Georgia NASEF Farmcraft 2024 Project Based Learning:

Pre-Season Challenge #1: Mass Timber & Agroforestry

Overview:

In this Project Based Learning (PBL) lesson, students will be tasked with researching how working forests can be utilized to sustainably source local lumber, as well as how these products can be used effectivley in commercial buildings. Students will then present their learning by building and sharing a Minecraft world that displays and demonstrates their understanding and educates others on mass timber in their area.

Focus Standards:

- NGSS Standards
  - **MS-ESS3-2 Earth and Human Activity** -
    Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
  - **MS-ESS3-5 Earth and Human Activity** –
    Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.
- ITTEA Standards for Technological and Engineering Literacy –
  - **STEL-1Q** - Conduct research to inform intentional inventions and innovations that address specific needs and wants.
- ISTE Standards
  - **3 Knowledge Constructor** - Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories, and pursuing answers and solutions.
  - **6 Creative Communicator - 6c** Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models, or simulations.
  - **7 Global Collaborator** - Students use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.
- **Georgia Agriculture Standards-**
  - AFNR-FS-3 Evaluate human needs and demonstrate the role of forestry in meeting the needs of humans historically, currently, and in the future.
  - AFNR-FS-5 Compare and contrast Georgia trees and explain their environmental and economic value.
  - AFNR-FS-7 Connect concepts to explain an understanding of forest regeneration principles and practices.

gpb.org/Georgia-Farmcraft

Objectives:

- Students will research both economic and environmental benefits of working forests.
- Students will investigate mass timber applications in Georgia.
- Students will design a Minecraft world that educates others on local timber stands and mass timber technologies.

Requirements/Task(s):

- **Task 1:** Complete a K-W-L chart (example provided below) of how working forests benefit both the environment and economy in Georgia. Additionally, what is mass timber and how is it being utilized in Georgia.
- **Task 2:** Research which trees are most common for timber production and used for mass timber technologies in Georgia.
- **Task 3:** Build, narrate, and submit a Minecraft world that demonstrates learning and displays and demonstrates their understanding and educates others on creating a viable local timber stand for mass timber production.

Procedure:

1. Students will tune into the livestream or watch the recording of the NASEF Farmcraft 2024 livestream, "**GA NASEF Farmcraft 2024 Preseason Challenge #1**." It is recommended that the team sponsor/educator watch with the students.
   a. Tuesday, February 13, 2024 @| 3:00pm ET
   b. Livestream and recording [YouTube playlist link](#)

2. **Present the challenge to the students:**

Pre-Season Challenge 1: Working Forests and Mass Timber

As the population continues to grow, resource use also continues to increase. Thus, there is a greater need to sustainably manage forests and utilize mass timber technologies instead of steel and concrete.

Research the type of wood that is planted in timber stands in Georgia for use in mass timber. Also, research what building structures are currently using this technology. Build, narrate, and submit a Minecraft world that demonstrates your learning, displays your understanding, and educates others on working forests and mass timber.

Some questions to consider when researching and developing your build:

What is the ecological and economic importance of Georgia working forests?

What is a timber stand, and what are the best ways to improve a timber stand?

What are the common tree saplings used in Mass Timber plantings in your area?

What is the connection between building materials and climate change?

What are the materials that can be used in for the structures in your build that will showcase mass timber technologies?

[gpb.org/Georgia-Farmcraft](#)

Considering the questions above, **guide the students through the "K" and "W" portions of the K-W-L** chart. K-W-L charts are graphic organizers that guide students through organizing information before, during, and after a unit, project, or a lesson. They can be used to engage students in a new topic, activate prior knowledge, share unit objectives, and monitor students' learning.

Ask students what they KNOW (or believe they know) This information may be incorrect, inaccurate, or misinformed. For this step of the process this is acceptable as their learning and research should be utilized to address misconceptions.

Ask student what they WANT to learn (or need to learn to effectively complete their project).

Learn more about K-W-L charts here: https://www.lucidchart.com/blog/what-is-a-kwl-chart

K-W-L Chart		
Topic:		
What I **KNOW**	What I **WANT** to Learn	What I **LEARNED**

3. **Guided student research**

   Students will investigate and explore the information necessary to complete their project based on their responses to the first two columns of the K-W-L chart.

Working Forests:
- https://youtu.be/fbQVVX3ioUo
- https://urldefense.com/v3/__https://gatrees.org/wp-content/uploads/2020/01/Sustainability-Report-for-Georgias-Forests-January-2019-WEB.pdf__;!!PrnngaAx4byl!wETCyeKgIVjNZnvCOseMe3Mcz9Id0kvGWeN6ksWriul0twotDD6YglphRln426PorRB3Y7HPht8tqFgQIcFwAZRL2A$
- https://gatrees.org/learn-explore/forests-for-georgia-georgia-for-forests/
- https://gpb.pbslearningmedia.org/resource/8b4fbd90-292b-47c0-bfbf-9670c241052e/what-is-a-working-forest/
- https://gpb.pbslearningmedia.org/resource/timber-harvester-video/georgia-forests-ii-virtual-field-trips/

Mass Timber:
- https://vimeo.com/365671391
- https://www.seedlingstosolutions.org/
- https://model.georgia.org/community/projects/wood/
- https://gfagrow.org/timber-in-georgias-first-living-building/
- https://www.woodworks.org/wp-content/uploads/wood_solution_paper-tall-wood.pdf
- https://gffgrow.org/economy/mass-timber/
- https://gfagrow.org/timber-in-georgias-first-living-building/
- https://livingbuilding.gatech.edu/
- https://www.nature.com/articles/nature25476

Have students share their resources and findings. **Guide the students through completing the "L" portion of the K-W-L** chart. This should serve to inform their choices in their builds.

4. **Project Build:**

Review the challenge with the students.

Pre-Season Challenge 1: Working Forests and Mass Timber

As the population continues to grow, resource use also continues to increase. Thus, there is a greater need to sustainably manage forests and utilize mass timber technologies instead of steel and concrete.

Research the type of wood that is planted in timber stands in Georgia for use in mass timber. Also, research what building structures are currently using this technology. Build, narrate, and submit a Minecraft world that demonstrates your learning, displays your understanding, and educates others on working forests and mass timber.

Some questions to consider when researching and developing your build:

What is the ecological and economic importance of Georgia working forests?

What is a timber stand, and what are the best ways to improve a timber stand?

What are the common tree saplings used in Mass Timber plantings in your area?

What is the connection between building materials and climate change?

What are the materials that can be used in for the structures in your build that will showcase mass timber technologies?

Students will work together with their team to complete the challenge in Minecraft Education Edition. Use this time to remind students to refer to their K-W-L chart to ensure they are including the information and discussion points they have discussed.

For technical support and regarding the use of Minecraft Education Edition for the challenge, please see the Using Minecraft: Education Edition NASEF Farmcraft Guide: https://www.nasef.org/media/3678/nasef-farmcraft-using-minecraft-education-edition.pdf

5. Submission:

To submit their projects, guide students to the NASEF Farmcraft 2024 Flip: https://flip.com/962a73de and select Preseason Challenge #1

Before submission, students should be asked to consider the following regarding their videos:

o   Make sure we can see what you are showing us.
o   No shaking: Consider the viewer. Are you keeping the "camera" steady?
o   Can we hear you? Is the audio clear?
o   Make sure to have the team's name in the title of the Flip submission

Special thanks to Georgia Forestry Foundation and Jamestown, LP for consulting and providing their expertise on this challenge. Learn more about what they do at https://gffgrow.org/ and https://www.jamestownlp.com/

gpb.org/Georgia-Farmcraft

K-W-L Chart

Topic:

What I **KNOW**	What I **WANT** to Learn	What I **LEARNED**