

# GENE POOLS

GRADE 5

UNIT 2

LESSON 4

<b>QUESTION</b>	Why do plants and animals look and act the way they do?
<b>CONTENT OBJECTIVE</b>	Understand how plants and animals inherit traits or characteristics. <i>(To meet the objectives, many of the activities in the lesson must be completed.)</i>
<b>LIFE SKILL OBJECTIVE</b>	Critical thinking
<b>STANDARDS AND BENCHMARKS</b>	<b>SCIENCE</b> Gather and analyze data to determine which explanations are most useful to the situation being investigated (using gene pools). Acquire information from multiple sources to investigate a science question or problem. Describe plant and animal traits. Understand the role reproduction plays in passing on traits to future generations. Analyze and explain dominant and recessive genes and their effect on future generations. Define terms related to genetics such as hybrid, purebred, and variety. <b>SOCIAL STUDIES</b> Recognize scientific and technological advances and their effect on history and satisfying consumer needs and wants. Use economic concepts to help explain historical and current developments and issues in local, national, or global contexts.
<b>INDICATOR</b>	Correctly identify future traits of corn and cattle according to gene combinations collected from gene pools.
<b>NOTES</b>	



# ACTIVITY 1 | MAKING A CORN PLANT

10 minutes

- MATERIALS** Unlined 8/12" x 11" paper (*one sheet per student*)  
 Crayons or markers  
 Tape  
 Real corn plants (*if possible, from different varieties*)

Do

Iowa usually ranks first in corn production in the United States annually. **Have you seen corn growing along roads? Have you seen pictures of corn plants?** Let's see what you remember about corn plants.

Take a piece of unlined paper and fold it horizontally into thirds. Keep the paper folded. Right below the bottom fold, one-third of the way from the bottom, draw a horizontal line to represent the ground.

On the bottom third of the paper, draw the parts of a corn plant that you can see below and just above the ground. Draw lines to connect your stem to the middle section of your paper. Keep the paper folded and pass it, with the middle section up, to the person on your right.

On the middle section of the paper, start your stem using the connecting lines from the lower third of the paper. Draw what you think is found in the middle part of a corn plant. Draw connecting lines leading from your stem to the top section of your paper. Pass the paper, top section up, to the person on your right.

On the top section of the paper, start your stem using the connecting lines from the middle section of the paper and draw what you think is found at the top of a corn plant.

Keep the picture you now have and label the parts.

**What grows into the ground to hold the plant in place? It also sends nutrients and water from the soil up into the plant.**

Roots; draw a line next to the roots and write the word "roots" on it.

**What part of the plant connects the roots to the rest of the plant and serves as a channel or tube to deliver nutrients and water?**

The stem or, in the case of a corn plant, the stalk connects the roots to the rest of the plant. Draw a line next to the stem and write the word "stem" on it.

**What part of the plant reaches for the sun and contains green chlorophyll, which helps the plant make food?**

Leaves; draw a line next to one of the leaves and write the word "leaves" on it.

**Where do seeds grow on the corn plant?**

They grow on the ear. Draw a line next to the ear and write the word "ear" on it.

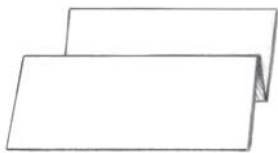
**What are the fine strings at the top of the ear called?**

They are called silks. Draw a line near the silks and write the word "silks" on it.

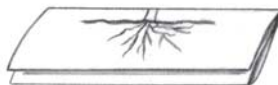
**What is the flower at the top of the corn plant called?**

It is called the tassel. Draw a line near the tassel and write the word "tassel" on it. If your picture is missing any of these parts, add them.

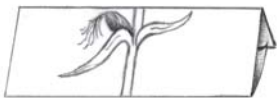
Now stand up and toss your corn pictures in the air. Pick up the picture closest to you and tape it to the edge of your desk with the roots down and the tassel up.



FOLD PAPER IN THIRDS



DRAW ROOTS ON BOTTOM THIRD



TURN PAPER  
DRAW MID-SECTION OF PLANT



TURN PAPER  
DRAW TOP-SECTION OF PLANT

## TRI-FOLD CORN PLANT

## REFLECT

Take a look at the corn plants around the room.

**What is necessary to plant corn?**

Seeds

**We plant seeds in the ground to grow a new corn plant, but where do the seeds come from?**

They grow on the ear of another corn plant. Sometimes the seeds are called kernels.

**How does a corn plant produce seeds?**

It has to do with the plant's reproductive system.

**What do most living things need to reproduce?**

They need a male and a female. A corn plant has both the male and female parts on it.

**Can anyone guess what the male part of a corn plant is?**

It is called the tassel.

**What is the female part of a corn plant?**

It is called the silks.

**What blows off of the tassel and makes some allergies flare up?**

Pollen blows off of the tassel and into the air. When you throw your papers in the air, they landed everywhere. That's what happens with pollen. Pollen either drops on the same plant or the wind takes it somewhere else. Generally, it blows to corn plants in the next few rows. Some pollen lands on the silks.

**Can anyone guess what happens next?**

The silks are really tubes that the pollen passes through until it reaches the ear of corn. Each fertilized silk produces a corn seed on the ear.

When the pollen from the male part of the corn plant (the tassel) landed on the female part (the silks) and went down the silk tubes during the fertilization process, many genes paired up.

**What are genes?**

Genes are regions in a DNA molecule that give something its traits or characteristics. One gene for a trait or characteristic such as height comes from the male/father and one gene for the same trait or characteristic comes from the female/mother.

When the traits from the genes of both parents come together, they form a gene pool. **What do you do when you hear someone say, "Let's pool our money so we can buy something?"** You put your money together. For plants and animals, the male and female gene traits are pooled, or gathered together, to produce certain traits or characteristics in a new corn plant.

**Look at the corn plants in the rows next to you. Do any of them look alike?**

No, each looks different.

**What are the characteristics or traits that look different?**

Thin or thick stems, number of leaves, number of ears of corn, bushiness of the tassels and silks, how tall the plant is, how big the roots are, shapes of leaves, how spread out the leaves are, etc.

**What gave the corn those traits or characteristics?**

Genes from the male and female parts of the plant gave it those traits.

**If the male gene had a trait that could make a corn plant tall, and the female gene had a trait that could make the corn plant short, what would the new plant look like?**

The gene traits don't mix together to make a plant of medium height. Gene traits are usually either dominant or recessive.

**REFLECT**  
CONTINUED

**Which gene trait would usually win and become the characteristic or trait for the new plant?**

The dominant one would dominate or take over. The recessive trait would recede or pull back.

**If the tall corn plant was the dominant trait and the short corn plant was the recessive trait, would the new corn plant be tall or short?**

It would be tall because tall was the dominant gene trait.

Let's try another characteristic. **If a female gene had a dominant trait that made the corn plant wide and the male gene had a recessive trait that made the corn plant narrow, what would the new corn plant (coming from the seed on the ear of corn) look like?**

The dominant trait would dominate, making the corn plant wide.

When pollen from one plant blows to the silks on another plant (instead of dropping on the silks of the same plant), a **hybrid** seed starts. That means genes from different plants (of the same species) pool to create seeds that will produce a plant with characteristics different than the original plants. When you threw your corn plant picture in the air and it landed somewhere other than your desk, you created a new hybrid corn. If pollen falls on the silks from the same plant it is called an **inbred** or **purebred**. If you threw your corn plant picture in the air and it landed on your own desk, you would call it an **inbred** or **purebred**.

**How many people had new corn plants that were hybrids? Inbreds?**

If the plant that you threw up in the air landed on your own desk, it's an inbred. If it landed on someone else's desk, it's a hybrid.

**Most people plant hybrid corn. Why would they want hybrid corn?**

Hybrid corn provides the best, most desirable traits from different plants. But the process of hybridizing corn is more complicated than just letting pollen from one plant blow to other corn plants. Breeders use inbred plants to create hybrid plants. It takes several generations, maybe 7 to 10 years, to develop a hybrid seed that's ready to sell to farmers.

To review, list the following words on the board and ask the students what they mean to the reproductive system of a corn plant.

Tassel	Silks	Gene	Trait	Gene pool
Dominant trait	Hybrid	Inbred	Purebred	Recessive trait

**APPLY**

*Show the real corn plants and talk about the differences in the corn growing near your community.*

**Have you noticed any seed company signs posted beside fields in the area?**

**Did you notice that the signs had different numbers on them?**

The numbers indicate the different varieties of corn.

**Did you notice the different characteristics of the corn or beans growing next to each other in these seed test plots?**

Take a look the next time you drive in the country.

**What makes Iowa the leading seed production state?**

Iowa is the leading seed production state because of its rich soil, long history of corn production, and top quality farming practices. Also, people such as George Washington Carver, Henry A. Wallace (Pioneer Hi-Bred, International, Inc.), the Garsts, the Blacks, and other families studied, experimented, educated, and started seed businesses here.

**APPLY**  
CONTINUED

**Have you or someone you know detasseled corn?**

**What are you doing when you pull the tassel off the corn?**

You stop it from pollinating the silks.

**Do you detassel corn that's going to be used to feed livestock such as cattle?**

No

**Why?**

The seeds aren't going to be used to grow new plants; they are going to be eaten. **What are the seeds from detasseled corn plants used for?**

Farmers use them to grow new plants.

*Compare gene pools in corn plants and humans. Look at differences in height, bone structure, color, size of feet, etc.*

# ACTIVITY 2 | CORN GENE POOLS

15 minutes

**MATERIALS** 10 envelopes or paper lunch bags labeled as described below  
 10 red circles cut from card stock or cardboard, or use game chips  
 10 white circles cut from card stock or cardboard, or use game chips  
*Gene Pool for Corn* activity sheet (one per student, found on page 101)

Write the following information on the envelopes or lunch bags.

- |                               |                             |
|-------------------------------|-----------------------------|
| 1. female/mother/height       | 6. male/father/height       |
| 2. female/mother/sweetness    | 7. male/father/sweetness    |
| 3. female/mother/kernel color | 8. male/father/kernel color |
| 4. female/mother/spread       | 9. male/father/spread       |
| 5. female/mother/roots        | 10. male/father/roots       |

Put one red and one white circle in each envelope or lunch bag.

(Activity adapted from Truby, Steve. Dominant/Recessive Characteristics. Ames, Iowa: Iowa State University Extension, March 2001. 4H 4A.)

## DO

On opposite sides of the room, spread out the labeled envelopes or paper lunch bags. Distribute the Gene Pool for Corn activity sheets.

### GENE POOL FOR CORN

D = Dominant / d = Recessive

Traits	Female/ Mother	Male/ Father	Offspring Gene Combination	Next Generation Trait
<b>Height</b> D-tall / d-short	Sample: D	d	Dd	Tall
<b>Sweetness</b> D-not sweet / d-sweet	Sample: d	D	dD	Not Sweet
<b>Kernel color</b> D-yellow / d-white	Sample: D	D	DD	Yellow
<b>Spread</b> D-wide / d-narrow	Sample: d	d	dd	Narrow
<b>Roots</b> D-deep d-shallow	Sample: D	d	Dd	Deep

Look at the activity sheet.

**What are the general traits or characteristics for the corn plants listed on the sheet?**

Height, sweetness, kernel (or seed) color, spread, and roots.

**What is the dominant trait for height?**

Tall

**What is the recessive trait for kernel (or seed) color?**

White

There are five envelopes or bags representing the gene pool from the female part of the plant, the silks, on one side of the room. There are five envelopes or bags representing the gene pool from the male part of the plant, the tassel, on the other side. Each envelope or bag has a label that corresponds with your activity sheet. For instance (*hold up an envelope or bag*), this label says female/mother/height. Find the horizontal row that has the trait about height and find the column that is labeled female/mother.

## DO CONTINUED

Each envelope contains two circles or chips. One is red and the other is white. The red circle represents dominant gene traits. The white circle represents recessive gene traits. You will draw one chip out of each envelope and record that trait in the correct space under female/mother or male/father on your activity sheet. Write a capital “D” if you drew a red circle or chip. Write a lower case “d” if you drew a white circle or chip. Then put the chip back in the envelope. *Have a student demonstrate the process by drawing a circle or chip from the female/mother/height envelope or bag, recording it properly on the activity sheet, and returning the circle or chip to the envelope or bag.*

Now, quietly and calmly, take your *Gene Pool for Corn* activity sheets and pencils with you to the envelopes or bags. Take turns drawing a circle or chip out of one envelope at a time. Record in the space on your activity sheet that matches the label on the envelope or bag a capital “D” if you chose a red one for dominant or a lower case “d” if you chose a white one for recessive. Then return the circle or chip to the envelope or bag. Go through all the envelopes or bags in both the female and male gene pools before you return to your seat.

*Start with the following directions after everyone has finished finding all the female and male traits.* In the third column, labeled “Offspring Gene Combination,” combine the two genes you drew for each trait. For example, if you have a capital “D” written in the female/mother column and a capital “D” written in the male/father column, write the two capital “Ds” next to each other in the “Offspring Gene Combination” column. *Write DD on the board.* You will have all sorts of combinations of genes such as Dd, dD, dd, DD. *Write the sample combinations in a list on the board and give the students time to record their gene combinations.*

In the fourth column, labeled “Next Generation Trait,” use the gene combinations to determine the traits or characteristics for the next generation or the new plant.

**Which gene trait will be dominant and therefore expressed or shown in the next generation of the plant for a height gene combination of “Dd?”**

Because “D,” the dominant trait, is tall, the new plant will be tall. In the fourth column, write down the characteristic of the new plant, which in this case is tall. Anytime there is a capital “D” it will become the trait or characteristic expressed in the new plant.

**When would the recessive trait become the trait or characteristic expressed in the new plant?**

The recessive trait becomes characteristic when you have a “dd” combination or two recessive traits.

**Does anyone have a “dd” combination?**

**What trait will your new plant have?**

Complete recording the traits or characteristics.

Finally, turn your activity sheets over. Use crayons or markers to draw the new corn plant according to the description in the column titled “Next Generation.”

## REFLECT

**How many of your new corn plants had the following traits or characteristics?**

*Have the counters and recorders put the traits and numbers on the board.*

tall	short	not sweet	sweet	yellow kernels
white kernels	wide plant	narrow plant	deep roots	shallow roots

**What were the most common traits?**

**Is the most common new corn plant in this room/field tall or short?**

**Is it sweet or not sweet?**

**Does it have yellow or white kernels?**

**Does it have a wide or narrow spread?**

**Does it have deep or shallow roots?**

## REFLECT

CONTINUED

*On the board, have someone draw the most common combination of gene traits in a new corn plant from the field that's developing in your classroom.*

**Are there any recessive characteristics in the most common new corn plant drawn on the board? What are they?**

**Did your corn plants have any recessive characteristics?**

**What were they?**

**Why did they end up with recessive characteristics?**

They had a combination of two recessive gene traits, "dd."

**Where did the gene traits come from?**

They came from the gene pools of the female/mother and male/father.

**What part of the corn plant sends the male gene traits?**

The tassel, which makes the pollen

**What part of the corn plant sends the female gene traits?**

The silks, which are tubes going down to the ear of corn

**What is formed from the fertilization process and also carries the gene combination that will become the characteristics of the new corn plant?**

Seeds or corn kernels

You may want to collect the activity sheets to evaluate the student's understanding of dominant and recessive gene trait combinations and the next generation trait.

## APPLY

Pick the corn from the side of your desk. On the back of the first corn plant you drew, write down or draw a product you want to make or have from the corn you picked. You can write down more than one product. Remember that the number one use for the corn that is grown in Iowa is to feed animals. It has 3,500 other uses, so the sky is the limit! *You may want to copy the Uses of Corn list from the Adding Value: Products Made From Iowa's Agricultural Commodities book and put it on the overhead projector for students to refer to in this activity.*

Next, list the characteristics or the corn traits that might be needed in your corn product. For example, if you picked a product that tastes sweet, the corn would have to have a gene trait that makes it taste sweeter. What trait might the seed need to have in order to be made into plastic or ethanol? Use your imaginations; only the scientists (breeders), salespeople, professors, and the farmers will know which traits are necessary to use corn in thousands of different products.

**Unless the characteristics you listed come from a combination of two recessive genes, "dd," what would be the dominant gene found in the corn used to make your product?**

Write down your guess. *Have the students tell about their products, traits, and possible dominant genes.*

*If possible, ask a local grain farmer or seed dealer to explain the types of traits or characteristics of corn and soybeans that are preferred in your area. Have them explain why the traits are popular. Before the farmer or seed dealer visits your classroom, have the students guess which characteristics are popular, how they arrived with the next generation type, and why that would be a popular trait.*

*Think about other plant crops and characteristics that may be affected genetically. For example, apple color, crispness, size; tomato shape, color, texture, number of seeds; and so on.*

# GENE POOL FOR CORN



D = Dominant / d = Recessive

Traits	Female/ Mother	Male/ Father	Offspring Gene Combination	Next Generation Trait
<b>Height</b> D-tall / d-short				
<b>Sweetness</b> D-not sweet / d-sweet				
<b>Kernel color</b> D-yellow / d-white				
<b>Spread</b> D-wide / d-narrow				
<b>Roots</b> D-deep / d-shallow				

(Adapted from Truby, Steve. Dominant/Recessive Characteristics. Ames, Iowa: Iowa State University Extension, March 2001. 4H 4A.)



# ACTIVITY 3 | CATTLE GENE POOLS

15 minutes

**MATERIALS** 10 envelopes or paper lunch bags labeled as described below (*back side of plant envelopes*)  
 10 red circles cut from card stock or cardboard, or use game chips  
 10 white circles cut from card stock or cardboard, or use game chips  
*Gene Pool for Cattle* activity sheet (*one per student, found on page 104*)

Turn the envelopes or lunch bags over and write the following label information.

- |                         |                       |
|-------------------------|-----------------------|
| 1. female/mother/horned | 6. male/father/horned |
| 2. female/mother/color  | 7. male/father/color  |
| 3. female/mother/feet   | 8. male/father/feet   |
| 4. female/mother/height | 9. male/father/height |
| 5. female/mother/face   | 10. male/father/face  |

Put one red and one white circle in each envelope or lunch bag.

## Do

**Combinations of male and female genes give plants their traits or characteristics. Is that what happens in the animal kingdom?**

Yes, gene combinations from a female/mother and a male/father determine a plant's traits or characteristics. Let's see how this works for cattle.

### GENE POOL FOR CATTLE

D = Dominant (red chips) / d = Recessive (white chips)

Traits	Female/ Mother	Male/ Father	Offspring Gene Combination	Next Generation Trait
<b>Horned</b> D-polled, nohorns / d-horned	Sample: d	D	dD	horned
<b>Color</b> D-black / d-red	Sample: D	d	Dd	black
<b>Feet</b> D-normal, two toed / d-mule foot, toes fused	Sample: d	d	dd	mule foot
<b>Height</b> D-normal / d-dwarf	Sample: d	D	dD	normal
<b>Face</b> D-white / d-not white	Sample: D	D	DD	white face

Distribute the *Gene Pool for Cattle* activity sheet and turn the gene pool envelopes or bags over to show the labels. Have the students identify the gene traits listed on the activity sheet. Then have them draw the dominant and recessive genes from the envelopes and record them on their activity sheets. They should continue to fill in the rest of the columns and attempt to draw a picture of the next generation cow. If you have not already completed *Activity Two, Corn Gene Pools*, refer to its *DO* section for more detailed instructions.

## REFLECT

**How many of your cattle had the following traits or characteristics?**

*Have the counters and recorders list the traits and numbers on the board.*

polled	horned	black	red	two-toed feet
mule feet	normal height	dwarf	white face	non-white face

**What were the most common traits?**

**Do the most common new cattle have horns?**

**Are they black or red? What kind of feet do they have?**

**How tall are they?**

**What color face do they have?**

*Have someone draw on the board the most common combination of gene traits in a cow from the herd that's developing in your classroom.*

**Are there any recessive characteristics in the most common new cow drawn on the board?**

**What are they?**

**Did your cattle have any recessive characteristics?**

**What were they?**

**Why do the new cattle have recessive characteristics?**

They have a combination of two recessive gene traits, "dd."

***Where did the gene traits come from?***

*Gene pools from the female/mother (cow) and male/father (bull).*

*You may want to collect the activity sheets to evaluate the students' understanding of dominant and recessive gene trait combinations and next generation traits.*

## APPLY

**What are the most popular breeds of cattle living in Iowa?**

**What do they look like?**

Ask a local producer or an extension agriculture specialist, or check the Internet, especially [www.iabeef.org](http://www.iabeef.org). The students also could look for cows in the country.

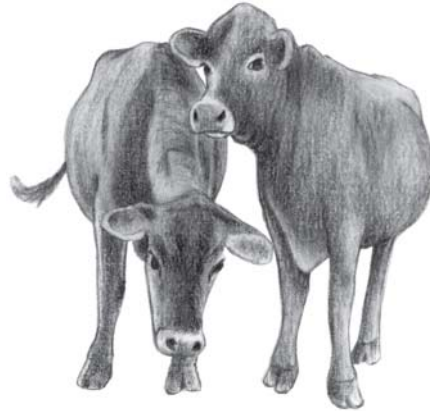
If you could raise a cow, what gene traits would you like it to have? Why?

**What is your favorite pet?**

**What gene traits do you think it has?**

Talk about ears, eyes, height, bone structure, feet, hair length, color, etc.

# GENE POOL FOR CATTLE



D = Dominant (red chips) / d = Recessive (white chips)

Traits	Female/ Mother	Male/ Father	Offspring Gene Combination	Next Generation Trait
<b>Horned</b> D-polled, no horns / d-horned				
<b>Color</b> D-black / d-red				
<b>Feet</b> D-normal, two toed / d-mule foot, toes fused				
<b>Height</b> D-normal / d-dwarf				
<b>Face</b> D-white / d-not white				

(Adapted from Truby, Steve. Dominant/Recessive Characteristics. Ames, Iowa: Iowa State University Extension, March 2001. 4H 4A.)



# ACTIVITY 4 | WHY BOTHER? FOOD PRODUCTION WEB

**10 minutes**

- MATERIALS**
- Chalk or marker board and chalk or markers
  - Butcher paper or sheets from a large flip chart (*one per group*)
  - Markers
  - Iowa Food Production Web poster

**DO**

Write the following two questions on the board.

**What reasons are there to use different gene combinations to create specific plant characteristics?**

**What reasons are there to use different gene combinations to create specific animal characteristics?**

We're going to divide into groups of four. Each group will have 6 minutes to find as many answers as possible to the questions on the board. *Think of an incentive for the winning team such as extra free time, etc.* The winning team will win \_\_\_\_\_ (state incentive). Think about the characteristics of different plants such as flowers and their colors, shapes, etc.; vegetables and their shapes, tastes, textures, etc.; trees and their uses; etc. Think about the characteristics of different animals such as your pets and domestic livestock and their uses. You can use butcher paper, flip chart paper, or two pieces of scrap paper to make two columns. Label one plants and the other animals.

### REASONS TO DEVELOP NEW GENERATION TRAITS

**PLANTS** \_\_\_\_\_

- Examples include:
- Consumers want a specific color and size of flower blossom.
  - People want watermelons with fewer seeds.
  - People want to plant more corn plants per acre.
  - Shorter, thicker stalks hold up in windy conditions.
  - Some gene traits make plants disease resistant.
  - Some cucumbers make crisper pickles.

**ANIMALS** \_\_\_\_\_

- Examples include:
- Pet owners want smaller dogs for their apartments.
  - People want leaner meat (has to do with genetics, feed, environment).
  - Some gene traits lead to more babies.
  - Some traits help disease resistance.
  - The structure of a horse may make it fast.

**REFLECT**

Discuss the reasons specific gene traits may be more desirable. Some of the students' answers may be silly. That will make the exercise more fun. You can discuss the reality of the listed reasons. Also discuss how some traits may not only be linked to genes, but also to food and the environment.

**Where do these reasons fit on Iowa's Food Production Web?**

The icons from Lesson 3, Activity 6, Iowa's Food Production Web, illustrate that consumer choices at the store, what consumers want for storing and processing agriculture items, and how plants and animals grow are all related in some way to genetic traits. *Review the icons from Lesson 3, Activity 6 and discuss them.*

## APPLY

### **Why is genetics such a popular, important field to study?**

People and the environment have demanded or desired that plants and animals have specific traits to improve health or desirability for many, many years. Science and technology enable us to study genes. There are economic incentives involved. There are many people who also believe that we should not study or work with genes. People's values, beliefs, and attitudes determine how they feel and act toward genetic engineering.

### **How have you influenced genetic engineering?**

We influence it by the choices we make when purchasing anything made from agriculture products. Give specific examples such as choosing red apples over green ones; buying seeds to grow tall sunflowers versus short ones; wanting purebred pets with specific ear, eye, coat, tail, and structure characteristics; and choosing one brand of leather sports equipment over another.

## OPTIONAL ACTIVITY IDEAS

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**“HYBRID” HOMEWORK** Find at least one sign, advertisement, Web site, brochure, or newspaper article that has the word “hybrid” in it. Write down information from that source and note where you found it such as the location of the sign, the name and date of the magazine or newspaper, the Web address, or the name and location of the store and the product you found there. **What was the source saying about corn, soybeans, flowers, or apples? Can you figure out and write down what the dominant trait (flavor, texture, color, disease resistant, etc.) of the hybrid is?** Share your findings with your class.

**A BILLION DOLLAR PEST** Complete the *A Billion Dollar Pest* activity prepared by the ISU Extension 4-H Youth Development Food, Fiber, and Environmental Science Program for use in local schools by Iowa Farm Bureau Ag in the Classroom volunteers. Contact your local extension or farm bureau office to locate a copy or have one of the farm bureau volunteers come to your classroom. The activity is about the European Corn Borer and bt corn.

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**REFERENCES** Education Services. *Developing Hybrid Corn*. Des Moines, Iowa: Department of Communications, Pioneer Hi-Bred International, Inc.

Education Services. *Hybrid Seed Production – Glossary of Terms*. Des Moines, Iowa: Department of Communications, Pioneer Hi-Bred International, Inc.

Truby, Steve. *Dominant/Recessive Characteristics*. Ames, Iowa: Iowa State University Extension, March 2001. 4H 4A.

