Cut the following 7 papers on the lines. Use the resulting squares as the bingo call cards and add some learning to the game.

Footprints

Look closely at damp muddy areas for footprints of birds and animals. They can tell you a lot about which creature lives nearby, as well as what direction they were traveling. The size of the footprint can give you a good idea about the size of the animal. They can also tell you if they stood, ran, walked, or hopped. The animal tracks you find tell you that the animal most likely lives, eats, and raises its young nearby.

Here is a link to common tracks you might see.

- https://blog.nwf.org/2014/12/who-goes-there-identifying-animal-tracks-in-your-backyard/

Pinecone

Not all "pinecones" come from pines. Cones come from conifer trees. The native (wild) conifers in our neighborhood are Douglas fir, western hemlock, Sitka spruce and western red cedar. The job of the cone is to keep the tree's seeds safe. The woody parts on the outside of a cone are called scales. The cones close their scales to protect the seeds from cold temperatures, wind and animals who might eat them. They open up and release their seeds when it is warm and easier for the seed to fall or blow out and germinate (sprout) on the ground.

Fun facts: The little brown squirrel you see in our neighborhood is the Douglas squirrel (AKA a chickaree). It was named after the Columbia River explorer and botanist, David Douglas. These little guys love to eat the seeds in the Douglas fir cones. Douglas firs are also named after the explorer.

Slug or Snail

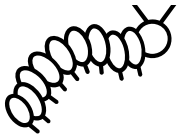
The main difference between a slug and a snail is that the slug is a type of snail that has no shell. Most garden slugs (the brown, black and leopard spotted ones, right) feed on leaves of many plants (especially seedlings), ripening fruits and garden vegetables. When they eat they create irregular holes on leaves and fruit. Too much feeding can injure plants, which annoys gardeners. Luckily, our native "banana slugs" (which are yellowish with black blotches) are decomposers and play in important role in our ecosystem. They eat detritus (dead organic matter) like fallen leaves, animal droppings, moss, and mushroom spores. Then they recycle their food into nutrient-rich waste, which fertilizes soil.

Fun facts: Banana slugs are one of the slowest creatures on Earth, traveling at a maximum speed of just 6 ½ inches per minute! They are also the 2nd largest slug in the world growing up to 9-inches long!

Here is a link to more banana slug information.

- https://www.pugetsound.edu/academics/academic-resources/slater-museum/exhibits/terrestrial-panel/banana-slug/

Caterpillar



Caterpillars are the larval stage of butterflies and moths. They are some of the most easily observed insects in our backyards and gardens because they cannot fly or run away. Since caterpillars eat all sorts of plant material they are considered both good guys and bad guys. Butterflies are wonderful pollinators and pretty to watch during the day, so the damage they do is generally forgivable. Moth caterpillars, not so much. The peskiest of these are western tent caterpillars and fall webworms. Both spin webs into large tents to house hundreds of caterpillars. One becomes a brown moth, the other a white one.

Fun fact: many of our native butterflies use stinging nettle as "host food" for their caterpillars. **Ouch!**

Here is a link to caterpillar images.
https://www.discoverlife.org/mp/20q?guide=Caterpillars

Here is information on Good guys = butterflies Bad guys = some moths
https://extension2.missouri.edu/ipm1019

Flower or leaf bud

A bud is a small growth on a stem or branch containing a future leaf, flower, or shoot. Many buds require a period of cold temperature in order to force them to develop. This is also a rest period during which they are pretty tolerant of cold. Most buds form at the end of summer or in fall. They remain small and close to the plant with a protective covering. In spring when sap begins to flow, the bud begins to swell noticeably. It is much like a cocoon where a new form emerges after a period of time. Flower buds often appear at the tip of a branch, while leaf buds appear on stems. Buds are useful for identifying leafless plants in winter.

Here is a great link to winter tree identification using buds.
https://www.uwsp.edu/cnr-ap/leaf/Documents/LEAFWinterTreeIDKey.pdf

Seed packet

A seed is the part of a plant that can grow into a new plant. A typical seed includes three basic parts: (1) an embryo (baby plant), (2) a supply of nutrients (in cotyledons) for the embryo , and (3) a seed coat. In the beginning, seeds are *dormant* for a while (resting). When the seed is ready to develop, it needs water, air and warmth, *but not sunlight,* to become a seedling. Sunlight will be needed once the plant germinates (sprouts). Beginners should consider starting with fast and easy-to-grow seeds like radishes, lettuce, chives, marigolds, calendula, and cosmos

Here is a link "all about seeds."
https://web.extension.illinois.edu/gpe/case3/c3facts1.html

Here is a link to "how plants spread seeds."
http://www.bbc.co.uk/gardening/gardening_with_children/didyouknow_seeds.shtml

This is a link about how to grow vegetables:
https://pubs.extension.wsu.edu/home-vegetable-gardening-in-washington-home-garden-series

Big leaf maple leaf

Big leaf maples have grown in Washington for several thousand years. They grow to 100 feet tall and can have trunks 3 feet in diameter. Their leaf is the largest of any maple, measuring 6-24 inches across, hence their name. The seeds, buds, flowers and even saplings are a favorite food of many birds, and mammals. The tree has interesting yellowish, scented flowers that hang in clusters 4 inches long. These are followed by winged seeds (whirlybirds) called samara, which flutter down in the fall.

Fun facts: Ferns (licorice fern) grow on the trunks and branches of big leaf maples! Caterpillars of tiger swallowtail butterfly like to munch on maple's leaves.

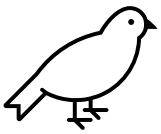
Here is a link to information on big leaf maple and others. Scroll down to the "starflower image herbarium." Click on "flowering trees."
https://www.wnps.org/starflower

Rainbow

The scientist, Donald Ahrens, said that rainbows are "One of the most spectacular light shows observed on earth". They are made up of seven colors - red, orange, yellow, green, blue, indigo, and violet, and are created by light striking water droplets. They are an optical illusion, though—because they do not actually exist in a specific spot in the sky. Their appearance depends on where you are standing and where the source of light or sun is shining. This is usually behind the person seeing the rainbow. So, next time it is raining in the distance while the sun is shining, turn your back to the sun and look straight out and up towards the rain.

Here is a nice link from NOAA
https://scijinks.gov/rainbow/

Bird



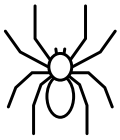
Birds are fun to watch and pretty to see, but we can also benefit from their presence. Many birds eat a variety of pest insects like aphids, mosquitoes, grubs and even slugs. Many birds like hummingbirds are excellent pollinators, and others control weeds by eating weed seeds. Larger birds like hawks and owls control mice, voles, and rats.

To keep birds happy in our neighborhoods, they need to find food to eat, water to drink, places to roost (rest), places to have babies, and safety from predators. If you want to attract birds to your yard, you will need a variety of plants and features like a place to nest or hide, and water to drink and wash in.

The most common backyard birds throughout the year in the Washington State are American robin, song sparrow, American crow, black-capped chickadee, dark-eyed junco, European starling, northern flicker, spotted towhee, house finch, and American goldfinch (Washington's state bird).

Here is a link to a backyard bird photo gallery.
https://www.nwnature.net/birds/backyard.html

Spider



Spiders are an important part of our ecosystem. Gardeners like these predators because they prey on many pest insects. They are arachnids with 2 body parts, eight legs, several eyes (usually 8), and little "hands" near their mouth to help them eat. Their fangs can inject venom into prey to restrain them. Their most interesting feature are their spinnerets, used for spinning silk.

Spiders go through an incomplete metamorphosis. Eggs are laid in large groups surrounded by a silken cocoon. The immature spider is a mini copy of the adult, but it goes through several molts (sheds and grows a new exoskeleton) before becoming an adult.

Here are some helpful links about spiders.

- https://pubs.extension.wsu.edu/common-spiders-of-washington-replaces-eb1548
- https://pubs.extension.wsu.edu/beneficial-insects-spiders-and-mites-in-your-garden-who-they-are-and-how-to-get-them-to-stay-home-garden-series

3-leaf clover

A weed is a wild plant growing where it is not wanted. Some people feel like clover, which is a legume, is a weed. But some have discovered it has a superpower that has to do with the air we breathe.
Our air is about 78% nitrogen. Only about 20% is oxygen. Clover with the help of a bacteria can take nitrogen, an important plant nutrient, from the air and put it in the soil. That is because clover forms a special (symbiotic) relationship with good bacteria. That means the plant and bacteria each gets something from the other and gives back something in return. Ah, teamwork! The bacteria attach itself to the plant's root and stores the nitrogen there for the plant to use. When plants die and decompose nitrogen returns to the soil. All legumes have this superpower: beans, peanuts, peas, lentils, chickpeas. Some flowers are legumes too: baptisia, lupine, wisteria and, sweet pea. These flowers are great for pollinators too!

Here's a link to more information.
https://aces.nmsu.edu/pubs/_a/A129/

Fern

Ferns seem to be everywhere in western Washington. Sword, deer, licorice, bracken, and lady ferns are the most common around here.
These ancient plants have been living on this planet for more than 300 million years, since BEFORE dinosaurs. Ferns do not have flowers and seeds. They have spores, visible in small clusters called sori on the underside of leaves. These are used to make new ferns.

Ferns can give shelter to birds that are feeding, while other critters, like frogs and turtles, can hide inside them. Fronds may be used as nesting material by many animals too. Today, ferns are the second-most diverse group of plants on Earth, with around 10,500 living species.

Here is a great link to the ferns growing around us. Scroll down to the "starflower image herbarium. Click on "ferns and horsetails."
https://www.wnps.org/starflower

Butterfly

Butterflies are insects that go through a complete metamorphosis. That means that in each stage of their life cycle they look completely different-- (egg, larvae/caterpillar, pupa/chrysalis, adult). Also, the food they eat as caterpillars and adults is completely different as well. If want to attract butterflies to your yard or neighborhood, you will need to have plants that the caterpillars eat, called "host" plants, as well as flowers full of sugary nectar for the adults. Why? They are wonderful pollinators! When they pollinate plants, their bodies collect pollen from flowers and carry it to other plants. This helps fruits, vegetables, and flower to produce new seeds. Most of our food is available to us because of pollinators.

Here are some informational links about WA butterflies and what they eat.

- https://www.fs.fed.us/wildflowers/pollinators/What_is_Pollination/syndromes.shtml
- https://wabutterflyassoc.org/wp-content/uploads/2015/03/Common-Butterflies-of-Puget-Sound-2.pdf
- https://www.kidsbutterfly.org/faq
- https://magazine.wsu.edu/2012/07/30/life-histories-the-butterflies-of-cascadia/
- https://wabutterflyassoc.org/wp-content/uploads/2019/08/PacificLowlandAug2019FromPollinatorOrg.pdf

Garter snake

The common garter snake is the most wide-ranging reptile in North America. In Washington it is found from coast to mountain, to forests, to sagebrush deserts, and your yard--usually close to water.

Three species of garter snakes occur in Washington. Small garter snakes eat all sorts of insects, and worms, but gardeners love that they eat slugs; larger snakes also eat amphibians, small rodents, and fish in their diet.

Garter snakes survive in suburbia and towns because they give birth to live young, and so do not require safe places for their eggs. When disturbed, garter snakes will try to escape, but if threatened they may strike, bite, or smear stinky liquid on your hands. A bite from one of these nonvenomous snakes may be alarming but will rarely break the skin.

Here are some links about Washington snakes.

- https://wdfw.wa.gov/species-habitats/living/snakes
- https://wdfw.wa.gov/sites/default/files/publications/00635/wdfw00635.pdf

Berries

Although delicious, the blackberries you see taking over fields and forest edges are an invasive plant that is on the King County noxious weed list. Common native edible wild berries found in western Washington are dewberries, salmonberries, huckleberries (red & blue), Oregon grape, salal, thimbleberry, & black raspberries.

Many feel that the most delicious of these is the trailing blackberry or dewberry (*Rubus ursinus* which means bear bramble). When walking on a trail or in a park, look down low for its powdery blue-green stem. Male, and female flowers are found on separate plants. Berries only form on the female vine, and around here that's July-August. Dewberry was used to create the loganberries, boysenberries and marionberries we see in stores and markets.

All sorts of birds and animals eat berries, and thickets of berries shelter and protect them. The flowers are nectar sources to pollinators, and leaves are nest material for native bees. Caterpillars (larvae) of wester tiger swallowtail, mourning cloak, hairstreak, and spring azure butterflies eat the leaves.

Here is a quick guide to berries of the Pacific northwest, and how to grow them.

- https://thewholeu.uw.edu/2017/06/28/a-quick-and-juicy-guide-to-berries-of-the-northwest/
- https://pubs.extension.wsu.edu/growing-small-fruits-for-the-home-garden-home-garden-series-replaces-eb1640

Bird nest

No matter what style a bird uses, all nests serve the same purpose—to protect eggs and hatchlings. The skill to create them comes almost entirely from instinct. Birds build nest with natural material around them like leaves, lichen, moss, feathers, and animal fur. They might also use human-made things like string, paper, fabric, even shiny things like nails and wire.

Different birds build nests in trees (inside holes or on branches), bushes, and on the ground. Some make mud nests that stick to sides of structures like buildings or bridges.

Birds are beneficial. They eat insect pests, pollinate plants, and eat weed seeds. They are also entertaining stress-relievers to observe. If you want to encourage birds to visit your garden, provide them with three essential elements: the right variety of quality food (flowers or seeds), fresh water for drinking and bathing, and safe cover.

Here is a nice link to the different types of nest birds make.
https://celebrateurbanbirds.org/types-of-nests/

Hummingbird

Hummingbirds are amazing!. They can hover in one spot, fly backwards, side to side, straight up and down, even upside-down! Their wings can beat 20 to 100 times a SECOND!

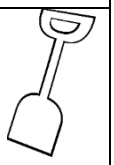
Aside from being neat to watch, they perform an important role in our ecosystem. They pollinate plants, and most of the food we eat comes from pollinated plants. If you want to attract hummingbirds to your yard, add plants with tubular flowers, and/or hummingbird feeders.

Two kinds of hummingbirds live in our neighborhoods, Rufus, and Anna's. The tiny Rufus hummingbirds are marathon flyers. They migrate from Mexico and Central America in March, which is pretty amazing for something weighing less than a dime. Anna's hummingbird is a little bigger than Rufus and stays here year-round. Both eat insects but prefer flower nectar or nectar in feeders. Amazingly, their 1.5-inch nests are made of plant parts, feathers, and SPIDER WEBS.

Here are some links about each bird and the flowers they like.

- https://www.fs.fed.us/wildflowers/pollinators/What_is_Pollination/syndromes.shtml
- http://www.seattleaudubon.org/birdweb/bird/rufous_hummingbird
- https://www.seattleaudubon.org/birdweb/bird/annas_hummingbird

Shovel



The humble shovel has been around since the Neolithic time (stone age 12,000 years ago) when archaeologists found evidence that large animals' scapula (shoulder blade) were used as a shovel. Metal shovels became mass produced in the 1700s. STEM brainpower has clearly been used for eons!

This "compound" machine is known for its simplicity. A shovel is composed of the simple machines of wedge and lever. The wedge is the blade of the shovel. This allows the head of the shovel to cut into the ground. The shovel becomes a lever when you move to pick up the dirt, and the hand closer to the end of the handle is the fulcrum.

This tool makes a gardener's life easier, where both your garden and your back will thank you.

Bee

Most people think of honeybees when they think of bees, but they are having problems. Luckily, there are many native bees in our neighborhoods that can fill in for them. There are bumble bees who live in small groups, and many gentle solitary bees, who live alone. These include mason bees, sweat bees, mining bees, and leafcutter bees.

Thanks to bees we have apples, oranges, pumpkins, and many other foods that develop from a flower. Bees pollinate the flowers. When bees drink nectar from flowers, they get covered with sticky pollen, then when they move from flower to flower, they carry pollen with them, fertilizing nearby plants. This helps plants make seeds for new plants. Pollinators = food.

To help these wonderful insects, plant a variety of flowers, and plant so that there is something in bloom most of the spring and summer

Here is a chart showing which kids of flowers pollinators like.

- https://www.fs.fed.us/wildflowers/pollinators/What_is_Pollination/syndromes.shtml

Here are some other resources.

- https://www.arboretumfoundation.org/about-us/publications/bulletin/bulletin-archive/pacific-northwest-bees/
- https://askdruniverse.wsu.edu/documents/2015/09/bee-guide.pdf/

Squirrel

There are 4 kinds of squirrels in western Washington: Douglas, eastern gray, northern flying squirrel, and Townsend's chipmunk. They are cute to look at, and rather smart, but are they a friend or enemy? Find out by investigating this link.

https://wdfw.wa.gov/species-habitats/living/species-facts/tree-squirrels

Fun Facts:

- Tree squirrels don't hibernate but will remain in their nests in cold or stormy weather but do go out to find food they stored nearby.
- Flying squirrels can go at least three miles in four hours, soaring from tree to tree.

To prevent problems:

Do not: feed squirrels or let them inside the house. Cover the dryer vent and keep tree and shrub branches 10 feet away from the sides and tops of buildings. Keep squirrels out of birdhouses, fruit, and nut trees, and definitely protect garden bulbs, plants, and seeds.

Worm

Earthworms are among the most visible of soil organisms. They play a key role in keeping soils healthy. That's why finding ways to make them thrive is important.

- Worms are nature's natural recyclers. They eat fallen leaves, decomposing fruit, animal poop and other organic matter, and they eat **all day long**.
- After eating so much, worms themselves poop too. Leaving nutrient rich "worm castings" behind as fertilizer for plants.
- When they dig, they open up tunnels that allow air and water to enter. This then bring air and water to plants.
- Worms are a food source for birds, snakes, and other animals.

Here is a great resource for more information about worms.
https://extension.psu.edu/earthworms

Needle-leaved tree

Trees with needle-like leaves are usually conifers (have cones).. The needles help these trees survive in challenging conditions. They help preserve and retain water, protect them from the cold and make it easy for snow to slide off.

Because needles grow in groups they capture more sunlight, so they can photosynthesize more, and because they are evergreen they can photosynthesize year-round. Photosynthesis is the process where plants capture sunlight and use it to make their own food.

Needle leaved trees around us are, Douglas fir (the image here), western hemlock (our Washington State tree), plus Sitka spruce, shore pine, white pine, and western yew.

Western Red cedar is a conifer but does not have needle leaves. It has scale-like leaves

Here is a great resource for conifers in our area. Scroll down to "starflower image herbarium" then click "coniferous trees."
https://www.wnps.org/starflower

Hose or watering can

Water is a unique and precious natural resource! Water is essential for life! It is the only substance on earth found in all states of matter (solid, liquid, gas). Our water on Earth now, is the same water the dinosaurs drank! Nearly 70% of Earth's surface is covered in water, but most of this is salty and not drinkable. Actually, less than 1% of Earth's water is available for humans to use.

It is important to conserve water because it is not distributed evenly over the planet, AND it must be shared with all living things: people, animals, and plants. If we conserve water, existing water supplies can be used longer, and shared equitably.

Of all the 52 states in the USA, Washington is ranked 30th in annual rainfall, with an average of 38 inches of rain a year. Our summers, however, receive only about 3 inches of that.

Here are some interesting links.

- https://wateruseitwisely.com/kids/
- https://climatekids.nasa.gov/water-cycle/
- https://www.usgs.gov/special-topic/water-science-school
- https://web.extension.illinois.edu/world/water.cfm

Seedling

A seedling is young plant that has been grown from a seed. Seedling development starts with germination (sprouting) of the seed. A typical young seedling consists of three main parts: the radicle (embryonic root), the hypocotyl (embryonic shoot), and the cotyledons (seed leaves). The two kinds of flowering plants have a different numbers of seed leaves: monocotyledons (monocots) have one blade-shaped cotyledon, and dicotyledons (dicots) have two round cotyledons.

Seedlings need a lot of light, water, the right temperature, and when it is time, extra care transplanting them into a garden or pot. **Here are some helpful links about seedlings.**

- https://extension.psu.edu/seed-and-seedling-biology
- https://jmgkids.us/kids-zone/jmgkidsweb/monocotvsdicot/
- https://extension.umd.edu/hgic/topics/seedling-care

Cloud

Each cubic meter of cloud will contain about 100 million tiny droplets of water floating in the sky. Clouds form as a result of water vapor (a gas) transforming into liquid water through a process called condensation.

There are many kinds of clouds, and each kind tells a story about what the weather will be like. Fog is a cloud close to the ground. Rain and snow happen when so many droplets stick together that the clump gets bigger and heavier, until gravity causes them to fall to Earth.

Most people think that western Washington gets lots of rain, but that is incorrect. Of all the 52 states in the USA, Washington is ranked 30th with an average of 38 inches of rain a year.

Here are some neat links about clouds.

- https://scied.ucar.edu/clouds
- https://climatekids.nasa.gov/cloud-formation/
- https://scijinks.gov/clouds/

Mushroom or fungus

Mushrooms are fungi. They are not plants. They reproduce through spores rather than seeds. A mushroom is actually the fruit of the fungus. Some can be eaten (yeast is a fungus), and some are used for medicine. Fungi are important decomposers. They recycle 85 percent of the carbon from organic matter and unlock nutrients so they can be used by other organisms.

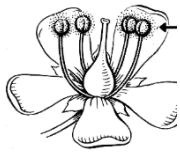
There is a special kind of fungus called Microryza. It lives in soil and forms a relationship (symbiotic) with plant roots. They supply water and nutrients to plants, and plants supply it with sugars.

There are also fungi that live on trees. They look like a shelf, so they're called shelf fungus.

Here is a link to mushrooms and shelf fungi we might see.

- http://www.alpental.com/psms/PNWMushrooms/PictorialKey/index.htm
- https://herbarium.usu.edu/fun-with-fungi/shelf-fungi

Anther with pollen



The male part of a flower is called a stamen. The stamen consists of a long tube called a filament, and it has a pollen-producing, oval-shaped knob on its end called the anther. Pollen is the powdery substance that causes plants to form seeds, and they in turn become new plants. Pollination is the transfer of pollen from the anthers of a flower to the stigma (female part of flowers) of the same or another flower.

Bees are the most important movers of pollen. Flies, beetles, wasps, birds, butterflies, and moths also help. Plants work hard to attract their pollinators and offer them rewards. The flowers offer pollen and nectar (a sugary liquid), to lure pollinators. Different flower shapes, color, patterns, and scents are all part of the plant's efforts to attract pollinators. Both flowering plants and conifers (plants that grow seeds inside cones) make pollen.

Here is a chart showing the difference flowers pollinators like.

- https://www.fs.fed.us/wildflowers/pollinators/What_is_Pollination/syndromes.shtml

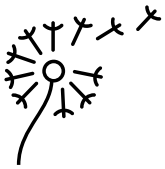
Chewed leaf

What chewed this leaf? Be a detective and look at other leaves and the stem. What do you see? Do you see any creatures?

- If you see slime then slugs are guilty.
- If you see holes that do not go all the way through the leaf, then sawfly caterpillars could be to blame.
- If you see a wilted leaf, whole stem, or seedling cut to the ground, then cutworms are likely responsible.
- If you see round holes in plants of the cabbage family, then the cabbage white butterfly caterpillar is probably the culprit.
- If you see ragged chewed holes in leaves, stems, and fruit, then grasshoppers might be at fault.
- If you have lots of chewed leaves, to the point there are not many left, then hornworms might be to blame.
- If you do not see a critter but see little black specks (insect poop called frass) then the culprit has moved on.

Remember, if there are just a few chewed leaves on your plant, don't worry. It will survive.

Dandelion

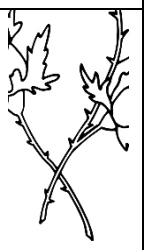


It is said that a weed is a plant growing where it is not wanted. Most people consider dandelions weeds, but they can be a beneficial as well.

- Its taproot will bring up nutrients for shallower-rooting plants and add minerals and nitrogen to soil.
- It releases ethylene gas which helps fruit to ripen.
- It is a source of natural rubber.
- It has some medicinal properties.
- Young tender leaves can be eaten.
- The taproot can be roasted to make tea.
- It attract lots of pollinating insects.

With the problems facing honeybees and native bees, dandelions provide a really important source of nectar and pollen for pollinators.

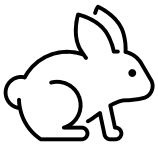
Thorny branch



Since plants cannot run away from predators, some have developed defensive strategies to fight them off. Some plants produce chemicals that are poisonous or that taste bad. Other plants have developed modified leaves or stems that have changed shape and have become hardened and sharp. Thorns (spines and prickles) make it difficult for predators to bite, chew and eat. Ouch!

Some thorny, spiny, and prickly plants that we grow, or that grow wild around here are black berry, salmon berry, bog current, crab apple, hawthorn, thistle, rose, raspberry, barberry, firethorn, and quince. However, plant scientists can, and have created plants that no longer have thorns. Our native (wild) dewberry is the parent of loganberry, which doesn't have thorns.

Cottontail rabbit



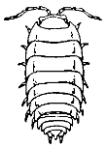
Although we live in the west, the bunnies we see are eastern cottontail rabbits. They were introduced here in the 1930s. They are really cute but can cause lots damage to plants. The good news is that we can plant plants they dislike.

Here are some interesting facts.

- They eat their poop for more nutrients.
- They can run 18 miles per hour to escape predators.
- They are solitary animals with a territory of 5-8 acres.
- Females make shallow cup-shaped nests in the ground.
- Females are pregnant for 30 days, and usually produce 4-8 "kittens."
- Mothers leave the nest most of the day to eat but return each evening to nurse.
- Babies are independent by 4-5 weeks, and breed at 2-3 months.

Here is a link about Washington rabbits.
https://wdfw.wa.gov/species-habitats/living/species-facts/rabbits

Pill bug – roly-poly

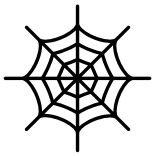


Pillbugs and sowbugs are also known as wood lice, roly-poly, and potato bugs. They are not insects. They are crustaceans and related to crabs and shrimp. Both are grey and prefer very damp areas. Sometimes these creatures are considered pests by gardeners, however they rarely damage healthy plant tissues. Both are scavengers that usually feed on decaying organic matter. Since they recycle valuable nutrients, help create healthy soil, and improve plant life, they should be considered beneficial creatures.

Fun facts:.

- Both breathe through gills.
- Mothers carry their eggs in a pouch.
- They don't urinate (pee).
- They eat their own waste (poop).
- They have blue blood.

Spider web



Fun facts:

- Spiders make their webs from silk, a natural fiber made of protein.
- Spiders often eat their silk.
- Spider silk is 1 tenth the diameter of human hair but is 10 time stronger than a steel strand of the same weight.
- Silk can stretch up to four times its original length.
- Different spider species can have different colored silk or even woolly and Velcro-like silk.
- Spiders silk comes from special glands, and each is linked with a particular spinneret (a nozzle-like organ).
- It looks like spiders make one strand of silk, but actually make many strands and spin them together like rope.
- Silk can be spun to wrap cocoons around young.
- They can use silk to go "fishing" for bugs.
- Spiderlings can throw a line of silk and use it like a parachute and fly away.

Leaves we eat

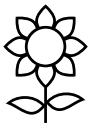
We can eat many leaves in gardens and from grocery stores. Some of these leafy green plants are kale, arugula, bak choy, mustard greens, beet greens, lettuce, and spinach. All these have wonderful health benefits.

This link explains health benefits.
https://njaes.rutgers.edu/home-lawn-garden/leafy-greens.php

There are many wild plants that can be eaten too, but **DO NOT** eat any without proper research and parental approval.

Here is a link to more information about edible wild plants.
https://s3.wp.wsu.edu/uploads/sites/2053/2015/09/73aEdibleWildPlants.pdf

White flower

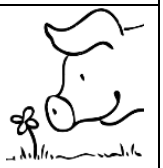


Flowers have a job to do--make more plants. To do that pollinators are essential. Flowers everywhere come in an amazing variation in colors, shapes, sizes, and smells. The variety is tied to a partnership between flowers and their pollinators. Different flowers attract different pollinators. White flowers attract some bees, beetles, birds, and moths. Flower shapes also attract different pollinators. Bees and butterflies like flat flowers they can use as landing platforms. BHummingbirds on the other hand like funnel-shaped or tube-like flowers and strong stems to land on. Bumble bees like having "nectar guides," lines that point to the nectar. Even flower scent plays a role in attracting pollinators. Bees like fresh, mild odors, whereas flies like stinky ones.

Here is a chart showing pollinator preferences.
https://www.pollinator.org/pollinator.org/assets/generalFiles/Pollinator_Syndromes.pdf

Plants Need Pollinators; Pollinators Need Plants!!!

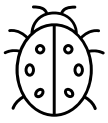
Fragrant flower



Plants have formed associations with animals to make sure flowers are pollinated and seed produced. To help this process, plants provide the pollinator with the signals and rewards. Flowers grow in a variety of colors, shapes, size that attract specific pollinators, but they also produce a variety of scents to attract them. Some pollinators have limited vision but have the ability to find a flower by its fragrance. If a pollinator can recognize an odor it can easily find the flower.

To attract pollinators, you might want to grow these flowers:
Bee balm (*Monarda didyma*), garden phlox (*Phlox paniculata*), Oriental lily (*Lilium orientalis*), English lavender (*Lavandula angustifolia*), Sweet autumn clematis (*Clematis terniflora*), peony (*Paeonia lactiflora*), sage (*Salvia*), roses (*Rosa)*. Scented herbs like rosemary, mint, and basil can be added to the list, and can perform double-duty in your kitchen.

Beetle



Beetles are insects that usually have 2 sets of wings. One set is actually the beetle's elytra—their shell-like wings. The other is hidden beneath the elytra. Beetles are beneficial in many ways. They are important decomposers, and as predators, they reduce populations of problem insects, especially caterpillars and even slugs. Ladybird beetles (ladybugs) are important predators of aphids. Ladybugs are not with us long, however. Their life cycle is over in about 28 days.

Fun facts:

- Beetles do not see very well.
- Beetles make up the largest group of insects with about 350,000 species. They make up 40% of all insects.
- They use their antennae to smell and feel.
- They have holes in their sides that act like lungs.
- They go through a complete metamorphosis.

Here are some helpful links.

- http://www.biokids.umich.edu/critters/Coleoptera/
- https://www.si.edu/spotlight/buginfo/beetle

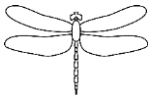
Wheelbarrow

Wheelbarrows are human-powered carts with one wheel that help carry all sorts of heavy things. It is one of those ideas that seems so simple but took some STEM knowhow to create.. The STEM problem they solved was efficiency related. One person hauling things was hard work and time consuming. So, it is believed that ancient Greeks solved the problem by taking the concept of a lever, plus the wheel and axle to make something revolutionary. The handles act as the lever and the wheel and axel are the fulcrum. This "compound machine" has been around for thousands of years and has changed little. Gardeners can thank the ancient Greeks for their STEM knowhow.

Here is an interactive Smithsonian lesson on 6 simple machines, and another link to diagrams.

- https://learninglab.si.edu/collections/simple-machines/rtP6c4ptWXGmBejf
- https://etc.usf.edu/clipart/galleries/776-simple-machines

Dragonfly



Dragonflies are known as mosquito hawks because they love to eat flying insects that "bug" us like gnats, midges and mosquitos. They can eat many times their weight in mosquitoes every day, and for this reason every gardener (actually everyone) loves them.

Dragonflies have a fascinating life cycle. They begin their life in water, where they look like spiky, armored beetles. Then they crawl out of the water, attach themselvs to a vertical surfice, and crawl out of their exoskeleton. It's an amazing complete metemorphosis to see.

The green Darner dragonfly became Washington's official Insect, thanks to the hard work of a Kent elementary school. The green darner is a beautiful insect with a long blue abdomen, green thorax and a bright green head with a yellowish-green face. It is about 3 inches long and has a wingspan of 4 to 6 inches. In the days of dinosaurs, dragonflies had a 3-foot wingspan!

For more on green darners see these links.

- http://www.biokids.umich.edu/critters/Anax_junius/
- https://uwm.edu/field-station/common-green-darner-rest-story-family-aeshnidae/