ECHOS®

Early Childhood
Hands-On Science

# Busy Buzzing Bees

# Acknowledgements

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## Contents

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## Overview

**Overall Goal: Children learn about the special features of honeybees and their important role in helping transfer pollen from one flower to another.**

| Lesson | Objectives | Vocabulary | Key Concepts | Tools |
|---|---|---|---|---|
| **#1: Pollination** | Children will investigate how a honeybee's legs help transfer pollen from flower to flower. | abdomen<br>antennas<br>honeybee<br>pollen<br>pollination<br>stinger<br>thorax<br>wings | • Bees are insects, and all insects have three pairs of legs, a head, thorax and abdomen, and one pair of antennas.<br>• Bees have two pairs of wings.<br>• Bees have a stinger they use to protect their hive.<br>• As bees move from flower to flower, pollen gets trapped in their hairy legs and body.<br>• Pollen falls off the bees' legs and is transferred from one flower to another. | bee model<br>real honeybee in resin |
| **#2: Honey** | Children will explore how honeybees use their proboscis to collect nectar to make honey. | beehive<br>hexagon<br>honey<br>honeycomb<br>nectar<br>proboscis | • Bees have a hairy, straw-like tongue called a proboscis.<br>• Bees use their proboscis to gather nectar from flowers for food.<br>• Bees live in beehives.<br>• Bees store nectar in their honeycombs.<br>• Each honeycomb is made up of hexagonal (six-sided) cells. | dropper |
| **#3: Scent of a Bee** | Children will learn that honeybees use their antennas to smell, and that honeybees living in the same hive have the same scent. | scent<br>senses<br>smell(s) | • Bees that live in the same beehive have the same scent.<br>• Bees use their antennas to smell and identify bees from their beehive.<br>• Bees also use their antennas to find their own beehives. | |
| **#4: Bee Dance** | Children will be able to describe how honeybees use body movement to communicate the location of a flower. | communicate<br>near/far<br>waggle dance | • There are many ways to communicate, or say things, without talking.<br>• Bees communicate using a special dance.<br>• When bees find flowers they tell other bees in their hive where the flowers can be located by doing a waggle dance.<br>• A figure-8 dance means the flowers are far away.<br>• A circle dance means the flowers are near. | |

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# Science Process Skills

| Science Process Skills | Lesson #1 | Lesson #2 | Lesson #3 | Lesson #4 |
|---|---|---|---|---|
| **Observing** | | | | |
| Identifies object properties | ● | ● | ● | ● |
| Uses senses to observe concrete, familiar objects | ● | ● | ● | ● |
| Differentiates between models and the real thing | ● | ● | ● | ● |
| Uses measurement tools to record observations | | | | |
| Uses tools to observe objects or events | ● | ● | | |
| **Describing** | | | | |
| Describes key attributes of objects | ● | ● | ● | ● |
| Creates drawings or models depicting objects | ● | | | |
| Describes changes in objects | | | | |
| Discusses changes in variables that affect an investigation | | | | |
| **Categorizing** | | | | |
| Notices similarities and differences | ● | ● | ● | ● |
| Sorts objects into groups using one attribute at a time | | | | |
| Establishes own sorting criteria | | | | |
| Sorts objects using multiple attributes | | | | |
| Provides reasoning for grouping objects | | | | |
| **Predicting** | | | | |
| Verbalizes thinking | ● | ● | ● | ● |
| Recognizes and extends patterns | | | | |
| Makes simple predictions | | | | |
| Makes predictions based on observations | | | | |
| Uses estimation to make quantitative predictions | | | | |
| **Experimenting** | | | | |
| Investigates models of objects/phenomena | ● | ● | ● | ● |
| Manipulates materials | ● | ● | ● | |
| Identifies factors that might affect the outcome of an experiment | | | | |
| Participates in collecting data | | | ● | ● |
| Interprets data using symbols or graphs | | | | |
| Performs trial-and-error investigations | | | ● | |
| **Drawing Conclusions** | | | | |
| Makes verbal interpretations of observations | ● | ● | ● | ● |
| Finds patterns from data collected | | | | |
| Connects findings from an investigation | | | | |

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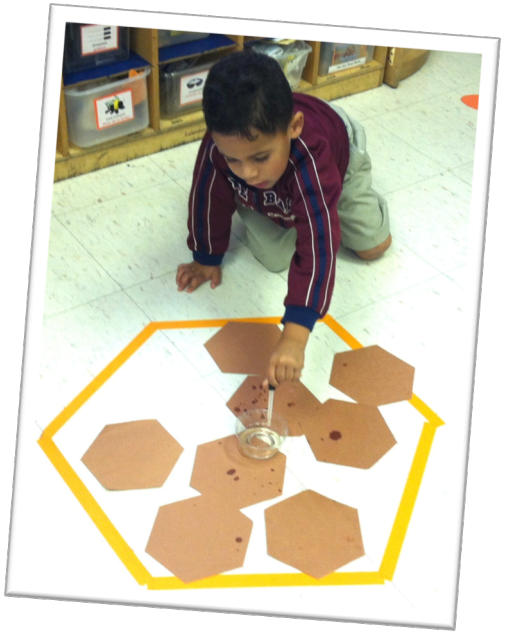
## Lessons at a Glance



Why do bees need six fuzzy legs? In ***Pollination***, a delightful bee puppet draws children in as they discover how bees use their legs to transfer pollen from flower to flower. As the lesson progresses, children observe that the fuzzy hairs on a bee's legs trap pollen; the pollen falls off as the bee travels from one flower to another.

Does the sound of the word proboscis [proh-**boh**-sis] sound funny to you? In ***Honey***, children find out how important a proboscis is to a bee. Bees use the straw-like proboscis to collect nectar. Children pretend to be bees as they collect nectar with droppers and transport it to the "hive."

In ***Scent of a Bee,*** children use their noses the way bees use their antennas to smell. Bees can use scent to identify other bees from their hive. Children wear antennas headbands and fly around as they use their sense of smell to find their hive. Will the bees' antennas lead them home?

In ***Bee Dance*** children waggle dance their way to learning how bees communicate. When bees return to the hive, they do a waggle dance to communicate the distance and direction of flowers. A circle dance means that the flowers are near the hive; a figure-8 dance means that the flowers are farther away. Through modeling and role-play, children explore and describe how bees move their bodies and shake their abdomen to communicate the location of a flower.

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## Key Concepts

Bees are a fascinating subject for both children and adults, from their complex social behaviors to the production of honey. Bees are insects, just like butterflies and ants. Like most insects, they have attributes that children can learn to identify: six legs, three body segments (a head, thorax and abdomen), two antenna, and four wings. Honeybees also have a stinger in their abdomen that they use to protect their hives or when they sense danger. ***Busy Buzzing Bees*** introduces these life science concepts using exploration of real objects, models, and dramatic play.

- Honeybees have a **stinger** in their abdomen that they use to protect their hives or when they sense danger.
- Honeybees do not have a nose, but they can still detect scents using their antennas. Bees sip **nectar** with their tube-like **proboscis** and collect **pollen** on their hairy legs.
- When bees fly from flower to flower, **pollen** gets trapped in the hairs on their legs. As they fly to other flowers, the pollen falls off and is transferred to other flowers.
- Honeybees live in a community called a **hive**. Bees store honey in **honeycombs** made up of six-sided figures, called **hexagons**.
- Some flowers depend on bees and other animals to transfer pollen from one flower to another. This is called **pollination**.
- Bees transport nectar back to the **hive**. At the hive, nectar is processed into honey.
- When a bee finds a good source of pollen or nectar, it goes back to the hive and does a **dance** to communicate the location of the flowers to the other bees.
- When bees dance in a circle, it indicates that the flowers are nearby, while a figure-8 **waggle dance** means that the flowers are farther away.

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# Lesson Guide

**TEACHER TALK**

Teacher talk is indicated by **bold letters that appear in large print**. When you first start teaching ECHOS, you may need to rely heavily on this text to ensure that you are presenting the science concepts accurately. As you become familiar with the text, use it as a guide or refer to it only as needed. You should always read the entire script prior to delivering the lesson.

**TEXT IN ALL CAPS**

Text IN ALL CAPS appears throughout the script to emphasize a step or instructions given to children.

**VOCABULARY WORDS**

Vocabulary words are introduced during the lesson and reinforced in the Outcomes section.
They appear in ***red italic letters*** the first time they are introduced.

**MATERIALS IN BLUE LETTERS**

Materials listed in blue letters in the *Material Preparation* page, indicate materials that are non-consumable. Once acquired, these materials do not need to be replaced.

**SCIENCE AREA**

The last page of each lesson contains suggested materials that could be added to your science area. Before adding any materials for children's independent use, evaluate whether the item is safe to be explored with limited supervision. The science area should be a place that children use freely to explore and conduct their own trial and error experiments, rather than a display area.