

Honeybees, Beekeepers, and the Green World

Ten-session, 12-hour unit designed for 3rd grade students to work with the DC Beekeepers Alliance (www.dcbeckeepers.org) to learn about one of nature's most important living things...bees!

A beekeeper team will meet with an entire class once a week for 6 weeks in the Fall: There is a Mac or PC-compatible presentation for each session which has already been prepared. There are 4 "hands-on" sessions in the Spring, one of which requires two class sessions with two classes of students present throughout.

Objectives:

Students will...

- * Learn about connections between the plant, animal, and human worlds through the study of pollination, honeybee biology, and the art & science of beekeeping.
- * Explore the role that pollinators play in plant and human health and analyze the connectedness of environmental and community viability.
- * Focus on the bees themselves and apply biological study into their physical structure, their complex social behavior and its evolutionary basis, and the impact of their presence/absence on connected species.
- * Study beekeeping and concepts related to human agriculture and technological innovation driven by the observation of animal biology.
- * Get hands on experience creating bee forage, nests, and hives.

Fall Classes

SESSION 1 :

Why are pollinators important, and why do we work with only one kind, the honeybee?

- What is pollination?
- Pollination: the play (acting out why flowers need bees to transfer pollen)
- The structure of a true flower
- How do bees and flowers work together?
- There are many kinds of bees, why do we only work with honeybees?
- Examples of pollinated fruits and veggies

Materials:

- One lily flower per 2 students (best to buy 48 hours in advance, usually 3 blooms per stem—one dozen usually covers a whole class, flower wholesalers recommended)
- Flower anatomy handout (http://www.dcbeckeepers.org/presentations/Flower_anatomy.docx)
- http://www.dcbeckeepers.org/presentations/Class1-flower_and_pollination.pptx

SESSION 2:

Who lives in a beehive?

- The members of the honeybee family: the Queen, the Workers, the Drones
- How is the family organized? Who does what jobs?
- A day in the life of a honeybee colony
- What are the body parts of a bee?

Materials:

- Observation hive
- One dead/dried bee per student
- Bee anatomy hand out (http://www.dcbeckeepers.org/presentations/bee_anatomy.pdf)
- Magnifying glasses
- http://www.dcbeckeepers.org/presentations/Class2-family_anatomy.ppt

SESSION 3:

What is a beehive and what do beekeepers do?

- What is the beekeeper's job?
- How does the beekeeper's work change each season?
- Is the beekeeper's work different in different places?
- How do bees live in the wild?

- How have people lived with bees in the past?
- Opportunity to explore modern boxes, frames (an empty Langstroth hive will be present)
- Beekeeper protective gear and tools will be shared

Materials:

- Empty 8-frame Langstroth hive with frames
- skep
- Honey frame, brood frame
- “Welcome to My Honey Farm” coloring book, one per student plus instructors (available from DC Beekeepers at cost, about \$.50)
- http://www.dcbeekeepers.org/presentations/Class3-hives_feral.pptx

SESSION 4:

Bees or Wasps or Hornets?

- Plants and pollinators of many kinds “talk” to each other
- But are all “bees” the same?
- Different insects live in different places (habitats)
- Different insects eat different things (forage and plant partners)
- Some sting, some don’t, and some do for different reasons
- What does a stinger look like? How do they work?

Materials:

- Empty 8-frame Langstroth hive with frames
- Wasp nest (if we can get one)
- Handout comparing honey bees, bumble bees, wasps, hornets
- http://www.dcbeekeepers.org/presentations/Class4-beesandfriends_stings.pptx

SESSION 5:

Are Bees in Trouble?

- Bees in the news
- Using graphs and charts to understand the facts
- Diseases
- Environmental problems
- Climate change
- Industrial agriculture
- How beekeepers help
- What are your ideas? (brainstorming)

Materials:

- Easel and markers for kids’ ideas
- “Ten Ways to Help Bees” Handout (<http://www.dcbeekeepers.org/ten-things-you-can-do-help-urban-honeybees>)
- http://www.dcbeekeepers.org/presentations/Class5-Bees_in_trouble.pptx

SESSION 6:

What are the products of the hive and why do bees make them?

- Bees make different contributions at different times of their lives:
 - Young bees make wax, produce royal jelly
 - Middle aged bees raise young, “cure honey,” clean using propolis
 - Older bees forage for food, propolis
- Propolis: Smelling, feeling, hive products as medicine, why the bees produce propolis
- Beeswax: Discussion, rolling candles to take home, how the bees use beeswax
- Honey: tasting, comparing varieties, why the bees make so much
- Pollen, royal jelly
- Rolled candle activity

Materials:

- Honey sticks, one per student

- Bee pollen to try, 3-4 packs per student
- Propolis to handle (one block per table)
- Propolis trap
- Plain beeswax foundation, one half sheet per student
- Candle wicking, 4-6 inches per student
- http://www.dcbeekeepers.org/presentations/Class6-hive_products.pptx

Spring Classes

SESSION 7:

Hands on: Making seed balls

- Review of pollination and why bees do it
- Why is pollination important to us?
- Why might pollinators need more to eat now?
- What local plants do bees like?
- What seeds do we have today/choosing your seed balls contents?
- Where are good places to put these plants?
- Why does the seed ball resemble an “artificial fruit?”
- How can we tell if this helped pollinators?
- How have people lived with bees in the past?
- Opportunity to explore modern boxes, frames (an empty Langstroth hive will be present)
- Beekeeper protective gear and tools will be shared

Materials:

- 25 pound bag of sterilized worm castings.
- 2.5 pound tub of air dry clay, rolled and cut into 2” diameter, ¼” thick disks, 2-3 for each student
- Several packages of organic, pollinator-friendly plants (enough for each student to pick a couple of 2-5 different plants for each ball)
- Cups of water for each table
- Plain paper on which to let balls dry
- Markers for students to label (on paper) which seed balls are theirs.
- Handout of seed ball instructions for students to take home
- http://www.dcbeekeepers.org/presentations/hands-on-pollinationreview_seedballs.pptx

SESSION 8:

Hands on: Making pollinator nests

- Review of where honey bees live
- Compare to where other pollinators live
- Are they the same?
- Why might pollinators need more “habitat?”
- Two kinds of nests for two kinds of pollinators
- Where might these nests belong in our neighborhood?
- How can we tell if bees move in?

Materials:

- 1 linear foot of untreated lumber, preferably 1”x4”, per child, cut into 3” sections and pre-drilled with holes from 1/4” to ½”. Scrap OK.
- 2 3.5” long wood screws per child
- 2 linear feet of dried/hollow bamboo pole (less than ¾” diameter) per student, cut into 6” lengths
- 2-4 pipe cleaners per child
- 1 glue gun and glue sticks per 4 children (6 per class)
- Markers for decorating lumber nests
- two-sided instructional handout, 1 per child plus more for instructors
(http://www.dcbeekeepers.org/presentations/Make_a_Nesting_Block.docx and
http://www.dcbeekeepers.org/presentations/Make_a_Tube_Nest.docx)
- http://www.dcbeekeepers.org/presentations/hands-on-making_nests.pptx

SESSION 9:

Hands on: Painting bee hives

- Review of the honey bee life cycle
- Review of how people keep honey bees
- What do you remember about our study of bees?
- What would you like to tell other people?
- How beekeepers help
- Plan your design on paper
- Draw your design on one side of one hive body

Materials:

- 1 plain, white-painted hive body for each 4 students
- one or two sheets of legal sized paper for each student to plan their drawing
- Two buckets of permanent markers on each table: one of colors which bees can see, one with colors outside their visual spectrum
- Optional: markers will fade unless solar protection applied afterward.
- http://www.dcbeckeepers.org/presentations/hands_on_review_beevision_decorating.ppt

SESSION 10:

Hands on: Harvesting honey

- Review: why do bees make honey?
- What about beeswax?
- Analyzing a frame of honey
- The tools we will use
- How we will use the tools
- The importance of taking turns
 - Uncapping
 - Spinning
 - Bottling

Materials:

- Hand sanitizer
- Drop cloths to cover work area
- Trash bags
- 1 capped frame of honey for each 4 students
- hive bodies to hold frames
- metal tray to hold hive bodies
- At least one honey extractor
- Two or more bottling buckets
- Two or more stainless filter sets
- One uncapping station per 6-8 students
- 2 uncapping forks for each station
- One four-ounce honey bear bottle for each student, teacher, and some extras
- Optional: markers will fade unless solar protection applied afterward.
- Water for hands, tool cleaning