Minnesota Flowers for Bees & other Pollinators

This Hyperdoc belongs to:  Your Name Here

Change activity boxes to green when complete!
What are your favorite pollinated foods?

How would you feel if you could never eat them again?

How can we prevent this from happening?

Image source: http://www.kenyonbee.com/tag/pollination/
Why are pollinators dying out?
What can we do about it?
How does pollination work?

Need the Brainpop login & password? Ask your teacher.

Passed the quiz with time to spare? Check out: Extension video  Pollinator fact sheet  www.pollinator.org
Where do pollinators live?

Create a food web to help visualize the energy transfer in each pollinator’s ecosystem.

Where does it live? What flowers does it pollinate? What predators does it face? Is it endangered? Does it pollinate foods that humans will eventually consume?

Work in small groups to choose a pollinator:

Search pollinator species to find articles, videos and more.

Links and info on Minnesota-specific pollinators and their habitats

This is where each group will create their food web. Slide 1 is an example. Only edit your group slide!

Images: Use Insert/Images/Search. Label items with text boxes. Use line/arrow tools to show energy transfer.
Minnesota Flower Maps - Partner Jigsaw
Which flowers thrive in each MN biome?

Minnesota DNR Biome Website
Daisy Facts

Impatiens Facts
Snapdragon Facts
Geranium Facts
Orchid Facts

USDA Plant Hardiness Zones
Lily Facts
Marigold Facts
Petunia Facts
Violet Facts
Columbine Facts

Search more here: Coreopsis, Delphinium, Dianthus, Iris, Phlox, Rose, Salvia
BIOMES: (Type Y or N)


Plant Zones: List Habitat(s):

Daisy
Impatiens
Snapdragon
Geranium
Orchid
Lily
Marigold
Petunia
Violet
Columbine
Coreopsis
Delphinium
Dianthus
Iris
Phlox
Rose
Salvia
Which **Minnesota** flowers are good pollinizers? For which pollinators?

This is where it gets **FUN**!

You get to give your **own** opinion on each kind of flower.

You may work alone or in small groups **BUT** the “appeal” and “Worth time/$$$ to plant” columns should be done **individually**.

You don’t have to go in order. Finish as many as you can.

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### MINNESOTA FLOWER RATING SHEET

<table>
<thead>
<tr>
<th>Flower Name</th>
<th>List Pollinators</th>
<th>Type*</th>
<th>Appeal**</th>
<th>Difficulty***</th>
<th>Worth time/$$ to plant?</th>
<th>Why</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akebia</td>
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<td>Begonia</td>
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<td>Chrysanthemum</td>
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<td>Columbine</td>
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<td>Coreopsis</td>
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<td>Delphinium</td>
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<td>Dianthus</td>
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<td>Geranium</td>
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<td>Iris</td>
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<td>Lily / Daylily</td>
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<td>Magnolia</td>
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<td>Narcissus</td>
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<td>Orchid</td>
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<td>Penney</td>
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<td>Pericallis</td>
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<td>Phlox</td>
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<td>Rose</td>
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<td>Salvia</td>
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<td>Snapdragon</td>
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<td>Violet</td>
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</tbody>
</table>

*Type* = annual, perennial, wild, bedded, herbaceous, etc. / Rate 1-5 (1=low, 5=high)
So much vocabulary! What does it mean?

Your homework for tonight: practice the vocabulary! Play some games, try the quiz.
Today’s Tasks:

1. Select group of 2-4 students (3 is ideal)
2. Review rubric as a class, take notes
3. Select a biome & get approval for location
4. Brainstorm potential pollinators & projects
5. Start dividing up tasks
Garden Project Timeline

Use the rubric to keep your team on task!
Create a job list for each person as needed.

Today (Tuesday) = Brainstorming Day (choose a project you care about!)
Thursday / Friday = Research Days (be sure to keep track of your sources!)
Next Monday = Garden Design Day (+material/cost list, procedure list)
Next Tues/ Thurs = Presentation + Authentic Audience Script Creation Days
Next Friday = Presentation Day (gSlides, Adobe Spark or Screencast)

NOTE: If you stay on task, you should have very little to do outside of school :)
Research Days: **CITE ALL SOURCES!**

Use approved sites on the following slides whenever possible.
Feel free to use the link at right for help in making website, book & article citations.

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**Citation Machine** is a stand-alone website.
Copy/paste the citation in alpha order where you want it to go.

**EasyBib** is a gDocs add-on, auto inserts & alphabetizes citations for you.
Research Days: **CITE ALL SOURCES!**

Use approved sites on the following slides whenever possible. “Googling” is a last resort! Be sure to check for author credentials & publication date.

**Flower Resources:**
- Minnesota Wildflowers (a field guide to the flora of Minnesota)
- Plants A-Z
- U of MN
- Bachman’s
- The Home Depot

**Pollinator Resources:**
- Bee Lab
- Department of Natural Resources (mn)
- Department of Agriculture (mn)
- Minnesota Zoo
- Million Pollinator Garden challenge

**Pollinator Garden Resources:**
- USDA United States Department of Forest Service
- Flowering Bee Lawns for Pollinators
- Xerces Society for Invertebrate Conservation

**Pollinator Garden Resources (PDFs):**
- Agricultural Landscapes (PDF: 919 KB / 6 pages)
- Yards and Gardens (PDF: 7.86 MB / 6 pages)
- Roadsides and Rights-of-ways (PDF: 3.57 MB / 4 pages)

**Living Landscapes in Minnesota:**
- A Guide to Native Plant Scaping
Select 1 or 2 YouTube videos and TED talks to watch that may be helpful. Take notes!!!

The Hidden Beauty of Pollination (7:40)
This Old House builds a pollinator garden (9:36)
Can cities save our pollinators? (4:00)
Top 10 Pollinator plants (7:48)

4 Easy ways you can save bees (2:08)
Roadside flowers for pollinators (4:00)
How farms can protect pollinators (3:45)
Colonies Collapse Disorder (4:23)
Research Days: CITE ALL SOURCES!

Below are helpful commercial websites for pricing, procedures and authentic audiences. “Googling” is a last resort! Be sure to check for author credentials & publication date.

Places to get pricing:

- www.amazon.com
  (select Patio, Home & Garden)
- www.gardeners.com
  (Garden supply store)
- www.naturehills.com
  (Online plant nursery)
- www.prairienursery.com
  (Native plants, seeds, grasses)
- www.lowes.com
  (Soil, tools, plant boxes, etc.)

Gardening/Planting Procedure Ideas:

- Designing a Native Garden
- Designing a Pollinator Garden
- Designing a Roadside Garden
- Prairie Restorations Pollinator Kit
- Pollinator Friendly Cities
- 7 Easy Steps to a Pollinator Garden

Authentic Audience Ideas:

- School administrators
- Business/resort owners
- City Council/Developers
- Local farms or crop co-ops
- Family/friends, neighbors
- State and local officials
- Nonprofits & public

USDA School Gardens Checklist
Garden Design Day: Divide & Conquer!

What are each group member’s strengths? Work **smarter**, not **harder**.

Garden Design Tools:
- Sketchup Free
- Pencil & Paper

Or choose your own modeling tool!

Material Cost List:

<table>
<thead>
<tr>
<th>Item Name</th>
<th>Justification: Why is it needed?</th>
<th>Unit Cost</th>
<th>Quantity</th>
<th>Total Cost</th>
</tr>
</thead>
</table>

Installation Procedures:

Students using the digital version may add a hyperlink to each item in its online store if desired.
Flower Garden Design Tips

Not sure where to start? Here are some resources that may help.

**Better Homes & Gardens design tips**

**Easy Flower Garden Design tips**

**Tips for a 3-Season Flower Garden**

**Country Living tips with links & tools**

**Houzz Modern Pollinator Garden tips**

**Bughaven Pollinator Garden tips**

**Things to keep in mind:**
- Sunlight access? Full / Partial / Shade
- Diversity in colors, height, season
- Upkeep: Annuals or perennials?
- What will bloom, when? Continuous?
- Arrangement, focal point, grasses
- Competition from “Critters” or people?
- Spacing, maintenance access
- Distance from any pesticide use
- Can location / audience pay for it?
- Installation / maintenance staff cost?
- Weather protected? / Water access?
Arboretum Field Trip Day!

Don’t forget your Smartphone & Notebook!

Be sure to watch for signs of designated pollinator gardens, flowers and displays.

The “Bee Line” shuttle will take you to the Tashjian Bee & Pollinator Discovery Center.

Take lots of pictures, videos and notes on:

- Colors, names, what’s in bloom
- Pollinators on specific pollinizers
- Cool facts & figures you can cite

Source Citation: Click here
Pollinator Garden Visual Presentation

Select from Google Sites, Adobe Spark, or gSlides + Screencastify

You have 2 days to create your presentation & finish up any old work!

Google Sites

SKILL LEVEL: EASY
- Collaborative website in Drive
- Add pages, links, pics, text
- Built in themes, layout, headings
- Easy to “publish” and share
- No recording features needed
- Sites support: click here

Adobe Spark

SKILL LEVEL: ADVANCED
- Visual storytelling like iMovie
- Add slides, layouts, music
- Add links, pics, videos
- Record audio on each slide
- Download or embed project
- Spark help: click here

Screencastify

SKILL LEVEL: MEDIUM
- Create Slides as usual
- Record up to 10 min presentation
- Embed yourself talking
- Exports to YouTube or Drive
- Use earbuds’ built-in mic!
- Screencastify help: click here
Name of individual:
Title of individual:
Name of business or location:
Email or physical address:
Social media account address if applicable:

How do you plan to get a hold of the person?

How will you present this part of your project?

Will you send them links to your garden design and/or presentation?

Examples:

- Writing a formal letter
- Writing a formal email
- Twitter for Business

This is due on presentation day! It can be homework if desired.
Presentation Day! You made it!

Please be respectful of each group as they present their project.

Don’t forget to share your final project with the teacher! Set sharing to “anyone with the link can view”.

Complete the rubric when done! Add notes on the back of what parts you did, etc.