



Name:

Date:

Oak Woodlands Energy Transfer

Practice: Set 1

Acorns are a traditional staple food and energy source for the Native people of Northern California. Oak trees take energy from the sun and convert that energy into nutritional organic compounds that other animals eat. Acorns are highly nutritious! Native peoples have used acorns to cook traditional foods for thousands of years. Humans do not consume raw acorns. In addition to cooked acorns, humans also consume other animals that eat acorns such as grasshoppers and quails.

1. Based on the information above, to which trophic level do acorns belong? How do you know?
2. Based on the information above, to which trophic level do humans belong? How do you know?
3. If **10%** of energy is transferred between trophic levels and **1 ounce (oz)** of acorns contains **1000 calories (kcal)** of energy, how many calories does a person obtain by eating **1oz** of acorns? **2ozs**? Illustrate your work using simple drawings.
4. How much **energy (in kcal)** is lost when a human eats **1oz** of acorns? List at least one way energy is lost between trophic levels. Illustrate your work using simple drawings.



Practice: Set 2

1. **1 pound (lb)** of grass contains **40,000 kcal**. If only **10% of kcals** are transferred from a lower trophic level to a higher trophic level, how many **kcals** does a deer receive from eating **1lb of grass**? Illustrate your work using simple drawings.
2. Based on your answer above, if the same deer needs **160,000 kcals per week**, how many **lbs** of grass does it eat per week?
3. There is a massive drought that knocks out half of the grass population! Only **1000lbs** of grass remain. For how long would **10** deer live off of 1000lbs of grass?

Practice: Set 3

1. If the deer weighs **150lbs** and its meat contains a total of **750,000 kcals**, how much energy (in kcals) does **each pound** of deer meat contain?
2. If a human requires **17,500 kcals per week**, how many **lbs** of deer would a human have to eat **per week** to get their required calories? (Remember the 10% Energy rule!)
3. If the average deer weighs **150lbs**, how many people could live off of one deer for one week? Round up or down to the nearest *whole* number.
4. How many **150-pound** deer would be needed to feed a group of **ten** people for **one month**?

Practice Reflection:

1. The energy transfer questions in Set 3 have humans consuming *only* deer meat in their diet. Do humans only eat one kind of food? How do you think the human diet should be designed instead?
2. The questions in Set 3 have humans eating all the deer meat available in the food web. Is this responsible? Why or why not?
3. If humans were to consume all the possible deer in their food web, what would happen to the deer population? What about the grass population?
4. Why is it important that humans only take what they need from their food web?