



Minecraft: Education Edition Lesson Template

Please use the following template as a workspace for your Minecraft: Education Edition lesson plan. When you are ready, you can submit your lesson to the community site by heading to education.minecraft.net/create-lesson and don't forget to create your educator profile. Thank you for your contribution to Minecraft for learning.

Lesson Overview

Lesson Photo (accepted file types are JPG or PNG. Minimum dimensions are 750px by 368px. This image will be cropped slightly in some views on the site. Please make sure that you center your area of focus in this image.)

Title (30 characters)

Outflow Order

Short Description (50 characters)

Students explore how outflow is treated for reuse.

Student Ages

8-10 11-13 14-18

Subjects

| | | |
|---|--|-------------------------------------|
| <input type="checkbox"/> Math | <input type="checkbox"/> Government and Politics | <input type="checkbox"/> Technology |
| <input checked="" type="checkbox"/> Science | <input type="checkbox"/> Art and Design | <input type="checkbox"/> Geography |
| <input type="checkbox"/> World Languages | | |

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- Reading and Writing
- Animals
- Business & Entrepreneurship
- Climate & Environment
- Digital Literacy
- Dramatic Arts/Theater

- Gaming
- History
- Music
- Physical Health & Wellness
- Religion & Philosophy
- Safe & Civil Schools

- Service Learning & Social Good
- Social and Emotional Health
- Computer Science
- Careers and Management
- Special Education
- Leadership

Skills

- Character
- Citizenship
- Collaboration
- Communication
- Creativity
- Critical Thinking
- Project Based Learning

Lesson Plan

Learning Objectives (3000 characters)

Students will...

- explore how outflow (*wastewater*) gets from a home to a water treatment plant.
- understand that **biosolids** are used in composting.
- learn how outflow is treated in order to go back into the city system.

Guiding Ideas and Questions (3000 characters)

Introduction

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Students will begin their exploration in the school and right-click on the teacher. They should click Lesson 2. In doing this, they will follow the trail across the street to the water treatment plant. Here, students will learn how outflow is cleaned to be used again by farmers for irrigation. Finally, they will learn how outflow from the water treatment processes is used to make nutrient-rich compost.

Guiding Questions

- What are examples of outflow?
- Where does outflow go once it goes down a drain?
- How can water be treated to reuse it?
- Why is clean water important, even if it is being used for farm irrigation systems?

Teacher Preparation & Notes

- Possible NGSS standard(s):
 - **K-ESS3-3:** Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.
 - **MS-ESS3-3:** Apply scientific to design a method for monitoring and minimizing a human impact on the environment.
- The teacher should prepare three clear cups that contain the following: extremely dirty water, somewhat dirty water, and clean water.
- For the closing activity, each group of students will need various materials to create a water filtration system. These can include liter soda bottles, coffee filters, cotton balls, rocks, etc. The teacher should cut the top portion off of the liter bottle ahead of time if this is being done with younger children—see “*Make a Water Filter*” link.
- The following vocabulary will be used in this lesson and the teacher may want to introduce these to the students beforehand.
 - reclamation
 - clarification
 - biosolid
 - weir
 - aeration
 - microbes

Student Activities

Note: Performance expectations (PE) are mentioned in parentheses throughout the activities and connected to the expectations listed after the activities.

Introduction:

- The teacher will gather students for examples of outflow (*wastewater*) and jot these down on the board. Then, s/he will ask students to think about where this outflow goes. Students should take a moment to discuss this with their neighbors before sharing their answers.
- Next, the teacher will bring out three clear cups. One will have extremely dirty water, one will have somewhat dirty water, and one will have clean water. S/he will ask students which cup of water they would rather use to water a plant or drink (*the one with the clean water*) and why. The teacher will ask students to think about what it means to have *clean* water and how the process of treating water may happen.

Minecraft World Exploration:

Students should take notes on what they learn as they complete this exploration.

- Students will begin their exploration in the school by the teacher. They should right-click on her and choose Lesson 2. They will find themselves guided to the city's water treatment plant. They will need to begin at the front where they will be introduced to the NPC who explains what an outflow reclamation plant is and does (*PE1*). Next, the student will make his/her way around the outside of the plant, learning about the process of water treatment. It is important that students take note of the changing color of the water as it goes through the treatment process. This can be seen behind the NPCs (*PE2, PE3*). Each NPC explains a particular process in the water treatment process.
- After learning about disinfection, students will walk to an NPC that will explain that clean water can now be used for farm irrigation (*PE2, PE3*). Then, students will follow the trail to the NPC that explains how biosolids taken from treating the outflow can be used to create nutrient-rich compost.
- Students can click the "Compost" button to be transported to that area. If they do, they will read about how biosolids are used in the composting process. Students may explore this area, but it is not required.

Closing:

- Students will gather as a class and the teacher will once again show them the three cups of water s/he shared at the beginning of the lesson. Again, s/he will ask the students

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how they think dirty water, or outflow, becomes clean enough to be used for irrigation at local farms. The teacher should refer to the students' prior ideas and compare those to what they learned during their Minecraft world exploration.

- After discussing the process of treating outflow, the teacher will tell students that they will be working in small groups to create a water filter. Their goal is to get the cleanest water that could be used to water plants (*particularly classroom plants, if available*). Each group should be given three cups of dirty water, three empty cups (*to dump the filtered water*), a clean liter soda bottle, and have a variety of materials available to create their filters. They will be able to choose their materials and conduct three trials (PE4).
- Small groups will share their cleanest water with the class and explain how they made their best filter. The class will end the lesson by discussing the importance of clean water, even if it is used only to irrigate plants.
- **BONUS CLOSING ACTIVITY:** Should the teacher wish to have students explore the compost facility more at the end of the "Minecraft World Exploration" section, s/he could also have students create their own worm bin composter in the classroom (*see link*). The soil created in the composter could be used to plant classroom plants and then their filters could be used to water those plants. With permission, students could place labeled buckets in the cafeteria for the school to leave compostable materials during the week. This will also teach their schoolmates more about composting as well!

Performance Expectations

Students will be able to...

- give examples of outflow and where this water goes (PE1).
- explain how outflow can be treated to be reused by farmers (PE2).
- explain why treating outflow is important before reusing it (PE3).
- understand basic water filtration systems to be used in the classroom (PE4).

External References

- [Make a Water Filter](#) (*website containing an example set up for student water filters*)
 - [How to Make a Simple, Inexpensive Worm Bin Composter...](#) (*website*)
-

Supporting Files

Supporting File (recommend no more than five, file formats supported are DOC/DOCX, GIF, JPG, MP3, PDF, PNG, PPT, PPTX, TXT, WMA, XLS/XLSX, XPS, and ZIP)

- Make PDF rubric