyear Arizona and its cotton production. Have students complete the student worksheet by using research materials and the student map.

Extension Activity: Have students complete a timeline that represents Goodyear, Arizona's cotton production and growth. Students may also research all of the byproducts of cotton besides rubber tires.

Review/Summary: Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Use observations as the basis for reteaching areas where student mastery may need improvement.

Evaluation: Focus the evaluation of student achievement on mastery of the objectives as stated in the lesson. A written test can also be used to assess the student achievement of the objectives.

Cattle through Time



Arizona State Learning Standards. This lesson is correlated to the following State Learning Standard.

1. **American History-** students recognize the relationships of events and people and interpret significant patterns, themes, ideas, beliefs, and turning points in Arizona and American History.

Arizona State Objectives: This lesson addresses the following objectives: (Strand, Concept, Performance objective)

Fourth Grade: 1.5.4, 1.7.1

Fifth Grade: 1.1.2, 1.1.4

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Create a timeline
2. Identify the changes of the Cattle Industry through the years

Materials needed:

- ✓ Student Worksheets
- ✓ Scissors
- ✓ Writing surface
- ✓ Pencil
- ✓ Encyclopedia/internet

Terms:

Stockyards- an enclosed yard, with pens or stables, where livestock is kept temporarily before being slaughtered, treated, sold or shipped.

Cattle Trail- a trail that was used to take cattle to market

Teaching Strategies: There are several teaching strategies available for this lesson. Pick the one that will best fit for your students.

- Divide students into small groups. Copy and give each group their own set of historical strips (printing on different colors for each group will help with sorting at the end). Have the students organize the historical strips in order from oldest to most recent. After each group is finished discuss as a class and try and determine the correct order of events. Students can line up with their strips across the classroom to make a class timeline.

- Give each student the Cattle through Time timeline. Ask the students to read through the timeline and pick 1 or 2 events/facts that most interest them. Then divide the class into small groups. Each group is responsible for teaching their interesting fact/item/event to the rest of the group. Have students research their fact using the internet, encyclopedia, or any other resource materials that are available. Students will teach their interesting fact to their small group. Once completed, have the students share 1 item they learned from their group with the class.
- Have students write an essay comparing and contrasting the cattle industry through time.
- Have students complete the timeline worksheet provided.

Review/Summary: Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Use observations as the basis for reteaching areas where student mastery may need improvement.

Evaluation: Focus the evaluation of student achievement on mastery of the objectives as stated in the lesson. A written test can also be used to assess the student achievement of the objectives.

Great Balls of Fire

Derived from Oklahoma Ag in the Classroom



Arizona State Learning Standards. This lesson is correlated to the following State Learning Standard.

1. **Inquiry Process-** the basis for student's learning in science. Student's use scientific processes.

Arizona State Objectives: This lesson addresses the following objectives: (Strand, Concept, Performance objective)

Fifth Grade: 1.1.2, 1.2.1, 1.2.4, 1.2.5, 1.3.1, 1.4.2

Sixth Grade: 1.1.2, 1.2.1, 1.2.2, 1.2.3, 1.2.5, 1.3.1, 1.4.1

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Identify cotton terms.
2. Students will demonstrate lab safety.
3. Understand the flammability of different fabrics.
4. Create and test hypothesis

Materials needed:

- ✓ Lab table or table covered in aluminum foil.
- ✓ 2 deep glass dishes
- ✓ Long fireplace matches
- ✓ 1 flat glass or metal pie pan
- ✓ Metal tongs
- ✓ Leather glove
- ✓ 3" swatches wool, cotton, linen and silk
- ✓ 3" swatches of polyester, acrylic, and nylon
- ✓ Pitcher of water
- ✓ Fire extinguisher
- ✓ Stop watch
- ✓ Magnifying glass

Terms:

Absorb- to soak up a liquid or take in nutrients or chemicals gradually

Bale- a large bundle or package of a raw material such as hay or cotton, tightly bound with string or wire to keep its shape during transportation or storage

Cotton Boll- rounded seed-pod of the cotton plant

Evaporate- to change a liquid into a vapor

Flammable- readily capable of catching fire

Fleece- the coat of wool on a sheep or similar animal

Shear- to cut hair, fleece, or foliage from the surface of something using a sharp tool

Textile- raw material used for making fabrics, e.g. fiber or yarn

Texture- the feel and appearance of a surface, especially how rough/smooth or soft/hard it is

Teaching Strategies: *Check with your school's safety officer, principal or appropriate school administrator before conducting this activity.*

1. Read and discuss background and vocabulary
2. The demonstration should be performed over a lab table or a table covered in aluminum foil. Clear the area of loose paper or debris
3. Review lab safety rules
4. Show students fabric swatches
 - a. Student will identify the swatches according to their fiber content
 - b. Students will use online sources to find the source of each fiber identified
 - c. Students will record information on Worksheet A
5. Students will predict the rate (fast or slow) of flammability and burn for each fiber on the worksheet
6. Assign one person as a timekeeper and provide him/her with a stop watch
7. Hold one fabric swatch at a time with the tongs, and light the edge
 - a. The timekeeper will record how long it takes each sample to burn
 - b. Hold each sample above the glass dish so the class can observe the burning pattern.
 - c. As the remains fall into the glass dish, students will observe the characteristics of the ash (color, texture, etc)
 - d. Students will discuss the effect each material might have on a burn victim
8. Transfer the ashes or residue to the pie plate
 - a. Students will inspect the materials with a magnifying glass
 - b. When students are finished examining the ashes, place the ashes in water
9. After all fabrics have been burned, students will answer the questions on Worksheet B.
10. Students will compare and contrast the properties of the different kinds of fabrics.
 - a. What differences did students see between the natural and synthetic fabrics?
11. After the class discussion each student will write a short summary of the results of the fiber test by reviewing the information gathered on Worksheets A and B.

Review/Summary: Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Use observations as the basis for reteaching areas where student mastery may need improvement.

Evaluation: Focus the evaluation of student achievement on mastery of the objectives as stated in the lesson. A written test can also be used to assess the student achievement of the objectives.

Who Ever Heard of Magnetic Cereal?



Arizona State Learning Standards. This lesson is correlated to the following State Learning Standard.

1. **Inquiry Process-** the basis for student's learning in science. Student's use scientific processes
2. **Physical Science-** an understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions.

Arizona State Objectives: This lesson addresses the following objectives: (Strand, Concept, Performance objective)

Fourth Grade: 1.1.3, 1.2.3, 1.3.4, 5.3.4

Fifth Grade: 1.1.1, 1.1.2, 1.2.3, 1.3.3

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Students will understand the importance of reading nutrition labels
2. Students will understand the importance of iron in their diet.

Materials needed:

- ✓ A good strong magnet
- ✓ 1-quart Ziploc bag
- ✓ Fortified with Iron Cereal (3 cups)
- ✓ Small bowl
- ✓ Water
- ✓ Clear plastic cup
- ✓ Plastic stir stick
- ✓ Magnifying glass

Terms:

Iron- one of the most abundant metals on Earth, is essential to most life forms and to normal human physiology. Iron is an integral part of many proteins and enzymes that maintain good health. In humans, iron is an essential component of proteins involved in oxygen transport.

Oxidized- combined with or having undergone a chemical reaction with oxygen

Teaching Strategies: Read the background information to your students. Follow the steps on the direction sheet. Have your students hypothesize if the magnet will pick up the cereal.

Review/Summary: Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Use observations as the basis for reteaching areas where student mastery may need improvement

Dirty Pennies

Derived from copper.org



Arizona State Learning Standards. This lesson is correlated to the following State Learning Standard.

1. Inquiry Process- the basis for student's learning in science. Student's use scientific processes

Arizona State Objectives: This lesson addresses the following objectives: (Strand, Concept, Performance objective)

Fourth Grade: 1.1.1, 1.1.4, 1.2.1, 1.2.5, 1.3.4

Fifth Grade: 1.1.1, 1.2.1, 1.2.5, 1.3.3

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Students will discover copper oxide
2. Students will understand the effect of acid on copper oxide

Materials needed:

- ✓ 10 dirty pennies
- ✓ 4 tablespoons of lemon juice
- ✓ 8 tablespoons of vinegar
- ✓ 1 teaspoon of salt
- ✓ Small bowl
- ✓ 1 spoon
- ✓ 2 steel nails
- ✓ 1 steel screw
- ✓ Paper towels
- ✓ Stop watch

Terms:

Acidic- An acid (from the Latin *acidus* meaning *sour*) is traditionally considered any chemical compound that, when dissolved in water, gives a solution with a hydrogen ion activity greater than in pure water. A pH less than 7.

Copper Oxide- when copper is exposed to oxygen copper naturally oxidizes to copper oxide, turning the copper a blue/green/white color

Teaching Strategies: Have the students complete the experiment in groups or as a class. Have students complete the student worksheet as they complete the experiment.

Review/Summary: Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Use observations as the basis for reteaching areas where student mastery may need improvement.