TEACHING OUTSIDE THE CLASSROOM
GROWING TEXAS

Based on Sixth and Seventh Grade Texas Essential Knowledge & Skills

Photograph of Mr. and Mrs. W. M. Hipp in vegetable garden, San Antonio, Texas, 1942. The University of Texas at San Antonio Special Collections.

UTSA INSTITUTE OF
TEXAN CULTURES
A Smithsonian Affiliate

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Introduction

Dear Educator,

Thank you for choosing *Teaching Outside the Classroom: Growing Texas.* These easy to incorporate activities will inspire inquiry-based learning and bring the museum experience to your classroom! This activity includes images and documents intended to inspire outdoor education and participation, while focusing on the geography of Texas.

As a *Let's Move!* museum, the ITC is committed to bridging the gaps between the past, the present, and the future. Through this lesson, we hope that your students are inspired to get outdoors and develop a healthy and active lifestyle. For more information about *Let's Move!* you may visit letsmove.gov.

As educators, we at the ITC understand that you may need to adapt these lessons to fit the constructs of your classroom and the needs of your students. Please feel free to copy the handouts included for personal and educational purposes, or create your own, provided you credit the Institute of Texan Cultures.

We hope that you will visit us at the Institute of Texan Cultures, and continue to use our classroom resources to promote your students' learning experiences. If you have any questions before your visit, please do not hesitate to contact us.

Best,

The Institute of Texan Cultures
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Table of Contents

Texas Essential Knowledge and Skills

Included in this curriculum are lessons that meet the following Texas Essential Knowledge and Skills (TEKS). Lessons may be adapted and/or used by additional grade levels to meet other TEKS not listed.

§113.18. Social Studies, Grade 6, Beginning with School Year 2011-2012.

(6) Geography. The student understands that geographical patterns result from physical environmental processes. The student is expected to: …(B) identify the location of renewable and nonrenewable natural resources such as fresh water, fossil fuels, fertile soils, and timber; and (C) analyze the effects of the interaction of physical processes and the environment on humans.

(7) Geography. The student understands the impact of interactions between people and the physical environment on the development and conditions of places and regions. The student is expected to: (A) identify and analyze ways people have adapted to the physical environment in various places and regions; (B) identify and analyze ways people have modified the physical environment such as mining, irrigation, and transportation infrastructure; and (C) describe ways in which technology influences human interactions with the environment such as humans building dams for flood control.

(20) Science, technology, and society. The student understands the influences of science and technology on contemporary societies. The student is expected to: (A) give examples of scientific discoveries and technological innovations, including the roles of scientists and inventors, that have transcended the boundaries of societies and have shaped the world; (B) explain how resources, belief systems, economic factors, and political decisions have affected the use of technology….(C) make predictions about future social, political, economic, cultural, and environmental impacts that may

(21) Social studies skills. The student applies critical-thinking skills to organize and use information acquired through established research methodologies from a variety of valid sources, including electronic technology. The student is expected to: (A) differentiate between, locate, and use valid primary and secondary sources such as computer software; interviews; biographies; oral, print, and visual material; and artifacts to acquire information about various world cultures; (B) analyze information by sequencing, categorizing, identifying cause-and-effect relationships, comparing, contrasting, finding the main idea, summarizing, making generalizations and predictions, and drawing inferences and conclusions; (C) organize and interpret information from outlines, reports, databases, and visuals, including graphs, charts, timelines, and maps; (D) identify different points of view about an issue or current topic; (E) identify the elements of frame of reference that influenced participants in an event….

§113.19. Social Studies, Grade 7, Beginning with School Year 2011-2012.

(9) Geography. The student understands the location and characteristics of places and regions of Texas. The student is expected to: (A) locate the Mountains and Basins, Great Plains, North Central Plains, and Coastal Plains regions and places of importance in Texas during the 19th, 20th, and 21st centuries such as major cities, rivers, natural and historic landmarks, political and cultural regions, and local points of interest; (B) compare places and regions of Texas in terms of physical and human characteristics; and (C) analyze the effects of physical and human factors such as climate, weather, landforms, irrigation, transportation, and communication on major events in Texas.

(10) Geography. The student understands the effects of the interaction between humans and the environment in Texas during the 19th, 20th, and 21st centuries. The student is expected to: (A) identify ways in which Texans have adapted to and modified the environment and analyze the positive and negative consequences of the modifications; and (B) explain ways in which geographic factors such as the Galveston Hurricane of 1900, the Dust Bowl, limited water resources, and alternative energy sources have affected the political, economic, and social development of Texas.

(11) Geography. The student understands the characteristics, distribution, and migration of population in Texas in the 19th, 20th, and 21st centuries. The student is expected to: (A) analyze why immigrant groups came to Texas and where they settled; (B) analyze how immigration and migration to Texas in the 19th, 20th, and 21st centuries have influenced Texas….

(20) Science, technology, and society. The student understands the impact of scientific discoveries and technological innovations on the political, economic, and social development of Texas. The student is expected to: (A) compare types and uses of technology, past and present… (C) analyze the effects of various scientific discoveries and technological innovations on the development of Texas such as advancements in the agricultural, energy, medical, computer, and aerospace industries; (D) evaluate the effects of scientific discoveries and technological innovations on the use of resources such as fossil fuels, water, and land; and (E) analyze how scientific discoveries and technological innovations have resulted in an interdependence among Texas, the United States, and the world.

(21) Social studies skills. The student applies critical-thinking skills to organize and use information acquired through established research methodologies from a variety of valid sources, including electronic technology. The student is expected to: (A) differentiate between, locate, and use valid primary and secondary sources such as computer software, databases, media and news services, biographies, interviews, and artifacts to acquire information about Texas; (B) analyze information by sequencing, categorizing, identifying cause-and-effect relationships, comparing, contrasting, finding the main idea, summarizing, making generalizations and predictions, and drawing inferences and conclusions; (C) organize and interpret information from outlines, reports, databases, and visuals, including graphs, charts, timelines, and maps; (D) identify points of view from the historical context surrounding an event and the frame of reference that influenced the participants; (E) support a point of view on a social studies issue or event; (F) identify bias in written, oral, and visual material; (G) evaluate the validity of a source based on language, corroboration with other sources, and information about the author; and (H) use appropriate mathematical skills to interpret social studies information such as maps and graphs.

Take Your Classroom Outdoors!

Tips for Creating a Classroom Garden

1. **Commit to it.**
   A classroom garden is a rewarding and wonderful undertaking, but just like your garden at home, it requires regular care. In order for both you and your students to be successful, spend the time necessary to plan your garden and commit to scheduling consistent class time to both work in your garden and harvest the fruits of your labor. Students will not only be able to apply classroom content to a relevant experience, but they will gain confidence in their abilities and learn important qualities such as hard work and follow-through.

2. **Know your zone.**
   When planning your garden, it is essential to know your environment. The USDA divides the United States into 11 Hardiness Zones that helps gardeners and growers determine which plants will thrive at a specific location. This is a great place to start when determining what to plant, but you must also consider light, soil moisture, temperature, duration of exposure to cold, and humidity.

3. **Be practical.**
   If this is your first foray into gardening or if you are a master gardener, you must consider the age and ability of your students. Just as you would create grade-level appropriate activities for your classroom, you should consider the size and type of garden your students will experience success in growing. Don't be afraid to start with small container gardens until you have several successful seasons under your belt.

4. **Be resourceful.**
   With school budgets already tight, building a classroom garden may seem like an added expense that is out of reach. Do not be afraid to ask for support from local nurseries, public gardens or master gardener associations. Businesses and organizations may be willing to donate both materials and time, making your classroom garden into a community success.

5. **Eat what you grow.**
   No food tastes better than when you grow it yourself, so don't be afraid to eat what you grow! Harvest the fruits of your classroom garden and offer your produce to the school cafeteria for use in school lunches. Plan a special meal for educators, parents and community volunteers. Or let students have a special snack to celebrate their gardening successes. Just be sure to consider food allergies before allowing students to try their harvest.

How Does Your Garden Grow?

Estimated Time:

Materials:

- Copies of reproducible *How Does Your Garden Grow*, pages 7-9.

Instructions:

1. Students should complete the accompanying activities and questions:
   - Answer the comprehension questions at the end of each section, and complete the map and garden activity questions

   Recommended websites for completing the activities include:

   http://aggie-horticulture.tamu.edu/organic/files/2011/03/E-502_home_vegetable_guide.pdf

   http://aggie-horticulture.tamu.edu/organic/files/2011/03/E-561_growing_herbs_texas.pdf

   www.almanac.com/plants/hardiness-zone

   - Students will express understanding of gardening by designing their own garden at the end of the activity. They must consider the season, sunlight, and variety of plants when planning their garden.

Note: This assignment may be completed individually, or with a partner.

NAME: _____ DATE: _____ PERIOD

How Does Your Garden Grow?

Directions: Complete the following questions by reading the passages, examining the maps and analyzing the charts.

Why should you grow a garden?

Knowing where your food comes from is one of the first steps you can take in adopting a healthy lifestyle. By adding fresh, locally grown fruits and vegetables to your diet, you will be able to taste and feel the difference healthy foods can make in your body. A garden takes work and dedication, but there are many benefits to eating what you grow.

Local foods are fresher and taste better! Since your fruits and vegetables come straight from your garden and do not have to sit for days in warehouses and on trucks, your food will have better flavor and be better for you. Growing your own food can also help the environment. Your garden helps promote green space in your community, reduces the need for gas-guzzling trucks to haul food from one place to another, and you can learn gardening practices that can improve the soil quality of your garden, making sure your garden will continue growing for years.

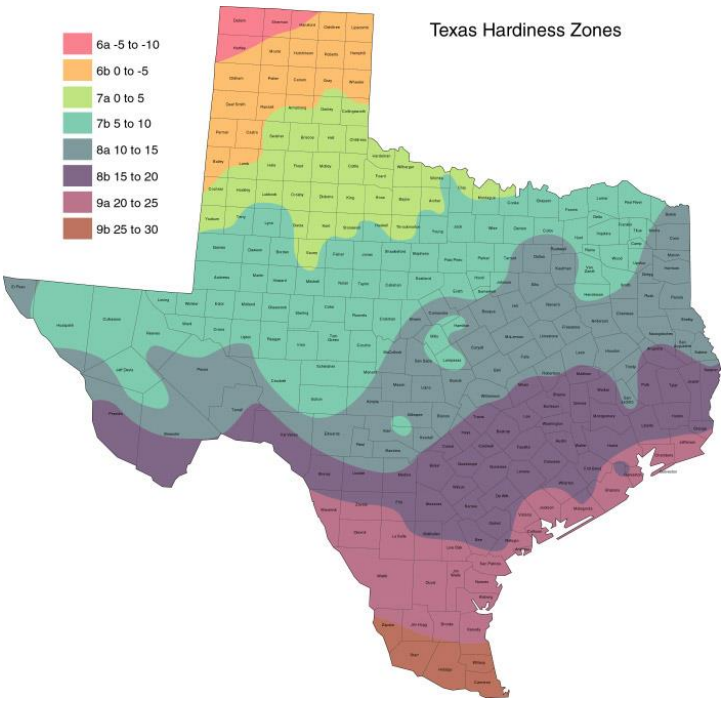
Why should you grow a garden? _____

_____

Know Your Zone

The USDA divides the United States into 11 Hardiness Zones that helps gardeners and growers determine which plants will grow where you live. This is a great place to start when determining what to plant.

Use the map below to determine which hardiness zone you live in. Each zone is labeled with a number and a letter, for example, Brownsville is located in zone 9b. Next to that in the legend you will see the average lowest temperature that area may expect to experience during the winter. This also helps growers determine which plants may survive through the winter.



Put a • in the approximate location of your hometown.

What Hardiness Zone do you live in? _____

What is the average lowest temperature for your zone?

_____

Using the websites provided by your teacher, make a list of fruits and vegetables that would survive in your garden:

- _____
- _____
- _____
- _____
- _____

'Tis the Season

Gardens grow throughout the year, if you are growing the right plants. In Texas, most gardeners plant their gardens in spring, just after the last freeze of the year, and again in the early fall.

Using the websites provided by your teacher, determine if the plants in the word bank should be planted in the spring or fall. Then, write each in the correct column. Hint: Some of them may fall under both columns.

Word Bank

Beans	Mustard
Broccoli	Onion
Brussels Sprouts	Watermelon
Cabbage	Pepper
Carrots	Tomato
Beets	Cucumber
Potato	Asparagus
Peas	Lettuce
Cauliflower	Eggplant
Garlic	

Spring Garden	Year Round	Fall Garden

Some vegetables only grow in specific seasons, but you may be able to find them in the grocery store year-round. Why do you think that is?

_____

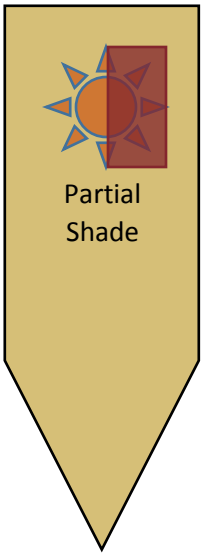
Bring on the Sun

Every plant needs some light as a part of a process called **photosynthesis**. Plants use light, carbon dioxide and water to create the energy they need to grow. How much light a plant needs varies by the type of plant it is. When deciding what plants to include in your garden, you must consider how much sun or shade your garden will get. Plants and seeds are marked with labels that tell you how much sun that particular plant needs to grow. The labels below are like those you might find in fruits and vegetables at your local nursery.

Use the website provided by your teacher to categorize the plants in the word bank as either full sun or partial shade.

Full Sun

_____
_____
_____
_____
_____
_____
_____
_____
_____



Partial Shade

_____
_____
_____
_____
_____
_____
_____
_____
_____

Word Bank

Bean	Radish
Broccoli	Tomato
Lettuce	Carrot
Pepper	Kale
Pea	Pumpkin
Turnip	Cabbage
Spinach	Squash
Parsley	Potato
Okra	Beet

Mix It Up!

Gardens grow best when there is a wide variety of items growing together, and that includes flowers and herbs. Including flowers and herbs in your vegetable garden has many important benefits. Flowers attract bees, which help with pollination- the process that causes plants to be fertilized and develop seeds. Flowers and herbs attract other insects that can be beneficial to your garden, and help keep damage-causing insects away.

Why are flowers important to grow in a vegetable garden?

_____

Herbs also add to a vegetable garden and are great to have in the kitchen! Herbs are used to flavor all different kinds of foods. Most of the time we cook with the leaves, but sometimes we use the seeds and roots, too.

Use the website provided by your teacher to complete the chart about herbs that grow in Texas. You may need to ask a family member to help you think of a dish that uses each herb as flavoring.

Herb	Sunlight it Needs	Parts you Use	Dish it is In
Basil			
Coriander/Cilantro			
Dill			
Oregano			
Rosemary			

Design Your Own Garden

Now that you have completed all of the activities, use the space below to design your own garden. Be sure to indicate which season your garden represents, and include a variety of vegetables, flowers and herbs. Label each item that you plant, and pay close attention to where you place each item. Part of your garden is shady.

Is your garden planted in spring or fall? _____

Growing Texas: An Introduction to Agriculture in Texas

Estimated Time: 30 minutes

Materials:

- Copies of reproducible *Growing Texas: An Introduction to Agriculture in Texas*, pages

Instructions:

1. Instruct students to read *Growing Texas: An Introduction to Agriculture in Texas*.
2. As students read, they should complete the accompanying activities and questions:
   - Answer the comprehension questions at the end of each section.
   - Summarize the content of the reading by writing 2-3 sentences about farming and agriculture in Texas.

Note: This assignment may be completed individually, or with a partner.

NAME: _____ DATE: _____ PERIOD

Growing Texas: An Introduction to the History of Agriculture in Texas

Directions: Read about Texas agriculture and answer the questions that follow.

Texas has long been thought of as a land of opportunity. Travelers in the 1800s reported that Texas had rich soil and thick forests. They described natural harbors and rivers that made travel and shipping by boat easy. These descriptions and the ease of getting land in Texas drew people from all over the United States and the world. They hoped to find a chance to work the land and earn wealth.

Why was Texas appealing to many settlers?

_____

_____

In the 1820s and 1830s, immigrants moved to Texas from all over the United States and Europe. Pioneers came to Texas in search of cheap and farmable land, new opportunities for their families, and adventure in a new frontier.

Thinking Culturally

Most of the early Czech settlers were farmers and believed that having a farm was the best and most creative way of life.

Many Czechs settled in Central Texas. A story says that when they saw some good land, they turned off the road. They kept going until their ox carts got stuck in deep mud. This thick, black soil that stopped their carts would be good for growing crops so that is where they settled.

Why do you think Czech settlers valued farming?

_____

_____

What does your family consider when deciding where to live?

_____

_____

_____

_____

Anglo-American settlers building a log cabin on the Texas frontier. UTSA Special Collections Library.

Families from all cultures settled in Texas and began raising crops for food and eventually for sale. Early pioneers grew corn as their main food crop. It could be eaten fresh, or dried to last through the cold winter months when most plants do not grow. Families usually had a vegetable garden to provide a variety of other foods. They often grew cotton that could be used to make clothing or sold so the family could buy other things they needed.

For early settlers in Texas a family farm was essential to survival. These subsistence farms grew enough to feed the family, and provided some extra that could be sold or bartered to obtain goods and services families would otherwise not have.

What is a subsistence farm?

_____

_____

Following the Civil War, many families in Texas lost their land because of financial difficulties, while other land owners had large amounts of land that they were

unable to farm. Tenant farming began. This allowed farmers to rent land they could not afford to purchase, and it became a way of life in Texas for several decades.

What is tenant farming?

_____

_____

Sharecropping was similar to tenant farming. Tenants received a share of the value of the crops that they grew, minus the costs of renting the land and sometimes the equipment, too. Unfortunately, sharecropping created a cycle of poverty that many Texans could not get out of. By the time the sharecropper paid their debt to the landowner, they often had little money left.

How did sharecropping affect the farmers that worked the land?

_____

_____

Following World War II, farming in Texas started to become big business! Large commercial farms and ranches largely replaced smaller family farms.

Opposing Viewpoints

Read the excerpt below from the oral history of Eugene Ballard and answer the questions that follow.

Well, them, them, people what lived out there, them sharecroppers on Mr. Bob People's place. They'd get out there and, ah, work and make big crops. And have plenty of money. And Mr. Bob People's, he told the white people in the community at that time…he was real caring.

How does this description of sharecropping differ from what you already knew?

_____

_____

Why do you think he has a different perspective?

_____

_____

_____

Spectators watch a tractor demonstration on Eisenhauer farm near San Antonio. UTSA Special Collections Library.

In 1940, there were 420,000 farms in Texas and by 2008 that number had decreased to 247,500. The number of people working on farms has also significantly decreased. In 1940, approximately 23% of Texans worked on farms and ranches, while in 2008 that number is down to below 2%. Despite this decrease in the number of farms and farm workers, Texas continues to rank second among states in highest agricultural production.

How has farming changed in Texas since World War II?

_____

_____

Just as when the early pioneers settled Texas, corn is still an important crop grown in Texas. Cotton, corn, grain sorghum and wheat are the largest cash crops grown in Texas. Cash crops are those crops that are grown for profit.

In addition to those grains, Texas also produces a large amount of fresh produce. Onions were the top cash crop in 2008 and watermelons came in second. Other vegetables grown for mass sale in Texas include cabbage, carrots, squash, cantaloupes and honeydew melons.

What are some of the main crops grown in Texas today?

_____

_____

Summarize What You Learned

Write a brief summary of farming and agriculture in Texas.

_____

_____

_____

Water and Irrigation in Texas

Estimated Time: 30 minutes

Materials:

- Copies of reproducible *Water and Irrigation in Texas*, pages

Instructions:

2. Instruct students to read *Water and Irrigation in Texas*.
3. As students read, they should complete the accompanying activities and questions:
   - Answer the comprehension questions at the end of each section, and complete the map and primary source questions.
   - Summarize the content of the reading by writing 3-4 sentences about aquifers, irrigation and drought in Texas.

Note: This assignment may be completed individually, or with a partner.

NAME: _____ DATE: _____ PERIOD

Water and Irrigation in Texas

Directions: Complete the following questions by reading the passages, examining the maps and analyzing the charts.

Water in Texas

Water is necessary for growing the food that we eat. More than 75% of the world's usable water goes to agriculture. In Texas, we rely on fresh water from 9 major and 21 minor aquifers. An aquifer is an underground layer of rock, gravel, sand, or silt that stores water. The water pumped out of aquifers is called groundwater. In Texas, approximately 79% of groundwater produced is used for irrigating fields to grow crops. Groundwater is also used to meet the needs of people living in towns and cities across Texas. Do you know where your water comes from?

Define aquifer: _____

Why is groundwater important? _____

_____

Irrigation

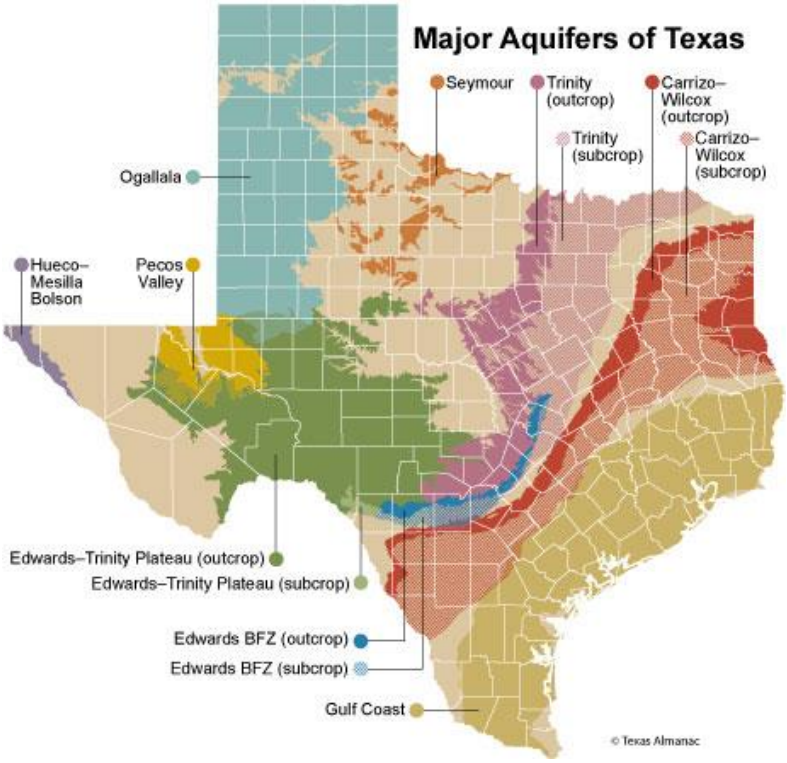
Irrigation is the process used to supply dry land with water through the use of ditches, pipes and/or streams. Irrigation systems may be very simple or highly complex. This process has been around for nearly 4,000 years! In Texas, 16th century records from Francisco Vásquez de Coronado indicate that Native American tribes near El Paso and Pecos irrigated their fields using water from the Rio Grande and Pecos Rivers. Today, complex irrigation systems are used to supply agricultural fields, without which crops could not grow. This system helps Texas to be a leading producer of agricultural products in the United States.

Define irrigation: _____

Why is irrigation important in Texas? _____

_____

Geography Skills



Using the map of major aquifers in Texas, answer the following questions.

Locate the county in which you live. Does your county reside in a major aquifer zone? If yes, which one?

_____

_____

Nearly 97% of water pumped from the Ogallala Aquifer is used for irrigating crops, while only 39% of water pumped from the Gulf Coast Aquifer is used for irrigation. Based on the map, and your knowledge of Texas geography, what do you think accounts for this difference?

_____

_____

_____

Drought

Drought can be a very dangerous weather condition, especially in Texas where we depend upon groundwater to supply our crops and our cities. A drought is a long period without rain that causes damages to crops. Aquifers are recharged, or filled, through precipitation that seeps through the ground. When a drought affects the land, it also affects the groundwater supply. From 2010 through 2012, Texas has experienced an ongoing drought that caused an estimated $7.62 billion in lost crops and livestock. Drought conditions in 2011 were the worst Texas had seen since 1895. In late 2013, approximately 4% of Texas remained in "extreme" or "exceptional" drought conditions, the two most severe categories.

Define drought: _____

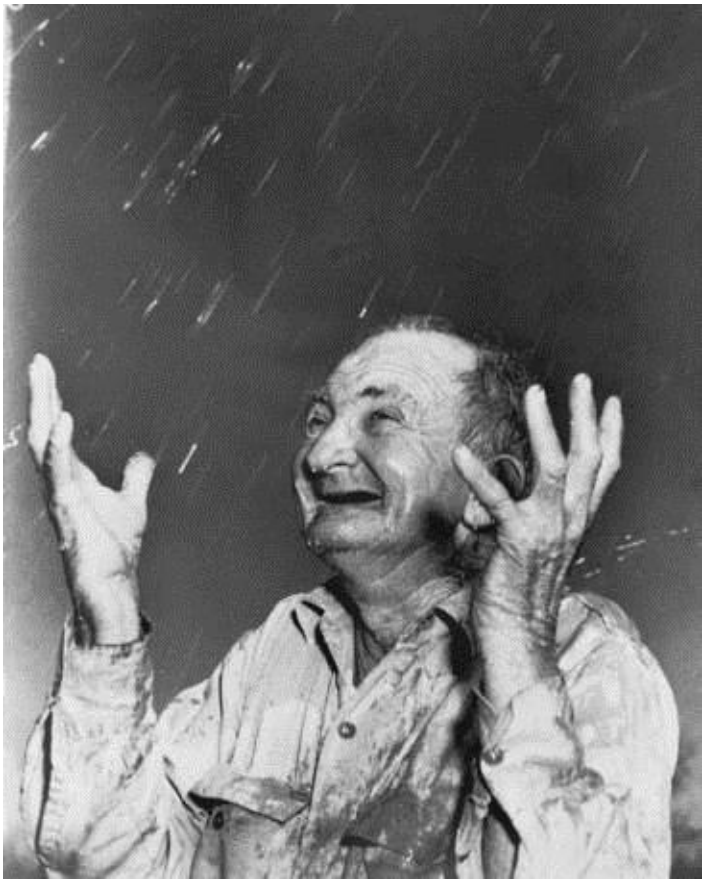
How does drought affect the groundwater supply in Texas? _____

_____

How does drought affect you and your family? _____

_____

Analyzing Primary Sources



Using the historical image, answer the following questions.

Describe what you think is happening in this picture.

_____

_____

_____

How does this picture make you feel?

_____

_____

_____

What does this image tell you about the importance of rain for farmers?

_____

_____

_____

_____

_____

Summarize What You Learned

Write a 3-4 sentence summary about what you learned about aquifers, irrigation and drought.

_____

_____

_____

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Images

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San Antonio Light Collection. "Spectators watch tractor demonstration on Eisenhauer farm near San Antonio". University of Texas at San Antonio Special Collections (L-3823-C).