

## **PA Farm Show Teacher Lesson Plans for Middle School Academic State Standards Related to Lesson**

### **Lesson One: Farm Fresh Foods**

- 4.4.3. Explain how agriculture meets the basic needs of humans.
- 10.1.6. Analyze nutritional concepts that impact health.  
Identify the foods to include specific food groups.
- 10.2.6. Explain relationship between health-related information and consumer choices.
- 11.3.6. Describe well balanced daily menu using dietary guidelines and food guide.

### **Lesson Two: Bees and Pollination**

- S7.B.1. Structure and functions of organisms.
- S7.B.3. Ecological behavior and systems.
- 3.2.7. Explain and apply scientific and technological knowledge.
- 4.2.7. Know that raw materials come from natural resources.
- 4.4.7. Compare/contrast how animals and plants affect agricultural systems.

### **Lesson Three: What Is Grown on Pennsylvania Farms?**

- 4.2.7. Know that raw materials come from natural resources.
- 4.4.3. Identify the role of sciences in Pennsylvania agriculture.
- 4.4.7. Explain agricultural systems' use of natural and human resources.

### **Lesson Four: Animal Byproducts**

- 4.2.7. Know that raw materials come from natural resources.
- 4.4.3. Know the importance of agriculture to humans.
- 4.4.3. Identify the role of sciences in Pennsylvania agriculture.

### **Lesson Five: Identifying Beef & Dairy Cattle**

- 15.2. Classify, contrast, and compare objects.
- 2.9. Name geometric shapes.
- 4.4.7. Explain agricultural systems' use of natural and human resources.

### **Lesson Six: Measuring and Counting Horses**

- 2.1. Demonstrate knowledge of basic mathematic facts.
- 2.2. Solve word problems using mathematic skills.
- 2.3. Select and use appropriate instruments and units for measuring

## **Follow Up Activities for Lesson Plans:**

# Lesson One: Farm Fresh Foods

## What is MyPlate?

### **Purpose:**

The purpose of this lesson is to introduce the USDA MyPlate and motivate the students to seek good nutrition.

### **Time:**

One Forty-Five Minute Class Period

### **Objectives:**

*The learners will:*

- Discuss prior knowledge about good nutrition.
- Identify food groups of the USDA MyPlate.

### **Materials:**

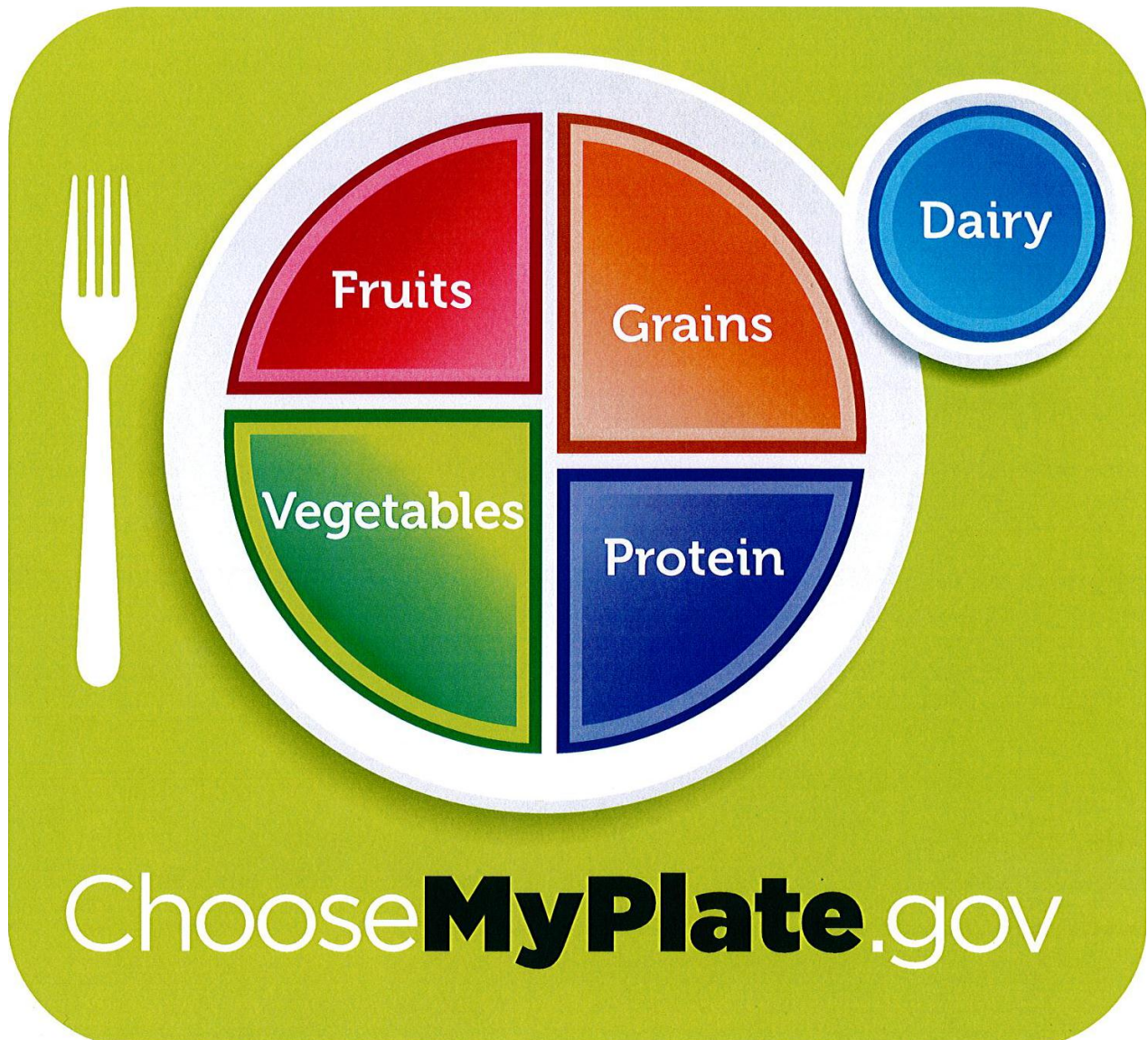
- A colored MyPlate printout (Figure 1)
- Garden tools
- Seeds and soil

### **Instructional Procedure(s):**

- Display a poster or drawing of MyPlate and tell the students that this is the daily food guide recommended by the USDA. The guide shows us what foods we need each day and in what proportions. Point out each section and have students identify the colors and labels of the sections.
- Have students list and categorize the foods that they consumed or saw at the Farm Show.
- Explain the different food groups. Help the students understand that the recommended amount to eat from each food group is represented by the amount of space it is given on the food pyramid. For example, the grain group takes up the entire bottom portion of the food pyramid because the recommended 6-11 servings is double the amount recommended of any of the other food groups.
- Plant a school garden
  - School gardens offer opportunities for fun and physical activity while also serving as an important educational tool to help students understand how healthy food is produced and where their food comes from. Some research suggests that, when used as part of a nutrition education strategy, school gardens can increase knowledge of fruits and vegetables and influence behavior change among children.
  - Plant an indoor or outdoor fruit, vegetable or herb garden that students are responsible for tending to and growing. Try and grow something from every food category on MyPlate.

- If resources are an issue, help students develop a partnership with local businesses, parents or other community groups such as the USDA Cooperative Extension Service. Many communities have “master gardener” programs that could help.
- Schools can further make the link between agriculture and nutritious food by inviting local farmers’ markets to operate from area school yards

Figure 1:



# Lesson Two: Bees and Pollination

## Purpose:

The purpose of this lesson is to learn the significance of bees and pollination to the production of food.

## Background:

Honey bees live in large groups called colonies. A single colony will have anywhere from 40,000 to 60,000 bees. With so many bees in each colony, it is important that different jobs are given to different bees, and that each bee knows what it should be doing. Organization is important because the success of the colony depends on how well the bees perform their jobs. To function well as a group, the entire colony must work as a team for the good of the hive.

Within the hive, there are three types of bees: the queen, workers, and drones. Each has its own particular purpose in the hive. In a hive there is only one queen. The queen, as well as worker bees, has stingers which are used to defend their territory. The queen is able to sting multiple times; while worker bees can only sting once. Drones do not have stingers at all. The queen is the largest bee in the hive, with a longer abdomen and a shiny thorax. She keeps the colony going by laying as many eggs as possible. A productive queen will lay as many as 2,000 eggs in a single day. The worker bees make up the largest portion of the hive, although they are the smallest bees in the hive. They are all female and can only sting once and then they die. Drones are larger than workers and have rounded abdomens, huge compound eyes, and powerful wings. Drones are the male honey bees in the hive and they serve one purpose, to mate with the queen bee, but not all drones mate. Drones that do mate, die; drones that do not mate are kicked out of the hive by the worker bees. The worker bees do this in order to conserve the food supply. Unfortunately for drones they lack the essentials to survive.

Honey bees are very important to plants. They are the strongest link in the chain between the people who grow the food and the people who eat the food. Without honey bee pollination, the food we eat could decrease by 1/3. Foods such as watermelons, cucumbers, squash, blueberries and strawberries, as well as many others fruits, vegetables and nuts, are all pollinated by honey bees. This is because bees are pollinators. Pollinators are animals that help plants reproduce, or make more plants, by spreading pollen from one plant to another. The bright colors and scent of flowers are what attract bees. Once a bee lands on a flower, it crawls inside to drink the nectar. Then, the pollen grains that are on the flower's anthers, stick to the bee's body. They then "comb" the pollen from their body and deposit it onto their back legs. This part of their leg is called their pollen basket.

## Time:

Forty-five minute class period + additional classes

## Objectives:

*The learners will:*

- Identify bee types
- Understand the use of pollen
- Describe why bees and pollination are important

## Materials:

- Research materials on bees
- Computer with Internet access
- Five healthy young tomato plants in pots – no blossoms
- Cotton swabs

## Instructional Procedure(s):

1. Have students research information about bees and pollination from what they learned at the Farm Show.
2. Review knowledge about bees, pollen, and pollination.
  - Make sure they understand that bees use pollen from flowers as food and when they land on the flowers to collect pollen they spread pollen from one flower to another.
  - Bees play important roles in food production.
3. Display five plants for the class. Make sure to inform students that each fruit (tomato plant) of a plant grows from the base of the blossom.
4. Divide class into groups. Challenge each group to use the plants to design an experiment that will answer "How do bees aid in the production of fruits and vegetables". After reminding students of the requirements of valid scientific experiments, have the groups write up their designs.
5. Have groups share their experiments then help them to refine until the class arrives at these steps:
  - Label pots 1 through 5
  - Place plants 1 through 4 near south facing window
  - Separate 5 from the rest and be sure to allow it to get the same amount of light. (5 is the control)
  - Don't let any plants get too hot or too cold.
  - After few weeks, when all plants have fair number of flowers, use the same cotton swab to gently tease open all flower tips on plants 1, 2, and 3.
    - Gently rub swab over the tip of each flower (swab represents bee moving to flowers)
  - Use separate swab for plant 4
  - Don't do anything to plant 5
  - Continue to tease plants until you see marked changes
  - Describe similarities and differences between control plant and pollinated plants.
  - Are there differences between the three cross pollinated plants and the plant that was only pollinated with its own flower?

6. Have students write up a lab report describing the results of the experiment and explain the conclusions from the experiment.
7. Additional: Have students research plant structure. Each student should draw a diagram of the "anatomy" of a tomato blossom, labeling each part. Students should accompany their diagrams with written explanations of how pollination works and why pollination is necessary to produce fruit.

### **Additional Activities:**

1. Further demonstrate the importance of bees by making lip balm or candles from beeswax.
  - Lip balm recipe
    - Measure a small amount of beeswax (pellets) into a heatproof measuring cup.
    - Measure the same amount of almond oil into the same cup. You may use other kinds of oils instead.
    - Heat in microwave for about two minutes then stir till beeswax is melted.
    - Add a bit of vanilla extract, almond extract, or peppermint oil to give a different flavor.
    - Pour mixture into tubes or other tiny containers.
  - Candle recipe
    - Cut the beeswax sheets. For a tapered candle, cut the wax in half, diagonally from top to bottom. For a smaller votive candle, cut the wax in half, width-wise. Do not cut the beeswax if you want to create a pillar candle.
    - Cut the wick so 1/2 inch sticks out of both ends of the candle.
    - Place the wick 1/4 inch from the edge of the beeswax sheet. Roll the beeswax around the wick and press the wax tightly against the wick. This holds the wick in place.
    - Roll the beeswax up around the wick until the entire sheet of wax is completely around the wick. Keep the bottom edge as straight as possible as you roll. The votive and pillar candle sheets end with an even crease. The tapered candle has a diagonal crease down the side of the candle.
    - Press the edge of the wax into the side of the candle to hold it. Hold the bottom wick over and press the bottom of the candle firmly until it is flat.
2. Have the students read about honey bees to gain an understanding of their biology. Emphasize the benefits of honey bees to humans. Honey bees provide honey and pollinate crops. Have the students present either written or oral reports about what they have learned.

# Lesson Three: What is Grown on PA Farms?

## Purpose:

The purpose of this lesson is to learn what products are derived from agriculture and grown in Pennsylvania.

## Time:

Thirty-five minute class period

## Objectives:

*The learners will:*

- Consider all things in the classroom that come from agriculture and Pennsylvania agriculture.
- Interpret U.S. Department of Agriculture's National Agricultural Statistics Service (NASS) data to discover where agricultural commodities used in snacks are grown.

## Background:

Agriculture is food but really it's much more. Your classroom is filled with many products grown on a farm. For example, the wood on your pencil or ruler may be made from cedar grown on a tree farm. Paper could be made out of pulp of trees, feathers, or eggshells. Fabrics, tennis balls, rugs, could all be made from wool. Ink and crayons may be made from the oil of cottonseed, soybeans, corn and sunflower seeds or from the fat of beef and cows. Chalk may be from the bones of cows or pigs. Glue and other adhesives are made from other parts of cows, sheep, and pigs.

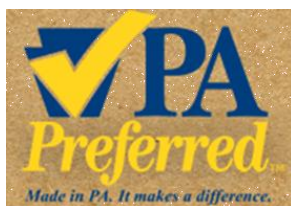
So where do the agriculture commodities come from? Every part of our country is good at raising different agricultural products. This is because of the climate, suitable land, and amount of rainfall. Fruits and vegetables are grown in temperate parts of the country such as California and Florida. Wheat, barley, and corn grow well in the Mid-west portion of the United States. Some parts of the country, land is not suitable for crops or planting so this land provides a great opportunity for livestock grazing. Because of modern technology for production, harvesting, transportation, storing, and processing, we are able to have just about any kind of food we want at any time of the year. The census of agriculture gathers numbers to help know what grows best in which part of the country.

## Materials:

- PA Census of Agriculture  
[http://www.agcensus.usda.gov/Publications/2007/Online\\_Highlights/County\\_Profiles/Pennsylvania/cp99042.pdf](http://www.agcensus.usda.gov/Publications/2007/Online_Highlights/County_Profiles/Pennsylvania/cp99042.pdf)
- Handout: Identify products from agriculture
- PA Preferred logo labels






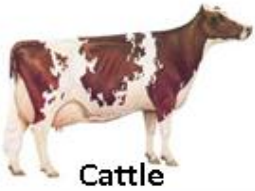


## Instructional Procedure(s):

1. Discuss "agriculture", "PA Preferred™", "commodity", "end products" and "by-product"
  - a. Have students look up these words dictionary
    - i. What page is it on?
    - ii. What column?
    - iii. How many syllables are in the word?
    - iv. Use it in a sentence
  - b. Bring in examples of commodities, end products, and by-products.
    - i. E.g. wool, wool fabric/wool sweater, lotion (lanolin from wool)
2. Identify agriculture versus non agriculture products
  - a. Walk around the classroom and pick up different objects that are made from agriculture or not made from agriculture
  - b. Have students do the same.
  - c. Use the handout to identify products and classify them.
3. Use snack foods to demonstrate food products of commodities. Have students identify the major commodity in or derived from this snack food.
  - a. Corn Chips
  - b. Potato Chips
  - c. Apple Chips/Applesauce
  - d. Beef Jerky
  - e. Pretzels
  - f. String cheese
4. Identify the origin of the commodity derived from snack food.
  - a. Use the [www.nass.usda.gov](http://www.nass.usda.gov) site to identify where the commodity is grown. Make sure to check Pennsylvania first. Some of these products could be PA Preferred™ products.
    - i. To find PA agriculture statistics visit:  
[http://www.nass.usda.gov/Statistics by State/Pennsylvania/index.asp](http://www.nass.usda.gov/Statistics_by_State/Pennsylvania/index.asp)
    - ii. Check out the PA Preferred™ website for PA grown products:  
<http://papreferred.com/>
  - b. Use the PA Preferred™ logo on all products that are Pennsylvania grown.



## Identify Products from Agriculture

Directions: Write a list of items that come from each agriculture product.

|   |   |  |   |
|---|---|--|---|
|  <p>Trees</p>      |  <p>Wheat</p>    |  <p>Corn</p>   |  <p>Chicken/Eggs</p> |
|   |   |  |   |
|  <p>Soybeans</p> |  <p>Cattle</p> |  <p>Pigs</p> |  <p>Sheep</p>      |
|   |   |  |   |

## Pennsylvania Grown Apple Varieties

L F H L U E V M Y B D U L I F E A W Y D U Z S V A  
 I U G T I K C D P V E I Q C P N S A I X C P T G I  
 D Z P Y P I V L V C G N M O X R W E A T R X A M Q  
 N L D B N N E I A G M H U B Y L A P B I V L Y R N  
 K I O T Q P O Q O R B J D T N Z L S H E A K P G Y  
 S Q O G I L J Q R H A F T F F Y P S X O H I R E U  
 Q S P T R X S X G L H Z Y W V C J R X I D D V O Y  
 H K G D G E B Y M K J Z S V W I G O Y J A X L H Y  
 N Q L D L S G C O R T L A N D L O C N N K Y S I U  
 A Z Y D A L K N I P I L U B F E L C R A A E R F O  
 M U A P H I Q K I K W T B O U F D R N N G T C E E  
 Y M W A I E I H Z G F T U D J P E Z Z H K O T D F  
 A S M B T U D N O C A M E O I D N P A J U W L I K  
 T N K U W B R X M F P A G U D O D S H O H I D D N  
 S F X O T U N G P O O V S E S T E I U N S J C W E  
 G X N M B S V Z B N Z Y L Z R D L R B A L D E S G  
 L E E E V E U X I N A I Y W G Z I C S T S J Z C Q  
 O O A A E E K Y L S C V E P V W C Y W H J F W T C  
 D R W T R M Y W K I R I C B Y W I E S A Z G A H D  
 B E I I M P E Q O R W C X D X T O N Y N L Z W R W  
 X N P M K T H U E M O R W Q H C U O G H J F F P W  
 K M H T I M S Y N N A R G W J L S H G O U F E N Z  
 E R B H K C R A X A A Z N Z Z Q Z O N Q I O P J P  
 R T L Y E W Q B W Y C Q L O R H Z A M M Q I Y D U  
 Z X V F F W A P M W U J E D K Q L K S N N F E P F

BRAEBURN  
 JONAGOLD  
 CAMEO  
 JONATHAN  
 CORTLAND  
 MCINTOSH  
 EMPIRE  
 MUTSU  
 FUJI  
 NITTANY

GALA  
 PINK LADY  
 GINGERGOLD  
 RED DELICIOUS  
 GOLDEN DELICIOUS  
 ROME  
 GRANNY SMITH  
 STAYMAN  
 HONEY CRISP  
 YORK

# Lesson Four: Animal By-Products

## Objectives:

1. Students will investigate the effects of heat transfer on phase changes.
2. Students will investigate the effects of temperature changes on physical changes.
3. Students will apply the concepts of conduction and convection to the ice cream-making process.
4. Students will make observations, design experiments, record and analyze data, make models, and infer their findings.

**Time:** 1 hour

## Materials:

1 tablespoon sugar  
1/2 cup milk  
1/4 teaspoon vanilla  
6 tablespoons rock salt  
2 pint-size plastic food storage bag (e.g., Ziploc)  
1 gallon-size plastic food storage bag  
Ice cubes

## Activity:

Start the investigation after asking, "How does milk change from a liquid to a solid?" "How does ice cream work?"

Teachers measure the milk, vanilla, and sugar into a pint size plastic bag. Be sure to get as much air out of the bag as possible before sealing. Put that bag inside of another pint sized bag to minimize the salt leaking into the milk mixture. Again, be sure to get as much air out of the bag before sealing. Fill the big freezer bag with ice. Put the small bag into the big freezer bag and then sprinkle the salt on top of the ice. Using a hand towel or gloves, mix and shake the bag for approximately 5 minutes, making sure the ice surrounds the milk mixture. While students shake the bags, facilitate discussion about observations in changes in the milk mixture and ice. A 1/2 cup milk will make about 1 scoop of ice cream

*Anticipated responses:*

*The milk mixture is becoming a solid and has less liquid. The ice and salt are melting as time passes. After 5 minutes, the milk mixture should be ice cream! Pass out spoons, wipe off the small bags with a paper towel or napkin, and let students enjoy their finished product!*

## HOW DOES THIS HAPPEN?

Milk can change from a liquid to a solid with the help of ice and salt. It involves the exchange of heat. Cold does not exist by itself. It is simply the absence of heat. For example, a cold room is cold because some of its heat energy has escaped. Heat energy goes from places with more heat energy to places with less. The milk mixture has more heat energy than the salt and ice does. Therefore, heat energy went from the milk mixture to the ice and salt. The milk mixture lost heat energy, which caused it to cool and freeze, eventually becoming ice cream, a solid. The ice gained heat energy, which caused it to melt, eventually becoming salt water, a liquid. The addition of salt lowers the freezing temperature, which caused the ice cream to freeze sooner

## Discussions:

1. Lecture discussion:
  - a. Briefly discuss background information on ice cream making.
  - b. Discuss the reasoning for adding salt to the ice to make ice cream.
  - c. Discuss the experiment and basic setup.
  
2. Use the textbook, internet, or various other sources to find information on the following questions relating to the ice cream making experiment:
  - a. Various types of milk
  - b. Various salts to use and their effects on ice cream making
  - c. PA Dairy Industry
  - d. Various ice cream manufacturers
  
3. Find the definitions to the following ice cream making vocabulary:
  - a. butterfat
  - b. churn
  - c. custard
  - d. sorbet
  - e. syrup
  - f. gelato
  - g. temperature
  - h. thermal energy
  - i. heat
  - j. radiation
  - k. conduction
  - l. convection
  
5. After the textbook, internet, or various other sources research is completed have a class discussion on what was found.

## Follow-up Activities:

Students may enjoy their ice cream. Students may be interested in making other milk related foods such as some of those listed above.

# Lesson Five: Identifying Beef & Dairy Cattle

## Purpose:

The purpose of this lesson is to have students understand the differences between beef and dairy cattle.

## Time:

One forty-five minute class period

## Objectives:

*The learners will:*

- Distinguish between beef and dairy cattle and their main purposes.
- Understand how to use Venn diagrams in identifying similarities and differences between beef and dairy cattle.

## Background:

Meat comes from beef cattle and milk comes from dairy cattle. All female cattle breeds produce milk and both male and female cattle produce meat. Some breeds are better at providing meat and others are better at providing milk. Since we get milk from dairy cows, they usually have very large udders. For that reason their basic shapes are different from beef cows. The basic shape of a beef cow is a rectangle. The basic shape of a dairy cow is a trapezoid.

Some common dairy cattle have markings that make them easy to recognize. Holstein cattle are probably the easiest to recognize because they are white with black spots. But dairy cattle, like beef cattle, come in many different colors. Because they must be milked every day, dairy cattle usually stay close to the dairy barn. Beef cattle do not have to stay so close to home and are sometimes moved around from pasture to pasture. Sometimes the fields are many miles away from the farm or ranch house. For that reason the cattle you see in fields along the side of the road are more likely to be beef cattle.

## Materials:

- *A Field Guide to Cows* (John Pukite, Scholastic, 1998): A good review for students to see different types of cows and learn the differences between beef and dairy cattle.
- Handout: Beef and Dairy

## Instructional Procedure(s):




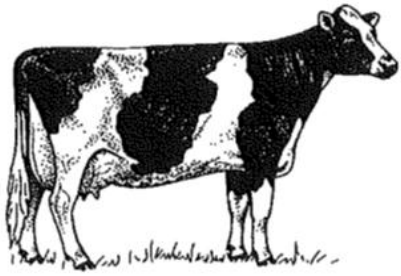
*Display the book A Field Guide to Cows by John Pukite.*



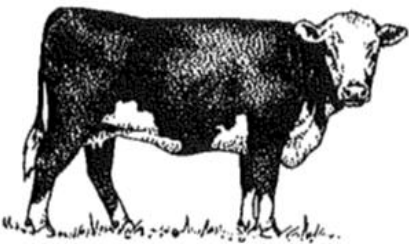
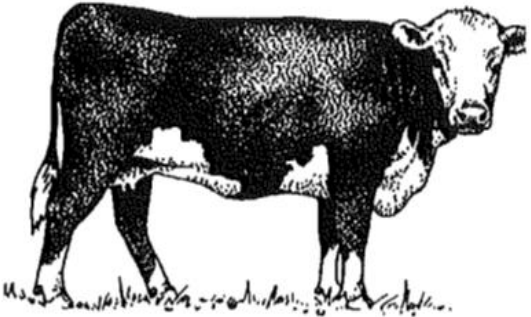
- Review *A Field Guide to Cows* and have the students discuss the differences in beef and dairy cattle.
- Review the types of cattle they saw at the PA Farm Show. Review the differences in breeds listed in the book.

- Use a Venn diagram to chart the similarities and differences between beef and dairy cattle.
- Bring products made from beef and dairy cattle to class and have students sort them to create beef and dairy product tables with the correct products.
- Have students research the different breeds of beef and dairy cattle. Specific characteristics, desired traits of the breeds, and breeding trends are details that should be researched.
  - Students should create their own beef/dairy herd using what they found in characteristics. What breed should be in your herd? Will it be beef or dairy? Hereford or Angus? Etc.

## Handout: Make a Beef & Dairy Breed Booklet

Directions: Read the sentences. Then fold and cut to make the beef or dairy book

|   |  |
|---|--|
| <p>cut</p> <p>Guernsey cows have orange bodies with white markings and white tail.</p>  <p>cut</p>   | <p>cut</p> <p>Jersey cows have tan bodies and brown feet. The tips of their tails are white.</p>  <p>cut</p> |
| <p>3</p> <p>fold</p>  <p>cut</p> <p>Holstein cows are some of the top producers of milk. A Holstein cow is black and white.</p> <p>cut</p> | <p>2</p> <p>fold</p> <p>1</p> <h1>Dairy Cattle</h1> <p>by _____</p>  <p>fold</p> <p>cut</p>                |

|  |   |
|--|---|
| <p style="text-align: center;">-cut</p> <p style="text-align: center;">Bragus cows are black and saggy.</p>  <p style="text-align: center;">cut</p>   | <p style="text-align: center;">cut</p> <p style="text-align: center;">Charolais cows are creamy white<br/>with a pink nose</p>  <p style="text-align: center;">cut</p>  |
| <p style="text-align: center;">fold</p> <p style="text-align: center;">8</p>  <p style="text-align: center;">cut</p> <p style="text-align: center;">Hereford cattle have reddish bodies<br/>and white faces.</p> <p style="text-align: center;">cut</p> | <p style="text-align: center;">9</p> <p style="text-align: center;">fold</p> <p style="text-align: center;">5</p> <h1 style="text-align: center;">Beef Cattle</h1> <p style="text-align: center;">by _____</p>  <p style="text-align: center;">cut</p> <p style="text-align: center;">cut</p> |

Answers:

Beef Cattle Breeds

- A. Hereford
- B. Angus
- C. White Park
- D. Limousin
- E. Texas Longhorn

Dairy Cattle Breeds

- F. Ayrshire
- G. Guernsey
- H. Holstein
- I. Jersey
- J. Brown Swiss



A.



B.



C.



D.



E.



F.



G.



H.



I.



J.

# Lesson Six: Measuring and Counting Horses

## Purpose:

The purpose of this lesson is to have the students learn math with horses.

## Time:

One forty-five minute class period

## Objectives:

*The learners will:*

- Learn how to measure
- Learn how to convert "hands" to inches
- Be able to do basic math

## Background:

Horses are measured in units called "hands." One hand represents 4 inches. The origin of measuring a horse this way is very old, but easy to understand.

Years ago, people did not have the common measuring devices like tape measures. To measure a horse, they used what was available. At various times in history and in different locales, a "hand" was defined as the width of a person's hand using the fingers only, the width of a person's hand using the fingers and the thumb, the height of a clenched fist, and possibly many others.

Somewhere along the way, the measuring unit of a hand was standardized to mean four inches. Though the origins are ancient, a hand is still the unit of measurement for horses that modern horse owners use today. This activity will allow students to convert horse heights into feet and inches and practice reading a ruler.

## Materials:

- *Measuring tape/stick or rulers*
- *Paper*
- *Scissors*
- *Handout: Counting Horses*

## Instructional Procedure(s):

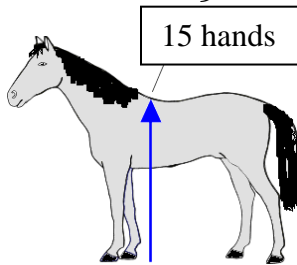
- Have the students complete the counting horses worksheet before starting the activity.
  - Answers to Counting Horses:
    1. Today: 3 gallons left to drink
      1.  $8 \text{ gallons} \times 7 \text{ days} = 56$
      2.  $56 - 5 \text{ gallons} = 51 \text{ gallons}$
    2.  $13 \text{ horses} \times 5 \text{ pens} = 65 \text{ horses}$
    3. Answer will vary

4. 1 horse
  5. 5 feet tall
    - $15 \text{ hands} \times 4 \text{ inches} = 60 \text{ inches}$
    - $60 \text{ inches} / 12 \text{ inches} = 5 \text{ feet tall at the withers}$
  6. 3 feet 6 inches tall
    - $11 \text{ hands} \times 4 \text{ inches} = 44 \text{ inches}$
    - $44 \text{ inches} / 12 \text{ inches} = 3 \text{ feet } 6 \text{ inches tall}$
  7. Yes. Horse's foot is 3.5 inches. Horseshoe is 4 inches
- Create a wall display that marks the standard heights for different breeds of horses and ponies.
    - Clydesdale: 17-18 hands
    - American Quarter horse: 15-16 hands
    - Standardbred horse: 14- 16 hands
    - Tennessee Walking horse: 16 hands
    - Percheron: 17 hands
    - Appaloosa: 14-16 hands
    - Shetland pony: 11 hands
  - As a class, figure out what each measurement is in feet and inches and then mark them with a cut out of a horse.
  - After the horses' heights are marked, students could make their own sign and put it on the wall. Students will be able to compare their height with the horses' height.
  - You could even measure students at the beginning of the year and then at the end to see how much they have grown.

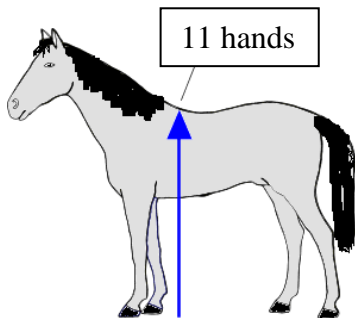
## Counting Horses

Directions: Answer the following questions. One “hand” is equal to 4 inches. There are 12 inches in a foot.

1. Horses drink about 8 gallons of water each day. If my horse drank 5 gallons so far today, how many more gallons will drink by the end of the week?
2. Horses come in many colors on our farm. We have five pens of horses. If I have 1 chestnut horse, 3 dappled grey horses, 5 palomino horses, and 4 paint horses in each pen. How many horses do I have?
3. Horses are measured in hands. One hand equals four inches. Using your hands measure the following items:
  - Your friend: \_\_\_\_\_
  - Your teacher: \_\_\_\_\_
  - This packet: \_\_\_\_\_
  - Your shoe: \_\_\_\_\_
4. If Sarah has 3 horses and Jake has 2 horses. How many more horses does Sarah have?  
Sarah has \_\_\_\_\_ more horse(s).
5. This horse is 15 hands tall, convert this measurement into feet and inches.



6. This horse is 11 hands tall, convert this measurement into feet and inches.





7. Measure the horseshoe to determine if it will fit on the horse's foot above? Horseshoes can be bent  $\frac{1}{2}$  inch with a hammer. That being stated will this shoe fit the hoof above?

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