



UNIT FOR WEEK 4

HONEY



I EAT MY PEAS WITH HONEY

I eat my peas with honey
I've done it all my life
It makes the peas taste funny
But it keeps them on the knife!

Ogden Nash

ON THE PATH TO HONEY



ASK THE AUDIENCE

- Have you ever seen a bee on a flower?
- Do you eat honey?
- What are some of your favorite products made from honey?
- What are some of your favorite fruits and vegetables?

THE POLLEN NECTAR HONEY CYCLE

The honey bees collect pollen and nectar; they store pollen and make honey from the nectar; they use the pollen and honey as nourishment to help make more bees and as energy to collect more pollen and nectar...and the cycle continues. It is because of this cycle that we are able to benefit from the honey produced by the colony!

POLLEN AND NECTAR

COLLECTING POLLEN & NECTAR: Using the sun as navigation and information from the round dance or waggle dance, the worker bees will forage for pollen and nectar all day. They fly from flower to flower collecting pollen and sweet nectar. The pollen is trapped in pollen baskets on the legs and abdomen, and the nectar is extracted through the bee's proboscis, or tongue, which functions like a straw. The nectar is stored in her honey sac, which is like a second stomach.

POLLEN IN THE HIVE: When the bees return to the hive, the pollen is removed from the bee's legs by worker bees that will pack it into the comb cells using their heads. The pollen is usually mixed with honey or nectar and enzymes to make a hard pack beebread. This is their main food source and a great source of protein for all hive members. It is also used to nourish the developing larvae.

MAKING HONEY: Once the bee returns to the hive, the nectar load is sucked from her nectar pouch, honey sac, by other worker bees through their proboscises. The workers then "chew" the nectar, which adds enzymes from the bee. Basically, honey is nectar that the bees have spit up and eaten over and over many times.

The bee then deposits the honey from her mouth into one of the cells in the honeycomb. The worker bees get as much water out as possible by fanning the honey with their wings. The honey bee is not born knowing how to make honey; the younger bees are taught by the more experienced ones. The reason the bees make honey is so that they can have food in the future and during the winter when there are no flowers blooming.

LESSONS ON POLLEN AND NECTAR

THE FOLLOWING FORMULA BEST DESCRIBES HONEY

Sucrose (nectar) + invertase
(bee enzyme) = fructose +
glucose = Honey!

BuzzAboutBees.net

HONEY FACTS

Honey is the only food on the planet that will not spoil or rot.

Honey has been used for millennia as a topical dressing for wounds since microbes cannot live in it. It also produces hydrogen peroxide. Honey has even been used to embalm bodies such as that of Alexander the Great.

When left in a cool dark place for a long time, honey may start to “crystallize”. When this happens, loosen the lid, boil some water, place the honey container in the hot water, turn off the heat and let it re-liquefy. It is then as good as it ever was. Never bring the honey to a boil or put it in a microwave, doing so will kill the beneficial enzymes.

Fermented honey, known as Mead, is the most ancient fermented beverage. The term “honey moon” originated with the Norse practice of consuming large quantities of Mead during the first month of a marriage.

To make one pound of honey, workers in a hive fly 55,000 miles and tap two million flowers.

It takes one ounce of honey to fuel a bee’s flight around the world.

Honey is nectar that bees have repeatedly regurgitated and dehydrated.

POLLINATION

Once a honey bee discovers a good source of nectar, she will continually return to that same type of flower. Because she prefers to collect nectar from one kind of flower, she spreads pollen from one plant to another individual of the same variety. The pollen sticks to the bee’s legs and gets dusted onto the next plant that the bee visits. This is called pollination. A flowering plant must get pollen from a flower other its own in order to have fertilization and produce fruit and nuts. This makes us very dependent on bees and other pollinators for our food!

In North America alone, honey bees pollinate nearly 95 kinds of fruits, including almonds, apples, avocados, blueberries, cranberries, cherries, kiwi fruit, macadamia nuts, asparagus, broccoli, carrots, cauliflower, celery, cucumbers, onions, legume seeds, pumpkins, squash, and sunflowers. Farmers are dependent on the bees visiting their crops to maintain good production levels.

In Spain, hilly terrain and antiquated planting and harvest practices keep farmers from retrieving more than about 100 pounds [of almonds] per acre. Growers in the Central Valley, by contrast can expect up to 3000 pounds an acre. But for all their sophisticated strategies to increase yield and profitability, almond growers still have one major problem - pollination. Unless a bird or insect brings the pollen from flower to flower, even the most state-of-the-art orchard won’t grow enough nuts. An almond grower who depends on wind and a few volunteer pollinators in this desert of cultivation can expect only 40 pounds of almonds per acre. If he imports honey bees, the average yield is 2,400 pounds per acre, as much as 3,000 in more densely planted orchards. To build an almond, it takes a bee.

Hannah Nordhaus, *The Beekeeper’s Lament: How One Man and Half a Billion Honey Bees Help Feed America*



HOW SWEET IT IS

No Live Bees Required: use [this link](#) to observe inside the hive and [this link](#) to observe outside of the hive.

1. Look in the Observation Hive and find bees with pollen on their legs and abdomen. Notice how these bees are greeted by other worker bees that remove and transfer the pollen.
2. Look for cells with nectar (more clear) and how they differ from the honey cells (more dense and usually capped).
3. Look for the pollen stores, vibrant yellow-orange cells. Identify foods dependent on honey bees.
4. Research and share recipes that highlight the use of honey in cooking. It can often be substituted for sugar.
5. Write your own poem about bees.

INTERACTIVE WITH THE HIVE

