COLLEGE OF SOCIAL & BEHAVIORAL SCIENCES
Women in Science & Engineering

The Bio/Diversity Project

Lesson Title: Insects of the Sonoran Desert

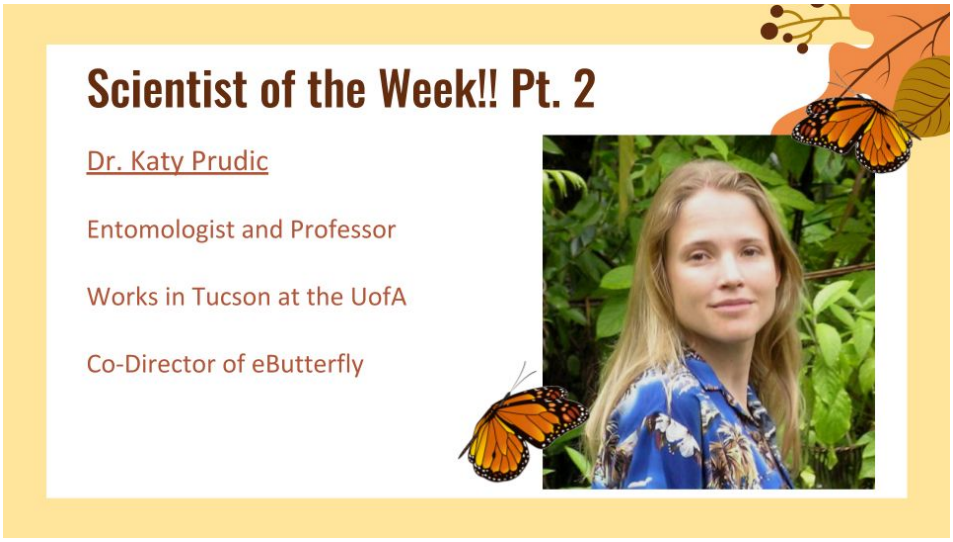
Teacher: Juliana Williams, Tara Doyle

Grade Level: *5th grade*

Time: 60 minutes

Adapted from: [https://www.enchantedlearning.com/subjects/insects/printouts.shtml]

AZ State Science Standard:	*5.L4U3.11:* ● *Obtain, evaluate, and communicate evidence about how natural and human-caused changes to habitats or climate can impact populations*
Learning Objective:	● *Students will be able to explain how the biodiversity of insects is beneficial to humans* ● *Students will be able to understand that the insect population is declining as a result of human activity*
Language Objective: (Optional)	N/A

Scientist of the Week:	This lesson will be about Insects in the Sonoran Desert. Dr. Charles Henry Turner studied insects such as bees. When presenting the scientist of the week, we will explain how this lesson is about insects and Dr. Turner studied them! Since he studied bees, when we talk about bees later on in the lesson we will connect back to Dr. Turner and the fact that he studied them and how they can recognize patterns.  We also chose Dr. Katy Prudic as a more current scientist! We will talk to the students about her eButterfly website and how it is used to track butterflies in Central and North America! 

Vocabulary	Materials
• Entomology • Insect • Pollination	Provide a bulleted and hyperlinked list of relevant materials for the lesson • Presentation: https://biodiversityproject.arizona.edu/sites/default/files/Wheeler%20Lesson%204%20%281%29.pdf • Video Link “Why have insect populations have been dying off? What’s the impact?” https://youtu.be/7Tv8UZV6vMM • Kahoot link: https://create.kahoot.it/v2/share/insects-of-the-sonoran-desert/66f4f9f4-5cca-458a-b4a1-610dceb41a01

Seasonality: (If more specificity is required, please note date/time range under the season)

Highlight which season(s) your lesson would be most suited to. When working with the natural world, it is important to keep this in mind for your planning! Some activities are possible for a brief window of time while others may be appropriate during any time of year.

Monsoons	*Autumn*	*Winter*	*Spring*	*Dry Summer*
July-Sept.	Oct.-Nov.	Dec.- Feb.	Mar.-Apr.	May-June

Guiding Questions:

- What important ecosystem functions do insects perform?
- What is the impact of the decline in biodiversity of insects?

5E Steps	Teacher Strategies	Student Behavior
Engagement/Introductory Activity: This is what you will do to get the students engaged in and excited about the topic of the lesson! It should also provide an opportunity for you to get an idea of what they do (and do not) already know, and the assumptions that they have going into the lesson.	To engage the students, we will use the NearPod 3D function in NearPod to show a 3D image of a tarantula. This 3D image can be rotated and examined by the student. We chose a 3D image because it is extremely visual and engaging, and will hook the students into the lesson. We will ask if anyone thinks that the spider is an insect, and go on to explain that yes, while many people think they are, they are not. They are arachnids.We will explain their body structure (thorax, abdomen, fangs.) We will also explain how they are gentle and fragile and are safe if left alone. We will then explain how this body structure is different from insect body structure (6 legs, antennae, etc.) This activity serves as a hook for the students and gives an example of what an insect is not, comparing it to what an insect actually is. To further introduce the topic of insects, we will explain that there are over a million different	The students will see an image of a tarantula in the NearPod slides. They will be able to use their mouse to click and drag the image around. If the student is unable to access NearPod for any reason, one of the teachers will be sharing their screen of the 3D image and the student will be able to watch via Zoom. The students will analyze the bodily structures of the tarantula, comparing it to the body structure of an insect as explained by the teacher. For this second activity, students will be asked to come up with as many different insects as they can within 1 minute. They will do so using the Collaborative Board function in the NearPod slides, which will pop up automatically. They can insert pictures and words through this technology. Students that are not able to type or access the technology can write out their answers on a

	types of insects, and even more than scientists have not discovered yet. Then we will assess what students already know by asking them to brainstorm as many different insects as they can within one minute. This will be done using the Collaborative Board function on NearPod. This will quickly start the students in their thinking about insects, as well as allow teachers to gauge their familiarity with insects.	paper and show the class, or enter their answers in the Zoom chat.
Exploratory Activity: Provide step-by-step instructions on what the teacher and students will do in this activity to gain new skills and/or knowledge. Attach worksheets, PowerPoints, video links, or other material used to this section.	"What are insects good for?" We will discuss how insects perform waste management functions by enabling the decomposition of organic material. Termites break down dead wood, while ants feed on animal carcasses. We will also show the example of the dung beetle, which feeds on animal feces. Then we will explain the other benefits that insects provide. Pollination allows the production of our favorite fruits and veggies, and bees produce the honey we enjoy. Finally, we will give the example of the silkworm which creates valuable silk fabric. Next, we will watch a vidoe about declining insect populations in North America.	In this section of the lesson, students will learn about the importance of insect biodiversity. They will see six specific examples of functions that insects provide for humans, from waste management to the pollination of food and the production of useful items. Students will also see the specific insect species that corresponds to each function. Then, students will watch the "Bug Population Declining" news clip. https://youtu.be/7Tv8UZV6vMM

	This is a short and engaging 2 minute news broadcast that features a young child explaining why she's concerned about protecting insects.	
Explain: What questions or prompts will you use to get students to explain their observations or to explain what the outcomes of the activity that they participated in were? This should provide an opportunity for students to communicate their new understandings, as well as to articulate what they still do not understand.	After the video about the bug population declining is shown, we will ask the students questions about the video. We will ask the students ● What insects they talked about ● Why insect populations are declining ● What additional questions they have about the topic This will be a great way to have students explain what they learned as well as ask questions.	After students watch the video they will be asked the following questions by the teachers and volunteers will give their answers: ● What insects they talked about in the video ● Why insects are dying off ● What additional questions they have about the topic
Extension Activity/Questions: This section provides an opportunity for students to connect the knowledge that they have gained to other contexts – can they take what they learned and logically expand upon it, or apply it to alternate situations? Provide one or two additional ideas for activities that students can use to expand upon the new knowledge that they have gained.	In the lesson we learned about the role of insects, as well as their decline in the world. To explore these concepts, we will ask the students "If all insects died, how would it affect humans?" This will allow the students to connect knowledge from the lesson and expand it to other concepts and situations. In this example, they will be expanding their knowledge to a situation where all insects are gone. They will also be required to expand their knowledge to humans/their own life and how it would affect them. This will not only allow them to show the knowledge they have gained about the	After learning about the role of insects and their decline, students will imagine a world where insects disappeared. What unpleasant things would we see, hear, smell and taste? What pleasant things wouldn't we get to see, hear, smell or taste? Students will respond to the prompt, "If all insects died, how would it affect humans?" They will then type in their best answer using the Collaborate Board function in the NearPod slides. Students that are not able to type or access the technology can write out their answers on a paper and show the class, or enter their answers in the Zoom chat.

	important roles that insects have (such as in pollination, ridding of water, making silk, etc.) but will also allow them to envision a world where insects are not conserved. The teachers will then read over some of these answers with the class.	
Evaluation Activity: How will you evaluate whether or not the students have achieved the learning objective(s) of the lesson?	At the end of the lesson, we will open a Kahoot we have created that covers topics from the lesson. https://create.kahoot.it/v2/share/insects-of-the-sonoran-desert/66f4f9f4-5cca-458a-b4a1-610dceb41a01 The questions include topics about exoskeletons, the function that insects play, insect decline, and fun facts about wasps and bees. The Kahoot is 6. To access the Kahoot, one teacher will share their screen with the Kahoot questions, and the code will be given so that students can log in in another window.	Students will log into “Kahoot.it” and enter the code given by the teacher. They will have both Zoom and Kahoot open. They will then answer questions from the lesson in a fun and competitive format.