

1: The Story of Pollination Part 2, Bees

The Story of Pollination Pollination is the main way many plants reproduce. Male plant spores (pollen) are combined with female cells (ovules) to eventually produce a seed.

How much of our food production depends on bees? Plant-pollinator networks are everywhere. The gut content of pollinators b. The fingerprints left by pollinators when they visit plants c. The DNA left by pollinators when they visit plants d. The identity of pollen loads on the body of pollinators 7. All species have similar number of interactions b. Most species have few interactions and few species have many interactions c. Most species have many interactions and few species have few interactions d. There is not a common characteristic, all networks are different. Explore 20 minutes In this section of lesson students explore pollination by completing a simulation of bee pollination. Identify the animal bee structures involved in pollination. Demonstrate how pollen moves from the male stamen to the female stigma. A small dish or container filled with talcum powder. You can also use corn starch, flour, or different colors of chalk dust. Cotton swabs Procedure 1. Give each student a photocopy of Flower Diagram. Have them study the line drawing of the flower. Ask them to identify and write down each plant part described below. Female and sticky or feathery to trap pollen the stigma Female and holds up the stigma the style Female and contains the egg-producing ovary the pistil Male and produces pollen grains the anther 2. Give each student a photocopy of Bee Diagram. Have them study the line drawing of the bee. Ask them to identify and write down the bee structure or structures that do the following: Divide the students into two groups: Give each member of the plant group a cotton swab and a small amount of "pollen" talcum or other type of powder in a container or dish. Instruct each member of the pollinator group to visit a member of the plant group and dip a finger into the pollen. At this point, ask the class to name the part of the plant that the pollinators touched the stamen, which consists of the anther and the filament to get the pollen on their fingers. Have them determine whether it is a male or female part. Ask what they were looking for when they got to the plant nectar and what appendage they used to get it proboscis bristles. Have each member of the plant group hold aloft a cotton swab. Explain that the pollinators have just visited one plant and will now move on to another plant of the same species. Ask the students what part of the flower the swab represents stigma and whether it is a male or female part female. Have each group meet separately to discuss its specific role as a pollination partner and how it benefitted from the pollination process. Have each group select a spokesperson who will take notes and report the findings to the class.

2: Sid the Science Kid: Pollination Interactive Story | Speakaboos

Pollination: A Love Story That Feeds The Earth. I've been sharing these beautiful vidoes on twitter for quite some time. They are absolutely stunning, and help to remind us about the wonder of creation and the marvel of pollination - a gift provided freely by nature, and one that feeds us.

Pollination is the process of moving pollen grains, which contain male sex cells, from the anthers the pollen-containing part of floral stamens, the male reproductive structure of flowers to the stigma the glandular female receptive portion in the pistil female reproductive organ. When a pollen grain lands on the female part of the flower, the male sex cell joins with the female sex cells in the flower in a process called fertilization to form a seed from which a new plant can grow. The anthers and stigma can be on the same flower self-pollination or on different flowers crosspollination , but must be of the same species. All higher plants, including flowers, herbs, bushes, grasses, conifers, and broad-leaved trees, use pollination for sexual reproduction. Pollination can be accomplished by abiotic means such as wind and water. Many pollen grains are small less than 0. Thus wind can carry the pollen grains to other members of their species. Many plants, to ensure pollination, grow in dense stands and produce millions of pollen grains. Wind-pollinated plants generally have small, inconspicuous flowers that dangle in the wind e. Grasses have wispy plume-like flowers that catch grains floating in the air. Some water plants such as the hornwort have their pollen transferred by water currents. Many plants use animals such as insects, birds, and bats to transport pollen grains. This process, referred to as biotic pollination, requires a relationship between the pollinator and the flower to be pollinated. Such a relationship is usually established by some kind of direct attractant, such as nectar, sweet-tasting pollen, odor, or visual attraction e. There may also be an indirect attraction, such as when insects of prey visit flowers to catch other visiting pollinators. Insects, including bees, beetles, flies, wasps, ants, butterflies, and moths, are common biotic pollinators. As an insect crawls in and out of flowers in its search for nectar or other food source, it receives a dusting of pollen grains from the anther, the male part. When the insect visits another flower, the pollen rubs off on the stigma, the female part. If the pollen is left on the same species of flower, a long tube grows from each pollen grain down the stalk style of the stigma and into the ovule at the base, which contains the female egg cells. The male cells from the pollen grains pass along the tubes to the female cells and fertilize them. Plants with trumpet-shaped flowers, such as petunias, have nectar at the bottom, so only insects with long tube-like tongues can act as their pollinators. The best-known and best-adapted biotic pollinator is the bee. The bee is a relatively large insect with a large demand for food both for itself and for its carefully lookedafter brood. It normally gets all of its food from flower blossoms. The bee has an ability to remember plant forms, which aids in its ability to find flowers. Social bees live together in a communal nest and often share foraging and nest activities. The amount of food carried into a hive by a honeybee has been estimated to be times its own requirements. Social bees have developed communication systems that permit them to inform each other about the location and sources of food. These communication systems include odor paths, special buzz tones to alert other individuals, and dances that can indicate direction, distance to, and yield of a source of food. The female bee mates and then constructs a nest underground or within woody stems containing many smooth-walled cells. The cells are filled with a mixture of nectar and pollen, which provides all the food required for larvae to complete their development into adult bees. Biotic pollination may also be accomplished by such animals as birds and bats. For example, hummingbirds feeding from the hibiscus flower carry pollen on their beak and heads. Bats hover in front of flowers that open at night, licking nectar and covering their faces with pollen. Successful pollination, often mediated by animals but also accomplished abiotically, is extremely important for food production as well as maintenance of biological plant diversity. Pollination of plants is necessary for seed set, fruit yields, and reproduction of most food crops. Many threats to animal pollinators and pollination processes have been identified. These include use of toxic chemicals , decline in pollinator populations, habitat loss, and migratory corridor fragmentation. Toxic chemicals can kill pollinators, and wild pollinators are often more vulnerable to insecticides and herbicides than domestic honeybees. Pesticides that are known to be less toxic to pollinators

can be used to reduce stress on pollinator populations. Fewer pollinators will result in fewer plants. When factors such as the use of pesticides and habitat fragmentation reduce populations of pollinators, plants will have low reproductive success. Some endangered plant species may even become extinct. Appropriate pesticide spraying set-back distances should be based on on-site determinations made by pollination ecologists familiar with the plant and pollinator species involved. Another threat to pollination processes is the decline in honeybee populations. The Varroa mite is an external parasite that was identified in the United States in and affects bee colonies in thirty states. This mite lives and feeds on developing bee larvae so that when the bees hatch, they are small and deformed. Varroa mites can be controlled by placing medicated plastic strips inside hives to kill the mites. The bees walk on the strips and then carry the medicine on their feet to the larvae growing in the honeycomb. The tracheal mite infects the respiratory system of adult honeybees. These mites were found in the United States in and are now present in most states. These tracheal mites make bees weak and can kill an entire colony. To control the mites, an antibiotic powder, such as terramycin, is mixed into sugar and oil and is placed inside the bee hive. Diseases and use of pesticides also take their toll on bee populations. There are several diseases that can kill bees; these include American foul brood, chalk brood, European foul brood, paralysis virus, sacbrood disease and kashmir virus. Some bacterial diseases can be treated by stirring antibiotics into feed sugar. Often, if a hive is badly infected, the hive is burned to prevent the infection of other hives. Also, the spraying of pesticides e. Some pesticides kill bees directly while they are in the crops, while others are carried back to the hives with the pollen, where they are stored in the honeycombs. The bees and larvae die when they eat the pollen, which can be at any time of year. Often the pesticide does not kill the entire colony, but makes the colony susceptible to mite infections or freezing in cold weather. Several other factors have contributed to declining bee populations. Africanized bees, a type of highly defensive bee that is also known as the killer bee, became established in the United States in, after years of northward migration from South America where they were first released. Beekeepers often are forced to abandon their hives when Africanized bees move into an area. Also, bee populations that have been weakened by other factors are in danger of freezing in winter, due to an insufficient number of bees to provide necessary warmth; or an insufficient supply of food to convert to heat energy. Finally, loss of agricultural subsidies and price supports in the United States adversely affects the economics of managing bee colonies. Habitat loss and the severing of migratory corridors also constitute threats to animal pollinators and pollination processes. Habitat fragmentation is the division of natural ecosystems into smaller areas due to land conversion for agriculture, forestry, and urbanization. As habitat areas become smaller and widely scattered, they may be insufficient to provide an adequate diversity of host plants and nectar sources that their pollinators require. Habitat fragmentation may also cause reduction in pollinator populations due to loss of nesting habitats. Ecologists need to monitor populations of pollinators and habitat fragmentation trends to determine possible causes of pollinator decline and to develop land use plans to protect pollinator populations such as maintenance of habitat set-asides or greenbelts near agricultural fields and timber areas. The severing of migratory corridors can also disrupt pollination processes. Some pollinating animal species, such as nectarivorous bats, navigate through a variety of nectar-providing plants as they migrate from tropical to arid and temperate environments. For example, a type of long-nosed bat flies a loop of 3, mi 5, km to follow the sequential flowering of at least 16 flowering plants species, including tree morning glories, several century plants, and giant columnar cactus. Severing of migratory corridors by habitat and vegetation destruction or by spraying of toxic pesticides may adversely affect the success of the migration. For example, migratory monarch butterflies require critical habitats through their migratory cycle and can be affected if habitat is lost due to activities such as development.

3: What is pollination? - diagram for kids - Eden Project, Cornwall

The Story of Pollination, first published in , is a classic introduction to plant pollination, the process whereby pollen is transferred to a plant's female organs, part of the process of fertilization.

Image Copyright , David L. Green Unauthorized use prohibited Coated with Pollen This carpenter bee is covered with sticky, pale yellow pollen, as she goes from flower to flower. Many people think that the world would be better without bees. But actually life on earth would be much more difficult without bees. If all bees vanished, there would be great famines, and many people would die of starvation. Many fruits and vegetables would be so rare and expensive that few could afford them. Grasses and grains, and a few nuts, which are wind pollinated would still be available without bees, but there simply would not be enough food because bees do more pollination than any other kind of pollinator. There are thousands of kinds of pollinators - bees, flies, wasps, butterflies and moths, birds, bats, and even a few more exotic ones. All pollinators have their value, but they are not interchangeable, and some are more important than others. Many flowers are especially adapted to specific pollinators, and others cannot do the job. When Capri figs were imported to California from the Old World, growers could not get a crop until they came to understand that a special wasp is the only pollinator for that variety. After the capri fig wasps were imported and released, the trees began to bear fruit. Some flowers can be pollinated by a wide variety of pollinators. For example, cucumber blossoms can be pollinated by bumblebees, honeybees, and several species of solitary bees, by several kinds of syrphid flies, bombyliid flies, some wasps, butterflies and many other creatures. But the pollinators that do the greatest amount of pollination on earth are bees. Why are bees so valuable? They are abundant and widely dispersed over the earth. Pollen is caught in their fuzz. Some bees have a specific fuzzy area of their bodies that matches the shape of the flowers, so that they are very efficient. One bee researcher calls bees "flying Velcro patches. They carry a static electrical charge. This helps pollen and other small particles stick to them. They deliberately collect pollen. Pollen is a very high-protein food for bees. Some bees tend to stay with a specific kind of flower. For example, a honeybee that visits an apple blossom on its first flight, will usually visit only apple blossoms until there are no more, and she is forced to change to another flower. Other pollinators may visit a dandelion blossom, then go to an apple blossom. Dandelion pollen will not pollinate apple blossoms. Some bees are very brawny. They muscle their way into the flowers, past the anthers and the sticky stigma, spreading pollen as they do. Full Pollen Baskets This worker honeybee has returned to her hive with pollen, packed into pellets on her legs, and is seeking a honeycomb cell in which to store the pollen. Green Unauthorized use prohibited A frame of stored pollen There is also a little bit of honey in the capped cells in the corner of the frame. Close up of stored pollen Pollen comes in many colors, most often yellow or orange, but sometimes red, green or even black.

4: Seventh grade Lesson Pollination - The Story Behind Bees and Flowers

pollination is the first indispensable step in a process that results in the production of fruits, vegetables, nuts and seeds. Without the honey bees' pollination work, the quantity and

Why is there a picture of a bee on a honey cereal box? When Sid learns that bees make honey, he grabs his magnifying glass to investigate. He discovers that bees go from flower to flower. Then they turn that nectar into honey. Grab your magnifying glass and join Sid as he explores how honey is made and why we should say thank you to bees for all the work they do! Come discover with Sid the Science Kid. Honey is so good! Did you ever notice that the honey cereal box has pictures of bees on it? Because the cereal has honey. We get it from our friends the bees. You got it, Sid. Then the bees use that sweet juice to make honey for my cereal. You got it, Sid. The bees are making the nectar into honey. They make the honey to feed all the bees in the hive during winter, and to feed breakfast to you, Sid! I hear you made an interesting discovery today, Sid. And nectar is the sweet juice they gather from inside flowers. To make seeds, a flower needs pollen. So the bees are much better at bringing pollen from one flower to another. When they gather nectar, pollen sticks to their back legs. Flowers give nectar to the bees, and the bees carry pollen to other flowers so that more flowers can grow and they can give us more yummy fruit. Next time you see a pretty flower, thank our friends the bees. See you later, scientists!

5: The story of pollination. (edition) | Open Library

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The Pollinator Story Pollinators need your help! Our mission is simple. It contains over 25 varieties of a broad range of wildflower seeds , which includes three varieties of Milkweed for the Monarchs. In fact it will provide you with a stunning wildflower display designed to attract pollinators that your neighbors will admire. Some flowers rely on the wind to move pollen, while other rely on insects to move pollen. Insects visit flowers in search of food and sometimes even mates, shelter and nest-building materials. Some insects, such as many bees, purposely collect pollen, while others, such as many butterflies, move pollen incidentally because the pollen sticks on their body while they collect nectar from flowers. Why is Pollination Important? Pollinators play a critical role in flowering plant reproduction and in the production of most fruits and vegetables. Without pollinators, most plants cannot produce fruits and seeds. The fruits and seeds of flowering plants are an important food source for people and wildlife. Why are Pollinators in Danger? Simply put, pollinators need your help. There is increasing evidence that many pollinators are in decline. There are two primary factors that are contributing to their demise: Habitat Loss One of the biggest threats facing pollinators is habitat loss. As native vegetation is replaced by urban development, including roadways, commercial and private real estate, pollinators lose habitat necessary for their survival. Pesticides The proliferation and improper use of pesticides, particularly in agricultural use, has negatively impacted pollinators and their natural habitats. Pesticides include products such as weed killers and insecticides, which are designed to prevent, destroy or reduce pests, weeds and viruses. Both bee and butterfly populations have been devastated over the last several decades due to habitat loss and poisoning. We can no longer afford to sit on the sidelines and continue watching this downward trend. Unfortunately, there is no end in sight until agricultural practices and policies change. There is still time to fix the problem What you can do Plant seeds! The result will be a beautiful wildflower garden designed to attract our pollinators. We must act now and change course

6: Pollination: A Love Story That Feeds The Earth

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An Andrena bee collects pollen among the stamens of a rose. The female carpel structure appears rough and globular to the left. Bombus ignitus , a popular commercial pollinator in Japan and China [46] Pollination management is a branch of agriculture that seeks to protect and enhance present pollinators and often involves the culture and addition of pollinators in monoculture situations, such as commercial fruit orchards. The largest managed pollination event in the world is in Californian almond orchards, where nearly half about one million hives of the US honey bees are trucked to the almond orchards each spring. The US solution to the pollinator shortage, so far, has been for commercial beekeepers to become pollination contractors and to migrate. Just as the combine harvesters follow the wheat harvest from Texas to Manitoba , beekeepers follow the bloom from south to north, to provide pollination for many different crops. Honey bees are not the only managed pollinators: The alfalfa leafcutter bee is an important pollinator for alfalfa seed in western United States and Canada. Bumblebees are increasingly raised and used extensively for greenhouse tomatoes and other crops. The ecological and financial importance of natural pollination by insects to agricultural crops , improving their quality and quantity, becomes more and more appreciated and has given rise to new financial opportunities. Farmers can also raise native crops in order to promote native bee pollinator species as shown with L. The trend to monoculture means that greater concentrations of pollinators are needed at bloom time than ever before, yet the area is forage poor or even deadly to bees for the rest of the season. The other trend is the decline of pollinator populations , due to pesticide misuse and overuse, new diseases and parasites of bees, clearcut logging , decline of beekeeping, suburban development, removal of hedges and other habitat from farms , and public concern about bees. Widespread aerial spraying for mosquitoes due to West Nile fears is causing an acceleration of the loss of pollinators. In some situations, farmers or horticulturists may aim to restrict natural pollination to only permit breeding with the preferred individuals plants. This may be achieved through the use of pollination bags. There is a clear need across the agricultural industry for a management tool to draw pollinators into cultivations and encourage them to preferentially visit and pollinate the flowering crop. By attracting pollinators like honey bees and increasing their foraging behavior, particularly in the center of large plots, we can increase grower returns and optimize yield from their plantings. Environmental impacts[edit] Loss of pollinators, also known as Pollinator decline of which colony collapse disorder is perhaps the most well known has been noticed in recent years. These loss of pollinators have caused a disturbance in early plant regeneration processes such as seed dispersal and of course, pollination. Early processes of plant regeneration greatly depend on plant-animal interactions and because these interactions are interrupted, biodiversity and ecosystem functioning are threatened. Without this genetic diversity there would be a lack of traits for natural selection to act on for the survival of the plant species. Seed dispersal is also important for plant fitness because it allows plants the ability to expand their populations. More than that, it permits plants to escape environments that have changed and have become difficult to reside in. All of these factors show the importance of pollinators for plants, which are the foundation for a stable ecosystem. If only a few species of plants depended on pollinators the overall effect would not be as devastating however, this is not the case. It is known that more than Many researchers believe it is the synergistic effects of these factors which are ultimately detrimental to pollinator populations. Bees are essential in the pollination of agricultural crops and wild plants and are one of the main insects that perform this task. Neonicotinoids insecticides have been used due to its low mammalian toxicity, target specificity, low application rates, and broad spectrum activity. However, the insecticides are able to make its way throughout the plant, which includes the pollen and nectar. Due to this, it has been shown to effect on the nervous system and colony relations in the honey bee populations. Butterflies are helpful ecological indicators since they are sensitive to changes within the environment like the season, altitude, and above all, human impact on the environment. Butterfly populations

were higher within the natural forest and were lower in open land. The reason for the difference in density is the fact that in open land the butterflies would be exposed to desiccation and predation. These open regions are caused by habitat destruction like logging for timber, livestock grazing, and firewood collection. All these relations together form a network of interactions between plants and pollinators. Surprising similarities were found in the structure of networks consisting out of the interactions between plants and pollinators. This structure was found to be similar in very different ecosystems on different continents, consisting of entirely different species. Mathematical models, examining the consequences of this network structure for the stability of pollinator communities suggest that the specific way in which plant-pollinator networks are organized minimizes competition between pollinators [67] and may even lead to strong indirect facilitation between pollinators when conditions are harsh. But it also means that pollinator species collapse simultaneously when conditions pass a critical point. This simultaneous collapse occurs, because pollinator species depend on each other when surviving under difficult conditions. The improvement in conditions needed for pollinators to recover, could be substantially larger than the improvement needed to return to conditions at which the pollinator community collapsed.

7: www.enganchecubano.com: Customer reviews: The Story Of Pollination

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8: Pollination | www.enganchecubano.com

Pollination is the process by which pollen is transferred from the anther (male part) to the stigma (female part) of the plant, resulting in the production of fruits and seeds. This takes place in the angiosperms, the flower bearing plants.

9: The Story of Pollination

Pollination is a very important part of the life cycle of plants. Insects, birds, bats and the wind take pollen between flowering plants, which means the plants can make seeds and reproduce (have babies!).

The Person Formerly Known As You Modern communications electronics Figure 1 (j). Referees position on mat 87 Day 2 : Mixing the logical and functional The modern book of etiquette A religious encyclopaedia: or dictionary of Biblical, historical, doctrinal, and practical theology. Maternal management of infancy . Religious Vegetarianism Agricultural development in Haryana How can I be a detective if I have to baby-sit? Manual of clinical problems in nephrology The third fit: a brief, highly intermittent history of snark, part 2 Net interview questions and answers by shivprasad koirala 70 412 administering windows server 2012 r2 lab manual Flower farming business plan William Bloyd-Bloyed of Maryland, Virginia, North Carolina, and Green County, Kentucky and his descendant Principles of Gender-Specific Medicine, Volume 1-2 The phantom setter Robert Murphy Small engine spark plug chart Northeast from Boston Money Under the Table Microbiology for nursing and allied health students Workbench Guide to Computer Circuits Systems Visual analysis. Telling objects: a narrative perspective on collecting Edit in pages ipad Prisons Inside Out Alternatives in Correctional Reform Selection of English synonyms. The knight from Olmedo. I lost my keys and my car Nomadic cultural tradition Operating and capital program and . financial plan Motion Picture Guide L-M Alexander Boltin. Macromedia flash tutorial step by step Ringkasan novel laskar pelangi The fires of faith A school for unusual girls Out of that moment Socket programming in c linux tutorial Destined for the throne