

TTCD Lesson Plan (27): Pollinators

Unit: Pollinators	Grade(s): All	Class Size: 1-30	Lesson Duration: 45 minutes	Location: Classroom
Topic(s):	Pollination, Flower reproduction			
Student Prerequisites:	N/A			
Essential Questions:	What is pollination, and how does it help flowers reproduce? Why are pollinators, such as bees, butterflies, and birds, important to the environment? How do different pollinators interact with flowers to transfer pollen?			
Student Objectives:	Students will explain the process of pollination and how pollinators help flowers reproduce by transferring pollen between flowers. Students will identify common Alaskan flowers and pollinators, and describe their characteristics and the role they play in the ecosystem and food production. Students will participate in an interactive matching game where they will connect a common Alaskan flower with its corresponding pollinator.			
Standards:	Supports NGS Standards: 2-LS2-2: Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants. Relevant NGS Crosscutting Concepts: Cause and Effect: Events have causes that generate observable patterns. Structure and Function: The shape and stability of structures of natural and designed objects are related to their function(s). Cultural Standards E.1: Culturally-knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them by: recogniz[ing] and build[ing] upon the inter-relationships that exist among the spiritual, natural and human realms in the world around them, as reflected in their own cultural traditions and beliefs as well as those of others; E.2: Culturally-knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them by: understand[ing] the ecology and geography of the bioregion they inhabit;			

Local Context:	Students will identify local flowers and local pollinators as a building block for learning about pollination.
Vocabulary:	Pollination: Plants reproduce by a process called pollination, which is the process of transferring pollen from the male part of the plant to the female part of the plant to fertilize the plant and make baby plants, called seedlings. Flower reproduction: Reproduction means to have babies or offspring. Just like animals, plants need to be able to reproduce. The offspring of plants are called seeds or bulbs. Pollinators: A pollinator is anything that helps carry pollen from the male part of the flower (stamen) to the female part of the same or another flower (stigma). Some common pollinators include bees, hummingbirds, flies, and butterflies. Pollinators Syndrome: describe flower characteristics, or traits, that may appeal to a particular type of pollinator. Such characteristics can be used to predict the type of pollinator that will aid the flower in successful reproduction.
Dena'ina language words:	
Materials:	• Page 8 – 25 of this packet: https://www.nps.gov/common/uploads/teachers/lessonplans/Pollinators%20lesson%20plan4.pdf • Paper / writing journals • Pencils/pens • Project this PPT on a screen: Pollinators PPT
Instructor Prep:	• Print out page 8 – 25 of this packet: https://www.nps.gov/common/uploads/teachers/lessonplans/Pollinators%20lesson%20plan4.pdf
Introduction:	1. Project slide one of this PPT on the screen: Pollinators PPT 2. Show students the different flowers (or pictures) you have gathered. Ask them which one is their favorite. Have students write a paragraph in their notebook stating their opinion, supporting their point of view with reasons. Tell them to be prepared to share their writing with the class. Go around the room and have several students share which flower is their favorite and why. 3. Explain to students that just like they prefer some flowers over others, so do pollinators. For example, because a butterfly has a long, slender mouth part (proboscis), they prefer flowers that are long and tube-like. Some flies, on the other hand, have short, round mouth parts much like a sponge. For these pollinators, a wide-open flower is preferred. Or, for other pollinators, like moths, a flower that is open at night is preferred because that is when moths are active. The concept of pollinators preferring some plants over others is known as Pollinator Syndromes. Just like we have symptoms or

	characteristics which are specific to a syndrome or illness, pollinators have characteristics that are specific to their preferred plants. 4. Brainstorm with students some of the different kinds of pollinators that are found in Alaska: • Bees, birds, flies, beetles, and butterflies.
Activity:	1. Assign each student a pollinator or flower from page 8 – 25 of this packet: https://www.nps.gov/common/uploads/teachers/lessonplans/Pollinators%20lesson%20plan4.pdf. Feel free to pair students up if you don't have the right number of flowers/pollinators per person. 2. Explain to the students that they are to use the characteristics of their pollinators and plants to find their match - each plant has a specific pollinator. (Note: for several plants, the matching pollinator is not the only pollinator to help pollinate this plant.) 3. Encourage students to walk around the room and ask questions of the different students. This activity should be conducted through conversation, not just students reading the sheet of their classmates. Once everyone has found their pair, ask the students to sit next to their paired pollinator. 4. Click through this PPT as a class, asking students to share out if they found their pollinator and what were the characteristics they were looking for: Project this PPT on a screen: Pollinators PPT a. The PPT is animated, so you can reveal the appropriate flower match once the students have revealed their reasoning for choosing the pollinator they matched with.
Wrap Up:	Ask the class: Why are pollinators important? • Pollinators are essential to human survival. To produce seeds and reproduce, Almost 90% of the world's flowering plant species rely on animal pollinators. • Foods and beverages are produced with the help of pollinators include: apples, blueberries, melons, peaches, potatoes, pumpkins, and almonds • Without the actions of pollinators, agricultural economies, our food supply, and surrounding landscapes would collapse. Pollinator health affects everyone. Ask the class: Are all pollinators the same? • They may do the same job but in different ways and with different plants! <i>Evidence of learning: Students will identify the critical role of pollinators in our ecosystem and point to the unique identity / pairing of pollinator and plant.</i>
Lesson Adaptations:	• Watch this video, "The Beauty of Pollination": https://www.youtube.com/watch?v=MQiszdkOwuU&t=115s ○ Encourage students to marvel at how amazing it is that pollinators and plants have found their way to each other, that they can fit like a lock in a key!

Extensions:	- Do an art project as a class: Have students paint hanging flower baskets with their assigned pollinator or flower as a beautification project for the local garden. - Students could also paint on the Dena'ina word for the pollinator/plant they are painting. - Flower Pot Resources: https://www.amazon.com/KINGLAKE-Hanging-Balcony-Planter-Detachable/dp/B06X9G9PMB/ref=sr_1_6?crid=3U1CXLJ9R02HF&dib=eyJ2IjoiMSJ9.jE7bcNECtfB-7J9NIgDzTLNi9Dbw4_FSkil4Sk3Jfo838ISEKo72hNFdNp1vQuQrzPFelZJx5xZMEeQ7O6Vf7sMNEp2KqEgtwZLZU0FByVwPdVBtkjHTlrRrXCcRhOq10vKL1MFKg0Znm71TDol-QNrXNANRy6ZHedTH-Tagds9fqfLQIAvgO2EiqR5JdlrkmzwaNKj_gQL1A3FfOW5m2CJGdklh43DVVNaS8bdevQo1O-G0QWsrRgK1G9yKQrbFaT2GOAj9HiaVbFFChyVGiat3amvyuhan7Fg4j4hbKbzUVJc1mm2QyG_eWRvKX4e8GCNGU-4pcngv61NKcAIWILs60T5rEoOdwTBvPd-9BRcCABXPUK0FEoc1blhfdEmOa5G4Xy8cke1wfottEq8yTfppBD5EmuVqFmEKJxsHoo-Wgwm cudOZHs6iWfmFbnX.T4xZ9ryYGUvrANZhgX9w5g6Cw7ywoAmM17zhkveU8t0&dib_tag=se&keywords=hanging%2Bflower%2Bpots%2Bfor%2Bkids&qid=1743194290&srefix=hanging%2Bflower%2Bpots%2Bfor%2Bkid%2Caps%2C281&sr=8-6&th=1 - Paint Resources: https://www.amazon.com/h%C3%A9Bei-Acrylic-Washable-Classroom-Birthday/dp/B0DC674WS1/ref=sr_1_1_sspa?crid=2ZR7RC14NB5Y8&dib=eyJ2IjoiMSJ9.Jzz-r1nUQQL3Ha54htBgkOXjLxjFww06k2jGQEYUOKHs9XzGdb6upu3r0G SNIZkv2SkAUe1UxZPirJucGTPftZkE1lfnqeeUzZLmjOgHF9ZdpN5sdi NEMoB6iiFw8Ydn_abAnMOPrb3Q8vuf8JuBNvIbYdYHQDRIJQyO4WJog4a2Ixxw6u8UdvP8SG2_S5RmAUtQbRCpyl1nuOS5KcD3GwidezQFjCw-SmZCQFf1jEa-3EY1gE3pUKmuLPpRz7x4kisVzAhI6iAGlxjjswdC2_MF7u69bpTPa_HfVnPjsHk4.3-jPgulKokvHvJ5txYbh7h-DrLvLuk7c1RBjcgUBYZc&dib_tag=se&keywords=enamel%2Bpaint%2Bfor%2Bkids&qid=1743194377&srefix=enamel%2Bpaint%2Bfor%2Bkids%2Caps%2C188&sr=8-1-spons&sp_csd=d2lkZ2V0TmFtZT1zcF9hdGY&th=1
Reflections:	How did it go? What did students understand most/least? What could change about instruction or lesson plan?
Resources Used	Student Lesson Planning Template: https://www.nps.gov/common/uploads/teachers/lessonplans/Pollinators%20lesson%20plan4.pdf Pollinator PPT: Pollinators PPT Video: "The Beauty of Pollination": https://www.youtube.com/watch?v=MQiszdKOWuU&t=115s Alaska's Wanna-bees: https://www.fws.gov/story/alaskas-wanna-bees

