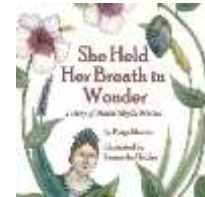


She Held Her Breath in Wonder

The story of Maria Sibylla Merian by Paige Menton



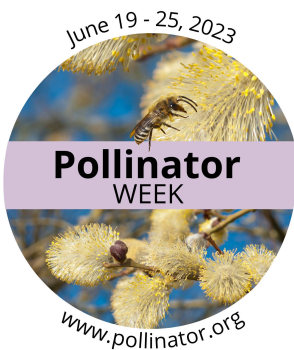
Find these terms from the book in this Word Search Puzzle:

Amsterdam
Butterfly
Cabinet
Caterpillars
Chrysalis

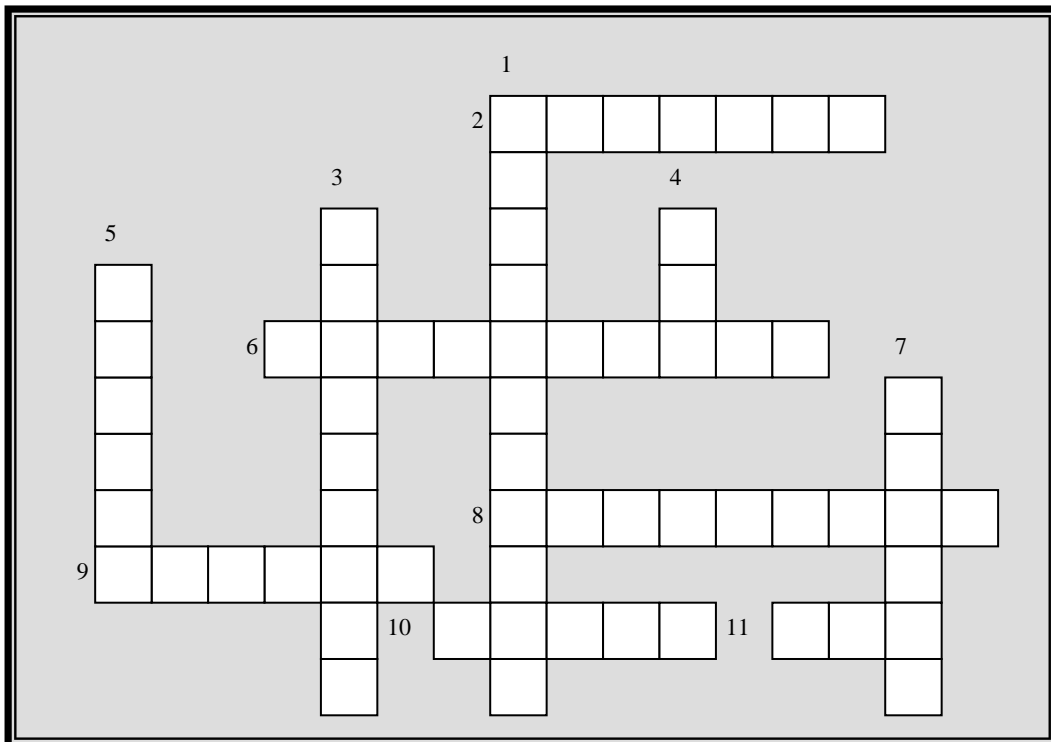
Cocoon
Collection
Curiosity
Embroidery
Insect

Maria Sibylla Merian
Moth
Nectar
Painter
Phase

Pollen
Silkworm
Suriname
Voyage
Watercolor



Pollinator Puzzle



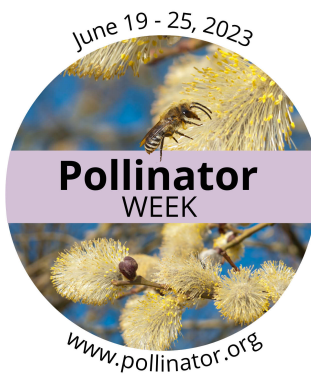
Pollinator Puzzle!

Read the clues to the right and find the matching answer for each number from the list below. Write your answer in the puzzle space with the correct number.

- | | |
|-------------|------------|
| bee | nectar |
| chocolate | butterfly |
| fruit | habitat |
| poison | pollinator |
| pollen | bat |
| hummingbird | |

Clues

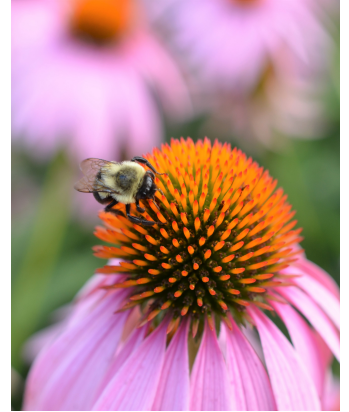
1. A small bird that moves fast!
2. An animal's home.
3. Sweet! This is a treat made possible by a pollinator.
4. This flying mammal likes cactus flowers.
5. Using this spray hurts pollinators too.
6. An animal that helps pollinate flowers.
7. Found in a flower. Sometimes it makes us sneeze.
8. A very colorful and beautiful pollinator.
9. Sweet liquid found in flowers.
10. Yum! Many pollinated flowers grow into these.
11. A busy garden insect.



Pollination Fast Facts: Gardeners

What is pollination?

- Pollination occurs when pollen grains are moved between two flowers of the same species, or within a single flower, by wind or animals that are pollinators. Successful pollination, which may require visits by multiple pollinators to a single flower, results in healthy fruit and fertile seeds, allowing plants to reproduce. Without pollinators, we simply wouldn't have many crops!
- About 75% of all flowering plants rely on animal pollinators and over 200,000 species of animals act as pollinators. Of those, about 1,000 are hummingbirds, bats, and small mammals. The rest are insects such as beetles, flies, bees, ants, wasps, butterflies, and moths.



Why are pollinators important to us?

- Worldwide, approximately 1,000 plants grown for food, beverages, fibers, spices, and medicines need to be pollinated by animals in order to produce the goods on which we depend.
- Foods and beverages produced with the help of pollinators include blueberries, chocolate, coffee, melons, peaches, pumpkins, vanilla, and almonds. Plants that depend on a single pollinator species, and likewise, pollinators that depend on a single type of plant for food are interdependent. If one disappears, so will the other.

What about bees that sting? What about allergies?

- Most species of bees don't sting. Although all female bees are physically capable of stinging, most bee species native to the U.S. are "solitary bees," that is, not living in colonies and don't sting unless they are physically threatened or injured. Only honey bees are defensive and may chase someone who disturbs their hive.
- It is wise, though, to avoid disturbing any bee or insect nest. For instance, if you spot an underground nest of ground-nesting bees, you might want to mark it with a stick so that it can be easily avoided.
- Some people are allergic to pollen of various flowering trees, plants and grasses, but not to all pollen. A common misunderstanding is that hay fever is caused by goldenrod pollen. It isn't! Ragweed is the main offender and should be avoided.



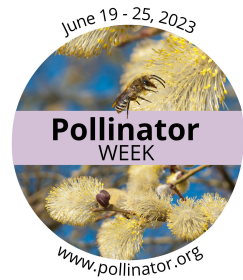
Ways You Can Help!

What everyone can do for pollinators:

- **Watch for pollinators.** Get connected with nature. Take a walk, experience the landscape and look for pollinators' midday in sunny, planted areas.
- **Reduce your impact.** Reduce or eliminate your pesticide use, increase green spaces, and minimize urbanization. Pollution and climate change affect pollinators, too!
- **Plant for pollinators.** Create pollinator-friendly habitat with native flowering plants that supply pollinators with nectar, pollen, and homes.

What you can do for pollinators:

- **Create** a pollinator-friendly garden habitat in just a few simple steps.
- **Design** your garden so that there is a continuous succession of plants flowering from spring through fall. Check for the species or cultivars best suited to your area and gradually replace lawn grass with flower beds.
- **Plant** native to your region using plants that provide nectar for adults plus food for insect larvae, such as milkweed for monarchs. If you do use non-native plants, choose ones that don't spread easily, since these could become invasive.
- **Select** old-fashioned varieties of flowers whenever possible because breeding has caused some modern blooms to lose their fragrance and/or the nectar/pollen needed to attract and feed pollinators.
- **Install** 'houses' for bats and native bees. For example, use wood blocks with holes or small open patches of mud. As little as 12" across is sufficient for some bees.
- **Avoid** pesticides, even so-called "natural" ones such as *Bacillus thuringiensis* (Bt). If you must use them, use the most selective and least toxic ones and apply them at night when most pollinators aren't active.
- **Supply** water for all wildlife. A dripping faucet or a suspended milk carton with a pinhole in the bottom is sufficient for some insects. Other wildlife need a small container of water.
- **Provide** water for butterflies without letting it become a mosquito breeding area. Refill containers daily or bury a shallow plant saucer to its rim in a sunny area, fill it with coarse pine bark or stones and fill to overflowing with water.
- **Share** fun facts, such as: a tiny fly (a "midge") no bigger than a pinhead is responsible for the world's supply of chocolate; or one out of every three mouthfuls of food we eat is delivered to us by pollinators.



Pollination Fast Facts: Educators & Students

What do pollinators mean to educators and students?

Some people think only of allergies when they hear the word pollen. But pollination, the transfer of pollen grains to fertilize the seed-producing ovaries of flowers, is an essential part of a healthy ecosystem. Pollinators play a key role in the production of more than 150 food crops in the U.S, such as apples, alfalfa, almonds, blueberries, cranberries, kiwis, melons, pears, plums, and squash.



Bees are the primary pollinators. However, about 200,000 invertebrate species, (bees, moths, butterflies, beetles, and flies) serve as pollinators, as well as about 1,000 species of vertebrates (birds, mammals and reptiles). In the U.S., the annual benefit of managed honey bees to consumers is estimated at nearly \$20 billion. The services provided by native pollinators contribute to the productivity of crops as well as to the survival and reproduction of many native plants.

What is pollination and who does it?

Pollination is a vital stage in the life cycle of all flowering plants. When pollen is moved within a flower or carried from one flower to another of the same species, it leads to fertilization. This transfer of pollen is necessary for healthy and productive native and agricultural ecosystems. Adequate pollination ensures that a plant will produce full-bodied fruit and a full set of fertile seeds. With no pollination at all, many of the foods we eat would no longer be available. The plants that many wild creatures rely on for food or shelter would also disappear. More than 80% of all flowering plant species need the help of animals to move their heavy pollen grains from plant to plant for fertilization.

What Can You Do for Pollinators?

Educate others about their place and purpose in the ecosystem and the services that they provide for the environment. Integrate pollinators into your curriculum.

- **Teach** *Nature's Partners*, an inquiry learning-based curriculum for young people in 4th through 6th grades.
- **Use** activities for both formal and informal educational settings.
- **Involve** young people in service learning opportunities so that they can contribute to their communities.
- **Adapt** the *Nature's Partners* curriculum in any way that works best for teachers and youth leaders.
- **Reference** the curriculum link at <https://www.pollinator.org/learning-center/education>