

Corn in the Classroom – Science of Corn

Course:	Corn in the Classroom
Unit:	Did You Know?
Competency:	Identify how corn grows, improvements in technology, and how farmers effect the environment.
Lesson Title:	Science of Corn
Estimated Time:	30 minutes
Terminal Performance Objective:	
Recognize how science and corn are intertwined	
Enabling Objectives:	
<ul style="list-style-type: none"> - Learn how corn utilizes sun, air, nutrients and water - Identify improvements in corn production (use math skills to determine differences in yields) - Recognize how ethanol is a renewable resource & helps reduce pollution 	
Materials, Supplies, Equipment, References and Other Resources:	
<ul style="list-style-type: none"> - PowerPoint - Corn in the Classroom Activity Book page 9 	

Interest Approach (Motivation):
<p>Question: How many of you and your families are working to be more “green” at home?</p> <p>Segway: By recycling, reusing and even reducing our use of products, we are all working to help clean our environment. But we aren’t the only ones. It is important for everyone to pitch in, in order to make a difference. We also live in a growing world, which requires our farmers to grow more food, feed and fuel to meet the needs of all people. Today we are going to talk about how farmers are growing more corn to meet our needs while still protecting our environment and being “green.”</p>

Instructor Directions/Materials:	Content Outline, Instructional Procedures and/or Key Questions:
PowerPoint - Identify what a plant needs to grow - Identify technology helping farmers improve practices	<ul style="list-style-type: none"> - Learn how corn utilizes sun, air, nutrients and water <ul style="list-style-type: none"> o For corn to grow big and tall it needs air, water, nutrients and lots of sunshine. (all of which Mother Nature helps provide) <ul style="list-style-type: none"> ▪ (Show slide 15) Plants need lots of water to grow tall and produce large ears of corn with healthy kernels. Most of the time rainfall provides enough water to grow healthy plants, however in some places rain is not enough. In these areas farmers water, or irrigate, their crops. Lucky for most farmers, only about 11% of corn in the U.S. requires irrigation. Farmers try to use the least amount of irrigation possible to conserve water. ▪ Plants also release lots of water. Like people sweat, plants put water back into the atmosphere. This is called transpiration and allows the plant to “recycle” the water. o Unlike people, who breathe in oxygen and breath out carbon dioxide, corn plants breathe in carbon dioxide and breath out oxygen – providing us with more air to breathe! o (Show slide 16) To grow big and tall, corn plants also need lots of sunshine. Not only do the plants use the sun to make energy, the sun helps the plant mature and grow.

Instructor Directions/Materials:	Content Outline, Instructional Procedures and/or Key Questions:
	<ul style="list-style-type: none"> ○ Lastly, corn needs nutrients in the soil and from the farmer in order to produce healthy ears (the part of the corn we use). <ul style="list-style-type: none"> ▪ Because sometimes there are not enough nutrients in the soil, farmers help their corn plants by applying extra nutrients (known as fertilizer). ▪ With the help of scientists, farmers continue to learn how to best feed their crops in order to conserve nutrients and only apply the nutrients the plant will use. ▪ Not only do we know more about how crops use nutrients, technology such as Global Positioning Satellites or GPS (like you might use in your car to get directions) helps farmers make maps of their field which shows exactly where nutrients are needed. ▪ In fact, with this information farmers can now produce 87% more corn per pound of fertilizer than they did 35 years ago, keeping our environment healthy. ○ In addition to science like GPS, farmers now have more choices thanks to science and innovation. By identifying different breeds and organisms that can live in different temperatures, live with less water and resist bugs and weeds, scientists have produced genetically modified seeds (GMOs) allowing farmers to produce more corn with less inputs such as nutrients and pesticides. <ul style="list-style-type: none"> ▪ Much like the watermelon and grapes we enjoy which have been modified to produce no seeds, GMOs are safe to consume and help feed the world using less water and pesticides.
<p>PowerPoint</p> <p>- Use math skills to identify improvements in corn production through differences in yields</p>	<ul style="list-style-type: none"> ○ Today farmers grow 5 times as much corn as they did in the 1930s on 20% less land. <ul style="list-style-type: none"> ▪ <i>(On slide 17) Amount of corn grown now – 5 kernels; amount of corn grown in the 1930’s - 1 kernel. This represents how much more we grow now.</i> ▪ <i>On the pie graph, the yellow shows how much land corn farmers use to grow corn now, compared to the entire graph, which is how much land we used to use to grow corn.</i> ○ In 1999 U.S. farmers produced nearly 134 bushels per acre. In 2013 they produced nearly 159 bushels per acre. <ul style="list-style-type: none"> ▪ Much of this progress is due to improvements in science and technology. Science helps each seed grow more quickly and more healthy. In fact, science helps farmers grow 2-5 bushels more per acre each year, allowing us to grow more corn for feed, food and fuel on less ground! ▪ Weather also plays a major role in crop production. Too much or too little rainfall or severely high or low temperatures can reduce yields and damage crops. ▪ <i>How many additional bushels did farmers grow in 2013 compared to 1999? (25) If 20 bushels are due to science, how many of those additional bushels can be contributed to farmers’ improvements? (5)</i>

Instructor Directions/Materials:	Content Outline, Instructional Procedures and/or Key Questions:
<p>Activity book page 9</p> <p>- Recognize how ethanol is a renewable resource and helps reduce pollution</p>	<ul style="list-style-type: none"> ○ We know how important it is to recycle and use materials that are better for the environment ○ Corn is doing just that! Farmers in Missouri and across the U.S. are using corn to make fuel for our cars. Unlike gasoline, which is made from crude oil, ethanol is a renewable fuel source that reduces our dependence on foreign oil and provides cleaner air for us all to enjoy. ○ Even the left over parts of the corn kernel are used after corn is made into ethanol. This leftover is known as distillers grains and is used to feed livestock because it is high in protein and fat. <ul style="list-style-type: none"> ▪ <i>Unscramble the words on activity book page 9 to see how ethanol helps our environment.</i>
<p>Closure/Summary:</p> <p>Review Questions</p>	<ul style="list-style-type: none"> - Just like you and I, farmers are helping to clean the environment. By using technology and recycling, they are protecting the air, water and soil we all live on. - What four things must a corn plant have to grow? A: Sun, air, nutrients, water - What is it called when a plant releases water? A: Transpiration - What do we put in our cars that is better for the environment than gasoline? A: Ethanol