

Agricultural Invention Connection



Throughout history, agricultural inventors and inventions have played a key role in growing, harvesting and processing food, fuel and fiber to satisfy our most basic human needs.

Grade Level: 5

Objectives:

- Identify agricultural inventors and their respective inventions.
- Examine one agricultural inventor/invention
 - Research this inventor/invention, including timelines, terminology, procedures and historical significance
 - Write an informative essay conveying research findings.

Educational Standards

Writing:

CCSS.ELA-LITERACY.W.5.2

Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

Reading:

CCSS.ELA-LITERACY.RI.5.7

Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.

CCSS.ELA-LITERACY.RI.5.8

Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s).

CCSS.ELA-LITERACY.RI.5.9

Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.

CCSS.ELA-LITERACY.RI.5.10

By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 4-5 text complexity band independently and proficiently.

Materials

- ☐ Book: The Inventor's Secret by Susanne Slade
- ☐ Photos of agricultural inventions
- ☐ Separate pages with the year of each invention, to match the photos
- ☐ Classroom/student tablets
- ☐ Books and web-based resources for research
- ☐ Writing journals or paper/pencil for recording research
- ☐ Guided Research Worksheet
- ☐ Consider [Read Write Think](http://www.miagclassroom.org) for additional pre-writing and writing resources

Engagement

Key Question:

What inventions play a key role in growing, harvesting and processing food, fuel and fiber to satisfy our most basic human needs?

Introduction:

Read The Inventor's Secret by Suzanne Slade

Opening Activity:

Mix up and spread pictures of agricultural inventions and papers with years out on the floor. Ask students to work together to predict the matched pairs of invention and year. At first, allow students to try to make matches without an explanation of what each item is. After some time has passed, provide explanations of remaining or incorrectly matched items to assist in pairing. Continue as time allows until either all are correct or students need further assistance. Reveal correct years and item pairs along with explanations of any remaining items.

Discussion Questions:

- Was there an item you'd never heard of before?
- What year/invention pair surprised you the most?
- Which item did you think was the oldest before finding the year?
- Which items did you think was most modern (newest) before finding the year?

Procedures

1. Each student will research one agricultural invention and its inventor. (if needed, two students may be assigned the same item due to quantities)
2. Utilize the attached pre-writing guide to assist in research answering the following questions:
 - How has _____ invention made an impact on society?
 - Who, what, where, when, why and what now?
3. Pre-writing Review: After research and outline is complete, teacher should work individually or in pairs with students to review research and essay outline. Provide feedback on validity of resources and structure of outline prior to students writing essay.
4. Peer Review: After first drafts of papers are written, provide time for peer reviews utilizing the peer review checklist. Emphasize peer reviews are a positive, helpful way writers work together to make improvements to their writing. Students should make revisions before final papers are submitted.
5. Submit final papers with a reference page and utilize rubric for grading.

Timeframes for research, writing and amount of class time could vary by class.

Evaluation

Utilize attached rubrics for research review, peer editing and final essay.

Peer Review Check list

Reviewer's Name: _____

Writer's Name: _____

What is the invention?

Who is the inventor?

Double Check Facts

Can you locate the following:

- ☐ Date Invented
- ☐ Location of Invention
- ☐ Purpose of this invention
- ☐ Short description of how the invention functions
- ☐ Is this item still used today?

Compliments

Name three things you liked about the author's writing:

1. _____

2. _____

3. _____

Suggestions

What suggestions do you have for the author?

Consider organization, word choice, sentence length, topic and details.

Edits

Read through your peer's essay to double check for any spelling errors, spacing problems, missed punctuation or other errors. Mark any corrections directly on the essay.

Adapted from: Peer Review Strategy Guide, Read Write Think

<http://www.readwritethink.org/professional-development/strategy-guides/peer-review-30145.html#related-resources>



Michigan

Agriculture in the Classroom

www.miagclassroom.org

Pre-writing Research Guide

Writer's Name: _____

What is the invention?

Who is the inventor?

When was the item invented?

Where was it invented?

What does this item do?

Why is this item important to society?

Does this item still exist today? Has it been modified in some ways?

What other items did this inventor create? (some inventors may not have any other items)

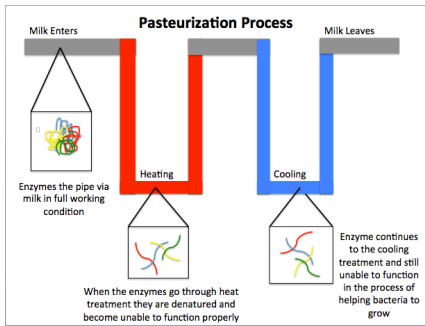
Writer's Name: _____

Topic

_____ made an impact on society by _____
(invention)

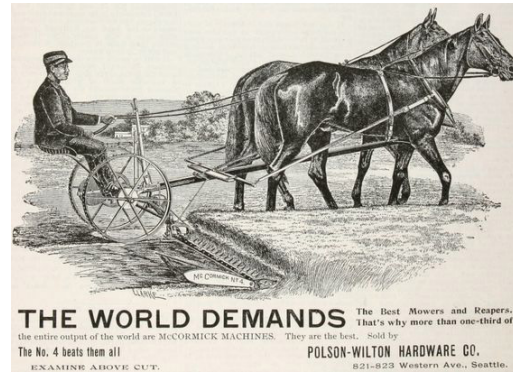
Introduction		
Main Idea 1	Main Idea 2	Main Idea 3
Supporting Details	Supporting Details	Supporting Details
Conclusion		

Agricultural Inventors Answer Key



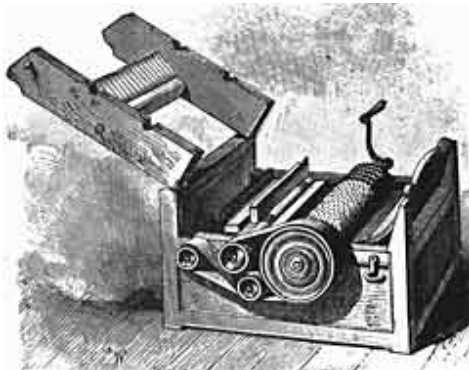
1864 Pasturization

The process of using heat to kill bacteria, such as in milk.
(Louis Pasteur)



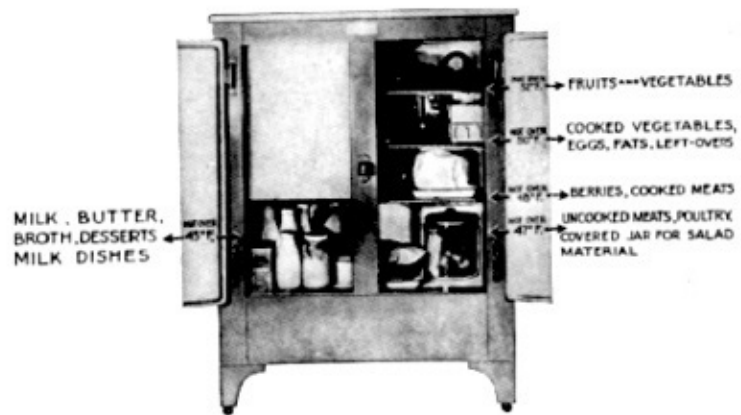
1834 "reaper" harvester

First machine to cut stalks or grasses using a reciprocating knife. (Cyrus McCormick)



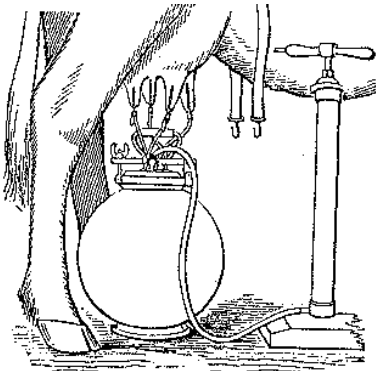
1793 Cotton Gin

Separates the sticky cotton seeds from the full cotton bolls for easier processing.
(Eli Whitney)



1802 Icebox

The first version of a refrigerator, the icebox stored ice in an insulated compartment to keep food cold. (Thomas Moore)



1878 Milking Machine

This first version of a milking machine did not function well but influenced future designs. (Anna Baldwin)



1867 Barbed Wire Fence

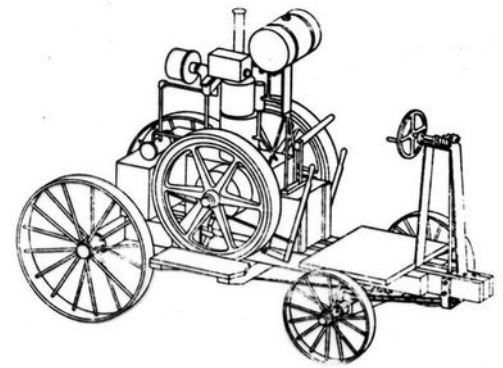
The first wire strong enough to hold in cattle. Cheaper and easier to handle than wood fences. (Lucien B. Smith)

Agricultural Inventors Answer Key Page 2



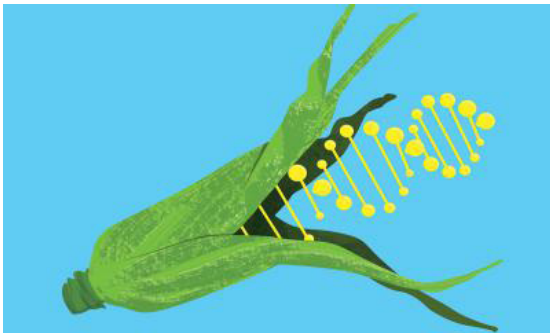
Roman Times

Growing plants in a controlled environment began in the Roman times and has improved over time.
(Emperor Tiberius)



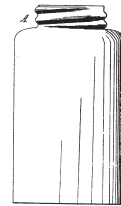
1892 Gasoline Power Tractor

Though steam engines already existed, this was the first gasoline powered tractor. (John Froelich)



1983 Genetic Engineering of Plants

Genetic modification in plants began to improve characteristics in plants.
(Herbert Boyer and Stanley Cohen)



1858 Mason Jar

A glass canning jar to preserve food at home was a big help to safely eat foods all year. (John L. Mason)

For more information about these or other innovations, visit Growing a Nation, the history of American agriculture at:
www.agclassroom.org/gan



1970 Harvey Harvester

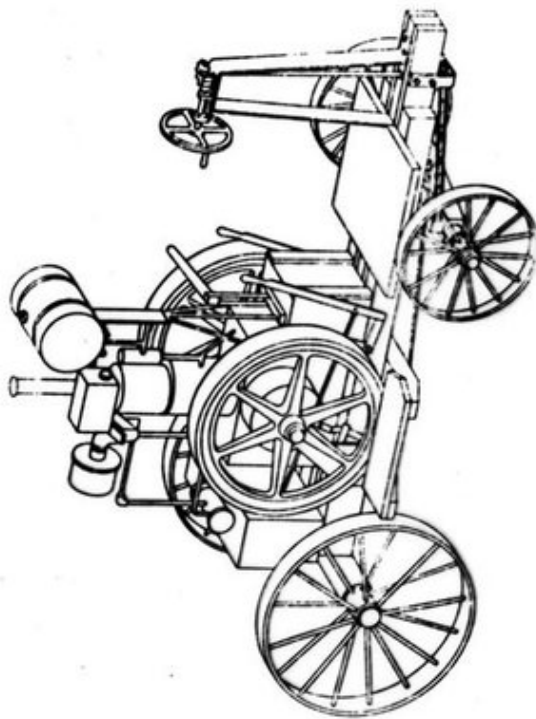
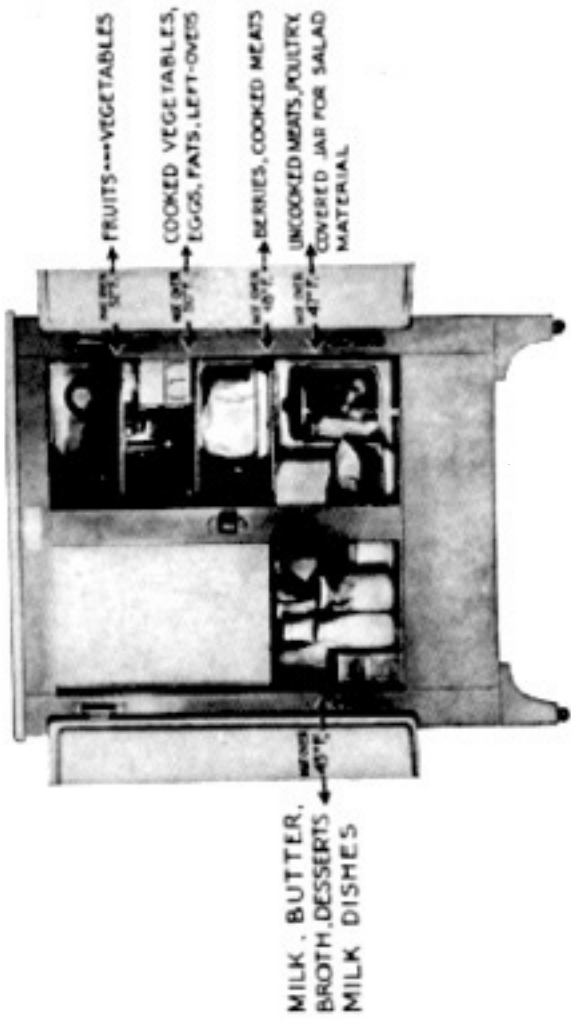
Drives over the rows of blueberry bushes and shakes off berries. (John P. Harvey)

www.miagclassroom.org

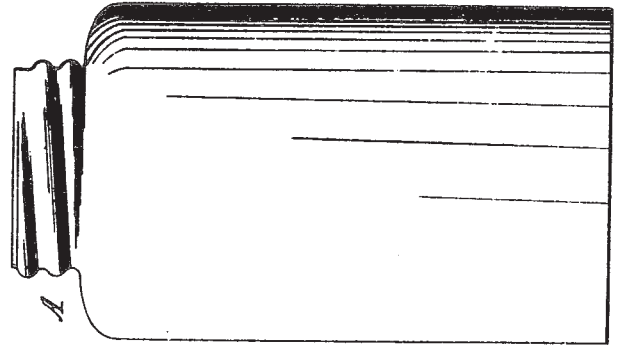
Agricultural Invention Connection Pre-Writing Research Rubric				
	Below Standard	Approaching Standard	At Standard	Above Standard ✓
6 W Questions (Who, what, where, when, why and what now?)	I correctly answered 3 or less of the 6 W questions	I correctly answered 4 of the 6 W questions	I correctly answered all 6 W questions	
Understanding of Invention	I don't know what my invention is or how it helps society.	I correctly identified my invention but I still need to understand how it helps society.	I understand what my invention is and how it helps society.	
Research Sources	I found less than 2 reliable resources about my invention.	I only found 2 reliable resources about my invention.	I found at least 3 reliable resources about my invention.	
Organization of Information	My pre-writing guide is not complete.	My pre-writing guide is complete but I need to work on the order of my information.	My pre-writing guide is complete and organized.	

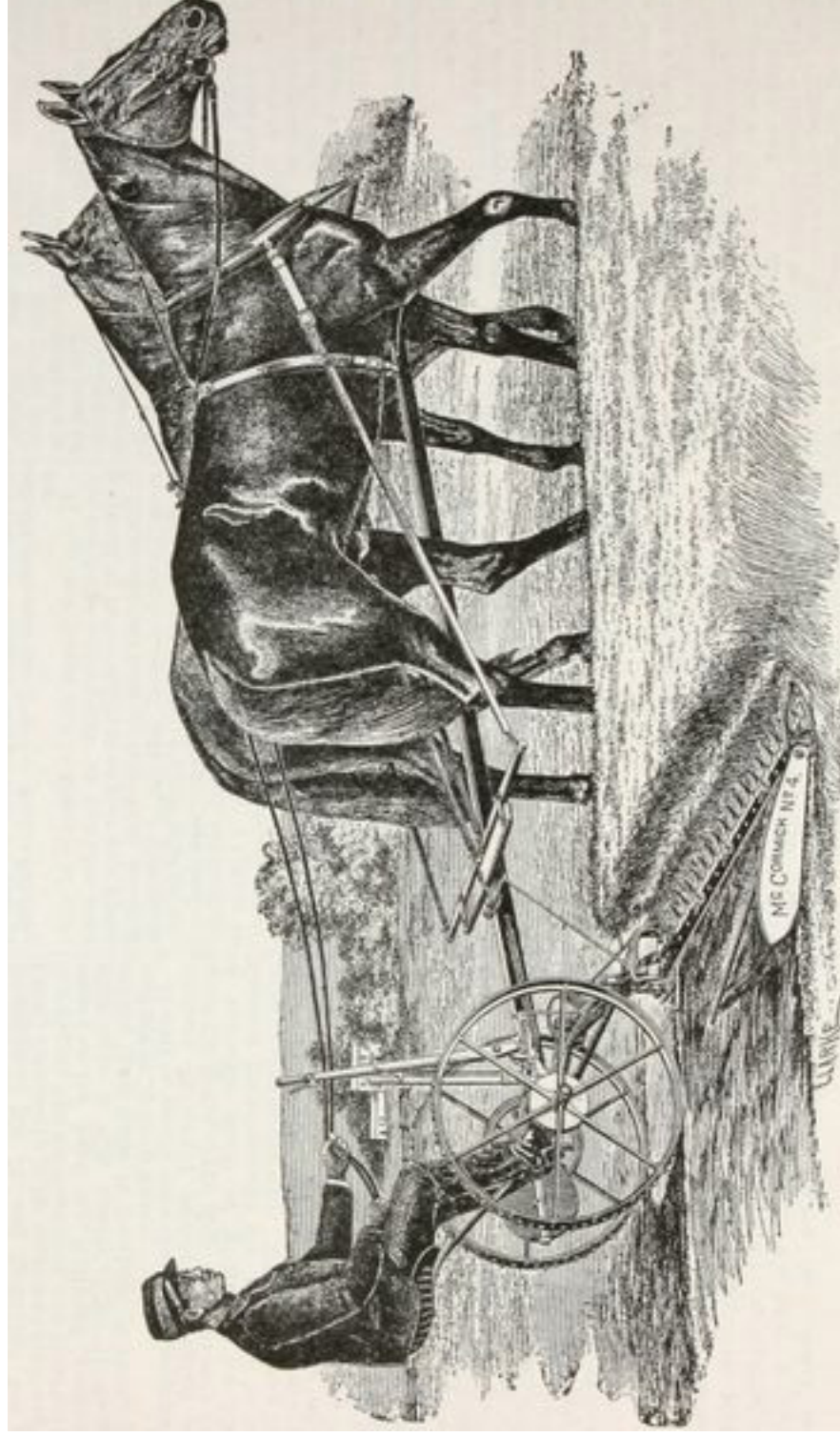
Agricultural Invention Connection Research Essay Rubric				
	Below Standard	Approaching Standard	At Standard	Above Standard ✓
6 W Questions (Who, what, where, when, why and what now?)	Writer included answers to 3 or less of the 6 W questions in the body of the essay.	Writer accurately included answers to only 4 of the 6 W questions in the body of the essay.	Writer accurately included answers to the 6 W questions in the body of the essay.	
Understanding of Invention	Writer incorrectly identifies the invention and does not understand how it functions or impacts society.	Writer correctly identified the invention but still needs to show further understanding of it's functions and/or impacts to society.	Writer shows an indepth understanding of the invention, it's impacts to society and an explanation of it's functions.	
Research Sources	Utilized less than 2 reliable resources about the invention.	Utilized only 2 reliable resources about the invention.	Utilized at least 3 reliable resources about the invention.	
Organization of Information	Writer conveys information but it is not in the proper order and is missing an introduction, body and conclusion.	Writer demonstrates partial organization of informational writing but may be missing a logical order or structure.	Demonstrated proper organization of informational writing. Clearly included an introduction paragraph, followed by body paragraphs and a conclusion.	
Grammar/Spelling	Frequent capitalization, punctuation, and spelling errors make writing difficult to understand.	Writer uses some capitalization, correct punctuation and correct spelling but document contains some errors which do not detract from over all message.	Writer uses proper capitalization, correct punctuation and document is free of spelling errors.	





MODEL H TRACTOR, made by John Froelich of Iowa in 1892, was the first practical self-propelled gasoline tractor. It was also the first to propel itself both forward and backward.





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Pasteurization Process

Milk Enters



Functioning enzymes enter the pipe in the milk

Heating



When the enzymes go through heat treatment they are denatured and become unable to function properly

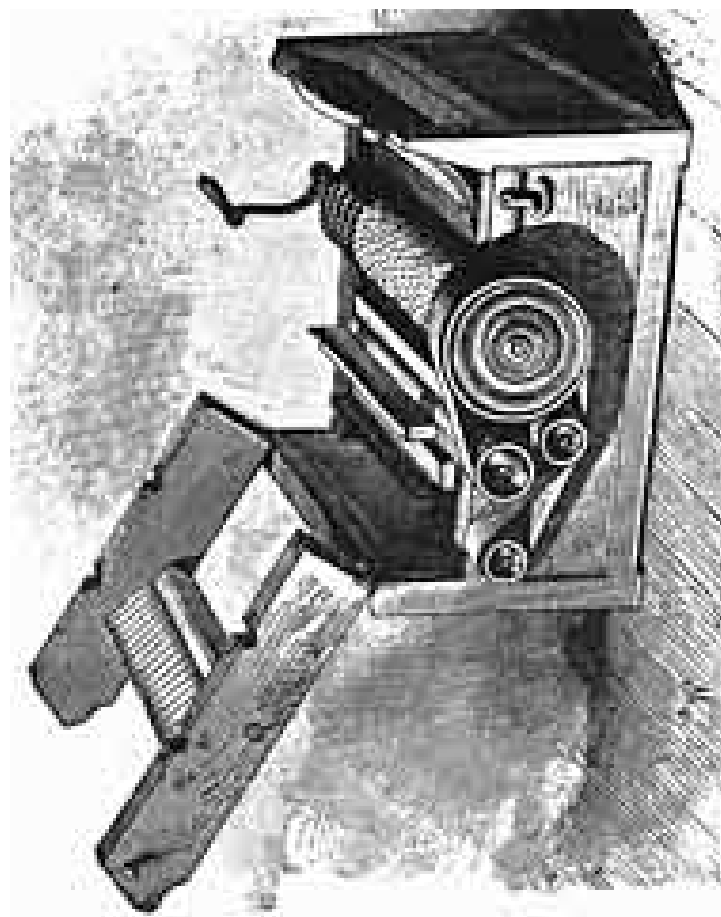
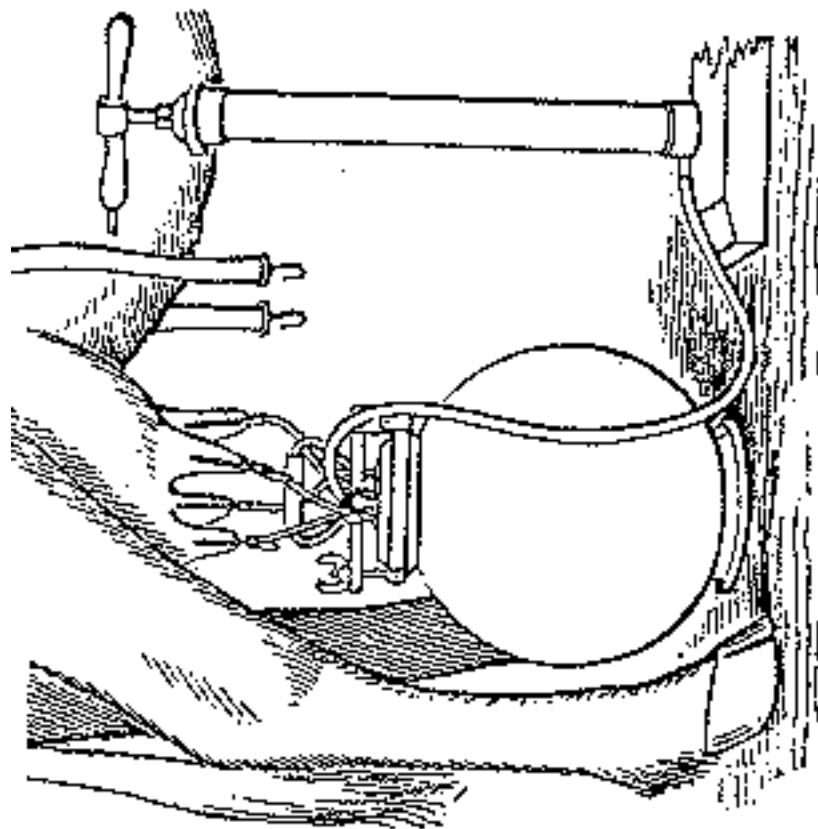
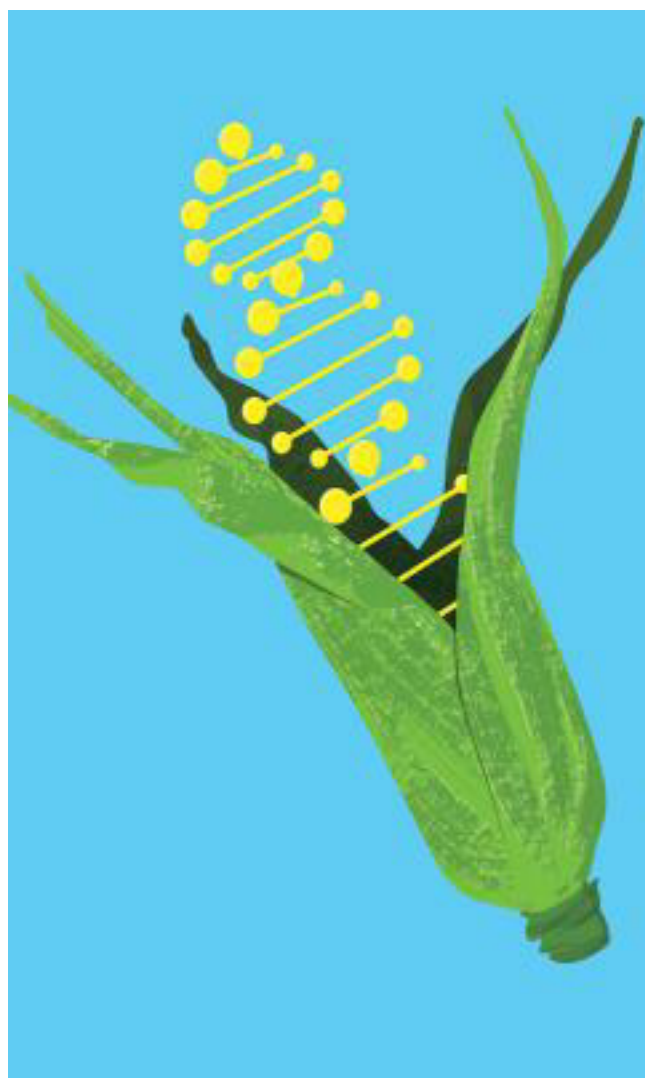
Cooling



Enzyme continues to the cooling treatment and still unable to function in the process of helping bacteria to grow

Milk Leaves







1864

1793

1834

1878

1802

1867

Roman Times

1892

1983

1858

1970