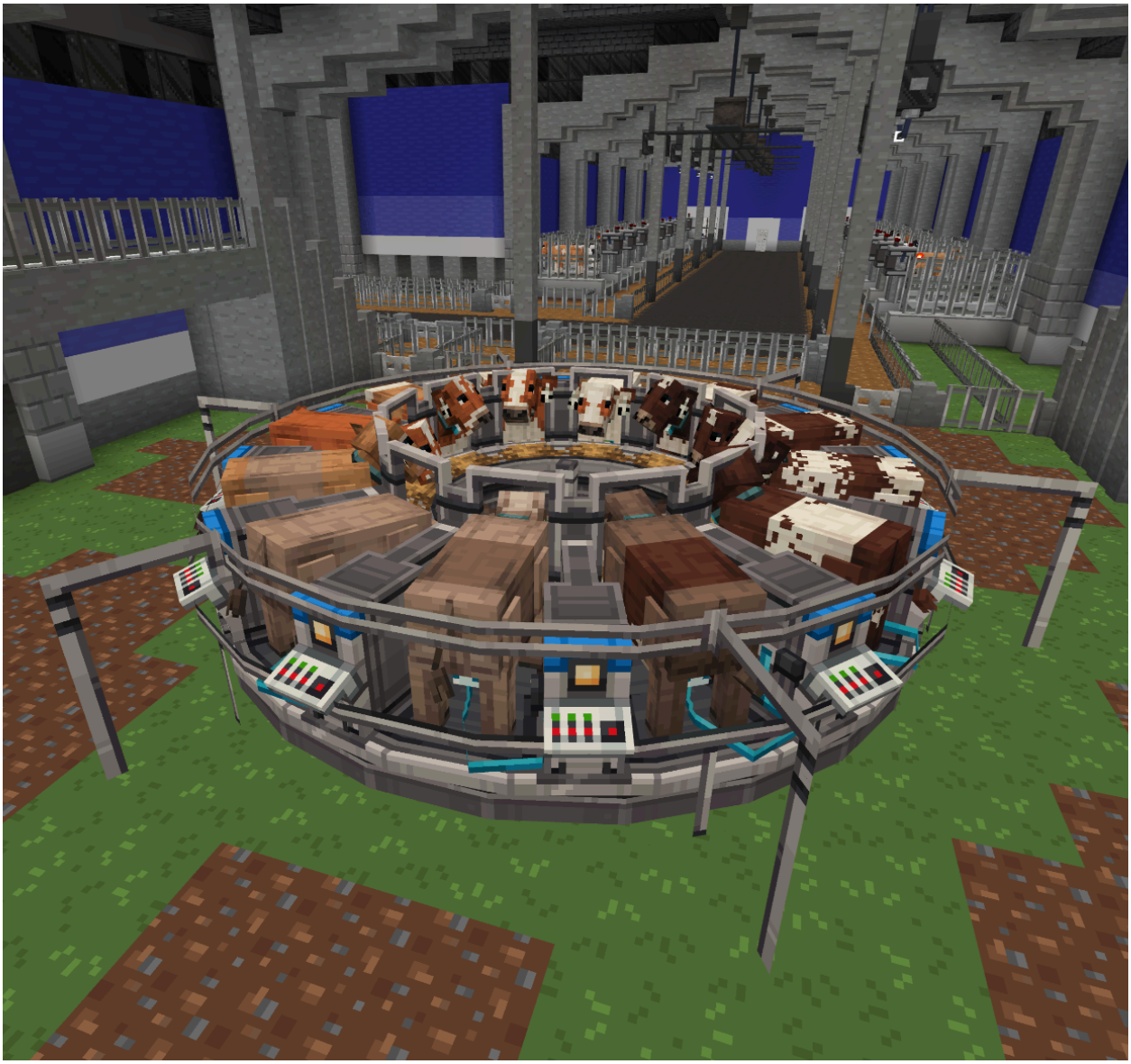
Lesson Plan

From Pastures to Processors

Grade: 8 | Subject: Science & Technology | Duration: 40 Minutes



Dairycraft Overview

Learning Objectives

This Minecraft world supports the following main achievement objectives:

- Teach students about the versatility of milk, as well as concepts such as states of matter and chemical/physical changes.
- Teach students about the nutritional benefits of milk.
- Teach students about life on a working farm, career options associated with dairy farming, and the layout and machinery used in modern farms.
- Teach students about waste management and renewable energy production on dairy farms.
- Teach students about how technology is transforming dairy farming.
- Teach students about the relationship between crop farming and milk production.

How to Use Dairycraft

Dairycraft is a fully automated Minecraft educational world, so there is no need for teacher input once students are in-game. Additional teacher input or guidance may be beneficial for students below the set lesson grades.

- Dairycraft has been designed as a single-player educational game. When completing most lessons, extensions, and sub-activities, each student should be in their own Minecraft world.
- Dairycraft can function on any device compatible with Minecraft: Education Edition.
- For collaborative play, students can be grouped into teams to complete the major extension task: building their own farm based on the knowledge they have learned.
- If you are new to Minecraft: Education Edition, the '[Support Center]' on the Education Edition website provides all the information you will need to get started.

Activities for Students

Dairycraft contains six main activities for students, each of which can be played independently of the others. It will benefit students to have completed Lesson 2 before proceeding with other lessons, in order to have a basic understanding of the farm's layout. Each lesson has an extension task, and after all six lessons are completed there is one major

extension activity in which students are encouraged to build their own farm using the information they have learned from the lessons.

At points in the game, students may be given external links to videos that explain certain processes or concepts in more detail. Everything else they need to learn and interact with is contained within the game.

Dairycraft Map Layout



Lesson 5: Overview

This Minecraft-based lesson immerses students in the exciting world of modern dairy farming, showcasing technological innovations in Ontario's dairy industry. Through this interactive experience involving activities and interacting with NPCs (non-playable characters), students will explore different milking systems, engage in hands-on tasks such as filling milk tanks and loading trucks, and uncover the role of wearable technology in monitoring animal health.

The lesson combines interactive gameplay with real-world applications, fostering curiosity and critical thinking about how advancements like milking parlours and cow wearables are revolutionizing dairy farming for the benefit of both farmers and cows.

Learning Objectives

During this lesson, students will:

- Learn about the milking process and technological advancements within the dairy farming industry.
- Understand the importance of cow comfort and efficient milking systems, including rotary, parallel, and robotic milking parlous.
- Explore the role of technology, such as wearables for cows and automated feed systems, in streamlining modern day dairy farming operations.
- Recognize the importance of animal care and its impact on milk production.

Curriculum Alignment

Designed for Grade 8 in the Ontario curriculum:

- Describe different types of systems, including food processing systems, and explain their purpose, inputs, and outputs.
- Use scientific terms like force, work, and efficiency to explain how systems and simple machines work, how energy moves through them, how they can lose energy, and how technology and consumer information help make systems safer and more efficient.
- Grade 8: Science and Technology D2.1 through D2.10

Overall Expectations

Students will learn how to:

- Demonstrate an understanding of technological systems and their applications in dairy farms.
- Develop skills in critical thinking and problem solving through interactive game-based learning.
- Identify ways in which technological innovations can help with the automation and advancement of dairy farms and milk production.
- Understand the ethical considerations and advancements in the dairy farming sector.

Specific Expectations

Students will learn how to:

- Identify the components of milking systems (rotary, parallel, and robotic) and explain their purposes on a dairy farm.
- Investigate how technology, such as cow wearables, contribute to improving dairy farming efficiency and animal health.
- Apply problem-solving skills to complete small tasks, such as pumping the milk into storage or delivering fresh unpasteurized milk to the processing facility.
- Explore how technology in agriculture supports sustainable farming practices.

Student Expectations

Demonstrate an understanding of the ways in which milk is collected from cows, how it is transported, and how cow health and comfort can be measured, as well as general technological innovations that are helping shape the dairy farming industry.

Activity and Extension Task Overview

During this lesson students will:

- Watch an introductory video about how cows are milked (optional).
- Interact with five non-player characters (NPCs) to learn about the different ways milk is collected and how technology is used to improve cow comfort and health.
- Complete two tasks, including pumping milk from the parallel milking parlour into the milk storage tanks and delivering unpasteurized milk to the milk processing facility.
- Take notes as they learn, and complete a randomized knowledge test at the end of the lesson.
- Complete an extension task involving rounding up two escaped cows using their GPS wearable.

Activity: Milking, Wearables, and Knowledge Test

Student spawns inside the main freestall barn, in the connection to the milking shed.

STEP 1 | Introduction

- NPC ‘Lena’ welcomes student and offers an optional video to watch.
- Student chooses to watch the video or proceed directly to the next stage of the lesson.

STEP 2 | Milking Parlours

- Student encounters NPC ‘Andrew’ in the milking shed.
- NPC ‘Andrew’ introduces student to how cows are milked, the types of milking parlour on the farm (parallel and rotary), and other types of milking parlours available (robotic).

STEP 3 | Knowledge Test

- Student takes a knowledge test based on the information they have just learned.
- Student needs to answer two randomized questions successfully in order to proceed. Incorrect answers prompt a review and retest.

STEP 4 | Milk collection and delivery

Student meets NPCs who provide information and guidance through two activities:

- Milk pumping activity: Filling the cold storage tanks inside the milk truck with unpasteurized milk collected from the milking parlours. Student is rewarded with a pail of speed-boosting milk.
- Milk truck loading activity: Delivering and unloading the milk to the processing facility. Student is rewarded with virtual ice cream produced in the milk-processing facility they have just delivered milk to.

STEP 5 | Veterinarian cow wearables

- Student encounters NPC ‘Jagrut’, who explains different types of cow wearable used on the farm (ear tags, collar transponders, location trackers).

STEP 6 | Automatic feeders

- Student encounters NPC ‘Katarina’, who explains how robotic feed-pushers dispense silage within the freestall barn.
- Student is given an activity: to restock an empty feed-pusher and feed the dairy cows.

STEP 7 | Knowledge Test

- Student interacts with NPC ‘Katrina’ for a knowledge test based on the information they have just learned about collecting milk, cow wearables, and automatic feeding systems like feed-pushers.
- Student needs to answer two randomized questions successfully in order to proceed. Incorrect answers prompt a review and retest.

STEP 8 | Reward and Feedback

- Successful completion grants a pail of speed-boost milk and the choice to continue on to the extension task or return to the spawn room to choose the next lesson.
- If student decides not to continue with the extension, the exclamation point above the Lesson 5 NPC in the spawn room turns amber, indicating student has yet to complete the lesson’s extension task.

Extension Task: Tracking and Herding Cows

Student spawns in the farm office.

STEP 1 | Locating and Herding Cows

- Student is introduced to the activity challenge by NPC ‘Bill’.
- Student locates two escaped cows on the GPS tracker map.
- Student takes a vehicle to collect the escaped cows, and leads them back to the field with a fence outlined in amber on the interactive GPS tracker map.

STEP 2 | Completion and Reward

- NPC ‘Shreya’ congratulates student for completing the task and extension task, and gives them the lesson-specific trophy.

- Student places their trophy in the spawn room trophy display cabinet for teacher verification. (The trophy and display cabinet demonstrate that student has completed the lesson in full.)

Miscellaneous

If you experience technical problems or bugs with this lesson, please report them directly through our website's bug report form: crackedcubes.co.uk/report-a-bug.

For general information about Minecraft: Education Edition, including additional information on how to play and set up lessons, please head to the dedicated Minecraft Education support center: edusupport.minecraft.net/hc/en-us.