ELA Common Core Content Standards:
Reading Standards for Literature 1, 2, 9
Reading Standards: Foundational Skills 4
Reading Standards: Informational Text 1, 5
Speaking and Listening Standards 1, 2, 3
Language Standards 1, 2, 4

Estimated duration:
1.5 hour session

Goal: Students will learn about some of the smaller Native mammals belonging to orders *Rodentia* and *Eulipotyphla*. They will learn to identify seven species, learn their Karuk, English and Latin names, and gain knowledge of their habitat and major characteristics. Furthermore, they will know and understand the seven levels of classification, and apply that knowledge as they practice classifying animals.

Teacher Background: While salmon and acorns make up the main bulk of the traditional Karuk diet, rodents play a unique role in the Native Food System. As the first targets for young hunters that served to protect valuable food supplies, and in order to supplement meals – especially during lean years, small rodents were traditionally caught with bow and arrows, in snares, and in nets made of iris root. Sometimes squirrel meat, for example, was cooked over an open fire, or sometimes with edible plant bulbs in an oven made of earth and stones. Some species are not hunted at all for meat, for example the common mole, as they are considered a taboo for consumption.

The relative plenitude of resources in the mid Klamath basin is a reflection of many centuries of careful land management. The Karuk People hold high respect for all living and spiritual beings, and have developed hunting and trapping strategies to harvest certain species, while recognizing that some species were "taboo" or "off-limits" for harvesting, as per long-standing tribal codes dictated by the **ikxaréeyav**[1], or Spirit People. Hunters also refrain from harvesting swamp robin: this is held in reserve for lean times. Most all animals are only hunted during certain times, and there are very specific indicators that frame these seasons; good example of this is the sturgeon, which is taboo to eat prior to Pikyávish, i.e. the World Renewal Ceremonies that occur primarily during the summer months.

[1] Pronounced, Ick-xah-RAY-yahv – the "x" is a "h" sound made at the very back of the throat.

Theme/Big Idea:	Western Science and Traditional Ecological Knowledge complement each other.
Big Questions:	What are some of the many Native species of rodents and small mammals that inhabit Karuk Ancestral Territory? What role do they play in the Native Food System? How are they featured in Karuk Oral Tradition?
Vocabulary:	Kingdom, Phylum, Class, Order, Family, Genus, Species, Subterranean, Cylindrical, Coniferous, Burrow

Materials:

Organizing Animals: The Taxonomy of Western Science, text (included)
keemishatunvêech - Small Wild Animals of Karuk Country, booklet (included)
Organizing the Animals: Vocabulary Worksheet (included)

Preparation: Copy **keemishatunvêech - Small Wild Animals of Karuk Country** and staple into booklets for each student. Copy **Organizing the Animals: Vocabulary Worksheet** for each student.

Discussion: Tell them that the indigenous people of this region were subsistence hunters and gatherers, which means that they took only enough food and fiber resources from the land and waters that the environment could replace in a short period of time. Ask students if they think people still act this way and probe further into their ideas of why and/or why not. Ask them if they know of any small animals that were traditionally hunted or trapped (correct answers can be a variety of birds, rabbits, gophers, squirrels, woodrats, beavers, porcupine, some reptiles and fish). Try to encourage students to ask each other for more details or explanations for their opinions.

Remind students that the relative plenitude of resources in our area is a reflection of many centuries of careful land management. Indigenous peoples in our area hold high respect for all living and spiritual beings, and have developed hunting and trapping strategies to harvest certain species, while recognizing that some species were "taboo" or "off-limits" for harvesting, as per long-standing tribal codes dictated by the **ikxaréeyav**[2], or Spirit People. Ask them if they know of any examples of small animals that are considered taboo (correct answers: dog, coyote, eagles, hawks, buzzard, crow, raven, owls, snakes and lizards).

Men would also refrain from harvesting swamp robin: this is held in reserve for lean times. Most all animals were only hunted during certain times, and there are very specific indicators that frame these seasons; good example of this is the sturgeon, which is taboo to eat prior to Pikyávish, i.e. the World Renewal Ceremonies that occur primarily during the summer months. Ask them why they think these would be taboo (correct answers can be "because they are not good to eat and would disrespect the animal to kill it," or "because the animals may be in their mating season," or "because this was part of their management system."

[2] Pronounced, Ick-xah-RAY-yahv – the "x" is a "h" sound made at the very back of the throat.

Tell students that nowadays, Natives and non-Natives still hunt animals, and some may rely on these sources of meat for their subsistence. They refer to the age-old knowledge that was passed down to them from the ikxaréeyav to their ancestors, and what is called Traditional Ecological Knowledge or TEK. Ask students if they know what this means, and you may wish to include the well-known ecologist M. Kat Anderson's definition of TEK, which she says is a "rich knowledge of how nature works and how to judiciously harvest and steward its plants and animals without destroying them." She describes its development as "the product of keen observation, patience, experimentation, and long-term relationships with plants and animals…built on a history, gained through many generations of learning passed down by elders about practical as well as spiritual practices."[3]

Preparing to Read: Tell students that while the main goal of this workbook is to practice western scientific taxonomy, it is important that they recognize that sophisticated systems of classification have existed since prehistoric times. The Karuk identify at least a half dozen squirrel species native to the Mid-Klamath region, and even these species have further specific names, depending on the time of year (whether the animals are hibernating, for example), their age, use, and size. Western Science is another system of knowledge: today, they will learn some important information about how Western Scientists classify different animals. The text they are about to read talks about taxonomy, which is the way many scientists around the world identify exactly which species is in discussion.

Reading: Have students read the first paragraph of **Organizing Animals: The Taxonomy of Western Science** aloud, and then read the rest of the text silently and highlight terms that they do not understand. Tell them that they can ask questions at the end of the reading period, or raise their hands for explanations.

Comprehension Evaluation: Ask students to summarize the definitions of the following terms: Kingdom, Phylum, Class, Order, Family, Genus, and Species. Ask them what they decided to call the *Neotoma fuscipes.*

Student Activity: Tell students that now they will receive a booklet that features seven small animals native to the Mid-Klamath region. Some of the text on the scientific classification is left blank for students to research and fill out.

Assign students one animal, and allow them to consult the internet or library reference books on animals to discover the answers. You may wish to divide the class into working groups, but remind them that they will report back to the class on their findings. Pass out the stapled **keemishatunvêech - Small Wild Animals of Karuk Country** booklets and give the class one half-hour for research.

Research Reporting: After reconvening, have students report back on their findings regarding the scientific classification of their animals. Answers are as follows:

[3] Anderson, M. K. (2005). *Tending the Wild.* Berkeley and Los Angeles, CA: University of California Press

House Mouse's phylum is Chordata, and class is Mammalia;
Mole's phylum is Chordata, and order is Eulipotyphia;
Shrew's kingdom is Animalia, and genus is *Sorex*;
Vole's order is Rodentia, and genus is *Myodes*;
Woodrat's phylum is Chordata, and class is Mammalia;
Gray squirrel's class is Mammalia, and species is *S. griseus*;
Ground squirrel's class is Mammalia, and species is *O. beecheyi.*

Reading: Students take turns reading the animal descriptions aloud.

Evaluation: Teacher will recognize the success of the students' research by their answers to the missing information. Teacher will then call on students to name the animals' habitat and main features after each animal description to gage their overall comprehension of the text.

Vocabulary: Assign the **Organizing the Animals: Vocabulary Worksheet** for homework. Answers are as follows:

1. Burrow
2. Kingdom
3. Species
4. Subterranean
5. Phylum
6. Coniferous
7. Class
8. Cylindrical
9. Order
10. Genus
11. Family

References: Mensa for Kids website: http://www.mensaforkids.org/teach/lesson-plans/classifying-animals/ .

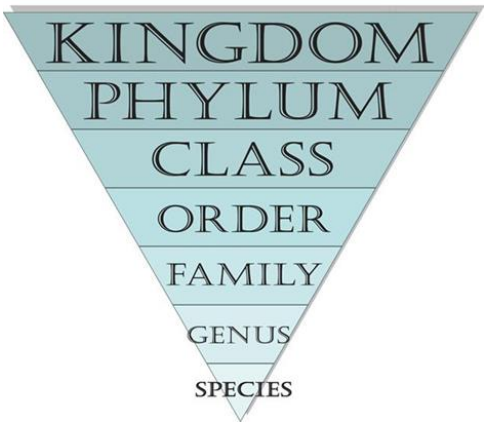
Driver, H.E. (1939). Cultural Element Distributions: X Northwest California. Anthropological Records 1:6. University of California Press, Berkeley, CA.

Hillman, L.G., Lake, F.K. (2016). Personal communications.

Organizing Animals: The Taxonomy of Western Science[4]

Back in the 18th century, a Swedish man named Carolus Linnaeus thought it was important to organize living things, and he developed a system to do just that. He started out interested in plants, but he ended up ordering all life as he knew it. Western Scientists still use the general format of his system today, but are constantly refining the system based on new knowledge.

Putting animals in order like this is called taxonomy. Taxonomists, or people who name animals, use a book called the International Code of Zoological Nomenclature, to look up rules for classifying animals. Linnaeus's system has seven levels: Kingdom, Phylum, Class, Order, Family, Genus and Species.



Every animal on the planet, down to the most microscopic creature you can imagine, can be classified according to this system. You can remember the order the system by following phrase: **K**eep **p**onds **c**lean **o**r **f**rogs **g**et **s**ick. The first letter of each word is the first letter of the level of classification.

These levels start out broadly — that means the top levels have the most animals, and they get narrower and narrower as you go down. So, by the time you get to the species, there is only one animal in the group. You can imagine these levels as an upside-down triangle.

Kingdom: Generally, western scientists agree there are six kingdoms. The animal kingdom (called Kingdom Animalia) is just one of those. In case you're interested, the others are Achaebacteria, Eubacteria, Protists, Fungi and Plants. Originally, Linnaeus only identified two kingdoms: plant and animal. Some scientists think that viruses should have their own kingdom, but currently they are not included under this system.

Phylum: Within the animal kingdom, the animals are divided into more than 30 phyla (which is the plural of "phylum"). You might be interested in Phylum Chordata — it's the one humans and all animals with backbones are in (do you see how "chordata" looks like the word "cord" — like spinal cord?)..

Class: The third level of classification is class. For example, Phylum Chordata has classes in it like birds, mammals (Mammalia) and reptiles.

[4] Adapted from the Classifying Animals lesson plan at the Mensa for Kids website: http://www.mensaforkids.org/teach/lesson-plans/classifying-animals/ retrieved on 3/7/2016.

Order: The next level, or rank, is order. Orders are smaller groups within the different classes. Lepidoptera is the order of moths and butterflies. Rodentia is the order within Mammalia that includes many species with small, sharp front teeth – but not all of them!

Family: The fifth rank of classification is family. When you get to this rank, people sometimes disagree about which family an animal belongs to, so you may find that different sources tell you different things. This can even happen with orders.

Genus: This rank looks like "genius," doesn't it? It's the second-to-last rank, and a genus may have only one or two animals in it. If animals are in the same genus, they are really closely related. In fact, you may not be able to tell them apart just by looking at them! When we write the name of the genus, we capitalize it and italicize it. For example, the genus of the Dusky-footed woodrat is *Neotoma*.

Species: If animals can breed together successfully, they are a species.

When an animal is called by its scientific name, then that means it is being identified by its genus and species. We use a lowercase letter and italics for the species, as is *fuscipes* for the woodrat. The scientific name of the Dusky-footed woodrat is thus *Neotoma fuscipes,* which is often written like this: *N. fuscipes*.

What would YOU call it? - I'd say "mean and ugly!

Photo by Daderot - Daderot, CC0, https://commons.wikimedia.org/w/index.php?curid=19912212

Name: _____

Organizing the Animals: Vocabulary Worksheet

Remembering that words sometimes have multiple meanings, choose the vocabulary word from the word bank that best fits the following sentences, which are based on this lesson's content:

kingdom	**phylum**	**class**
order		**family**
genus	**species**	**subterranean**
	cylindrical	
coniferous		**burrow**

1. The name for a hole or tunnel in which some small animals live is called a _____.

2. There are three main divisions into which natural objects are classified: the animal, mineral, and plant _____.

3. A group of animals that are similar and can produce young animals is called a _____.

4. When something is located or living under the surface of the ground, it is described as _____.

5. A large group of related animals, minerals, or plants is called a _____.

6. _____ is an adjective that describes a bush or tree that produces cones, such as pine cones.

7. The third level of western scientific classification is called the _____.

8. When something is shaped like a tube, with two straight sides and two circular ends, it is often described as _____.

9. An _____ is a group of related plants or animals that is larger than a family.

10. A group of related animals, minerals or plants that includes several or many different species is known as the _____.

11. The fifth rank of classification is called the _____.