FFL Principle 4- Mulch: The Unsung Hero of the Landscape
High School CER Lesson

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Program Type: In Class Activity | **Duration:** 90 min

Standards:

SC.912.L.17.3: Describes how ecosystem components like soil and water management influence plant health—aligned with moisture retention and nutrient cycling facilitated by mulch.
SC.912.L.17.10: Involves understanding biogeochemical cycles (water, carbon, nitrogen). The decomposition of organic mulch and its role in nutrient cycling directly supports this standard.
SC.912.L.17.11: Evaluates the ecological costs and benefits of resource use. Choosing sustainably sourced mulch ties into renewable resource evaluation and environmental consequences.
SC.912.L.17.12: Discusses political, social, and environmental consequences of sustainable land use. Proper mulching reduces fertilizer runoff, conserves water, and supports sustainable landscaping practices.
SC.912.L.17.17: Assesses the effectiveness of innovative environmental practices.
SC.912.L.17.20: Predicts how individual practices impact environmental systems. Students designing and applying mulch thoughtfully in landscapes helps them understand their roles in sustainability and ecosystem health.

Learning Objectives:

- Formulate a scientific claim about the benefits of mulching.
- Identify and evaluate evidence supporting the benefits of mulching.
- Construct a logical reasoning connecting evidence to the claim.
- Explain the environmental importance of mulching in a Florida-Friendly Landscape.
- Differentiate between various types of mulch and their appropriate uses.

Guiding Questions: What are the benefits of mulch for plants as well as the environment? What are the different types of mulch? How should mulch be applied?

Intended Outcomes

As a result of the program, what I want my audience to LEARN…	**As a result of the program, I want my audience to ACT by…**	**Assessment: (*How will you know* your audience has reached your intended outcomes)**
The Principles of mulch as it pertains to water conservation, weed control, temperature moderation, soil health and erosion prevention	Being able to select the best mulch for a specific location, apply it appropriately and explain why mulch is good for plants and for the environment.	Exit ticket, quiz and writing prompts

Schedule Layout:	**Items Needed:**
Bellringer (5 minutes) **Question:** "Look at the image on the board. What do you think is happening to the soil around this plant? How might we protect it? **Instructions:** Students should write down their initial thoughts in their notebooks. We will revisit this at the end of class. **Introduction & Claim (15 minutes)** **Engage with the "Mystery Material":** *"Today, we're going to talk about a simple yet powerful practice in agriculture and landscaping that has huge benefits for our plants and the environment. It's often overlooked, but it's like a superhero for your soil. Before I tell you what it is, let's watch a short video that might give you some clues."* **Introductory Video:** Show a short (2-3 minute) introductory video on mulching. A good option might be a university extension video or a general gardening video explaining what mulch is and its basic benefits.	Whiteboard or projector Markers or pens Access to the internet/computers for video and research (optional) Various mulch samples (pine bark, pine needles, melaleuca, eucalyptus,

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Unveiling the Claim: After the video, ask: *"Based on what you saw, what do you think is this 'superhero' material?"* (Guide them to "mulch"). **Claim** for investigation: **'Applying an appropriate layer of mulch significantly improves plant health and conserves environmental resources in a landscape.'** **Evidence Collection (30 minutes)** **Hands-On Activity: "Mulch Matters!"** *(see supplemental set up document)* **Guided Reading/Discussion (using FFL Handbook snippet):** Refer to the "FFL Handbook for Home Landscapes" and have students read the "mulch" section individually or in pairs Lead a class discussion to extract additional evidence: ● "What does the handbook say about how mulch helps with water?" ● "What does it say about weeds?" ● "What are the other benefits?" ● "What are the 'Guidelines For Using Mulch' and why are they important?" **Reasoning Construction (20 minutes)** **Introducing the CER Framework:** Review or introduce the components of a CER activity depending on student familiarity. **Claim (Already established):** *"Applying an appropriate layer of mulch significantly improves plant health and conserves environmental resources in a landscape."* **Collaborative Reasoning:** On the board, create a T-chart or a three-column table: "Evidence" and "Reasoning." ● Ask groups to share one piece of evidence they collected and brainstorm the reasoning- "Why did the mulch help the soil stay wetter?" ● Repeat this for several pieces of evidence Emphasize the scientific principles involved: ● **Water Conservation:** Reduced evaporation, improved infiltration. ● **Weed Control:** Blocking sunlight, physical barrier. ● **Temperature Moderation:** Insulation. ● **Soil Health:** Decomposition adding organic matter, promoting beneficial soil organisms. ● **Erosion Prevention:** Protecting soil from direct impact of rain and wind. **Elaboration (10 minutes)** **Types of Mulch and Best Practices:** Discuss different types of mulch (organic vs. inorganic, pros and cons). ● "How does choosing the 'right' mulch connect to SC.912.L.17 (Interdependence)?" (e.g., using local, sustainable mulches like melaleuca helps manage invasive species and supports the local ecosystem).	leaves, wood chips – if available) Two small potted plants (e.g., marigolds, small herbs) Watering can Small bags of soil Rulers or measuring tape Handout: "Mulch CER Worksheet" Quiz handout Writing prompt handout Optional: Spray bottles, thermometers (soil and air)
Differentiation Suggestions: **Support:** Provide sentence starters for the CER worksheet and writing prompt. Pair students strategically for activities. Use visual aids heavily. **Challenge:** Have students research the impact of "mulch volcanoes" on tree health. Ask them to design an experiment to test the effectiveness of different mulch types on soil moisture retention over time. Research specific invasive plants (SC.912.L.17) that can be used as beneficial mulch (e.g., Melaleuca).	