LESSON PLAN PACKET

Grades 1 to 5

Grades 1 to 5, ages 6 to 11

Ages 6 to 11. Readers who can work in pairs on a shared device.

> **Big idea:** Every native plant has a job: it feeds a specific insect or bird. Invasive plants take up space without doing that job.

This packet holds a 45-minute lesson, a reproducible student handout, and answer keys. It is built from the same data as the free games and tools on pollinatehappiness.com, a student-led project on Long Island where brothers Aidan and Ben Ellis have installed five native pollinator planters.

Lesson at a glance (45 minutes)

Time	Activity	What students do
0-5 min	**Hook: whose lunch is this?**	Look at a milkweed photo with chewed leaves. Predict who ate it and why only that plant.
5-15 min	**Who Eats This?**	In pairs, match each native plant to the animal that depends on it. Read each fact aloud after a match.
15-23 min	**Bee, Fly, Wasp, or Moth?**	Sort striped insects into bee, fly, wasp, or moth. Name the body clue that gave it away.
23-33 min	**Simple Bloom Builder**	Pick four plants that keep something blooming every summer month. Explain any gap to a partner.
33-40 min	**Bird ID Near You**	Enter the school's zip code and identify birds reported near the school this month.
40-45 min	**Exit ticket**	Answer three questions on the student page and hand it in.

Extensions (another day, or early finishers)

- **Name That Song:** Play a recording, pick the bird. Try it with eyes closed, then discuss what feature gave it away.
- **Field Bingo at a planter:** A card for each of our five installations, built from the plants growing there.
- **Flashcards for review:** The monarch life cycle and the planter plants decks.

Learning objectives

By the end of the lesson, students will be able to:

1. Match at least five native plants to the insect or bird that depends on them, and explain one match in a complete sentence.
2. Identify a bee, fly, wasp, or moth from a photo using at least one body feature (wings, antennae, eyes, or waist).

3. Plan a four-plant garden with something in bloom each summer month, and explain why gaps in bloom are a problem for pollinators.

Materials and prep

Materials

- One device for every two students (Chromebook, tablet, or laptop), or one projector for whole-class play.
- Headphones or speakers for the bird songs (Name That Song, extension).
- Student handout from this packet, one per student, and pencils.
- Optional: printed Field Bingo cards for a planter or schoolyard visit, and the bloom calendar guide.

Before class

- Open each game link on one device and play a round so you know the controls.
- Have the school's zip code ready for Bird ID Near You. Results change month to month, so check it the day before.
- Pair students so that a stronger reader is with a newer reader for the matching game.
- Print the handout and, if visiting a planter, the field-trip sheet and bingo card for that installation.

Online activities (free, no sign-up)

- **Who Eats This?:** https://www.pollinatehappiness.com/games/who-eats-this
- **Bee, Fly, Wasp, or Moth?:**https://www.pollinatehappiness.com/games/bee-fly-or-wasp
- **Simple Bloom Builder:** https://www.pollinatehappiness.com/games/bloom-builder?level=simple
- **Bird ID Near You:**https://www.pollinatehappiness.com/games/bird-id
- **Name That Song:** https://www.pollinatehappiness.com/games/name-that-song
- **Field Bingo at a planter:** https://www.pollinatehappiness.com/games/field-bingo
- **Flashcards for review:** https://www.pollinatehappiness.com/games/flashcards
- **Answer keys (printable):** https://www.pollinatehappiness.com/educators/answer-keys
- **Bloom calendar guide (printable):** https://www.pollinatehappiness.com/guides/long-island-pollinator-bloom-calendar

Vocabulary

Word	Meaning
Native plant	A plant that grew in this area before people brought plants from other places. Local insects and birds depend on it.
Invasive species	A plant or animal brought from somewhere else that spreads fast and harms the plants and animals that live here.
Pollinator	An animal that carries pollen from one flower to another so the plant can make seeds. Bees, butterflies, moths, flies, and hummingbirds are pollinators.
Pollen	Yellow dust made by flowers. Plants need it moved to another flower to make seeds.
Nectar	Sugary liquid in flowers that pollinators drink for energy.

Word	Meaning
Host plant	The plant a caterpillar must eat to grow. Milkweed is the host plant for monarchs.
Habitat	The place where an animal finds food, water, shelter, and a place to raise its young.
Life cycle	The stages a living thing goes through as it grows, such as egg, caterpillar, chrysalis, and butterfly.
Mimic	An animal that looks like another animal. Many harmless flies look like bees so birds leave them alone.

Discussion questions

Each question is followed by what a strong answer sounds like.

1. **Why can a monarch caterpillar not just eat any leaf?**
   Strong answer: Its body is made to eat milkweed only. Milkweed is its host plant, so if there is no milkweed nearby, monarchs cannot raise young there.
2. **What is one way to tell a hover fly from a bee?**
   Strong answer: A fly has one pair of wings, short stubby antennae, and huge eyes that almost touch. A bee has two pairs of wings and longer bent antennae.
3. **Your garden has flowers in June and September but not in July. Why is that a problem?**
   Strong answer: Pollinators need food all summer. In July they would have to go somewhere else or go hungry, so the garden needs a July bloomer.
4. **An invasive plant is green and leafy. Why is it still a problem?**
   Strong answer: Most local insects cannot eat it, so it does not feed caterpillars or birds, and it crowds out native plants that would.
5. **Which bird near our school surprised you, and what might it eat here?**
   Strong answer: Names a real bird from the quiz and connects it to a food: seeds, berries, or insects from plants.
6. **Why are some insects striped like bees?**
   Strong answer: Looking like a stinging insect protects them. Birds learn to avoid black and yellow stripes.
7. **If you could add one native plant to our schoolyard, which would you pick and who would it feed?**
   Strong answer: Names a plant from the games and the animal it supports, like goldenrod for migrating monarchs or black-eyed Susan seeds for goldfinches.

Standards touchpoints

- NGSS 2-LS2-2 (plants depend on animals for pollination and seed dispersal)
- NGSS 3-LS4-3 and 3-LS4-4 (organisms and habitat; environmental change)
- NGSS 5-LS2-1 (movement of matter among plants, animals, decomposers, and the environment)

Informal mapping to the Next Generation Science Standards; not a formal alignment. New York State's P-12 Science Learning Standards are built on the same framework; check your district's curriculum for exact codes.

STUDENT HANDOUT | free to copy

Plant Jobs: Who Depends on Whom?

Name _____ **Date** _____

Native plants have jobs. Each one feeds a certain insect or bird. Use what you learned in the games.

1. Pick one match from Who Eats This? Write the plant, the animal, and how the plant helps it.

_____

_____

_____

2. Name one clue that tells a fly apart from a bee.

_____

_____

3. Draw your four-plant garden. Label the months each plant blooms. Is there a flower every month from May to September?

EXIT TICKET

What is a host plant? Give one example.

_____

_____

Circle the pollinators.

Bee Hummingbird Robin Moth Earthworm

Why is an invasive plant a problem even if it is green and pretty?

_____

_____

Answer keys

Games that draw random questions list the full pool they draw from. Games built live from local data or random recordings have no fixed key, so the teaching point is given instead. A printable set of all keys is at https://www.pollinatehappiness.com/educators/answer-keys.

Who Eats This?

Each round draws from these plant and animal pairs.

Native plant	Who depends on it	Why
Common milkweed	Monarch caterpillar	Monarch caterpillars can eat nothing but milkweed.
Violets	Great spangled fritillary	Fritillary caterpillars feed at night on violet leaves and nothing else.
Spicebush	Spicebush swallowtail	The snake-mimic caterpillar eats only spicebush and sassafras.
White oak	500+ caterpillar species	Oaks host more caterpillars than any other North American plant, which feeds nesting songbirds.
Goldenrod	Migrating monarchs	September goldenrod fuels the monarch migration down Long Island's shores.
Bee balm	Ruby-throated hummingbird	The tubular scarlet flowers are shaped for hummingbird bills.
Cardinal flower	Ruby-throated hummingbird	Cardinal flower is pollinated almost entirely by hummingbirds; bees can't see red.
White turtlehead	Baltimore checkerspot	Turtlehead is the main native host of Maryland's state butterfly, though it also lays eggs on English plantain and a few other plants.
Golden Alexanders	Black swallowtail	Black swallowtail caterpillars prefer it to your garden parsley.
Little bluestem	Skipper butterflies	At least nine skipper species lay eggs on little bluestem.
Highbush blueberry	Southeastern blueberry bee	A specialist bee that buzz-pollinates blueberry bells by vibrating at just the right pitch.
Swamp rose mallow	Rose mallow bee	Ptilothrix bombiformis collects only hibiscus pollen.
Evening primrose	Sphinx moths	The flowers open at dusk, in seconds, for the night shift.
Coneflower seed heads	American goldfinch	Leave the cones standing and goldfinches feed on them all winter.
Winterberry holly	Robins and bluebirds	More than 40 bird species eat the red berries in late winter.
Black cherry	Eastern tiger swallowtail	Black cherry hosts over 400 caterpillar species, including the tiger swallowtail.
Red columbine	Returning hummingbirds	Columbine blooms in late April, timed to the hummingbirds' arrival.

Native plant	Who depends on it	Why
Mountain mint	Wasps, bees, and flies by the hundreds	The most-visited plant in Penn State's 2012 to 2014 pollinator trial.
Serviceberry	Cedar waxwings	Waxwings strip a serviceberry of June fruit in days.
Wild bergamot	Dufourea monardae	A specialist bee that collects only Monarda pollen.
New England aster	Last bumble bee queens	October asters feed the queens that will found next year's colonies.
Buttonbush	Swallowtails and wood ducks	Butterflies mob the flower balls; ducks eat the seed balls.
Woodland sunflower	Silvery checkerspot	Sunflowers host about 70 caterpillar species in the Northeast.
Eastern redbud	Leafcutter bees	They cut neat circles from redbud leaves to line their nests.

Bee, Fly, Wasp, or Moth?

Photos are drawn at random from these four groups. Use the tells to check answers.

Group	The tell
Bee	Bees have two pairs of wings, long elbowed antennae, and usually branched body hair that holds pollen. Eyes on the sides of the head.
Fly	Hover flies have one pair of wings, stubby antennae, and huge eyes that nearly meet on top of the head. They hover in place.
Wasp	Wasps are smooth and shiny with a pinched waist, long legs that dangle in flight, and little body hair.
Moth	Clearwing and hummingbird moths have feathery or clubbed antennae, a fuzzy fan tail, and hover with a long tongue like a hummingbird.

Simple Bloom Builder

Many gardens are correct. Check that every month from May through September has at least one plant in bloom, using no more than four plants. Teaching point: a gap month means hungry pollinators, so a good garden plans for the whole season, not just the prettiest month.

Bird ID Near You

Built live from birds reported near the zip code this month, so there is no fixed key. The game shows each answer. Teaching point: the birds outside your school change with the seasons, and real people's observations show it.

Name That Song (extension)

Random recordings, so no fixed key. Teaching point: listen for pitch, speed, and repeated phrases; many birds are easier to hear than to see.

Field Bingo at a planter (extension)

No answer key. Any square students can show, sketch, or describe counts.

Flashcards: monarch life cycle (extension)

The order and the months each stage is usually seen on Long Island.

Monarch butterfly

1. Eggs (Jun, Jul, Aug)
2. Caterpillars (Jun, Jul, Aug, Sep)
3. Chrysalises (Jul, Aug, Sep)
4. Adults (Jun, Jul, Aug, Sep, Oct)

Visit a real planter

Pollinate Happiness has five native pollinator planters on Long Island. Most of each planting is native perennials; the art museum's sensory planter and the high school planter also include some non-invasive ornamentals. All are at public or publicly accessible sites; check each site's hours before a visit. Bloom usually peaks July through September.

Wawapek Preserve

Cold Spring Harbor, NY 11724 | Suffolk County

Installed June 2021. Host: North Shore Land Alliance. Wawapek Preserve is open to the public from dawn to dusk. Park in the small lot off Shore Road and follow the meadow trail.

Field-trip sheet: https://www.pollinatehappiness.com/installations/wawapek/field-trip

Hicksville Public Library

169 Jerusalem Avenue, Hicksville, NY 11801 | Nassau County

Installed October 4, 2023. Host: Hicksville Public Library. The planter is in the front garden facing Jerusalem Avenue and can be seen any time the grounds are open.

Field-trip sheet: https://www.pollinatehappiness.com/installations/hicksville-library/field-trip

Theodore Roosevelt Sanctuary & Audubon Center

134 Cove Road, Oyster Bay, NY 11771 | Nassau County

Installed November 23, 2024. Host: Audubon New York. The sanctuary grounds and trails are open daily; the center building has posted hours.

Field-trip sheet:
https://www.pollinatehappiness.com/installations/theodore-roosevelt-sanctuary-audubon-center/field-trip

Nassau County Museum of Art

1 Museum Drive, Roslyn Harbor, NY 11576 | Nassau County

Installed Fall 2025. Host: Nassau County Museum of Art. The sensory planter is on the patio near the Manes Center; the nest boxes are along the meadow edge of the William Cullen Bryant Preserve.

Field-trip sheet: https://www.pollinatehappiness.com/installations/nassau-county-museum-of-art/field-trip

Syosset High School *(newest)*

70 South Woods Road, Syosset, NY 11791 | Nassau County

Installed September 28, 2026. Host: Syosset High School Environmental Club. The planter is at the front of the school beside the red Syosset High School sign on South Woods Road, visible from the sidewalk without entering the campus.

Field-trip sheet: https://www.pollinatehappiness.com/installations/syosset-high-school/field-trip

> **Field-trip sheets:** Each planter has a printable field-trip sheet at pollinatehappiness.com/installations/<slug>/field-trip with the address and host, what is planted, a look-for checklist that changes with the month, a five-question student worksheet, and a QR code back to the planter page.

Credit and sharing

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How to cite

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For a specific species profile, add the page title and URL. For tool results, add the zip code, radius, and the date you retrieved them, since they change daily. Underlying observations should be credited to iNaturalist and its contributors; weather data to Open-Meteo.

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About Pollinate Happiness

Pollinate Happiness is a student-led project founded in 2021 by brothers Aidan and Ben Ellis, who started it in 5th and 6th grade. They have installed five native pollinator planters on Long Island and built free games and zip-code tools from public data so any class can use them.

Questions, corrections, or a request for a grade-specific version:
https://www.pollinatehappiness.com/contact

All activities by grade band: https://www.pollinatehappiness.com/educators