

Beehive Lesson 2: Honey



Students learn how bees make and use honey, then they practice observational skills by exploring honey's wide range of colors and tastes.

Guiding Ideas

This project was developed with the American Beekeeping Federation's Kids and Bees program. Explore a new Minecraft world, created by Lifeboat, and use new lessons to introduce students to bees' dynamic and fascinating roles in their own hives and in broader ecosystems. Honey is Lesson 2 of 5 for the Beehive.

Learning Objectives

- NGSS Crosscutting Concepts: Patterns, Cause and Effect
- NGSS Science and Engineering Practices: Planning and Carrying Out Investigations
- NGSS Disciplinary Core Ideas: LS2.A: Interdependent Relationships in Ecosystems; PS1.A: Structure and Properties of Matter
- Understand the differences between nectar, honey, and pollen
- Make systematic observations about different kinds of honey

Performance Expectations

This lesson will enable students to:

- Describe how and why bees make honey
- Collect data about and compare characteristics of different kinds of honey

Skills

Collaboration, Communication, Project Based Learning

Total time needed

55-75 minutes

Materials needed for classroom activities

Three distinctive honeys (light, medium, and dark color), preferably local
Paper cups, enough to provide three samples and one cup of sticks to each group of 4 students
Three tasting sticks for each student
Small trash bags, enough to provide one to each group of 4 students
One printed copy of the Honey Tasting Worksheet for each student
Honey Color Chart - projection or one printed color copy for each group of 4 students
Honey Flavor and Aroma Chart - projection or one printed copy for each group of 4 students

Introductory questions

- ⬡ Raise your hand if you've eaten honey before.
- ⬡ Have you ever wondered how bees make honey? Take a guess about how they do it. Invite a few students to share their guess with the whole class.
- ⬡ What words would you use to describe honey? Do you think all honey looks or tastes the same? Why or why not?

Student Activities

Introduction (whole class) 10 minutes

Turn students' attention to the delicious mystery of honey by leading a discussion using the introductory questions above. Let students know that during this lesson, they'll learn the answers to these questions. As a class, watch "[Honey: How It's Made.](#)"

Minecraft Beehive (explore as individuals) 20-30 minutes

Students will meet a scientist in a lab outside of the beehive. The scientist will instruct the students to gather a bee costume, a camera, and a quill and paper from the chest. Students will transport to the hive and meet the NPC Bee Girl outside the hive and receive a welcome and introduction to the beehive.

Once students arrive in the hive, bee guide Aaliyah will ask students to help her make honey and will walk students through the bees' process gathering nectar, storing it in cells in the hive, and heating and fanning it with their wings to reduce moisture.

While in the honey section, students will also talk to bees Molly and Nia to learn about how honey flavor and color varies in different geographical regions and based on the plants bees are visiting. Ask students to take notes on which varieties of honey are produced in your state.

Please note that other bee NPCs exist in the Beehive; students will interact with them in other lessons. Also note that many of the NPCs have videos to share, so make sure students have headphones. If the students are having difficulty finding the sections of the hive, they can just ask the queen to send them to where they need to go!

In-Class Exercise and Discussion (whole class and small groups) 25-35 minutes

Now that the students understand how honey is made and that there are many varieties of honey in the US, bring the lesson close to home with a honey tasting party!

In advance, purchase three varieties of honey: a light, a medium, and a dark. Local honeys will make the lesson more personal for the students, but you might not be able to find three distinct local honeys, so just use whatever you can find! Try natural grocers or farmers' markets if you can't find three honey varieties at your regular grocery store.

The morning of this lesson, distribute the honeys into small paper cups. For each group of up to four students, pour a few tablespoons of each type of honey into its own cup. Set the prepared cups aside; they do not need to be refrigerated but they should be covered (covered loosely with a sheet of paper is fine). Also prepare a cup of tasting sticks for each group, with enough sticks for each student in the group to have three.

Put students in groups of up to 4. Hand out a [Honey Tasting Data Collection Sheet](#) to each student, and let them know that they will be responsible for recording data as they are taste-testing. BEFORE handing out the honey, briefly describe the five kinds of data students will be collecting, and how they will determine that information:

- Color: Either project or hand out a color copy to each group of the “Honey Color Chart” on page 5 of the [FlowHive booklet](#). Students will try to match the color of each of the three honeys to colors on the chart.
- Smell - intensity and description: Students will pass each cup around their group so that everyone gets the opportunity to waft each of the three honeys. Explain that intensity is how much of a smell you smell (is it only a little bit smelly vs. is it very smelly), and description is the words you would use to characterize the smell for someone who hasn't smelled it before. Project or hand out a copy to each group of the “Honey Flavor and Aroma Chart” on page 4 of the FlowHive booklet.
- Taste - intensity and description: When tasting each honey, students should take a single tasting stick from the cup on their table, continue holding the same end (so that the end that goes into the honey stays clean), dip into the honey cup and scoop up a small amount, and then let the honey sit on their tongue for a moment before making notes. Explain to students that they must only use each tasting stick once – double-dipping isn't allowed! After tasting their sample, students should immediately place their used tasting stick into the trash receptacle so it doesn't get accidentally re-used. As with smell observations, students will be noting both intensity and description, guided by the “Honey Flavor and Aroma Chart”. Encourage students to go beyond “sweet” and use descriptive words from the chart to differentiate between the honeys.

After giving these instructions, hand out a cup of tasting sticks and a trash receptacle (small bag or bin) to each table, along with either the first honey samples or all of the honey samples. Depending on your class, either walk the entire group through collecting data on each honey type (“We'll start with the lightest honey. [Hand out lightest honey cups to each group.] Pass it around and have each group member take notes about what they see and smell. Now get a fresh tasting stick, dip ONCE into the lightest honey, taste it, and write down your notes. Throw away your used stick. Now we'll move on to the medium honey...”), OR let the class know how much time they have to complete data collection, pass out all of the honey cups, and then circulate throughout the room to keep students on track.

After students have completed their sight, smell, and taste observations for all three honeys, gather the group together for a concluding discussion. Ask students if they made any surprising observations about their honeys. Ask students to raise their hands to indicate preference for light, medium, or dark honey: is there a consensus among the class? Invite a few students to defend why they chose their preferred honey. Do students have the same reasons for liking their preferred honey, or different reasons?

After the discussion, ask students to help with clean-up by placing all of the used tasting cups and sticks into the trash bags.

To deepen the discussion with older students, summarize, read individually, or read aloud information about your specific Beekeeping Region in the [Beekeeping Regions in the US](#) document. Invite students to compare their region with another region's beekeeping

practices and outcomes, and provide a best guess as to why differences between regions occur.

To give students an opportunity to practice planning an investigation, after describing the kinds of data to be collected, ask them to create their own data sheets instead of handing out the Honey Tasting Worksheet.

External Resources

[Minecraft Beehive File](#) - Download Beehive and open with Minecraft: Education Edition. You'll find this resource in your Templates, under Create New.

[Honey Color and Flavor](#) - This resource from the National Honey Board lists and describes many of the most common honey flavors.

[National Honey Board's Honey Locator](#) - This interactive map from the National Honey Board helps you find and explore apiaries all over the country.

[Beekeeping Regions in the US](#) - Pulled from the "Beekeeping in the United States Agricultural Handbook", this resource compares beekeeping practices and outcomes in seven geographical regions across the US; this is a dense resource and is suitable for upper middle and high school readers.

[FlowHive's Honey Flavor, Aroma, and Color Charts](#) - This guidebook describes the honey tasting process, providing reference resources for new and experienced tasters alike.

[Honey: How It's Made](#) - This 3-minute animated video explains how honey is made.

[Honey Tasting Data Collection Sheet](#) - Use this data collection sheet during a honey tasting exercise.

Vocabulary

Cell - the hexagonal compartment made of beeswax used to store honey, pollen, and nectar and to raise the brood

Comb - a mass of cells, usually formed in two layers with the cells fusing at the bases

Honey - a dense and sugary enzyme-rich liquid compound made by bees from the nectar of flowers

Honey crop - a storage organ in honey bees' abdomen used for carrying nectar, honey, or water

Nectar - a sugary liquid secreted by plants to attract pollinators

Pollen - the vessel housing a plant's male gamete

Proboscis - the tongue of a bee that acts as a straw

Further Study

[Kids and Bees Handbook](#)

[UC Davis Honey Tasting Flavor and Aroma Wheel](#)

[National Honey Board](#)

[American Honey Tasting Society](#)

[How to Taste \(and Fall in Love With\) Raw Honey](#)

[Honey Connoisseur: Selecting, Tasting, and Pairing Honey, With a Guide to More Than 30 Varietals](#)

[Taste of Honey: The Definitive Guide to Tasting and Cooking with 40 Varietals](#)