

# Feeding Our Future

**SUBJECT AREA:** SCIENCE

**GRADE:** 8



## GENERAL LEARNER OUTCOMES

### Unit D: Mechanical Systems (Science and Technology Emphasis)

Focusing Questions:

- How is energy transferred in mechanical devices?
- How do mechanical devices provide for controlled application of energy in ways that are efficient, effective and responsible?



## SPECIFIC LEARNER OUTCOMES

Students will:

1. Illustrate the development of science and technology by describing, comparing and interpreting mechanical devices that have been improved over time.
4. Analyze the social and environmental contexts of science and technology, as they apply to the development of mechanical devices.





## ASSESSMENT

**Students will provide evidence of learning by:**

Creating a Google Slide presentation with a partner that:

- Presents an Alberta agricultural example of how science and technology have improved a mechanical device to enhance efficiency in agricultural operations.
- Presents how the device used reflects social and environmental needs.



## MATERIALS

**[The Olds College Smart Farm \(4:51 min\)](#)**

**[The farms of the future \(2:59 min\)](#)**

**[Vertical mushroom farm in Nisku \(2:34 min\)](#)**



## LEARNING RESOURCES

Alberta Education Programs of Study





Science and technology are continually partnering to improve and develop mechanical devices that enhance efficiency in agricultural operations. While these devices are reflecting social and environmental needs, they also enhance proficiency and sustainability of agriculture resources.

“Social sustainability is based on the concept that a decision or project promotes the betterment of society.” Developments in science and technology continue to enhance the ability of sustainable agriculture to maintain our current quality of life. Innovation and improvement of mechanical devices used in modern sustainable agriculture are focused on making agricultural food products that are reliable, nutritious, safe, and affordable.

“Environmental concerns are vital to sustainable agriculture. Sustainable agriculture is frequently described as ecologically sound practices that have little to no adverse effect on natural ecosystems. However, more than that, sustainable agriculture also seeks to have a positive impact on natural resources and wildlife. This can often mean taking measures to reverse the damage. For example, soil erosion or draining of wetlands that have already occurred through harmful agricultural practices. Renewable natural resources are protected, recycled, and even replaced in sustainable systems. Also inherent to sustainable agriculture environmental concerns is the stewardship of non-renewable resources, such as fossil fuels.”

### **View and Discuss:**

Science and technology continues to developed mechanical devices to improve efficiency in the way producers do agriculture in the following video examples:

[The Olds College Smart Farm](#)

[The Farms Of the Future](#)

[Vertical Mushroom Farm in Nisku](#)

- How has science and technology improved or developed mechanical devices to enhance efficiency in agricultural operations?
- How has the use of the mechanical device helped create agricultural food products that are for the betterment of society?
- How has the use of the device taken into consideration environmental concerns?

# STUDENT ASSIGNMENT

## Feeding Our Future



Science and technology are continually partnering to improve and develop mechanical devices that enhance efficiency in agricultural operations. As feeding our growing global population is a continuing concern, these developments are geared toward the ability of sustainable agriculture to maintain our current quality of life. "Sustainable agriculture is frequently described as ecologically sound practices that have little to no adverse effect on natural ecosystems."

Your assignment as you follow the outline, is to create a Google Slide presentation with a partner that:

- Presents an Alberta agricultural example of how science and technology have improved a mechanical device to enhance efficiency in agricultural operations.
- Presents how the device used reflects social and environmental needs.

*Several research projects at the Olds College Smart Farm provide topics to use for this assignment. Some examples are listed below:*

### **Smart Farm Projects**

- Multi-Sensor Clusters
- WEEDit
- DOT Autonomous Platform
- Soil Nutrient Sensor (Teralytic)
- Animal Identification using Artificial Intelligence
- Growsafe
- Connectivity
- CropScan 3300H Grain Analyzer
- In-Bin Drying Monitors
- You may prefer to research your own idea.

### Slide Outline:

1. Title slide that fully captures the attention of the audience (include partner names).
  2. Explain how science and technology improved or developed this mechanical device to enhance efficiency in agricultural operations.
  3. How has the use of the mechanical device helped create agricultural food products that are for the betterment of society?
  4. How has the use of the device taken into consideration environmental concerns?
  5. Bibliography
- Slide information must be in point form.
  - You may need more than 1 slide to complete the slide outline points (maximum number of slides = 10).
  - URLs must be collected for information, videos, and pictures. Use the Bibliography slide to post URLs as your research progresses.
  - Insert audio you have recorded to further explain slide content if you do not present live. (Maximum time for presentation = 10 minutes).

Using your slides, you will explain your research on an agricultural example from Alberta, of how science and technology have improved a mechanical device to enhance efficiency in agricultural operations (maximum time 10 minutes). Be prepared to answer accurately any questions related to the facts presented on the slides. Each partner must have a speaking role. If you are unable to present live, insert audio you have recorded to further explain the slide content.



Objectives	Excellent	Proficient	Satisfactory	Limited
<b>Title Slide</b>  Slide includes your group names and an eye-catching image.	Fully captures the attention of the audience. Topic has a clear focus.	Captures the attention of the audience. Topic is focused.	Few audience members seem interested. Topic focus is vague.	Audience is not captured. No topic focus.
<b>Preparation</b>	Students created a clear plan and carefully chose roles and tasks for each team member. They managed their time well and worked together to share the workload.	Students had a rough plan and tasks for each team member. They generally managed their time and worked together to share the workload.	Students would have benefitted from more defined role and task assignments as well as overall better time management.	Students did not create a clear plan or assign roles and did not manage their time well.
<b>Organization</b>  Introduction (title slide), body content, and bibliography.	Presented findings in an organized manner and interesting sequences that were easy to follow.	Presented findings with some degree of organization and a logical sequence that the audience could follow.	Information and graphics are placed haphazardly throughout.	Audience cannot understand the presentation because there is no sequence and information is disorganized.
<b>Information</b>	Students showed a comprehensive understanding of the topic. Their information was accurate and well researched and their assignment was well supported by facts.	Students showed an understanding of the topic. Their information was accurate and their assignment was supported by facts.	Students showed some understanding of the topic, but their research was incomplete and/or their assignment was not supported by facts.	Students demonstrated little or no understanding of the topic. They did not appear to have done much research and their assignment was not supported by facts.
<b>Presentation</b>	Presentation included 9–10 slides. Information on slides was kept short and students expanded on information in attached videos and/or audio.	Presentation included 7–8 slides. Information on slides contained many sentences and the group had some difficulty explaining ideas beyond the information in the slides and attached videos.	Presentation included 6 slides. Information on slides contained many sentences and the group had difficulty explaining ideas beyond the information in the slides and attached videos.	Presentation included less than 6 slides. Information on slides contained many sentences, and group did not expand on information presented in the slides .

### Sources:

[https://www.ukessays.com/essays/environmental-studies/significance-sustainable-agriculture-7421.php#\\_Toc388111436](https://www.ukessays.com/essays/environmental-studies/significance-sustainable-agriculture-7421.php#_Toc388111436)

<https://soapboxie.com/social-issues/The-Environmental-Economic-and-Social-Components-of-Sustainability>