

(1) Douglas-fir cone

Pseudotsuga menziesii



Your object is a Douglas-fir cone! A cone is where a conifer tree (like a spruce, fir, or pine tree) stores its seeds. The hard, brown scales that cover the cone protect the seeds from seed predators, like birds and squirrels, while the seeds are growing. The seeds are winged and depend on the wind to spread them. The Douglas-fir is the biggest tree in Washington and is also one of the most common. It can

grow to more than 100 meters tall and can live for 700 years. We cut down Douglas-fir trees for lumber, and small ones are commonly grown as Christmas trees. Douglas-fir needles are a favorite food of many types of Washington caterpillars.

(2) Norway Spruce cone

Picea abies



Your object is a Norway Spruce cone! A cone is where a conifer tree (like a spruce, fir, or pine tree) stores its seeds. Did you notice the long and slender the cone, and the curved, thin scales? Those scales covering the cone served to protect the seeds while they were growing. The Norway Spruce is native to northern Europe and is the original Christmas tree, but is now planted all over

North America. The country of Norway donates an official gift tree each year to New York and Washington, DC. Like many large conifer trees, Norway Spruces live a long time – up to 600 years!

(3) Western White Pine cone

Pinus monticola



Your object is a cone from the Western White Pine! Did you notice how long the cone is? The Western White Pine produces the longest cone of any tree in Washington, and the tree itself is big - up to 70 meters (about 230 feet) tall! It's also the state tree of Idaho. The heavy scales on the cone protect the seed inside from seed-eating birds and mammals. When the scales open, the winged seeds drop out and are blown some distance away from the parent tree. Pine needles grow in clusters and Western White Pine needles are in clusters of five. Unfortunately, Western White Pines are threatened by a fungus disease that has killed 90 percent of them in this region.

(4) Paper Wasp nest

Polistes sp.



Your object is a Paper Wasp nest! Paper Wasps build nests to live in, just like bees build beehives. You can probably guess why they're called Paper Wasps - they build their nests out of fibers from plants, the same material we use to make paper to write and draw on. The fibers are mixed with the wasp's saliva, and then "glued" together to make a water-resistant, papery nest. A female wasp will lay an egg in each hexagon-shaped cell. Though these wasps have a painful sting, they only attack if they feel their nest is threatened. Otherwise, many gardeners like Paper Wasps because they eat insects that threaten crops and eat nectar from flowers, helping pollinate different plants.

(5) Caddisfly case

Order: Trichoptera



Your object is a caddisfly case! A caddisfly is an insect; the adult looks kind of like a moth, but with hairy wings. This case was the protective house where the baby (larval) caddisfly lived. Caddisfly larvae (which look like hairless

caterpillars with gills) live in streams and build a case out of pebbles, pine needles, or even bits of paper—anything that will stick together with silk they make themselves. Safe inside their mobile homes, they crawl around the stream bottom as they eat plant material or scrape algae off rocks. After several months, they crawl out of the water and fly away as adult caddisflies, leaving their mobile shelters behind.

(6) American Beaver chewed branch

Castor canadensis



Your object is a branch that was chewed on by an American Beaver! Beavers are nature's civil engineers, damming streams and creating wetlands all over North America. Their big, continuously growing, front teeth can gnaw through a branch this size in a few minutes. The branches are dragged to the dam that is being built or repaired, and wedged into place.

Beavers will use bigger branches first, then fill in the dam with smaller branches and rocks, then use mud to hold it all together.

(7) Rufous Hummingbird nest & eggs

Selasphorus rufus



Your object is a Rufous Hummingbird nest with eggs! This nest was built by a female hummingbird to hold two eggs -- hummingbirds almost always lay exactly 2 eggs! It is lined with lichen and old spider webs that she collected. The nest is placed on top of a branch and may look like a clump of moss, to hide it from hungry egg-eating predators like jays. She will incubate the eggs for 16 days. The babies hatch blind and helpless. The female immediately starts to deliver a mixture of flower nectar and tiny insects to her fast-growing babies. Their eyes open in 10 days, and in just 20 days they are able to fly away from the nest.

(8) Marsh Wren nest & eggs

Cistothorus palustris



Your object is a Marsh Wren nest with eggs! Marsh Wrens are small birds that fly through the marshes eating aquatic insects and snails. This nest was built by a male bird, hoping a female would come lay her eggs in it. He wove the nest with wet cattail reeds and grasses and lined it with cattail fluff and feathers. Males often build multiple nests on their territories, hoping to attract females. The rounded, domed shape of the nest protects the eggs and young from predators. They are shy birds, much easier to hear than to see. These musical wrens can sing up to 120 different kinds of songs!

(9) Spotted Towhee nest & eggs

Pipilo maculatus



Your object is a Spotted Towhee nest with eggs! This nest is made mostly of twigs and grasses to keep the eggs warm. Did you notice it's shaped like a bowl? Towhees nest on the ground, so this nest sits flat on its bottom, cupping the eggs inside. When it is especially cold, the female Towhee will spread her feathers and press her warm belly against the eggs. When the eggs

hatch, both adults bring food to the young 5 to 10 times per hour. To keep the nest clean, the parents take away fecal sacs (poop bags) produced by the young. Towhees are common forest birds in Tacoma. They forage for seeds on the ground by scratching in the soil with their big feet. Keep your eyes peeled for this black-headed bird scratching around on the ground!

(10) Darner dragonfly

Family: Aeshnidae



Your object is a Darner dragonfly! Darners are some of the fastest and biggest local dragonflies, with possible wingspans of more than ten centimeters. Sometimes called "mosquito hawks," they can fly up to 35 miles per hour! After hatching from eggs laid in the water, dragonflies begin life as larvae nabbing insects at the bottom of ponds with a powerful lower "lip." After spending a year underwater, the larva crawls out onto a reed or

stick, sheds its outer skin, and begins the second (and much shorter) part of its life as a flying insect. Adult dragonflies live 4 to 6 weeks. The Common Green Darner was voted Washington's state insect in 1997 by elementary school students.

(11) Shore Crab

Hemigrapsus sp.



Your object is a Shore Crab! These small crabs (the largest have a carapace width of about 6 centimeters) of the intertidal zone stay under rocks when the tide is out, hiding from gulls and other sea birds, their main predators. The female lays eggs and carries them with her for 3 to 4½ months before they hatch. These crabs spend the first month of their lives as tiny plankton

floating in Puget Sound before they return to the beach, where they eat mostly algae that they scrape from rocks with their big front claws. If a predator grabs a shore crab by the leg, the leg will drop off so the crab can get away, and another leg will grow in its place. If you pick one up, hold it on the flat of your palm to avoid a painful pinch. And remember, if you turn over a rock to look for shore crabs, flip it back over carefully. Always leave the beach the way you found it!

(12) Ground Beetle

Family: Carabidae



Your object is a Ground Beetle! Your beetle is encased in plastic because beetles, like all insects, have a lot of limbs and their skeleton is on the outside! That means they are *very fragile* after they die. Most ground beetles are carnivores, eating prey such as slugs, snails, and earthworms. Mainly active at night, these beetles use their antennae to sense food and danger. Ground beetles begin life as eggs laid in the soil, then

hatch out as larvae. It takes about one year for the mealworm-like larva to become an adult beetle. There are about 2,000 species of ground beetles in North America and over 40,000 species in the world, which makes it the most abundant group of animals on earth!

(13) Opossum pelvis

Didelphis virginiana



Your object is a pelvis from a Virginia Opossum! The pelvis (the “hipbone”) is where the legs connect to the skeleton in vertebrate animals – like you! Can you find the round sockets where the legs of this opossum attached? Can you find where the pelvis attaches to the spine? This pelvis is very strong and wide, allowing room for the large muscles that support the

opossum while it walks and climbs trees. Opossums, common in Tacoma, are actually marsupials! They are the only marsupials that live in the wild in North America. Like kangaroos and koalas, opossums carry their babies in a pouch.

(14) Great Blue Heron pelvis

Ardea herodias



Your object is a pelvis from a Great Blue Heron! The pelvis (the “hipbone”) is where the legs connect to the skeleton in vertebrate animals – like you! Can you find the round sockets where the long legs of this heron attached? The pelvis of the Great Blue Heron, like all birds, is attached to some of the backbones to make the body stiffer during flight. Herons use their long legs to walk along the shores of Puget Sound and freshwater

marshes hunting for fish and frogs. Did you notice how light your object is? Birds fly a lot and flying takes a lot of energy, so light and strong bones are an adaptation we see in birds.

(15) Bullfrog pelvis

Lithobates catesbeianus



Your object is a pelvis from a Bullfrog! The pelvis (the “hipbone”) is where the legs connect to the skeleton in vertebrate animals -- like you! Can you find the round sockets where the legs of this frog attached? Bullfrogs are common inhabitants of lakes and ponds all around Puget Sound. They are an introduced species, not native to the area, and their loud “jug-o-rum” calls announce

their presence. Frogs have the same three paired pelvic bones as birds and mammals, but the side bones are long and strong to support the big leg muscles that are very important for jumping. Bullfrogs rest on the shore but when approached by a potential predator, they make a huge leap into the water and swim quickly to the bottom with their big webbed feet. After a while, they slowly rise to the surface.

(16) Ochre Sea Star

Pisaster ochraceus



Your object is an Ochre Sea Star! You might have heard it called a ‘starfish’ but this star is not a fish at all. Ochre Sea Stars are very important predators in Puget Sound. They will eat mussels, barnacles, limpets, snails and other prey. They can pull apart shells with their strong tube feet (the suckers on the bottom of the star). Sea stars eat by pushing their stomach out of their mouths and

into their prey. The sea stars actually digest their prey while it is outside of their body! Most Ochre Sea Stars found in Puget Sound are purple, while the ones on the outer coast are ochre-colored, a shade of orange-brown. The white points you see in this object are the bones of the sea star. It doesn’t have a skeleton in the same way you do, but its body is full of small bony pieces that make it firm.

(17) Sand Dollar

Dendraster excentricus



Your object is a Sand Dollar! What you see here is just the dead shell of the Sand Dollar. When it is alive, this shell (called a test) is covered in a layer of skin and little tube feet to help it move around and bury it into the sand. Did you notice the small holes in the shape of a flower on the top of the sand dollar? That is where the animal's gill-like parts stick out, allowing it to "breathe." On the underside of the sand dollar is the "Aristotle's lantern" – a set of five jaws and teeth. When the sand dollar dies, the Aristotle's lantern can break apart and the separate jaw pieces look like little white doves.

(18) Sea Urchin

Strongylocentrotus sp.



Your object is a Sea Urchin! Technically, what you have is the test, or shell, of a sea urchin. When sea urchins are alive, they are covered in long spines that help protect it from predators. After urchins die their spines fall off, leaving the globe-like shell that you see here. Inside the shell, sea urchins have a complicated structure called an Aristotle's lantern with five "jaws" that allows them to scrape algae off rocks to eat. There are three species of sea urchins in the Puget Sound: red, purple, and green. Some people consider their eggs a delicacy!

(19) Moon Snail

Euspira lewisii



Your object is a Moon Snail shell! Common in sandy areas around Puget Sound, this is the largest known species of moon snail in the world. Did you know that snails actually make their shells? As the snail grows, the shell grows too. The lines on the outside of the shell are like tree rings, where each ring indicates another period of growth. The shell is important because it helps protect the snail from predators. As it crawls over the sand, the snail's body seems impossibly large for its shell. But it can withdraw completely inside its shell, blocking the "exit" with a plate called an operculum (the amber-colored thin "door" found with this specimen, which is made of keratin like your fingernails). Moon snails lay about 100,000 eggs in a spectacular "sand collar" made of sand and mucous, which looks like a sandy rubber plunger when you find one on the beach.

(20) Leafy Hornmouth

Ceratostoma foliatum



Your object is a Leafy Hornmouth shell! Did you know that snails actually make their shells? As the snail grows, the shell grows too. The lines on the outside of the shell are like tree rings, where each ring is another period of growth. The Leafy Hornmouth is a type of predatory snail that eats barnacles, clams, and mussels. It drills into its prey using a structure in their mouth called a radula, which looks a little like a tongue covered with teeth. Yikes! The radula grinds right through the prey's shell, and the snail pushes digestive juices (like the acids inside your stomach) inside its prey's shell and sucks out the digested tissue. If a Leafy Hornmouth is knocked off a rock, the spiral shape of its shell causes it to spin through the water so it settles with the opening facing downward, keeping it safe from predators.

(21) Hairy Triton

Fusitriton oregonensis



Your object is a Hairy Triton snail! Did you know that snails actually make their shells, not hermit crabs? As the snail grows, the shell grows too. The lines on the outside of the shell are like tree rings, where each ring is another period of growth. The Hairy Triton is the largest snail commonly found in Puget Sound. It gets its name from the hairy outer covering it has when it's alive; this "skin" protects the shell and provides camouflage. The Hairy Triton is a predatory snail that eats mussels, sea squirts, and even sea urchins. It drills into its prey using a structure in their mouth called a radula, which looks a little like a tongue covered with teeth. Yikes! The radula grinds right through the prey's shell, and the snail pushes digestive juices (like the acids inside your stomach) inside its prey's shell and sucks out the digested tissue. The microscopic larvae can remain swimming for up to 4 years before they develop into adults!

(22) Big Skate teeth

Raja binoculata



Your object is Big Skate teeth! The Big Skate is related to rays and sharks, and looks kind of like a large stingray. Just like sharks, the Big Skate can replace its teeth as they wear out and fall off. In fact, Big Skate jaws have more than 70 rows of teeth! The tiny, pointed teeth help it hold and crush its prey, mostly small animals like crabs and small fish. The Big Skate is commonly seen in the Puget Sound by scuba divers, where it swims along the sea bottom looking for food. You can probably guess why they're called Big Skates - they are one of the largest skates in the world, growing up to two meters (six feet) in length. If you're lucky, you might see Big Skate eggs when you go to the beach. The eggs look like small greenish brown pillows, and are sometimes called "mermaid's purses."

(23) Salmon jaw

Oncorhynchus sp.



Your object is a Salmon jaw! Unlike most other fish, salmon live in both fresh and salt water. Salmon lay their eggs in streams and rivers, and after the young hatch, they migrate to the ocean when they are old enough to survive in the open water. Did you notice how sharp the salmon's teeth are? Salmon will use those sharp teeth to eat small water insects in the river when they are young, and once the salmon gets to sea, it will mostly eat other fish. After a few years at sea, the adult salmon will use the stars, the earth's magnetic field, and then their amazing sense of smell to return to the same river where they hatched. There they will lay their eggs and die, and their decomposing bodies will provide important nutrients to the river ecosystem – it's the circle of life!

(24) American Beaver jaw

Castor canadensis



Your object is part of a jaw from an American Beaver! Did you notice that the front tooth is orange? The orange color comes from iron in the tooth enamel, which makes the tooth harder. Only the front of the tooth has iron, so as the beaver gnaws on branches, the back gets worn down while the front stays strong; this keeps the tooth sharp. They have to keep gnawing because their teeth never stop growing. Beavers use the tree trunks and branches they gnaw on to build their dams, which keep them safe from predators. Though beavers chew on branches to use for their dams, they mainly eat the soft inner bark of twigs, which they store in their dams to eat during the winter.

(25) Black-tailed Deer vertebrae

Odocoileus hemionus



Your object is part of a Black-tailed Deer spine! Each bone in the spine is called a vertebra, and together they form the backbone of the animal. Did you notice the three long, flat parts coming off the center of each vertebra? Those are important for muscles to attach, so the deer can move. The small discs go between the vertebrae and act

like shock absorbers, so the bones don't scrape against each other when the deer moves. Around Tacoma, you can see Black-tailed Deer around parks and ravines, where they forage for plants. Deer, like cows, are ruminants, meaning that after they chew and swallow their food, it is softened in a stomach called the "rumen." The food is then returned to the mouth and chewed again. Watch closely and you will see deer chewing their "cud"—this softened food. Deer food passes through a series of four stomachs before it is fully digested.

(26) Great Horned Owl vertebrae

Bubo virginianus



Your object is part of a Great Horned Owl spine! Unlike humans, owls and some other birds cannot move their eyes from side to side - they have to turn their entire head if they want to look at something. Owls have 14 bones in their neck, called vertebrae, which help them be more flexible when they turn their head. In fact, owls can turn their heads around 270 degrees (a full circle is 360 degrees). That's more than halfway around! How far can you turn your head? Great Horned Owls are named for the tufts of feathers that stand up on their heads for camouflage but are neither horns nor ears.

The owl's primary feathers are edged with fringes. Because of how air flows over the fringe, owls can fly silently, making it easier for them to sneak up on their rodent prey.

(27) Salmon vertebrae

Oncorhynchus sp.



Your object is part of a Salmon spine! This salmon was about half a meter long. Each small bone in the spine is called a vertebra, and together they form the backbone. Salmon hatch in freshwater like rivers and streams, and swim out to the ocean as adults. After spending a few years at sea, the salmon will

return to the river where it hatched to lay eggs. This can be a difficult journey, as some salmon have to swim against strong currents and obstacles, sometimes even jumping over beaver dams or small waterfalls, to get home! Did you notice the long pieces coming off the sides of the vertebrae? Those are for muscles to attach, and the longer pieces means bigger muscles. Bigger muscles help the salmon make that journey back up the same river where it hatched. After the salmon breed, they die; their decomposing carcasses are food for all kinds of animals, and add nutrients to the river ecosystem.

(28) Double-crested Cormorant skull

Phalacrocorax auritus



Your object is a Double-crested Cormorant skull! Double-crested Cormorants live near the water, roosting on docks, piers, and boats, and are in the water only when chasing and capturing fish. Did you notice the sharp, hooked beak? This beak helps the cormorant catch its prey, allowing them to catch a variety of fish - some even thicker than the cormorant's neck! Cormorants are closely related to pelicans, and like pelicans, cormorants can swallow fish

whole with their flexible lower jaw.

(29) Surf Scoter skull

Melanitta perspicillata



Your object is a Surf Scoter skull! The Surf Scoter is a large sea duck that dives below the water's surface to find mussels, clams and other invertebrates to eat. Can you see the ridges on the edges of its beak? Scoter beaks are thick and strong, and those ridges help the duck get a better hold on its slippery prey. Scoter beaks are so strong that they can even pull small mussels right off the rocks or pilings! The base of the beak (where it connects to the rest of the skull) is larger in adult males, probably to better show off the bright colors on the beak.

(30) Great Blue Heron skull

Ardea herodias



Your object is a Great Blue Heron skull! The Great Blue Heron lives in wetland habitats, using its long legs and toes to help it keep balanced while it wades through the water and searches for food. You noticed that the beak of the Great Blue Heron is long, thick, and sharp - perfect for capturing and spearing its prey, which is often small fish or frogs. Did you notice the large holes on the side of the skull where the eyes would be? Herons have large eyes because they rely mostly on sight to locate their prey. What do you think the hole in the back of the skull is for? That is where the spinal cord exits from the brain.

(31) Bigleaf Maple samaras

Acer macrophyllum



Your object is a Bigleaf Maple samara! Samaras are the dry fruits of the tree, which contain the seeds. Have you seen them spin through the air? The “wings” on the side of the samara allow it to twirl and spin like a helicopter as it falls. They’re sometimes called wingnuts or whirligigs! They can be blown some distance by the wind, and they may eventually sprout in the shade of another

tree. Bigleaf Maples grow in moist woodlands and are usually associated with coniferous trees. They are one of the largest deciduous trees in our area. This tree’s rough bark makes it a good place for ferns and mosses to grow.

(32) Red Alder cones, catkins

Alnus rubra



Your object is a cone and catkin from a Red Alder! Red Alder trees are commonly found around Puget Sound, often in areas that have been disturbed by logging or development. The long, slender parts are called catkins; these contain the male flowers. The wind carries the pollen from the catkins into the air, where it reaches the female flowers and fertilizes the seeds. The female flowers then develop into the little cones that hold the seeds. Red Alders were used by Native Americans when

fishing; when the bark is boiled, it produces a red dye that was used to color fishing nets to make them harder to see underwater. Red Alder roots hold bacteria that take nitrogen from the air and turn it into compounds that make the soil more fertile, benefitting all plant life.

(33) Garry Oak acorns

Quercus garryana



Your object is a Garry Oak acorn! An acorn is the “fruit” of an oak tree, or to put it another way, an oak’s way of making another oak. Did you notice the scaly top of the acorn? That is called the cupule, and it holds and protects the acorn while it grows. After they ripen, acorns fall, sometimes carpeting the ground under their parent tree. If they were all to sprout there, each seedling would have little chance of survival, competing for light and nutrients with the parent tree and all the other seedlings. However, nutritious acorns are a favorite food of many animals including squirrels and jays. These animals gather acorns and hide them to keep for winter-time meals. Some of these hidden acorns don’t get found and end up sprouting into oak seedlings far away from their parent trees.