

Minnesota Flowers for Pollinators



Ten 50-75 min. periods in early Fall or late Spring to accommodate MN Landscape Arboretum field trip

Grade 7

Purpose

7th grade students will learn about local floriculture including flower species, plant reproduction, and pollination.

Students will work in groups to research and design sustainable pollinator gardens using annual, perennial, and/or wild flowers indigenous to Minnesota. Each group will create an informational website or record a multimedia presentation describing the need, purpose, features, functions, cost, and future benefits of their garden design. Students will share their completed project in class and with at least one authentic audience.

The overarching goal is that students will gain a better understanding of the local flora and fauna that surround them at home, school, and in the community. Students will grasp the urgency of the pollinator problem at local, national, and global levels as it relates to agriculture and future food supply. Finally, students will be empowered to get involved in spreading the word and planting new pollinator gardens in their community.

Academic Content Standards

MN K-12 Academic Standards and Benchmarks

Science

- 7.4.2.1.3** Explain how the number of populations an ecosystem can support depends on the biotic resources available as well as abiotic factors such as amount of light and water, temperature range, and soil composition.
- 7.4.2.2.2** Describe the roles and relationships among producers, consumers, and decomposers in changing energy from one form to another in a food web within an ecosystem.

Social Studies

- 7.2.1.1.1** Apply reasoned decision-making techniques in making choices; explain why different households or groups faced with the same alternatives might make different choices.

Grade Level 7



Materials

Needed Daily:

- Hyperdoc - accessible at: <https://minnesota.agclassroom.org/educator/sclb.cfm>

The teacher can make a copy and then share it with his/her students. The hyperdoc can be posted to Schoology or Google Classroom so each individual student has his/her own copy.

- Headphones or earbuds
- Mobile device for classroom use (iPad, Chromebook, laptop – preferably at least 2:1 ratio)

Day 1:

- Slides 2-5 on Hyperdoc

Day 2:

- Minnesota Flower Rating Handout - 1 copy per student
- Slides 6-9 on Hyperdoc accessible

Day 3:

- Minnesota Pollinator Garden Project Rubric - 1 copy per student
- Slides 10-11 on Hyperdoc

Day 4 and 5:

- Slides 12-15 on Hyperdoc
- Pollinator Garden Project Group Notes worksheet for each group

Day 6

- Slides 16-17 on Hyperdoc

- Material Cost List and Installation Procedures worksheet for each group
- Colored pencils
- Paper (8.5 x 11 and 11 x 14)
- Pencil

Day 7

- Smartphone, camera, or video recording device for field trip (At least one per group)

Day 8-9

- Slides 19-20 on Hyperdoc

Day 10

- Slide 21 on Hyperdoc
- SMART board for presentation projection

7.3.1.1.1

Create and use various kinds of maps, including overlaying thematic maps, of places in the United States; incorporate the "TODALSS" map basics, as well as points, lines and colored areas to display spatial information.

Common Core Connections

Reading

CCSS.ELA-Literacy.RL.7.1

Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

Writing

CCSS.ELA-Literacy.W.7.6

Use technology, including the Internet, to produce and publish writing and link to and cite sources as well as to interact and collaborate with others, including linking to and citing sources.

National Agricultural Literacy Outcomes

Agriculture and the Environment

Vocabulary

Abiotic – physical rather than biological; not derived from living organisms

Annual – a plant that blooms during the summer from seed and must be replanted each year

Apiary – a place where bees are kept, a collection of beehives

Bedding – plants set into a garden bed or container when it is about to bloom; usually annuals

Biotic – animals in an ecosystem

Deciduous Forest – a woodland & river biome in central Minnesota full of trees that lose their leaves each year

Entomophily – when a plant is pollinated by insects

Flowering – plants that produce flowers, also known as angiosperm

Herbaceous – plants that have no woody stem above ground, often with roots and seeds that regrow each year

Indigenous – plants native to a geographical area that occur naturally and have existed for a long time

Perennial – a plant that blooms year after year, often replacing its parent plant with new offspring each year

Pollinator – an animal that transports pollen

Pollinizer – a plant that creates pollen

Prairie – a large open area of grassland; a common biome in western and southern Minnesota

Coniferous Forest – a cool and moist biome filled with cone-bearing evergreens, common to northern Minnesota

Zoophily – when vertebrates, such as birds or bats, pollinate a plant

- Describe benefits and challenges of using conservation practices for natural resources (e.g., soil, water, and forests), in agricultural systems which impact water, air, and soil quality. **(T1.6-8 b)**

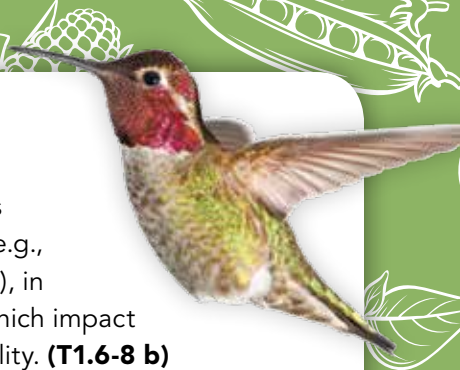
- Recognize the factors of an agricultural system which determine its sustainability. **(T1.6-8 h)**

Plants and Animals for Food, Fiber & Energy

- Explain the role of ethics in the production and management of food, fiber (fabric or clothing), and energy sources. **(T2.6-8 b)**
- Identify farm practices for plant protection (e.g., using a pesticide, integrated pest management, cultural practices) and the harvest of safe products for consumers. **(T2.6-8 c)**

Background— Agricultural Connections

Various species of flowers throughout Minnesota are pollinated by bees, butterflies, hummingbirds, and other animals. The natural ecosystems of wildflowers throughout Minnesota are shrinking, as are many pollinator populations across local, national, and global communities. Around one third of the world's crops depend on insect pollinators to bear fruit, seed, or nut; this includes a wide variety of fruits, vegetables, and trees. As the local and global population grows, food supply will need to increase to match it. Drastic changes are needed by individuals, farmers, and governments to help pollinators re-grow and expand their colonies in order to pollinate this increasing food supply.



Interest Approach - Engagement

1. Instruct students to complete the three polls on slide two of the Hyperdoc.
2. Discuss with students: How would you feel if you could never eat certain foods again? How can we prevent this from happening?
3. Have students watch the two videos (Pollinators Dying and Planting a Pollinator-friendly Garden) on slide three of the Hyperdoc. Students may write down main ideas and questions as they watch. You can facilitate a class discussion that focuses on their reactions.

Procedures:

The Hyperdoc (accessible at <https://minnesota.agclassroom.org/educator/sclb.cfm>) provides the lesson flow. The Hyperdoc walks students through the tasks included in this procedure. Teachers can add "stop here today" slides if they would like.

Ask

Day 1

- Activity 1:** Engagement activity (above) – What are pollinators and pollinizers? Slides 2-3 on Hyperdoc
- Activity 2:** Pollinators & plant reproduction – How does pollination work? Watch the Brainpop video and take the quiz included on Slide 4 of the Hyperdoc.
- Activity 3:** Minnesota ecosystems – Where do various pollinators live? Pollinator food web activity - Slide 5 on Hyperdoc

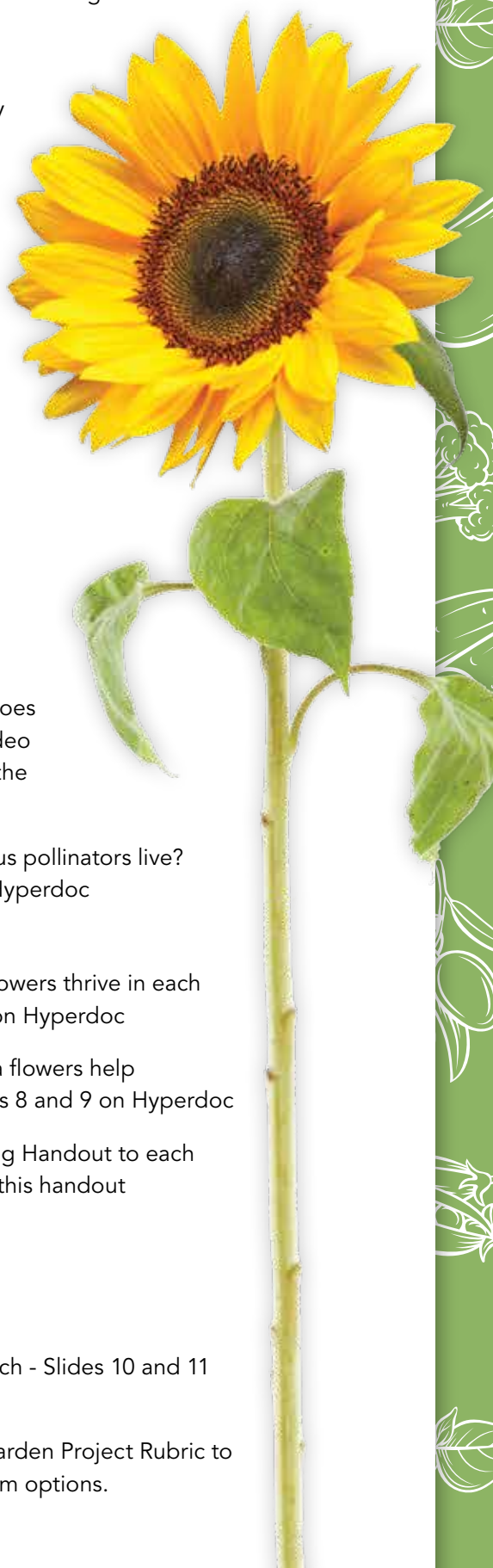
Day 2

- Activity 4:** Minnesota flowers map jigsaw – Which flowers thrive in each Minnesota biome? Why? Slides 6 and 7 on Hyperdoc
- Activity 5:** Flowers as pollinators – Which Minnesota flowers help pollinators? Pollinizer rating activity Slides 8 and 9 on Hyperdoc
- Provide a copy of the Minnesota Flower Rating Handout to each student so they can record their opinions on this handout

Collect

Day 3

- Activity 6:** Minnesota pollinator garden project launch - Slides 10 and 11 on Hyperdoc
- Provide a copy of the Minnesota Pollinator Garden Project Rubric to each student. Review as a class and brainstorm options.



Day 4-5

Activity 7: Two Group research days (books, databases, videos, and articles) – slides 12-15 on Hyperdoc

- Utilize the digital file, Pollinator Garden Project Group Notes, found on slide 12 of the Hyperdoc as a guide for student groups. Assist students as they complete this digitally.

Day 6

Activity 8: One garden design day, material selection, cost/upkeep analysis, and planting timeline/steps Slides 16 and 17 on Hyperdoc

- Utilize the digital files, Material Cost List and Installation Procedures, on slide 16 of the Hyperdoc for students to record details of their project.

Visualize

Day 7

Activity 9: Field trip to University of Minnesota Landscape Arboretum with smartphones - take photos/videos of flowers, pollinators, and gardens. Slide 18 on Hyperdoc. If this field trip is not possible, any garden area with a variety of pollinator friendly plants is acceptable.



Create

Day 8-9

Activity 10: Collaborative group presentation creation days (Google Sites, Adobe Spark, or Google Slides screencast) Slides 19 and 20 on Hyperdoc

Act

Day 10

Activity 11: Share presentations with authentic audiences. Complete group and self-evaluation Google form on Slide 21 on Hyperdoc

Enriching Activities

Links to these items are accessible at <https://minnesota.agclassroom.org/educator/sclb.cfm>

- Death of bees explained
- 4 Easy ways you can save bees
- Bee Beard
- Marla Spivak TED Talk – why bees are disappearing
- Minnesota Pollinators
- Minnesota Floriculture Quizlet flashcards
- U of MN Bee Lab website

Fun Fact

Minnesota, Wisconsin, and Michigan together have more than 500 species of native bees. Native bees and other insects are important pollinators.



Minnesota Flower Rating Sheet

Name _____

Hour _____

GOOGLE SEARCH KEYWORDS: Flower name, pollinator, price, season (Watch for "legit" sources!)

Flower Name	List Pollinators	Type*	Appeal**	Difficulty**	Worth time/\$\$ to plant? Why?
Azalea					
Begonia					
Chrysanthemum					
Columbine					
Coreopsis					
Daisy					
Dahlia					
Delphinium					
Dianthus					
Geranium					
Gladiolus					
Impatiens					
Iris					
Lily / Daylily					
Marigold					
Orchid					
Peony					
Petunia					
Phlox					
Rose					
Salvia					
Snapdragon					
Violet					

*Type = annual, perennial, wild, bedded, herbaceous, etc.

**Rate 1-5 (1=low, 5=high)

Minnesota Pollinator Garden Project Rubric

Group Members (2-4 students)

Circle Location: Lakeshore Farm Roadside Downtown School Orchard Home Apiary Park (Other?)

Circle Biome: Tallgrass Aspen Parkland Coniferous Forest Deciduous Forest Prairie Grassland

CATEGORY	1	2	3	4	Teacher Notes
Minnesota Flowers	2 or less chosen, not described	At least 3 chosen & some descriptions	At least 4 chosen & some descriptions	At least 5 chosen & features described	
Pollinators	Lacking pollinator and description	Names a pollinator but no description	Describe how 1 pollinator benefits	Describes how 2+ pollinators benefit	
Garden Design	Incomplete or unlabeled; not suited to location	Complete design but lacking details, labels, descriptions	Some detail / labels; may lack originality or descriptions	Detailed & labeled; unique environment features described	x2! Out of 8 pts
Itemized Cost List	Incomplete or incorrect item list	Most items priced & totaled, few justified	Most items justified, priced and totaled	All materials justified, itemized & totaled	
Installation Procedures	Illogical, incorrect or incomplete list	Some procedures listed, possible gaps	Mostly complete list, logical for location	Logical, complete list for location, timelines given	
Visual Presentation	<2 mins, incomplete or disorganized	2-3 mins, need not identified, no sources	2-3 mins, details need, how met, missing sources	3+ mins, details need & how met, cites sources	x2! Out of 8 pts
Authentic Audience	No audience listed, incomplete script	Audience not specific; script needs editing	Audience not specific; Business etiquette used	Specific, relevant contact business etiquette used	
Vocabulary	<5 vocab words	5-9 vocab words used	10-14 vocab words used	15+ vocab words used	
Group Work	5+ redirects needed	3+ redirects needed	Mostly on task, equal work	On task, equal work	
Group Score:					/ 44

Self Evaluation: I put forth solid effort: ____/ 2 I communicated well: ____/ 2

I was a team player: ____/ 2

Final Grade:

/ 50