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|  Daily Plan | **Instructor:** |  |
| **Daily Topic:** | Research SAEs and Plant Medium |
| **Materials, Supplies, Equipment, References, and Other Resources:** |
| Soil materials- Pete, mulch, fertilizer, sand, soil, perlite, vermiculite, compost (can replace with pictures or use small amounts)Flip Charts and Markers; Blank Printer Paper; Devices connected to the internet |
| Standards and Benchmarks |
| 2.0 Employ scientific reasoning to make informed decisions in AFNR systems. 2.01 Design and complete an experiment using the scientific method.2.02 Employ scientific measuring skills.2.03 Demonstrate safe and effective use of common laboratory equipment.2.04 Analyze, interpret, and report data from research.2.05 Utilize data to make an informed choice concerning AFNR systems.4.06 Identify nutrient requirements for optimal plant growth, their functions within plants, and nutrient sources. |
| **Intended Outcomes***What do you want students to know (K), understand (U), and be able to do (D)?* |
| **Essential Question:** | What makes the “best” soil mixture for plants? |
| **Objective(s):** | 1. Describe the three major types of research SAEs.
2. Conduct an experiment to solve an agricultural problem (ideal growing medium).
3. Design a medium to meet plant nutrient requirements.
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| **Activating Strategy****Preflection/Introduction (Interest Approach)***How will you prepare students for what you want them to learn today and link today’s activities with previous classes?* | **Estimated Time:** | **5 minutes** |
| **Activate-** Show students all of the potential items they could put in a growing medium mixture. Explain they are going to create a growing medium for plants in the greenhouse. They can choose whatever mixture they want, but the team with the “best” mixture is going to receive a prize!**Question-** What do you think the “best” mixture would be? How could we measure or determine the “best”? What do we need to know about what plants need to formulate the “best” mixture?**Explain-** Over the next few days, we are going to explore plant needs and examine how we can determine the “best” mix for them.  |

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| **Learning Approach 1** | **Estimated Time:** | **10 minutes** |
| **Teaching Strategy / Materials** | **Brief Content Outline** |
| See what students know-Have them come up with solutions and explain why they created the mix. | Ask student to work together in groups of 2-4 to come up with the “best” blend for the plants. Have the students fold a sheet of paper in half lengthways (hot-dog style). * On the left side of the fold, they should put the item to be added and the amount.
* On the right side of the fold, have them describe why they want that item in the mix (what it does for the plant) and why they chose that amount.
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| **Learning Approach 2** | **Estimated Time:** | **10 minutes** |
| **Teaching Strategy / Materials** | **Brief Content Outline** |
| Student Research-Students will use a device to research the needs of plants, and redesign their plant needs. Post it note-On a large post-it note, students will write their new mix and why (following the hot-dog style they created before) | Student Research-Prompt Search Terms (if needed)* Plant nutrient needs
* Ideal potting soil blend
* Potting soil mix for greenhouse
* Explore- UF EDIS Publications

Optional- Leave how the soil will be used vague. Give students two posted notes. They must give you a post-it note for each question they want to ask (to keep them from asking too many questions that are not well thought out). They should ask how the soil is being used.Tell them you are growing geraniums in 6” pots from plugs (can change based on what you are growing)  |

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| **Learning Approach 3** | **Estimated Time:** | **15 minutes** |
| **Teaching Strategy / Materials** | **Brief Content Outline** |
| Ask students to design an experiment to determine which soil is the “best”.Have them create a data collection chart on a large post-it. It should include:1- Hypothesis 2- Experimental steps (variables and control)3- Chart for data collection | Steps of the Scientific Method 1- Make on observation 2- Ask a question 3- Gather background data 4- Form a hypothesis 5- Test the prediction (gather and analyze data) 6- Draw ConclusionsSteps 1-3 are already done! The students will just need to do 4-6. Guide them to test only one variable in their experiment. For example changing the amount of perlite in their growing medium. |

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| **Learning Approach 4** | **Estimated Time:** | **10 minutes** |
| **Teaching Strategy / Materials** | **Brief Content Outline** |
| Invention- Create and market your soil mixture (invention)On a large post-it note, design a label for your soil mixture invention | Your Label Should Include-* The name of the product
* An image or logo
* 2-3 Features or benefits
* Size and weight

Optional- Students could use the internet to find what the bags of their competitors looks like  |

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| **Reflection/Wrap Up** | **Estimated Time:** | **10 minutes** |
| Ask discussion questions to the class or guide written reflection:* What are the three types of research based SAEs? How are they different and how do they go together?
* What are the advantages of each type? What are the limitations?
* Do they go in order? If so, what is the best order? Why might you choose to change the order?
* What is a problem you see that you could use this process to solve?
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