Cartoon Llamas, Fire, and Climate Smart Agriculture: Using Active Learning to make Complex Topics more Digestible to Youth

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Purpose

The purpose of this activity is to teach students about Best Management Practices and Concepts related to Climate Smart Agriculture.

Overview

This activity consists of two parts that can be done in the same day. In Part 1 the children will do an activity about albedo using different colored towels outside. They will go back to take the towels temperature after Part 2. In Part 2 of this activity students are introduced to material through the Lorenzo Llama Poster Drama. The instructor will show the students several posters. After, the students can use the coloring books or they can bring them home.

Student Outcomes

Students will learn several Concepts in Climate Agriculture as well as Best Management Practices.

Concepts in Climate Smart Agriculture:

- Albedo
- Prescribed Fire
- Black Carbon Deposition
- Agricultural Management

Best Management Practice:

- No burning
- No-till
- Native Planting
- Pollinator Habitats

Lorenzo Llama Poster Drama pg. 2

This activity can be done in around 1 hour to 1.5 hours

Materials

- Coloring Materials
- Lorenzo Llama Coloring Books
- 2 Chalk Sticks (One black and one white)
- 2 Wet Towels (One black and one white)
- Lorenzo Llama PowerPoint/Posters

Preparation

- Print off posters, if needed, and coloring books
- Make sure you have all the materials needed.
- You will need an extra coloring book to read the script off of while you are showing the Llama Drama poster/PowerPoint
- Review the concepts in the Teacher's Notes

Teacher's Notes

Agricultural Management is the process of overseeing all aspects of a farm or crop producing facility. Different people can have different styles of management. Some styles of management are more focused on efficiency or profit.

Climate Smart Agricultural Management is more focused on sustainability. Where a happy medium between efficiency/price and the farms ecological footprint is found.

A Prescribed Fire is a fire that is set intentionally usually with the goal of burning plant life in a controlled manner. These fires are most commonly used for ecological restoration as well as clearing stubble (what's left in the field after harvest).

No Burning is a best management practice that doesn't use burning to get rid of stubble, tilling can have negative effects including: soil compaction, and increased susceptibility to erosion.

The Happy Seeder is an alternative to burning and tilling. This machine directly inserts the seeds under the existing stubble. Native plants can also increase the sustainability of a farm. Growing
plants native to a region means they are already acclimated to the plants and animals of the area.

Using **Native Plants** can also be beneficial to **Pollinator Habitats**. These habitats hold insects responsible for the important process of pollination.

Albedo is how much light is reflected back from the body. A good example of this is snow! Snow has a high albedo, which means that it reflects a lot of light. Something with a low albedo would be dark in color like asphalt.

Black Carbon is the sooty black component of smoke which is made up of fine particulate matter. This Black Carbon can be deposited on different surfaces, in this case a glacier. Knowing how black carbon deposition effects albedo levels is important. If white snow reflects a lot of sunlight that will keep the glacier cool, slowing the rate at which it melts. While if the glacier is covered in black carbon it will absorb more heat, which in turn will cause the snow to melt faster.

Instructions:

Part 1: Introducing Concepts

1. Ask students what they know about agriculture. Some example questions:
    - Has anyone been to a farmers market?
    - What kinds of things did you see there?
    - Do you know which part of the world Llamas live?

Part 2: Albedo Towel/Chalk Experiment Setup

1. Take the students outside to set up the albedo towel/chalk experiment. You should bring your wet black and wet white towel as well as chalk. The towels should be wetted and placed on the ground. You can have the students draw the chalk circles as well. At this point you are just setting the towels in the heat so they can warm up while the rest of the lesson happens.

Part 3: Llama Poster Drama

1. Once back inside you can either pass out the coloring books so the students can follow along, or if you think that will distract them you can wait. You will need a coloring book as a script. Using the posters that you printed off or the PowerPoint presentation you can begin to tell the story to the students.

Part 4: Albedo Experiment Results

1. When you are finished giving the Poster Drama Presentation go outside and collect the results of the experiment. This can be done by asking the students to feel the towels and chalk then taking a simple tally. Once the tally is taken you should try and relate albedo experiment to the Poster Drama. Asking questions like: If the dark towel gets hotter quicker than how would black carbon affect the albedo of a glacier?

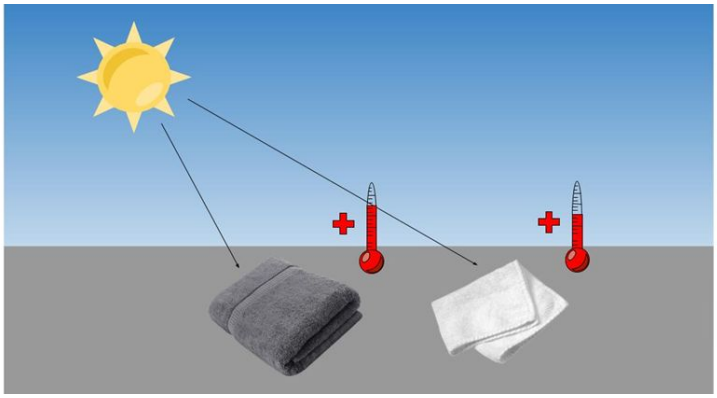

Illustration of the Albedo Experiment