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HONEY BEES

A learning & sensory-activity guide for students of Overbrook School for the Blind

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EDUCATIONAL & WORK STANDARDS / CURRICULUM EXTENSIONS & ADAPTATIONS

Common Core: 2nd / 6th Grades

- ***4.1.2.D.*** - Identify differences in living things (color, shape, size, etc) and describe how adaptations are important for survival.
- ***4.1.2.E -*** Identify how living things survive changes in their environment.
- ***4.3.2.B -*** Identify products and by-products derived from renewable resources.
- ***4.4.2.A*** - Identify agriculture as a living system and that food and fiber originate from plants and animals.
- ***4.4.2.E*** - Ask questions about objects, organisms, and events.
- ***4.5.2.A*** - Identify the natural resources used to make various products.
- ***CC.1.2.2.E*** - Use various text features and search tools to locate key facts or information in a text efficiently.
- ***CC.1.2.2.C*** - Describe the connection between a series of events, concepts, or steps in a procedure within a text.
- ***CC.1.2.2.J*** - Acquire and use grade-appropriate conversational, general academic, and domain-specific words and phrases.
- ***CC.1.2.2.K*** - Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade-level reading and content, choosing from a range of strategies and tools.
- **CC.1.3.2.A** - Recount stories and determine their central message, lesson, or moral.
- ***CC.1.3.2.B*** - Ask and answer questions such as who, what, where, when, why, and how to demonstrate understanding of key text details.
- ***CC.1.5.2.A*** - Participate in collaborative conversations with peers and adults in small and larger groups
- **CC.1.5.2.C** - Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information or deepen understanding of a topic or issue.
- ***4.5.6.D***. - Identify why organisms become threatened, endangered, and extinct.
- ***4.5.6.F*** - Understand how theories are developed; Identify questions that can be answered through scientific investigations and evaluate the appropriateness of questions; Design and conduct a scientific investigation and understand that current scientific knowledge guides scientific investigations; Describe relationships using inference and prediction; Use appropriate tools and technologies to gather, analyze, and interpret data and understand that it enhances accuracy and allows scientists to analyze and quantify results of investigations; Develop descriptions, explanations, and models useing evidence and understand that these emphasize evidence, have logically consistent arguments and are based on scientific principles, models and theories; Understand that investigations may result in new ideas for study, new methods, or technologies.

Expanded Common Core

- ***Assistive Technology*** - kit utilizes Active Learning materials
- ***Career Education*** - provides students with visual impairment ability to learn through hands-on experiences as with testing of germination rates for seeds grown in / out of greenhouses
- ***Compensatory Skills*** - builds skills necessary for accessing core curriculum including concept development, communication modes, object or tactile symbols
- ***Sensory Efficiency*** - instruction in the use of vision, hearing, touch, smell, taste. Includes proprioceptive, kinesthetic, and vestibular system processing.
- ***Social Interaction*** - creates opportunity for interpersonal relationships through awareness of body language, gestures, facial expression, personal space, self-control.

PA Career Standards

- ***13.1.3 / 13.1.5 - Career Awareness & Preparation -*** *recognize that individuals have unique interests and abilities, identify range of jobs available in community*
- ***13.2.3 / 13.2.5. - Career Acquisition -*** *Identify appropriate speaking and listening techniques used in conversation*
- ***13.3.3 / 13.3.5. - Career Retention & Advancement -*** *Identify how to cooperate at both home & school and to complete a task; identify effective group interaction strategies*

Curriculum Extensions & Adaptations

- ***Art: Make Your Own Honeybee & Honeybee Hive*** - students can make their own honeybee using tactical elements such as pompoms, pipe-cleaners and googly eyes and learn more about construction of the hive by making cells from toilet paper rolls.
- ***Culinary Arts: Carrot Salad wing Honey Dressing*** - students can take part in making a carrot salad with honey dressing from a recipe designed by the Philadelphia Free Library Culinary Literacy Center, learning more about the plants honeybees pollinate and the products honeybees produce.
- ***Career: Visit from a Beekeeper*** - students can learn about the business, art, and practice of beekeeping from a member of the Philadelphia Beekeepers' Guild. Members of the guild can borrow a traveling hive case that allows them to bring frames for public demos. info@Phillybeekeepers.org

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Walk through a field of flowers in early spring, summer, or fall & you might hear the BUZZ of busy honey bees…

EXPLORE: Teacher plays audio track of honey bees buzzing

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Honey bees are small, flying insects known for building hives out of wax and for making & storing honey.

They have dark black bodies with yellow banded stripes.

EXPLORE: If students are permitted to, students can taste a sampling of honey.

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**Honey bees fly long distances (*up to 3 miles!*)
to feed on the sweet, sugary NECTAR from flowers.**

They use their long straw-like tongues (PRO'BO'SCIS) to drink.

EXPLORE: Students feel straws that simulate the bees' long tongues. Students can sip sweet juice.

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Honey bees' bodies are covered in short, bristly hairs.
These hairs capture sticky, powdery POLLEN from flowers.

Bees bring POLLEN and NECTAR back to their hives.

EXPLORE: Students feel boars' hair hairbrushes & baby powder (pollen).

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Honey bees move pollen from one flower to another. This process is called POLLINATION and helps plants to reproduce

EXPLORE: Students pretend they are bees and hold spongy stress balls to simulate pollen grains. Students hand balls off to each other to enact how bees 'drop' pollen from one flower onto another.

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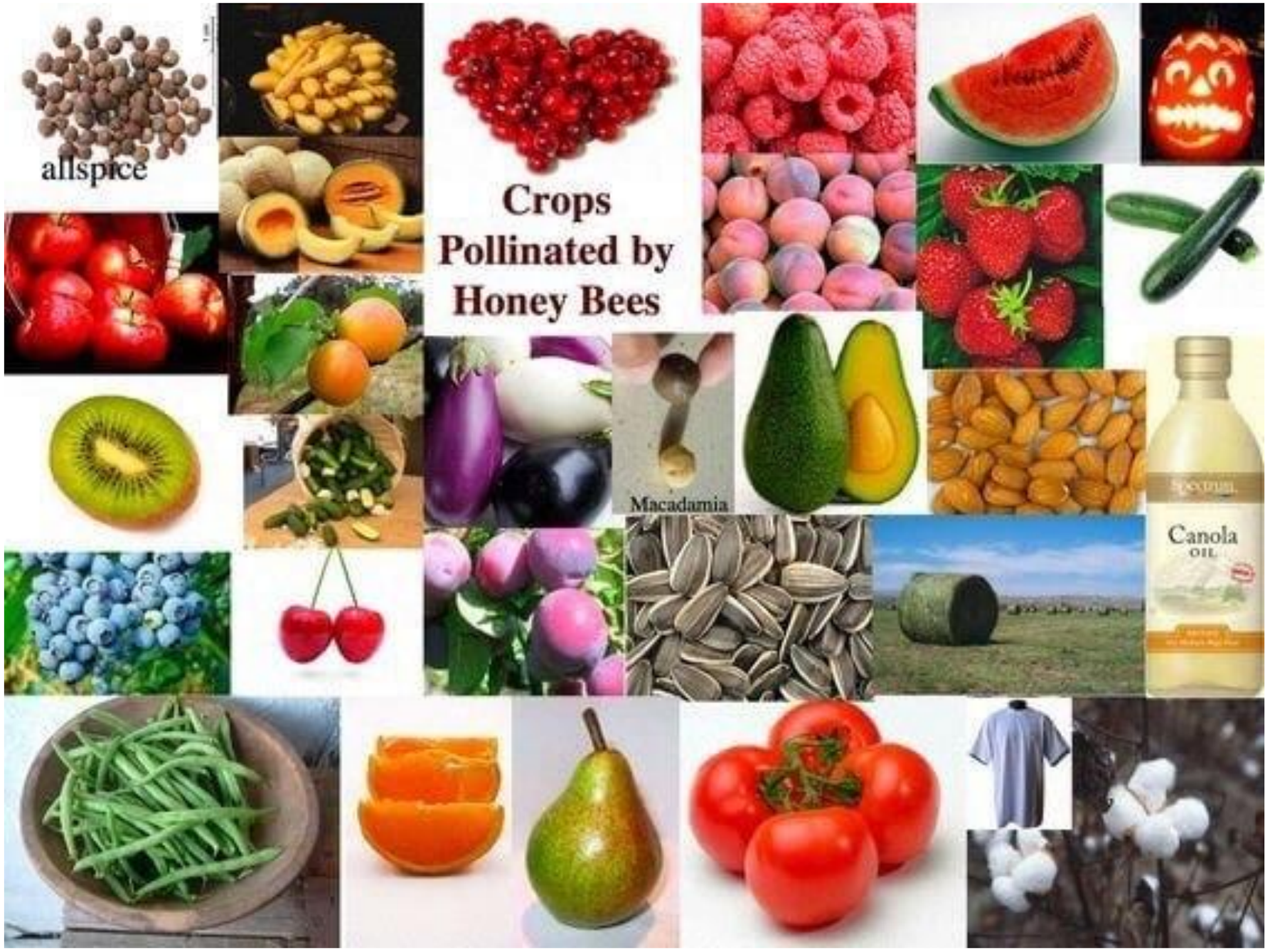
Without POLLINATION, many plants could not produce FRUIT, or SEEDS. Honey bees help POLLINATE one-third of all fruits and vegetables - including apples, blackberries, tomatoes, celery, and more!



EXPLORE: Students feel, hold, or taste a variety of fruits and vegetables pollinated by honey bees.

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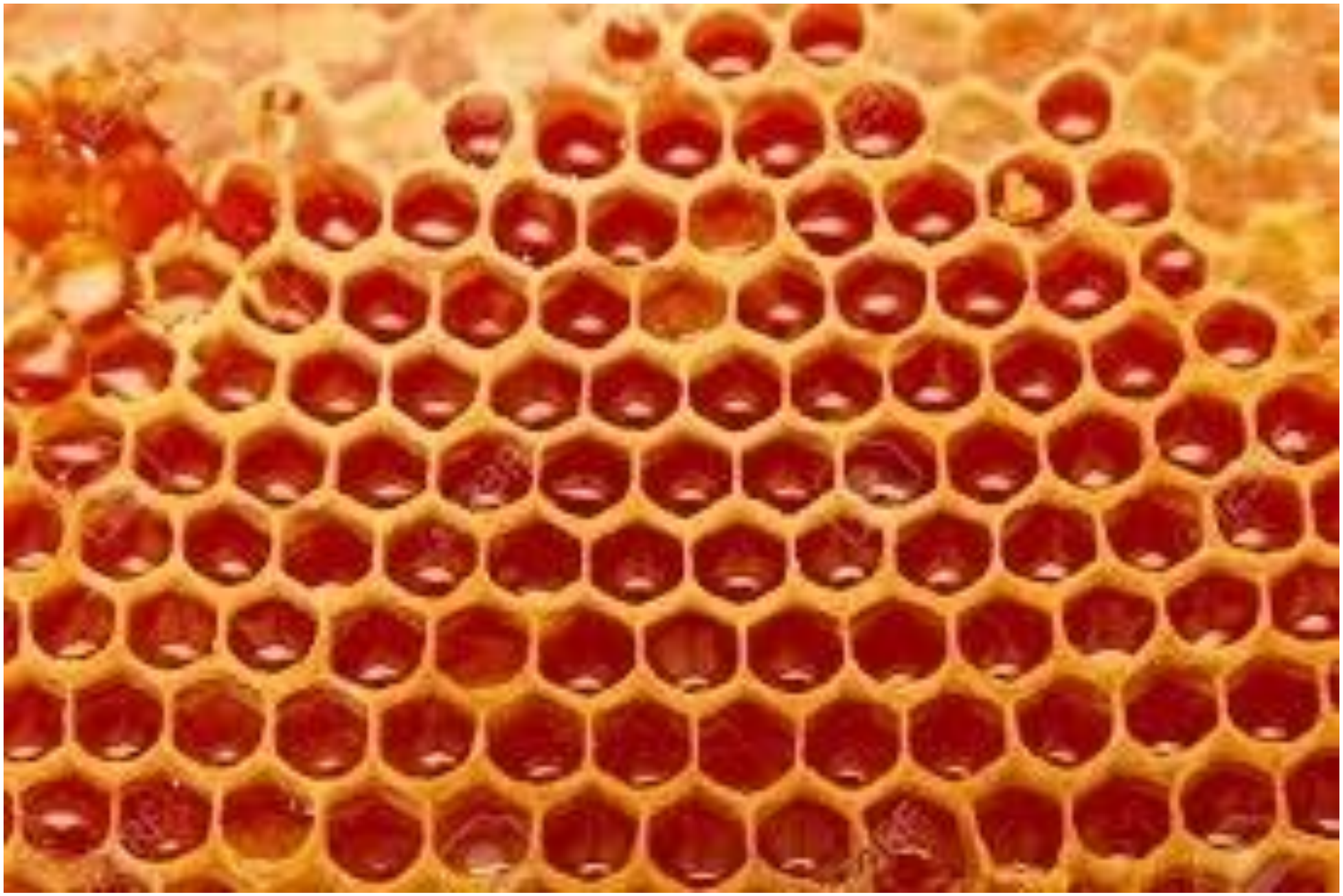
Honey bees live in HIVES they build from beeswax. The cells of their hives are 6-sided HEXAGONS.



EXPLORE: Students feel beeswax granules, hexagonal blocks (tracing the sides), and honeycomb.

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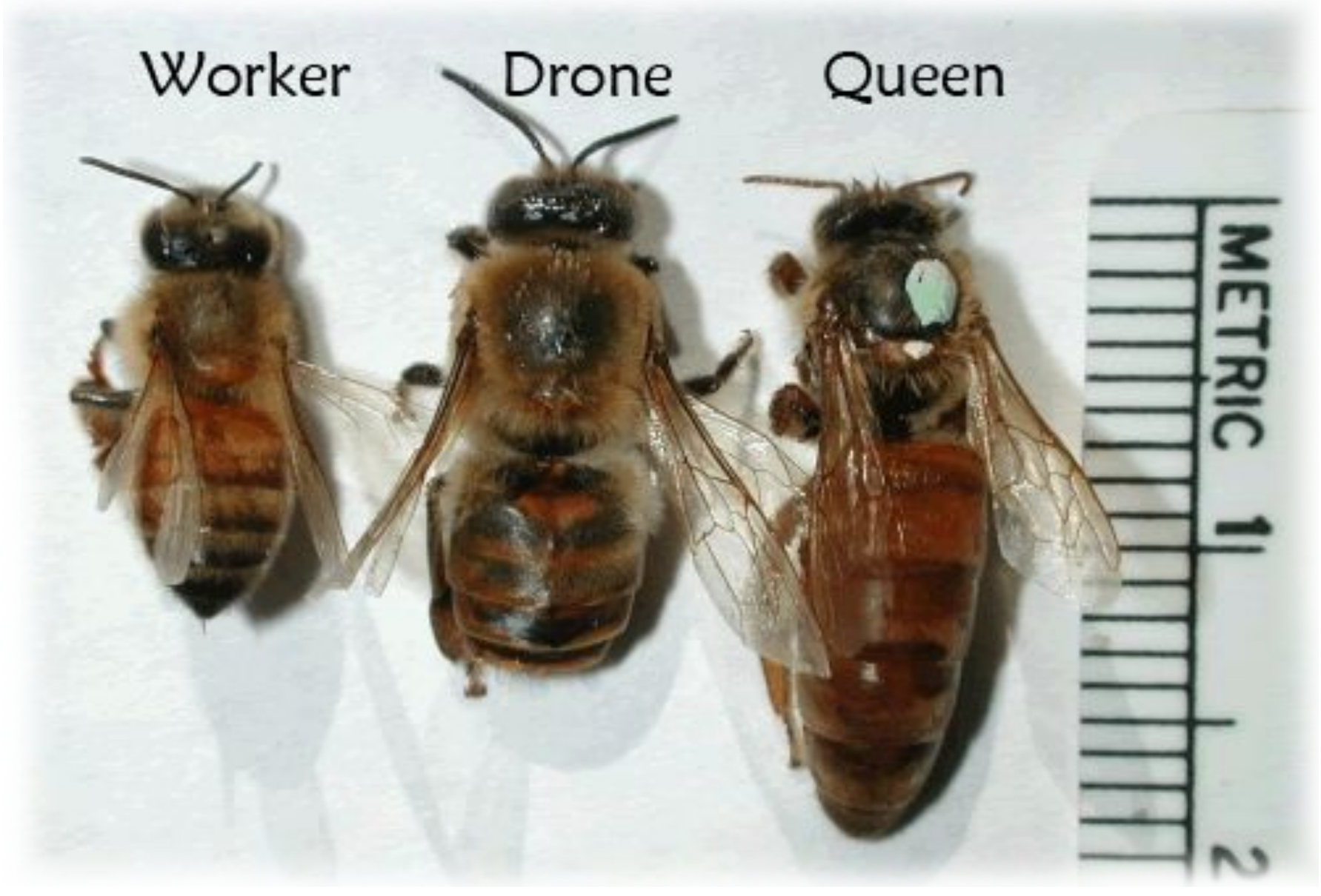
Honey bees are great team-players!
There are three main jobs inside the colony:
QUEEN, DRONE, AND WORKER.



EXPLORE: Students hold different clay models of the three types of bees to feel the difference in size of QUEEN, DRONE, WORKER as identifying factors of the bees in next (3) pages.

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The QUEEN is the largest bee of the colony.
She is the only one that can lay eggs.
As the boss, she calls all the shots!

EXPLORE: Students put on a crown to symbolize their queen-bee status!

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WORKER bees are female and hatch in 21 days.
They make up 80-90% of the hive.

They work different jobs throughout their life! Some collect pollen and nectar, feed broods of new bees, groom the queen, build new cells, and keep the hive heated or cooled to the right temperature.

EXPLORE: Students use paper folded fans to simulate fanning the queen and the new brood.

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DRONE bees are male and hatch in 24 days.
They only make up 10-20% of the hive. They are twice the size of WORKER bees and have LARGE EYES.

Their only role is to mate with QUEENS from other hives.

EXPLORE: Students put on large sunglasses to resemble large-eyed drone bees and act out flying.

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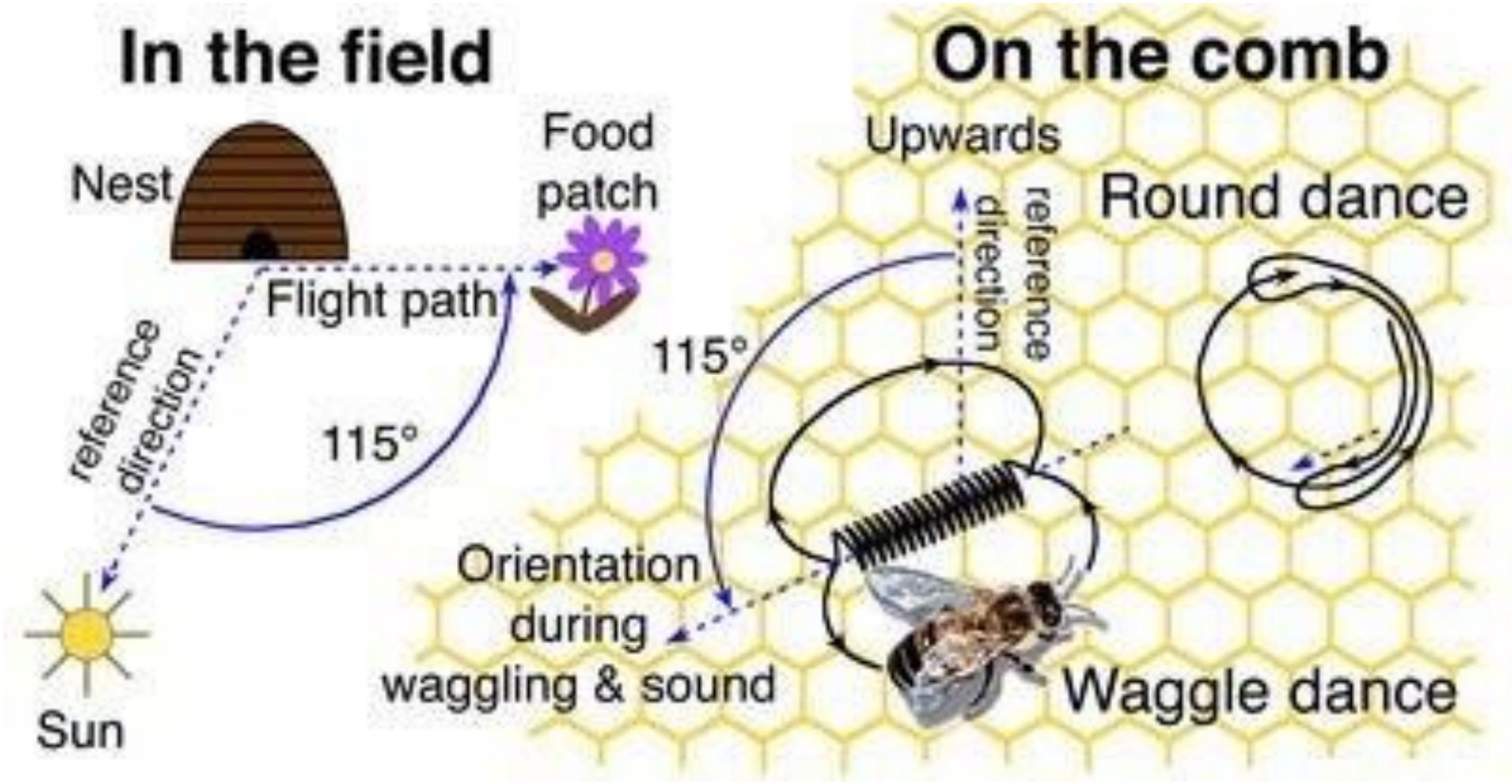
Worker bees DANCE to COMMUNICATE where to find food!

A ROUND DANCE shows flowers close to the hive (10-80 yards).
THE WAGGLE (side-to-side shaking of abdomen) shows food that's further away.



EXPLORE: Teacher plays sounds of bees waggling and assists students with wheeling or assisting students in replicating patterns - whether full body, or with finger (drawing a circle for ROUND dance, or shaking finger side-to-side to showcase WAGGLE)

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Honey bees also COMMUNICATE by odor cues called PHEROMONES.

To help LOCATE THE HIVE, honey bees release a scent that smells like lemons. To sound the ALARM to potential intruders, they release a scent that smells like bananas.

A worker honey bee fans air over the exposed Nasonov gland near the tip of her abdomen. The orientation pheromones produced by the gland help other bees orient to the colony.

EXPLORE: Teacher can spray WELCOME HOME SPRAY (lemon-scented) and ON-GUARD spray (banana-scented) for students to experience simulated bee pheromones.

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Honey bees are in decline but YOU can help honeybees THRIVE!

Support your local beekeeper.
Plant bee-friendly plants to provide flowers for food.
Bees get thirsty! Make a honey bee water feeder with a shallow dish and pebbles and wine corks.

EXPLORE: Students can fill a dish with marbles and water to make a bee-water dish. Students can plant seeds of wildflowers to provide food for honeybees.

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MATERIALS PHOTO:

MATERIALS LIST FOR SENSORY COMPONENT:

- Audio track of honey bees buzzing https://www.youtube.com/watch?v=4QVmtvzSmnE
- Jar of honey with small spoons for sampling
- Straws (and small cups of apple juice)
- Boars' hair hairbrush
- Baby powder
- Collection of small, spongey stress balls
- Sampling of fruits and vegetables pollinated by honeybees
- Honeycomb or beeswax
- Hexagonal blocks
- Beeswax grains
- Pollen grains
- Clay models of queen, worker, and drone bee
- Queen's crown
- Folded paper fan
- Large sunglasses
- Lemon scented spray (or lemon), banana scented spray (or banana)
- Small paper cups and wildflower seeds & soil
- or small dish with marbles to fill with water

PHOTO CREDITS BY SLIDE:

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