

What's The Buzz?

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Synopsis of the Activity:

Main Concept:

- Honeybee Communication

Learners will work in teams or hives to communicate the location of a pollen source and work to collect as much pollen as they can in a given amount of time with their artificial bees.

Audience:

- School Garden Project – El Camino Elementary – Ages 5-12yrs

Learning Objectives:

- Learners will be able to explain the importance of pollinators
- Learners will be able to understand the complex methods to which bees communicate with each other or the “Waggle Dance”
- Learners will be able to understand the potential threats to bee health and hive viability
- Learners will have a brief understanding into the concepts of division of labor, eusociality, and social complexity in the natural world
- Learners will be engaged with an interactive method for understanding the complexity of communication

Materials:

- Pipe Cleaners
- Black velveteen fabric
- Colored cotton balls
- Small pin board

Preparation and Set-up:

Pipe cleaner and cotton balls are used to make artificial bees. Depending allotted time, the activity could include allowing learners to make their own artificial bee. The small pin board should be covered in the velveteen

Guiding Questions:

- What have we learned about pollinators so far? What did we learn about bees last week?
- How do you think bees figure out where the best flowers are? Can you think of strategies a bee might use to let its sisters know where they need to go to get food?
- What are ways we communicate with one another?

- What sort of things do you think would prevent bees from being able to communicate with each other about food sources?

Activity Description:

Learners are split into teams and each given an artificial bee. Each team is designated to a “hive” and act as a colony of honey bees, where every member of the team is considered a forager. For purposes of the game, the hive will be the black velveteen pin board and will mimic a honeybee colony. Each team’s goal is to get as much pollen from their food source back to their hive as possible. Each forager must use their artificial bee to get pollen on their “hive”. The food source will be hidden by the facilitator and the first forager from each team will be given a hint by the facilitator where the food source is without revealing to the other hivesmates. The first forager from each team must find the food source, collect pollen, and communicate to the next hivesmate in line where the food source is. Hivesmates cannot communicate by talking or pointing, but must figure out a way to tell as many hivesmates as they can where the source is in order to collect pollen. The first forager has to communicate with one fellow hivesmate at a time and must wait until the forager has flown out of the hive in order to communicate with the next hivesmate. Any foragers that have returned to hive with pollen are allowed to help communicate to other hivesmates where the source is located.

After two or three rounds, facilitators can add scenarios to the game. These scenarios are written on card and presented as the following:

Attention All Colonies and Foragers,

-Your hive has been hit with a bacterial disease! This causes you to get really tired and hungry on your way to and from your plant source – *Here the facilitator can require the team to come up with a way to survive on the journey or require another forager to help them along this journey.*

-Your hive is located near a tomato farm has been exposed to some ugly chemicals used by the tomato farmers! It slows down many of your senses and ability to communicate with each other. – *Here the facilitator can prohibit take away a method the foragers are using to communicate their plant source location.*

Before the game begins learners are encouraged to cover as much of their “hive” with pollen as they can.

Post – Activity Follow Up:

The facilitator should lead a follow up discussion in order for learners to make connections of the game to honeybee communication. Posed questioning should include:

Was this game difficult? What made it hard? What strategies worked and didn’t work? What sort of information did you need to relay to your hivesmate in order to guide them to the source.

Teaching Strategies:

This activity aims to exemplify the complexities of honeybee forager communication. Honeybees communicate distance, direction, and viability of a sources with the waggle dance and this method of communication is extremely effective. By forcing learners to use their bodies and think outside the box, the goal is to get learners thinking about how much cooperation and hard work goes into the maintenance of a highly social colony. This understanding by learners should be assessed through post activity questioning.

Primary teaching strategies include:

- Pre and post game questioning of learners knowledge and difficulties with the game,
- Relating various aspects and difficulties of the game with the realities of colony maintenance by bees.
- Allowing learners agency to figure out the best way to complete the game on their own

Vocabulary:

- Pollination
- Division of Labor
- Waggle Dance
- Forage/Forager
- Eusociality
- Pesticide

Science Content Background and Additional Resources:

<http://www.outdoorbiology.com/files/resources/activities/FlowerPowder.pdf>

*Alternatives could include using pipets and a small container at the hive to mimic the carrying of nectar back to the hive instead of pollen. Pipets can be decorated to mimic a honey bee for added effects.

*Can also incorporate themes of plant/nutrition diversity and its impacts on bees and benefits for the natural world with different plant sources.