# Agriculture Education & Advocacy

## **Lesson 1: Raising Food**

### **Grade Level & Subject:** 6-8 / Life Sciences **Lesson Duration:** 50 minutes (with 10 and 25 minute extensions)

#### **OBJECTIVES**

#### Learning Objectives:

- Students will identify and describe the essential resources needed for raising plants and animals for consumption (general and specific) by collaboratively discovering how to grow the ingredients for a ham and cheese sandwich in a jigsaw activity.
- Students will begin to recognize the factors of an agricultural system which determine its sustainability and make plans for an advocacy project that will improve agricultural and/or environmental systems.
- Students will analyze how human and environmental factors influence agriculture and the growth of organisms, leading to a discussion about the interconnectedness between food and the environment in preparation for the end-of-unit advocacy project.

Food Education Standards:	Content Area Standards:	This lesson also aligns to:
FES4: Food and the environment are interconnected (Recognize how climate and natural resources determine the types of crops and livestock that can be grown and raised for consumption) FES5: Food impacts health.	NGSS MS-LS1-5. Construct a scientific explanation based on evidence for how environmental <del>and genetic</del> factors influence the growth of organisms.	WIDA Standard 1 - Language for Social and Instructional Purposes WIDA Standard 4 - Language for Science

#### **LESSON SYNOPSIS**

Students will deconstruct a ham and cheese sandwich, trace the ingredients back to the sources and determine the environmental factors and resources needed to grow/raise each ingredient. Students will then determine if their school environment could realistically support raising/growing these ingredients, building a foundational understanding of their advocacy project.

Agriculture Education & Advocacy



#### **LESSON PREPARATION**

Prep Steps	Materials
<ul> <li>Make a sandwich or find a picture of one with the described materials (8 ingredients listed here) →</li> <li>Make copies of the student sheets (either online or and assign in Google Classroom or make paper copies)</li> <li>Review the lesson and make adjustments as needed for your class. Pre-assign groups (if desired, random works too).</li> </ul>	<ul> <li>Ham (or turkey), cheese, tomato, onion, lettuce, bread, mayonnaise, pickle</li> <li>Computer with internet connection and projector</li> <li>1:1 student devices (optional)</li> <li>Teacher and Student docs (linked below)</li> <li>Supplemental <u>readings</u></li> </ul>

#### VOCABULARY

- Advocacy [ ad-vuh-kuh-see ] (noun) public support for or recommendation of a particular cause or policy.
- Agriculture [ **ag**-ri-kuhl-cher ] (noun) the science or practice of farming, including cultivation of the soil for the growing of crops or animals to provide food, wool, and other products.
- Consumption [ kuhn-suhmp-shuhn ] (noun) the using up of a resource.
- Environmental factors/conditions [ en-vahy-ruhn-muhn-tl fak-terz ] (noun) the state of the environment, including natural resources (e.g., flora and fauna), soil, surface water, ground water, and any weather conditions like rain, snow, temperature, wind, etc.
- Ingredients [ in-gree-dee-uhnts ] (noun) the pieces or parts that go in to a greater whole
- Sustainability [ *suh*-stey-n*uh*-**bil**-i-tee ] (noun) the ability to be maintained at a certain rate or level.

#### **LESSON ACTIVITIES**

Teacher note: These learning tasks and videos are available online for students with access to 1:1 technology, but they should use headphones when watching videos. If your students do not have access to technology, or you don't want them online, feel free to print off the documents. If students are working online. With all documents, please <u>make a copy</u>, do not request access.

#### Engagement in Phenomena(5 minutes):

- Take out a ham and cheese sandwich (or show a picture of one). Make sure it has at least 8 ingredients: ham, cheese, tomato, onion, lettuce, bread, mayonnaise, pickles.
  - Teacher note: Depending on student populations, you might want to substitute turkey for the ham in the following sandwich. The lessons will generally reference ham (since pigs are more





# common in Illinois than turkeys), but please substitute as needed! The turkey information is at the end.

- As a class, ask, "What are the parts called that go into the food that we eat?" Have students get to the word *ingredients*. Give students 1 minute to see if they can identify everything that went into THIS sandwich.
- On the board or an anchor chart, list all of the ingredients that students brainstorm. Once the ideas are collected, see if the class can come to consensus around the EIGHT that are in this sandwich. If not, help them arrive at the ingredient list.
- Once the ingredient list is complete, ask students if they might have any ideas about where or how these ingredients came to be in our sandwich (ex. Ham comes from pigs). It's ok if students are not correct here, return to it later.. Have students get to the word or idea of *agriculture*, food that is raised and grown specifically for human *consumption* (eating/drinking/using).

#### Instruction (25 minutes):

- **5 minutes** Explain to students that you are curious if WE could agriculturally grow/raise all of the ingredients that went into this ham and cheese sandwich. What would we need to change about our school environment?
- Introduce the learning task students will be divided into groups. Each group will be assigned ONE of
  the sandwich ingredients and do a mini-research project about the *environmental factors/conditions*that are needed to grow/make the *crops/livestock* that the ingredients for the sandwich were made
  out of. Their task is two pronged: 1. Discover the factors that are needed to grow/raise their
  ingredient. 2. Brainstorm how the school environment could be used (hypothetically or realistically!)
  to raise that ingredient.
- Split students into eight heterogeneous groups and assign each group one of the ingredients. Watch the video: <u>Raising Animals</u> (<u>https://vimeo.com/757672130</u>) and hand out the corresponding materials to each group while the video [4:45] plays.
- **5 minutes**: After the video, engage the class in a discussion about the basic resources they noticed in the video (food, shelter, water) and ask them to describe how those resources contribute to the growth and development of the animals. Are the conditions the same for all organisms? Make sure to explore the specific resources needed for plant and animal growth shown in the video (environmental factors like sun, temperature, water, space, protection, food of cows vs chickens for example) and explain how these factors can influence the growth of organisms.
- **15 minutes:** Walk through the learning task with students, letting them know they will have about 15 minutes to complete the task. Have students complete their graphic organizer detailing the environmental and human-influenced factors for raising different plants and animals to make a ham sandwich.
- Circulate throughout the class, making sure students are supporting their thoughts with evidence. Draw out meaning from them asking them to justify their decisions. Ensure students place emphasis on how/why raising the ingredients would/wouldn't work for your school community.





• Collaboration (**10 minutes**): Come back together project the following table (next page) on the board (or draw a similar one)

Ingredient	Plant/Animal	Environmental Needs	Where in our school community could we raise it?	Is this something we could realistically raise?
Ham		• - • - • -		
Bread		• - • -		
Cheese		• - • - • -		
Lettuce		• - • - • -		
Tomato		• - • - • -		
Mayonnais e		• - • - • -		
Pickle		• - • - • -		
Onion		• - • -		





• Students will then present their findings to the class, while you fill out the table, have students explain their ingredient's resource requirements and how those resources support its growth. Have students collaboratively decide on the last column.

#### Closing & Assessment - (10 minutes)

- Facilitate a class discussion to summarize the key takeaways from the lesson, emphasizing the *interconnectedness* between food and the environment. Can all crops/livestock be grown anywhere and everywhere? How do humans have to change the environment to support agriculture? Highlight the findings that not all organisms need the same things to survive, and that specific conditions must be met for organisms to thrive.
- Introduce the concepts of *sustainability* and *advocacy*. Explain to students that even if/when we have an environment that is receptive to agriculture, how do we make sure we maintain that over time? How do we ensure we do not destroy the land? Advocacy is the willingness and ability to advocate (speak up) for a cause or belief that you think is important to create change. Explain to students that at the end of this project they will be working to reflect on an important issue around food and the environment, critically considering the importance of considering both environmental and community factors when planning.
- Assessment: Exit ticket Students will complete an exit ticket assessing knowledge around MS-LS1-5 and Food Education Standard #3.

#### CONSIDERATIONS (What adaptations are needed for diverse learners and/or varying dietary needs?)

- Some students may be vegetarian/vegan or balk at the idea of processing animals into food. Engage students in an empathetic way, validating their concerns and use the opportunity to discuss different diets around the world, in the USA, and in the school community.
- Diverse readings, videos, and visuals were provided, but some students may need support in applying their learning. Support as needed.
- Make sure students have access to language support such as Google Translate.

#### STUDENT SHEETS AND ASSESSMENTS

• Exit ticket available at the end of the student sheets on the next pages





#### **EXTENSION IDEAS**

#### • Short (10 min):

- If you have access to funds/ingredients make ham and cheese sandwiches!
- Being the first lesson extend any/all of the activities to deepen the discussion and understanding
- Long (25 min):
  - Watch Stories of Regeneration: Mollie Engelhart [13:02] -

https://kisstheground.com/mollie-engelhart/ Compare her farm to the school community. Could we do the same thing? Have students analyze real-world examples of how environmental factors have influenced the growth and development of plants and livestock in different regions. Conduct a debate or class discussion on the ethical considerations related to raising animals for consumption and the environmental implications of various farming practices.

#### **REFLECTION AND NEXT STEPS**

Activities that worked	Topics to revisit	Community extension opportunities





# Name \_\_\_\_\_ Date \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_ Date \_\_\_\_\_ Date \_\_\_\_\_

**Directions**: Read the following information on the environmental conditions needed to raise/grow your sandwich ingredient. Once you know what is involved, come up with an idea about where we could grow this in our school environment and what we would need to change to make it happen (Don't worry yet if you and your group think it's possible or not. At this point, all ideas are possible!).

Using the video Raising Animals, your background knowledge, and the ingredient resources, fill in the graphic organizer. If you finish early, please sketch and label a picture that details how your group thinks this might work at our school.

Ingredient - Ham | Animal - Hogs/Pigs - https://peipork.com/wp-content/uploads/2014/01/Pig-Basic2013-HR.pdf

- I. Watch the video: <u>How to Raise Piglets [https://www.youtube.com/watch?v=xiXtV\_hTNzI]</u>
- II. Read the following on raising pigs, focusing your learning on the agricultural aspects



**Housing -** When caring for livestock, housing should always be a consideration. Housing needs vary across species, however for pigs raised in seasonal climates, housing is a must. Pigs have a narrow thermal neutral zone, meaning they thrive and grow best under a narrow temperature range. Unlike sheep, goats, and cattle, pigs do not have a layer of dense hair or wool to act as outer insulation. In the summer, pigs can become sunburned or can easily overheat. When considering housing for pigs, first evaluate the climate that you are in, the location on your farm, and the size and number of pigs you wish to rear. Generally, you need 8 square feet per pig.

**Water** is possibly the most important nutrient. Poor-quality water or not enough water can result in decreased animal health. Water should be fresh, clean, and available at all times.

**Feeders** should be used to prevent pigs from eating off the ground. Well-designed feeders will also reduce feed waste on the ground. There are potential health concerns when pigs eat off the ground, including higher risk of excessive parasitic infections. Generally, it is recommended that each pig needs 12-14 linear inches (35.5 cm) of feeder space. Each pig will eat between 5-7 pounds of food per day which costs about \$40 per month. Pigs have simple stomachs and an efficient digestive system that enables them to eat a wide variety of plant and animal foods, including vegetation, roots, fruits, eggs, flowers, leaves, fish, and dead animals

Information adapted from: https://extension.psu.edu/so-you-want-to-raise-hogs





1. What resources are needed for your ingredient to grow (list at least 3 - be specific):

2. What environmental factors need to be considered for your ingredient to grow (list at least 3 - be specific):









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Name Class	Date

#### STUDENT SHEET: Lesson 1 - Raising Food - Sandwich Ingredient: Cheese (Milk/Cows)

**Directions**: Read the following information on the environmental conditions needed to raise/grow your sandwich ingredient. Once you know what is involved, come up with an idea about where we could grow this in our school environment and what we would need to change to make it happen (Don't worry yet if you and your group think it's possible or not. At this point, all ideas are possible!).

Using the video Raising Animals, your background knowledge, and the ingredient resources, fill in the graphic organizer. If you finish early, please sketch and label a picture that details how your group thinks this might work at our school.

Ingredient - Cheese| Animal - Cows - http://www.neacha.org/brochures/cattle.pdf

- I. Watch the videos:
  - A. <u>Taking Care of Cows</u> [https://www.youtube.com/watch?v=SRKPwWXjQfg]
  - B. <u>Extra Cheese, Please! [https://www.youtube.com/watch?v=C5LHi-mMczY]</u> (you can also read the book if you choose here: <u>https://files.eric.ed.gov/fulltext/ED413574.pdf</u>)
- II. Read the following on raising cows to make cheese. For your ingredient, please focus on raising the cows to get the milk rather than the process of making cheese.



**Housing -** When caring for livestock, housing should always be a consideration. Housing needs vary across species, however for cows, you will need approximately 2- 5 acres of pasture (grass) land per cow. In seasonal climates, housing is a must. Cows have a decent thermal neutral zone, meaning they can live and thrive in a wide range of temperatures, but in very hot summers or very cold winters, they will need shelter. You will need a strong fence to keep the cow penned in and some shade to escape the sun when they want.

**Water** is possibly the most important nutrient. Poor-quality water or not enough water can result in decreased animal health. Water should be fresh,

clean, and available at all times. Your cow will need between 30-40 gallons of water to drink each day.

**Feeders** should be used to prevent cows from eating off the ground except when grazing in their pasture. In addition to the grass they eat, cows should always have access to a good-quality mineral mix formulated for their production needs. High producing dairy cows will eat 110 to 120 pounds of wet feed a day or 50 to 55 pounds of dry matter a day. As cows produce more milk, they eat more. Cost of feeding a cow is about \$3 per day.

Information adapted from: https://extension.psu.edu/so-you-want-to-raise-beef-cattle-print





1. What resources are needed for your ingredient to grow (list at least 3 - be specific):

2. What environmental factors need to be considered for your ingredient to grow (list at least 3 - be specific):









Name	Class	Date

#### STUDENT SHEET: Lesson 1 - Raising Food - Sandwich Ingredient: Tomatoes

**Directions**: Read the following information on the environmental conditions needed to raise/grow your sandwich ingredient. Once you know what is involved, come up with an idea about where we could grow this in our school environment and what we would need to change to make it happen (Don't worry yet if you and your group think it's possible or not. At this point, all ideas are possible!).

Using the video Raising Animals, your background knowledge, and the ingredient resources, fill in the graphic organizer. If you finish early, please sketch and label a picture that details how your group thinks this might work at our school.

#### Ingredient - Tomato | Plants -

https://www.canr.msu.edu/uploads/resources/pdfs/michigan\_fresh\_growing\_tomatoes\_(sp)\_(e3174).pdf

- I. Watch the video: <u>Planting Tomatoes</u> [<u>https://www.youtube.com/watch?v=oy0VJeMbsOk</u>]
- II. Read the following on growing tomatoes.



Start sowing in late-January until late-March. Sow seeds in 7.5cm pots of moist peat free compost, top with a thin layer of vermiculite, then water and cover with cling film. Stand on a warm, bright windowsill or in a propagator.

When your seeds have germinated, remove the cling film (or take them out of the propagator) and keep the compost damp. Transplant seedlings when they reach about 2-3cm tall into 5cm pots filled with moist multi-purpose compost. Return them to the windowsill.

Move your tomatoes outside after the last frost in May. Choose a sunny, sheltered spot, where you can plant them into a border (into soil that has

had plenty of well-rotted garden compost added), or into 30cm pots, or put two or three plants in a growing bag.

Tall-growing tomatoes will require pinching out (removing side-shoots) and staking (tying plants to canes with soft string). When the first tiny fruits begin to appear, strip away the leaves underneath to allow light and air to reach them better. When there are four trusses (clusters) of flowers, pinch out the plant's growing tip. Once flowers appear, feed your plants weekly with liquid tomato food, such as Tomorite. Keep tomatoes well watered because irregular watering causes fruit to split or develop hard black patches, known as blossom-end rot. This is caused by a lack of calcium, which is found in water. Leave tomatoes on the plants so they can ripen naturally, which greatly improves the flavor. Towards the end of the season, prune off the older leaves to let in more light and prevent gray mold fungus taking hold. If the weather turns cold, pick the trusses to ripen indoors.

Information adapted from: https://www.gardenersworld.com/how-to/grow-plants/how-to-grow-tomatoes/





1. What resources are needed for your ingredient to grow (list at least 3 - be specific):

2. What environmental factors need to be considered for your ingredient to grow (list at least 3 - be specific):









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#### STUDENT SHEET: Lesson 1 - Raising Food - Sandwich Ingredient: Mayonnaise (Chickens/Eggs)

**Directions**: Read the following information on the environmental conditions needed to raise/grow your sandwich ingredient. Once you know what is involved, come up with an idea about where we could grow this in our school environment and what we would need to change to make it happen (Don't worry yet if you and your group think it's possible or not. At this point, all ideas are possible!).

Using the video Raising Animals, your background knowledge, and the ingredient resources, fill in the graphic organizer. If you finish early, please sketch and label a picture that details how your group thinks this might work at our school.

#### Ingredient - Mayonnaise | Animal - Chickens (for eggs) -

https://www.northdumfries.ca/en/living-here/resources/Documents/Basic-Chicken-Care-Information.pdf

- I. Watch the videos:
  - A. How to Make Mayonnaise [https://www.youtube.com/watch?v=ypQuZX5MVsl]
  - B. <u>Keeping Chickens [https://www.youtube.com/watch?v=mxYMikfTfpg]</u>
- II. Read the following on raising chickens to get the eggs for mayonnaise. For your ingredient, please focus on raising the chickens rather than the other ingredients or the process of actually making the mayo.



Hens use their coop to sleep and lay eggs. They also need shelter for harsh weather and protection from predators. A coop should provide around 4 square feet (0.4 square meters) of space per bird. For example, if you have 10 chickens, plan on providing a coop that's at least 4'×8' (1.2×2.4 meters) in size. This is the general recommendation for chickens that have access to a larger run or are allowed to free range. Chickens are happiest with adequate outdoor space to roam. A run attaches to your coop and should provide at least 10 square feet (0.9 square meters) of space per bird. Again, this is a general recommendation. The more space you can provide, the better.

**Necessities** - In addition to a safe coop and space to roam, chickens need feed, water, and a source of calcium. Chickens have different nutrient needs depending on their age, so make sure you purchase the appropriate feed. Chickens need consistent access to clean drinking water. If you live in a cold climate, you'll need to invest in a heated poultry drinker to keep the water from freezing in the winter. Laying hens also need access to a source of calcium to maintain healthy bones and lay eggs with strong shells. You should give your hens crushed oyster shells on a regular basis. Furthermore, chickens need access to grit. As chickens can't break down their food on their own, they rely on grit — or small pieces of rock and stone — to break down their food in their gizzard.

Information adapted from: https://www.healthline.com/nutrition/how-to-raise-chickens#chicks-vs-laying-hens





1. What resources are needed for your ingredient to grow (list at least 3 - be specific):

2. What environmental factors need to be considered for your ingredient to grow (list at least 3 - be specific):









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#### STUDENT SHEET: Lesson 1 - Raising Food - Sandwich Ingredient: Onions

**Directions**: Read the following information on the environmental conditions needed to raise/grow your sandwich ingredient. Once you know what is involved, come up with an idea about where we could grow this in our school environment and what we would need to change to make it happen (Don't worry yet if you and your group think it's possible or not. At this point, all ideas are possible!).

Using the video Raising Animals, your background knowledge, and the ingredient resources, fill in the graphic organizer. If you finish early, please sketch and label a picture that details how your group thinks this might work at our school.

Ingredient - Onion| Plants - https://phelangardens.com/wp-content/uploads/2019/02/VEG\_Onions2019.pdf

- I. Watch the video: <u>Grow Perfect Onions [https://www.youtube.com/watch?v=Xr\_QTp2J9Ek</u>]
- II. Read the following on growing onions.



Plant onions in early spring once the ground is workable. In-ground gardens and raised beds are both excellent options for growing onions. Space onion plants 6 inches apart in rows that are 12 inches apart. Grow them in a sunny spot that has fertile, well-drained soil. Improve your native soil by mixing in several inches of aged compost or other rich organic matter. Onions aren't great at taking up water, so it's important to keep soil moist so their shallow roots can drink up.

Growing onions requires abundant sun and good drainage. Raised beds or raised

rows made by mounding up soil are ideal, especially if your soil is heavy clay. Fill raised beds with soil designed to be just the right weight and texture for raised beds. Set plants 1 inch deep, so that their roots are well covered with soil but not buried too deeply. Space plants 6 inches apart in furrows 12 inches apart. Onion roots are shallow and not very efficient at taking up moisture, so they need a steady supply of water to grow without interruption. Although they actually recover well from drought and start growing again when watered, it is best to keep the soil consistently moist until the bulbs enlarge. You can harvest young onions just a few weeks after planting if you want to use them as "spring onions" or scallions.

For full-sized bulbs, let onions grow and mature. They are ready to harvest when the bulbs are big and the tops begin to turn yellow and fall over. Pull them up, shake off the soil, and lay them out to cure with the tops still attached. Any warm, airy location is a good place to do this; you can even sling them over a fence as long as they aren't rained upon. Bulbs must stay dry and have good air circulation. As the onions cure, the roots will shrivel and the necks above the bulbs will slowly dry – a natural process that helps to seal the top of the bulb, making the onions less likely to rot.

Information adapted from: https://bonnieplants.com/blogs/how-to-grow/growing-onions

### foodedu.pilotlightchefs.org





1. What resources are needed for your ingredient to grow (list at least 3 - be specific):

2. What environmental factors need to be considered for your ingredient to grow (list at least 3 - be specific):









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#### STUDENT SHEET: Lesson 1 - Raising Food - Sandwich Ingredient: Bread (Wheat)

**Directions**: Read the following information on the environmental conditions needed to raise/grow your sandwich ingredient. Once you know what is involved, come up with an idea about where we could grow this in our school environment and what we would need to change to make it happen (Don't worry yet if you and your group think it's possible or not. At this point, all ideas are possible!).

Using the video Raising Animals, your background knowledge, and the ingredient resources, fill in the graphic organizer. If you finish early, please sketch and label a picture that details how your group thinks this might work at our school.

#### Ingredient - Bread | Plants - Wheat -

https://plainsgold.com/wp-content/uploads/2012/08/PG-HWWFlyer-FINAL-080813.pdf

- I. Watch the videos:
  - A. <u>Growing Wheat https://www.youtube.com/watch?v=na8KGmrFRcY</u>]
  - B. <u>Harvesting Wheat</u> [<u>https://www.youtube.com/watch?v=Y8ATaktIcSs</u>]
- II. Read the following on growing wheat.



You can plant roughly twenty five plants per square foot, and this can yield between ten and twelve pounds of wheat grain when harvested. You can plant wheat in spring, or in fall, which is also known as winter wheat. Winter wheat is commonly grown by farmers because it's one of the few crops that can be grown easily at this time. Wheat thrives in full sun conditions, and you will need at least six hours of direct sunlight per day to produce a thriving wheat crop. A well-drained soil is best for wheat; poor drainage can lead to problems from excessive moisture. If the soil is too rich or heavy with nitrogen content wheat growth may be stunted. Wheat doesn't need a lot of water and most farmers who grow large amounts of

wheat rely on rainfall for its water needs. This can be challenging in seasons of drought. Home growers may choose to water during drought as needed; this is best done in early morning or at sunset. Drip irrigation is a useful method for watering wheat and keeping excessive moisture from the tops of plants, getting water to the roots where it is most needed.

Temperature is a consideration for growing wheat, because wheat is normally planted either in spring or fall. Spring-planted wheat can withstand higher temperatures, but fall-planted wheat has a longer growing season with cooler temperatures. Heavy rains or long periods of high humidity can affect wheat's growth. If your summers tend to have long periods of humid weather you can try planting wheat in a higher location or one more exposed to wind, which can tend to help the plants stay drier.

Information adapted from: https://www.thespruce.com/wheat-growing-guide-5272256





1. What resources are needed for your ingredient to grow (list at least 3 - be specific):

2. What environmental factors need to be considered for your ingredient to grow (list at least 3 - be specific):









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#### STUDENT SHEET: Lesson 1 - Raising Food - Sandwich Ingredient: Lettuce

**Directions**: Read the following information on the environmental conditions needed to raise/grow your sandwich ingredient. Once you know what is involved, come up with an idea about where we could grow this in our school environment and what we would need to change to make it happen (Don't worry yet if you and your group think it's possible or not. At this point, all ideas are possible!).

Using the video Raising Animals, your background knowledge, and the ingredient resources, fill in the graphic organizer. If you finish early, please sketch and label a picture that details how your group thinks this might work at our school.

Ingredient - Lettuce | Plants - https://agriculture.gov.tt/wp-content/uploads/2017/11/how-to-grow-lettuce.pdf

- I. Watch the video: <u>Growing Lettuce [https://www.youtube.com/watch?v=W9q\_4z3L7L0</u>]
- II. Read the following on growing lettuce.



Plant lettuce during the mild weather of early spring and fall. This nutritious, leafy green is a great option for in-ground gardening, raised garden beds, and containers. Space lettuce plants 6 to 18 inches apart (depending on the variety) in an area that gets a lot of sun and has fertile, well-drained soil.

Although lettuce grows fastest in full sun, it is one of the few vegetables that tolerates some shade. You can grow lots of lettuce in a small space, even a container. Mix it with other taller plants, such as tomatoes in the spring. In the spring, begin

setting out lettuce plants about a month before the last frost. Lettuce grows best within a temperature range from 45 to about 80 degrees. Hot weather makes it bitter; extreme cold freezes it. The most common lettuce pests are aphids. They love leaves and like to hide on the undersides and down in the crown of the plants. You can harvest leaf lettuce from the outside of the plant, leaving the central bud to grow more leaves, or you can cut the entire plant at the base. Leaf lettuce is ready to eat at just about any size, and you can pick the baby leaves for tender salads. Romaine lettuce forms its characteristic mid-rib before harvest; at full size it makes an upright leafy clump. Bibb types such as Buttercrunch form a loose head; you can harvest anytime, but for the classic Bibb rosette, wait until the lettuce is nearly full size (6 to 8 inches in diameter) and cut it at the soil line. Lettuce tastes sweetest in cool weather, which is why it is such a great fall crop. As the weather warms, plants will go to seed. By the time they begin to stretch and send out a seed stalk (called bolting), the leaves are bitter. When this starts to happen, harvest all your lettuce immediately and try storing it in the refrigerator, where some of the bitterness may disappear.

Information adapted from: <u>https://bonnieplants.com/blogs/how-to-grow/growing-lettuce</u>





1. What resources are needed for your ingredient to grow (list at least 3 - be specific):

2. What environmental factors need to be considered for your ingredient to grow (list at least 3 - be specific):









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#### STUDENT SHEET: Lesson 1 - Raising Food - Sandwich Ingredient: Pickles (Cucumbers)

**Directions**: Read the following information on the environmental conditions needed to raise/grow your sandwich ingredient. Once you know what is involved, come up with an idea about where we could grow this in our school environment and what we would need to change to make it happen (Don't worry yet if you and your group think it's possible or not. At this point, all ideas are possible!).

Using the video Raising Animals, your background knowledge, and the ingredient resources, fill in the graphic organizer. If you finish early, please sketch and label a picture that details how your group thinks this might work at our school.

Ingredient - Pickles (Cucumbers): https://secure.caes.uga.edu/extension/publications/files/pdf/C%201034\_4.PDF

- I. Watch the videos:
  - A. <u>Growing Lettuce</u> [https://www.youtube.com/watch?v=W9q\_4z3L7L0]
  - B. <u>Making Pickles</u> [https://www.youtube.com/watch?v=\_drkd5oNvpg]
- II. Read the following on growing cucumbers. Focus your learning more on growing cucumbers rather than making pickles.



Cucumbers need warm, fertile soil. Plant seedlings 36 to 60 inches apart, depending on variety (check the stick tag). In areas where spring is long and cool, you can warm the soil 3 to 4 degrees by covering the hill or row with black plastic. If you do not plant in black plastic, then mulch with pine straw, wheat straw, chopped leaves, or your favorite organic mulch shortly after planting. If the weather is unseasonably cool, you can wait a while to mulch until the ground is warmed by the sun. If you can, trellis your vines. This keeps the fruit clean and saves space.

Cucumbers grow fast and don't demand a lot of care. Just keep the soil consistently moist with an inch of water per week (more if temperatures sizzle and rain is scarce). Inadequate or inconsistent moisture causes oddly shaped or poor-tasting fruit. Several pests bother cucumbers. Squash bugs may attack seedlings. Slugs like ripening fruit. Aphids can colonize leaves and buds. Straw mulch helps keep slugs at bay, as can trellising vines to get the fruit off the ground. Vines are also bothered by cucumber beetles, which chew holes in leaves and flowers and scar stems and fruits, but worse than that, they spread a disease that causes the plants to wilt and die. You can pick cucumbers whenever they're big enough to use. Check vines daily as the fruit starts to appear because they enlarge quickly. Vines produce more fruit the more you harvest. To remove the fruit, use a knife or clippers, cutting the stem above the fruit. Pulling them may damage the vine. Don't let the cucumbers get oversized or they will be bitter, and will also keep the vine from producing more.

Information adapted from: https://bonnieplants.com/blogs/how-to-grow/growing-cucumbers

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1. What resources are needed for your ingredient to grow (list at least 3 - be specific):

2. What environmental factors need to be considered for your ingredient to grow (list at least 3 - be specific):









Name	Class	Date
		B 410

#### STUDENT SHEET: Lesson 1 - Raising Food - Sandwich Ingredient: Turkey

**Directions**: Read the following information on the environmental conditions needed to raise/grow your sandwich ingredient. Once you know what is involved, come up with an idea about where we could grow this in our school environment and what we would need to change to make it happen (Don't worry yet if you and your group think it's possible or not. At this point, all ideas are possible!).

Using the video Raising Animals, your background knowledge, and the ingredient resources, fill in the graphic organizer. If you finish early, please sketch and label a picture that details how your group thinks this might work at our school.

#### Ingredient - Turkey | Animal -

https://extension.unh.edu/sites/default/files/migrated\_unmanaged\_files/Resource000475\_Rep497.pdf

- III. Watch the video: <u>How to Raise Turkeys [https://www.youtube.com/watch?v=0xHMv92tkkE]</u>
- IV. Read the following on raising turkeys, focusing your learning on the agricultural aspects



**Housing -** Provide an indoor (nesting spot) location of 6 square feet for the turkeys in addition to 20 square feet or more outdoors. Provide a roosting area if possible. Keep them inside at night to provide more control over parasites and keep them safe from predators. Turkeys are social birds, so plan to spend time with them while you're outside. Allow one square foot of space for the young birds, up until they're two months of age. Keep them in a brooder to stay warm, dry, and contained until they're six weeks. Keep the brooder area draft-free. Young poults cannot regulate their body temperature for the first ten days. Use brooder guards, especially during the first week to keep the birds in place. After that, provide the space mentioned above. You can gradually increase the space if needed. Sources also say it's best to raise turkeys in groups of three to six. Turkeys in your backyard are a fun experience after they get through the most difficult few weeks.

**Water** is possibly the most important nutrient. Poor-quality water or not enough water can result in decreased animal health. Water should be fresh, clean, and available at all times.

**Feeders** If this is your first experience in keeping turkeys, make sure the birds eat within the first 12 hours of arrival at their new home. Sources suggest they learn to drink water before you feed them. Provide clean water to them at all times. Most poults (babies) will only be a day old, possibly two when you get them home. Put down wood shavings in their space, but not sawdust or newspaper. They may eat the sawdust instead of starter food and starve themselves to death. Newspaper on the floor can create splayed legs from slipping and sliding around.

Information adapted from: https://www.gardeningknowhow.com/garden-how-to/beneficial/raising-turkeys-at-home.htm

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#### TEACHER TABLE:

Ingredient	Plant/Animal	Environmental Needs	Where in our school community could we raise it?	Is this something we could realistically raise?
Ham		• - • - • -		
Bread		• - • - • -		
Cheese		• - • -		
Lettuce		• - • - • -		
Tomato		• - • - • -		
Mayonnaise		• - • - • -		
Pickle		• - • -		
Onion		• - • - • -		





# Name \_\_\_\_\_\_ Date \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_ Date \_\_\_\_\_

Based on the data and information collected from the class, do you think we could realistically ever raise all of the ingredients that go into a ham sandwich (pigs, cows, chickens, wheat, lettuce, tomato, lettuce, cucumber) in our school community? Why/why not? How would/wouldn't our environmental conditions provide the resources for the ingredients?

	Excellent	Acceptable	Basic	Not Complete
<b>Claim</b> - An assertion that something is true	Makes a claim that is sufficient to answer the question <b>and</b> is coherent.	Makes a claim that is sufficient to answer the question <b>or</b> is coherent	Makes a claim but it is not sufficient or coherent enough to answer the question	Does not attempt to make a claim.
Evidence - Support for your claim	Sufficient evidence is provided to support the claim <b>and</b> it is coherently presented	Sufficient evidence is provided to support the claim <b>or</b> it is coherently presented	Evidence is provided to support the claim but it is not sufficient <b>or</b> coherently presented	No evidence is provided to support the claim
Reasoning - Explain how/why your evidence supports your claim and conclude the argument	Includes all of the following: Describes how the cited evidence defends the claim Concludes the argument in a logical way Reader feels compelled to accept your argument	Includes two of the following: Describes how the cited evidence defends the claim Concludes the argument in a logical way Reader feels compelled to accept your argument	Includes one of the following: Describes how the cited evidence defends the claim Concludes the argument in a logical way Reader feels compelled to accept your argument	Includes none of the following: Describes how the cited evidence defends the claim Concludes the argument in a logical way Reader feels compelled to accept your argument

Adapted from: https://www.chemedx.org/blog/%E2%80%9Cscience-reasoning-rubric%E2%80%9D-support-argumentative-writing

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