



Official Breakout EDU Game

Agriculture Breakout!

Game Name:

Agriculture Breakout Challenge!

Game Designer: North Dakota Ag in the Classroom Team

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Content Areas:

Math, Science, Technology, Reading

Recommended Ages:

4th Grade to Adult

Ideal Group Size:

Groups of 4 students; combining to 5 students if needed; depending upon number of boxes.

Suggested Time:

One 55 minute class (Experienced Breakout.edu students will take less time)

Lock Combinations: Prior to the activity, set the locks as follows

3-Digit Lock - 3 Numbers	753
4-Digit Lock - 4 Numbers	2194 (Optional)
Color Lock - 5 colors	Red, Green, Yellow, Orange, Grey
Directional Lock - 5 Directions for the Directional Multilock	↑↑→↓←
Key Lock - Where is the key hidden?	Provided by teacher when mystery word is presented

Setup Instructions:

STEPS	
1	<i>Place flashlight in small box and lock with key lock. I leave the keys in the lock until the point I am setting up the challenge for the students, whereon I pull the keys and put them in my pocket. This reduces the chance of losing keys in the bags etc. The keys are also color coded, so you will tell the students that they need to tell you which color key they need.</i>
2	<i>Place the "LockStar!" sign and any prizes/treats in the large box. Affix the hasp and lock with three locks: color lock, directional lock and 3 digit lock.</i>
3	<i>Set out small cardboard boxes labeled for locks along with the challenge materials for each.</i>
4	<i>The students begin with the small box and the five cards to solve for the mystery word... the red cards, when the incorrect letter from each card is found, and corrected, will spell "Wheat." The yellow cards will spell "Honey."</i>
5	<i>When they present the mystery word, they receive their key and open the small box. They return the materials, small box and lock to the front. They are then given the large box, the GREEN cards (weather challenge) for the directional challenge. I always remind them that they have the clues to open the directional lock and DO NOT have any clues for the other locks. (this usually limits playing with the other two locks while they should be working on clues to open the directional one)</i>
6	<i>After they have successfully opened the directional lock, they return the materials and the lock to the front and receive the BLUE (Major Crops) materials to open the THREE NUMBER lock. Again, a reminder that they only have clues for the three number lock.</i>
7	<i>The process repeats with one student from each group bringing the materials and opened lock to the front and they receive the clues (Farm Resource Regions) for the final, COLOR WHEEL lock.</i>

Reflection Questions:

QUESTION	
1	<i>Describe your favorite puzzle from the game.</i>
2	<i>What was the most challenging puzzle in the game? What made it difficult?</i>
3	<i>Describe how solving a puzzle in the game relates to solving a problem in the real world.</i>
4	<i>Describe something new that you learned from doing this Breakout.</i>
5	<i>Describe how this game relates to what you are learning about.</i>

Alignment to standards:

Agricultural Literacy Outcomes

Agriculture and the Environment

Recognize the factors of an agricultural system which determine its sustainability (T1.6-8.h)

Discover how natural resources are used and conserved in agriculture (e.g., soil conservation, water conservation, water quality, and air quality) (T1.6-8.c)

Food, Health, and Lifestyle

Identify agricultural products (foods) that provide valuable nutrients for a balanced diet (T3.6-8.g)

Science, Technology, Engineering & Math

Explain the harmful and beneficial impacts of various organisms related to agricultural production and processing (e.g., harmful bacteria/beneficial bacteria, harmful/beneficial insects) and the technology developed to influence these organisms (T4.6-8.f)

Identify science careers related to both producers and consumers of agricultural products (T4.6-8.g)

Education Content Standards

Within Geography:

APHG Topic 5B: Agriculture, Food Production, and Rural Land Use: Major agricultural regions reflect physical geography and economic forces.

Learning Objective 1: Identify agricultural production regions associated with major bioclimatic zones.

Learning Objective 4: Explain the interdependence among regions of food production and consumption.

Within Science:

MS-ESS3: Earth and Human Activity: Apply specific principals to design a method of monitoring and minimizing a human impact on the environment.

Common Core Connections

Reading: Anchor Standards

CCSS.ELA-LITERACY.CCRA.R.1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.



CCSS.ELA-LITERACY.CCRA.R.2: Determine central idea or themes and analyze their development; summarize the key supporting details and ideas.

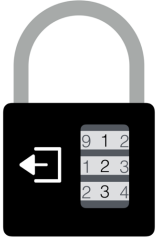
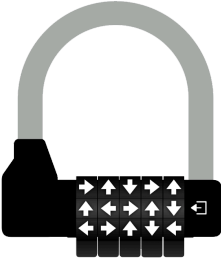
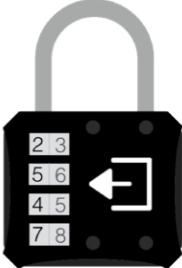
Speaking and Listening: Anchor Standards

CCSS.ELA-LITERACY.CCRA.SL.1: Prepare and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

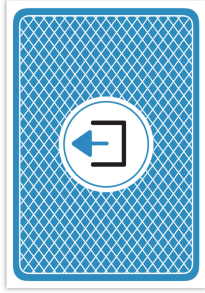
CCSS.ELA-LITERACY.CCRA.SL.2: Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

CCSS.ELA-LITERACY.CCRA.SL.5: Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

LOCK TYPE	LOCK COMBINATION	HOW WILL THEY KNOW THE COMBO?	WHERE WILL IT LEAD?
	<p>Used to lock the small box; the key is given to the students when they present the mystery word written on the card from Activity #1: Production Steps</p>	<p>Activity #1: The students receive five cards describing the production cycle in agriculture. They will need to put the cards in order of the production cycle. They will notice ONE misspelled word on each card. The CORRECT letter or what should be used to spell the word correctly on each card makes the mystery word. They will be directed to write the “mystery word” on the paper and give it to the teacher. The red cards spell WHEAT and the yellow cards spell HONEY.</p>	<p>To begin the game, we give students just the small box and the Activity #1 cards, which is the mystery word. When the students have solved this challenge, they receive the key, the large box and the green materials for the directional lock challenge.</p>
 <p>Directional Multilock</p>	<p>↑ ↑ → ↓ ←</p>	<p>Activity 2: Students will use the UV Flashlight to illuminate the arrows on the Climate Anomalies and Event Maps. They will match these to the numbered cards according to the type of climate described on each card. #1 Rainy Season matches TX ↑ #2 Flooding matches GE & AL ↑; #3 Heat Wave matches Northwest →; #4 Long Cold Season matches Midwest & NE ↓; #5 Drought matches ND area ←</p>	<p>When they have opened the lock, they put it in the box at the front of the class, return the materials and receive the next set for the three number lock. ALSO RETURN FLASHLIGHT.</p>

 <p>3-Digit Lock</p>	<p>753</p>	<p>Activity 3: Students will receive three blue cards (labeled A, B, & C) and the info on the Three Big Grains of the world. The students need to combine the correct answers in the small circles for each card. Card A is $4+3=7$, Card B is $4+1=5$, And Card C $1+2=3$</p>	
 <p>Color Wheel Lock</p>	<p>Set to: Red, Green, Yellow, Orange, Grey</p>	<p>Activity 4: Students will receive small cards with life cycle of a sunflower. They will put the cards in order from seed to sunflower. They will read the questions and match the colors of the regions with the answers: 1-Northern Crescent (Red) 2-Fruitful Rim (green) 3 -Heartland (yellow) 4-Prairie Gateway (orange) 5 - Eastern Uplands (Grey)</p>	
 <p>Four Number Lock</p>	<p>2194 OPTIONAL This challenge requires internet access so I haven't been using it.</p>	<p>Activity 5: The Pest Management Handbook has a QR Code on the back cover. Students will need scan this to have access to a quiz. They will use the information in the handbook to answer the digital quiz. When they have all the answers correct, this code will be revealed.</p>	
ITEM TYPE	COMBINATION / PURPOSE	WHAT WILL THEY DO WITH IT?	WHERE WILL IT LEAD?

 <p>Large Lock Box</p>	<p>Place certificate inside and any treats being provided.</p>		
 <p>Smaller Lock Box</p>	<p>Place Red Lens Viewer and UV Flashlight inside and lock with key lock.</p>		
ITEM TYPE	PURPOSE / ROLE	WHAT WILL THEY DO WITH IT?	WHERE WILL IT LEAD?
 <p>UV Flashlight</p>	<p>Needed to reveal directional arrows on Climate Anomalies and Events maps for Activity 2 (place in small box)</p>		
 <p>UV Pen</p>	<p>Needed for lesson prep to draw arrows on Climate Anomalies and Events maps.</p>		



Reflection Cards

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AGRICULTURE PRODUCER

A farmer is a producer

They **plant seeds** to grow crops. They control weeds and pests and harvest the crop. Many farmers raise and care for animals too.

1

PROCESSOR

A processor makes changes to grain and other products from the farm to make something we can eat or use.



2

DISTRIBUTOR

A **Distributor** will sell and deliver products to **retail stores, warehouses, restaurants or other buyers**. They often drive big trucks!



3

RETAILER

A retailer sells products **to the consumer**. Supermarkets account for about **75%** of all food **sales in the US**.



4

CONSUMER

Most Americans **do not grow** or produce **their own food**. When we buy food and other products, we are the consumer.



5

MYSTERY WORD

Can you solve the mystery word? Write it on this card and bring to your teacher!

— — — — —

M^YSTERY WORD

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Write it on this card and bring to
your teacher!

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AGRICULTURE PRODUCER

Farmers—What do they do?

They prepare the land and plant seeds to grow crops. They must control weeds and pests. Then they harvest the crop. Many farmers raise and care for animals too.

1

PROCESSOR

What do they do?

Most of the products and grains from the farm must go through several changes to make something we can eat or use. This is the role of the processor!



2

DISTRIBUTOR

What do they do?

A Distributor will sell and deliver products to retail stores, warehouses, restaurants or other buyers. They often drive big semi trucks.



3

RETAILER

What do they do?

A retailer sells products directly to the consumer. Supermarkets account for about 75% of all food store sales in the US.



4

CONSUMER

What do they do?

This is the last step in the process, when you make the purchase and buy the product. Most Americans do not grow or produce their own food.



5

MYSTERY WORD

Can you solve the mystery word? Write it on this card and bring to your teacher!

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What is AGRICULTURE?

Agriculture is the business, science and practice of growing and selling plants and animals to be used for food, fiber and fuel.



wheat plant

Wheat provides more nourishment than any other single food. It is the world's *most widely grown food crop*.

Three grains provide more than half of the world's food from plants—wheat, Rice & Corn!



corn plant

Corn

is 3rd in world grain production. The US is the world's leading producer of corn!

Rice is the main food for more than half the people in the world. It is also the second largest crop grown in the world.

Soil is essential for life! *Healthy soil is key for feeding people!*

Water is an vital part of agriculture. Currently, nearly *three*

fourths of the worlds fresh water is used in producing the food, fiber and products that we need to live. Farmers *conserve* and use the available water efficiently.



rice plant

What grain provides **more nourishment** than any other single food?

- 1 Corn
- 2 Rice
- 3 Soybeans
- 4 Wheat

What are the **three grains** that provide **more than half** of the **world's food** from plants?

- 1 Rice, Wheat and Barley
- 2 Corn, Soybeans and Wheat
- 3 Wheat, Rice and Corn
- 4 Wheat, Oats and Corn

What grain is **number three** in total production across the world?

- 1 Rice
- 2 Wheat
- 3 Soybeans
- 4 Corn

How much of our **total available freshwater** is estimated to be **used** in **agriculture**?

- 1 3/4
- 2 3/5
- 3 2/3
- 4 1/2

What grain is the **main food** for over half of the world's population?

- 1 Rice
- 2 Wheat
- 3 Soybeans
- 4 Corn

What kind of soil is the key to feed a growing nation?

- 1 Wet Soil
- 2 Healthy Soil
- 3 Loam Soil
- 4 Rocky Soil

A G R I C U L T U R E

Farm Resource Regions

Basin and Range

- * Largest share of non-family farms
- * 4% of farms, 4% of production value, 4% of cropland
- * Cattle, wheat and sorghum farms

Fruitful Rim

- * Largest share of large farms
- * 10% of farms, 22% of production value, 8% of cropland
- * Fruit, vegetables, nursery and cotton farms

Northern Great Plains

- * Largest farms and smallest population
- * 5% of farms, 6% of production value, 17% of cropland
- * Wheat, cattle, sheep farms

Heartland

- * Most farms (22%), highest value of production and most cropland.
- * Cash grain and cattle farms

Northern Crescent

- * Most populous region
- * 15% of farms, 15% production value, 9% of cropland.
- * Dairy, general crops and cash grain farms

Eastern Uplands

- * Most small farms of any region
- * 15% of farms, 5% of production value
- * Part-time cattle, tobacco and poultry farms

Southern Seaboard

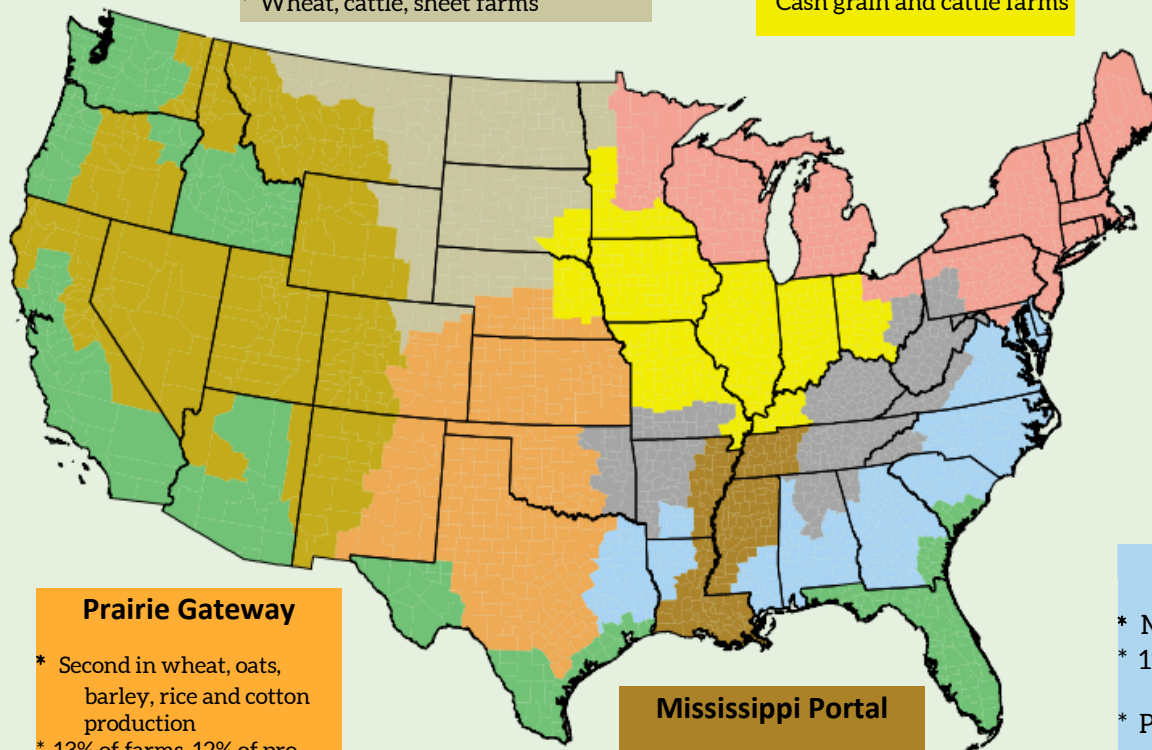
- * Mix of small & large farms
- * 11% of farms, 9% of production value, 6% of cropland
- * Part-time cattle, general field crops, poultry farms

Prairie Gateway

- * Second in wheat, oats, barley, rice and cotton production
- * 13% of farms, 12% of production value, 17% of cropland
- * Cattle, wheat, sorghum, cotton and rice farms

Mississippi Portal

- * 5% of farms, 4% of production value, 5% of cropland
- * Highest proportions of small and large farms
- * Cotton, rice, poultry and



Electronic files linking counties to the Farm Resource Regions are online at the [ERS home page](#).

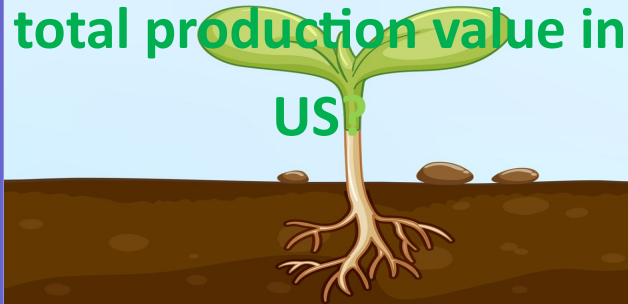
US FARMS

Where does our food come from??

In the United States, what region is **the most populous**, or has the most people living there, and **many dairy farms**?



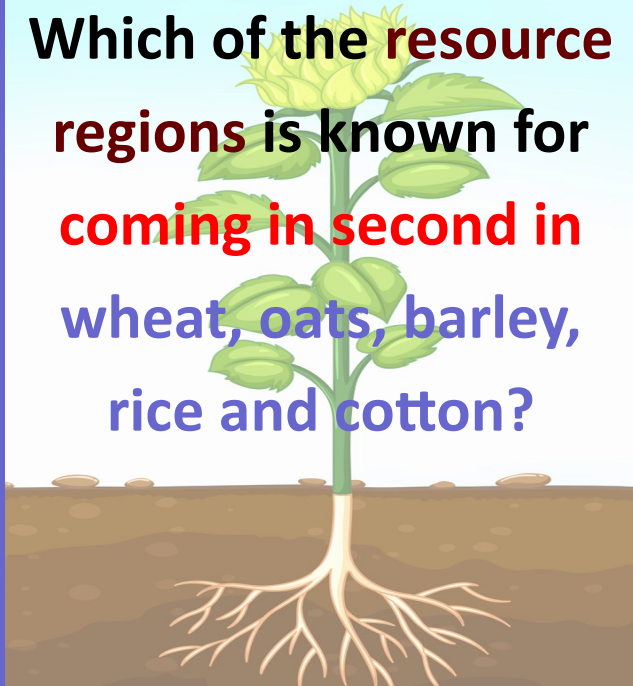
Which region has the **largest share of large farms**, only 8% of cropland but **23% of the total production value in US**?



The *Farm Resource Region* with the **most farms**, the highest value of production, and **the most acres of cropland** is what color?



Which of the **resource regions** is known for **coming in second in wheat, oats, barley, rice and cotton**?



This region of the United States has the **most small farms** and they do not require as much technology as the vast farms of the Heartland



1

Rainy Season

2

Flooding

3

Heat Wave

4

Long Cold
Season

Flooding is the **second-most widespread natural disaster** on earth (wildfires are #1). Land that is normally dry and **be-comes covered or soaked by water can prevent farmers from planting crops** or damage the crop by keeping oxygen from getting to the roots.

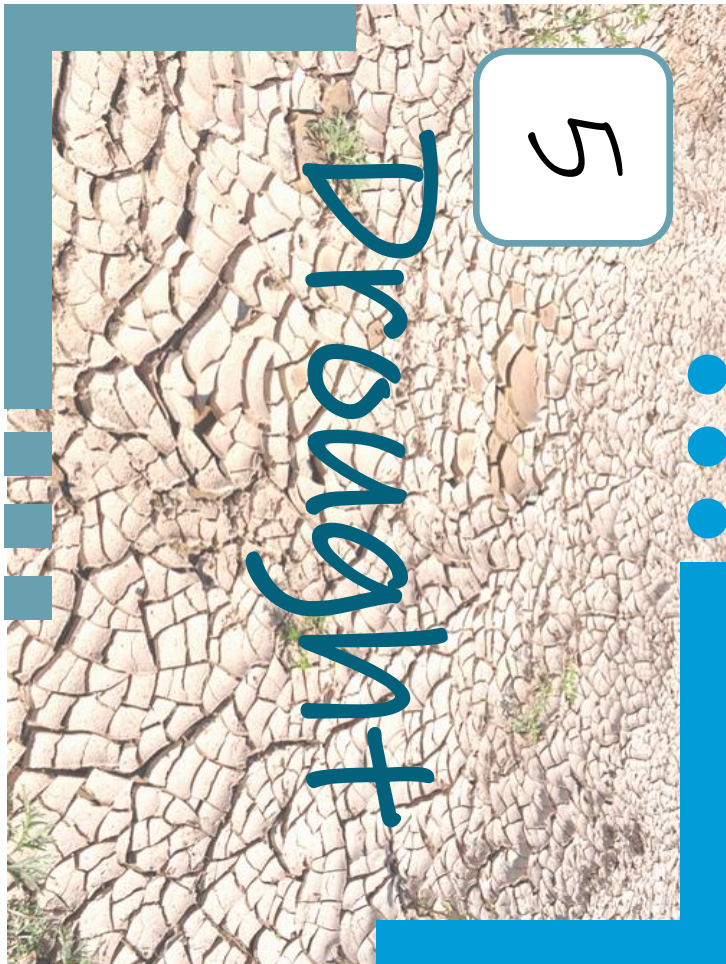
Wet conditions for many days or even weeks may prevent farmers from getting into their fields to plant or harvest. **Tender crops that are** just coming up from the soil die quickly when *they are under water.*

If it is too cold in the early spring, **tender plants can freeze** and die. Later, cold can freeze the cells of a plant, **interrupting the pathways for nutrients and water** to flow.

Above average temperatures **typically lasting for two or more days**, and can greatly speed the **ripening of fruits** and then dehydrate them. It can lead to *poor soil quality*, wind and **water erosion** of soils, and more wildfires.

5

Drought



A long dry period creates a drought. This condition ***does not have*** a definite **beginning or end** like tornados or hurricanes. The effects **may not be seen for weeks or months, when crop** production drops dramatically and ***many crops fail***.

U.S. Selected Significant Climate Anomalies and Events

