



ELA Common Core Content Standards:

Reading Standards Informational Text 4, 5, 7, 8
Reading Standards: Foundational Skills 1, 2, 3
Writing Standards 2, 3, 8
Speaking and Listening Standards 2, 4

Estimated duration: One 1.5 hour session, with optional time added for follow-up activity.

Goal: Students will learn about the dietary benefits of traditional Native diet and the detriments of a contemporary altered diet. They will learn the connection between physical health and the incorporation of Native foods into the diet.

Teacher Background: The prevalence of obesity and diet-related chronic disease is increasing in the United States, and the Native American population shows the most devastating rates of all ethnic groups. While the public's health is further threatened by rising antibiotic resistance; chemicals and pathogens contaminating our food, air, soil and water, the depletion of natural resources and climate change is negatively affecting the environmental health of our homelands. According to the American Public Health Association, "These threats have enormous human, social, and economic costs that are growing, cumulative, and unequally distributed. These issues are all related to food—what we eat and how it is produced."¹

In many parts of the United States, the industrial food system provides abundant, relatively inexpensive food. This is not the case in most areas that are highly populated by Native Americans. At the same time, much of the food that is commercially available is unhealthy, and the industrial food system is currently unsustainable. On the other hand, the traditional Native food system is replete with economically and environmentally sustainable healthy foods. Why, then, are Native peoples one of the poorest and most unhealthy ethnic populations in the country?

There are manifold reasons to explain the current situation: Our People's intimate and deep relationship to the landscape has been violently disrupted due to colonization and

¹ See <https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2014/07/29/12/34/toward-a-healthy-sustainable-food-system>, retrieved 7/19/2016.

globalization. Land appropriation, the ban on traditional land management practices – especially on cultural burning, and forced assimilation into Western culture has driven many Native people from their traditional homelands. Even those who remain have limited (or no) access to traditional foods and medicines. Additionally, the marginalization of Native cultures and the generations lost to the traditional forms of tribal education through the Indian Boarding School Era have led to what is widely known as intergenerational trauma. And finally, the current threats posed by increasing frequency and scale of wildfire, continued drought conditions and other symptoms of climate change, pest and disease infestation have highly and negatively impacted access to Native foods, fibers and medicinal plants.

For the Karuk and other Native Americans, hunting, fishing and gathering food activities not only contribute to the perpetuation of indigenous culture, but also are subsistence living measures with arguable economic benefits. While the Karuk people sometimes traded with other villages and tribes for specific foods, they worked with the environment to produce enough food to sustain themselves, the wildlife and health of the environment on which they depend. The many strenuous activities required to maintain food security also ensured the physical fitness of Native peoples, young and old, as attested by ethnographic and anthropological reports.

Theme/Big Ideas:	Personal well-being and the health of the Environment are intertwined
Big Questions:	How are the choices we make in the foods that we eat related to our physical wellness and the health of the environment?
Vocabulary:	natural resources, logistics, consumption, ecological footprint

Materials:

- Food Matrix Template** (included)
- Hunter/Gatherer Challenge** (included)
- Personal Ecological Footprint Questionnaire** (included)

Preparation: Review lesson background and discussion points. Print out copies of all materials for each student, whereby only one copy of the Hunter/Gather Challenge will needed per group. Acquire the following for the physical activity:

- stop watches or timers,
- measuring tapes or sticks,
- weights or equally heavy stacks of books
- chalk or erasable pens for marking

Discussion: Ask student to come up with a typical meal they might have for dinner. Write the food groups up on the board as column headings and the requirements for producing them as row headings (see example below and explain that “natural resources” refers to *things such as*

minerals, wood, coal, etc. that exist naturally in a place and can be used by people, and that “logistics” means *the commercial activity of transporting goods to customers*). Optional: hand out **Food Matrix Template** copies for an independent activity. Ask them where they think these foods are from and how they get from their original source to the table. For each food listed, have students brainstorm for the steps they think these foods are taken from source to table. Then ask them, what kind of physical activity do they, or their food provider, need to expend to get these foods (Answer may be: My mom drives to the store and back, boils the water for the noodles, microwaves the peas and heats the sauce on the stove). Then ask them what else is needed to get this food. Try to help them think of the cost factor: what are the financial needs for acquiring these foods. You may choose to add this step to the physical requirements needed to acquire these foods. (Example: Work to earn money needed to purchase foods).

Example Food Matrix:

Food	spaghetti	meat sauce	garden grown peas
Natural Resources needed to produce	-water -grain seeds -soil -energy for factory (lights, heating, electrical equipment) and for producing and packaging	-water -grain for feed -land -sewage -energy for stall (lights, electrical equipment) and for drying and packaging	-water -soil -peas to plant -land
Logistics	-ingredients to factory -truck to distribution center -truck to store -drive from store to home	-meat to factory -truck to distribution center -truck to store -drive from store to home	-planting peas from store to garden
Personal physical requirements	-walk to store and car	-walk to store and car	-gardening -harvesting -cooking
Personal financial requirements	\$\$ for food, car, and garbage disposal	\$\$\$ for food, car, and garbage disposal	\$ for water and peas for planting

If a Native food hasn't already been listed in your example dinner, ask them if they have ever gone to the forest or river to get food, and what kind of food they got. Ask them if they would be willing to tell the class what you learned about harvesting Native foods. Who taught them? What physical activities did you have to do to harvest the food?

Ask students what lessons they might learn when acquiring contemporary versus Native foods (Answers might be that they need to get a job to earn money to buy food, car and gas, or that

they might learn from others about which kinds of food and how to gather, hunt, and fish). Ask them which types of food require more physical activity if this hasn't already been discussed.

Preparing for Activity: Tell students that it is important for our bodies to stay active - not only to burn up the calories taken in by food, but to also maintain physical health. Many of the typical modern-day activities that young people do in their free time, such as playing video games and watching TV, require less physical exertion than in past times, e.g., hunting, gathering, and playing outdoors. Individuals have a responsibility for their own health, which includes personal care, like brushing teeth and washing hands before preparing foods.

Physical Activity: Hunter/Gatherer Challenge. Divide the class into four groups. Time and measure the students' hunting gathering movements. Have students chart their results and calculate the average for their team's results.

Discussion: Ask students if they can think of Native foods that might require the activities done in Session 1's Hunter/Gatherer Challenge in order to acquire them. Answers might be: Standing on One Leg – fishing or hunting from a difficult position; Jump – getting to resources across a creek; Balance on Toes – reaching high for berries or to dislodge nuts from trees; Carry Heavy Load – packing foods/firewood back home; Squat – harvesting Indian potatoes, roots or onions.

Then ask them if they know the term “ecological footprint.” Tell them that this term is a modern one, and some people use other terms to describe its general scope, such as “carbon footprint.” Have students brainstorm for all they can think of that contributes to a person's or a community's ecological footprint. Answers should include some or all of the following global phenomena:

- climate change,
- dwindling energy resources,
- impact of a person, company or community on the environment,
- amount of land, water, air and natural resources needed to produce the goods and services for a particular lifestyle, and
- the disposal of the wastes produced.

Activity: Tell students that the choices they make on what kinds of foods they eat not only affect their own health; they also affect the health of the environment. Pass out the **Personal Ecological Footprint Questionnaire** for students to fill out. You may need to explain that “mpg” means miles per gallon, and help them estimate what their family's vehicle might need for fuel. While this questionnaire may not be the best for their situation, it was developed by Eastern Connecticut State University to allow people to approximate their ecological footprint.

Math Activity: Have students tally up a grand total for their personal factor. Then, have students divide this by 300 to come up with an estimate for the number of earth's need to sustain the world's population if everyone lived as they do. Then have them divide this number

by 4.7 to come up with the number of productive acres needed to estimate the average ecological footprint for their needs. Again, this is a very rough estimate.

Follow-up Discussion: Begin discussion with the following information: Worldwide there are 4.7 biologically productive acres available per person, which doesn't include all of the other plants' and animals' needs. Some average footprints: United States: 24 acres; Canada: 22 acres; Italy: 9 acres; Pakistan: Less than 2 acres.

Ask them why they think there is such a discrepancy between the number of acres the citizens of each country uses for their personal ecological footprints (try to guide them to make the connection between the logistics involving in acquiring basic needs and energy consumption). Ask them if they think this is fair, and if not, what could be done to change this difference. Ask them if they think that the governments of countries should play a part in limiting the amount of energy people use to maintain their personal lifestyles. Ask them how their personal ecological footprint would change if they would be eating more native and locally produced foods.

Optional Activity: Have students make a list of the changes they could make in their daily lives that would reduce their ecological footprint. Then ask students to track the following over a two week period:

- water use
- food
- transportation
- energy use
- clothing
- stuff (see questionnaire for details)

After two weeks, have student retake the **Personal Ecological Footprint Questionnaire** and compare with their first data. You might choose to award appropriate prizes to "winners."

Name: _____

Food Matrix

Think of a typical dinner you might have at your home. For each of the foods that you would have, think of where these are from and how they get from their original source to the table. List each step next to the logistics row under each food. Then think of the physical activity you or your food provider (example: your grandma) need to do to get these foods (Answer for "spaghetti" may be: My grandma drives to the store and back, I boil the water for the noodles and microwave the peas, my step-dad heats the sauce on the stove, and my little brother sets the table). How much does it cost to get this food? If you choose, you can add that someone has to work or fish to get this food in the physical requirements row.

Food				
Logistics				
Physical requirements				
Financial requirements				

HUNTER/GATHERER CHALLENGE

Team up and time/measure each person's results for each activity. For the Carrying activity, you may consider using a set weight, such as a ten pound sack of potatoes/flour, and count the number of times a person can carry that weight around the basketball court. Compare averages to other teams to find who scores highest.

Team _____	Stand on One Leg (Time)	Jump (Distance)	Balance on Toes (Time)	Carry Heavy Load (Number)	Squat (Time)
List members below:					
1					
2					
3					
4					
5					
TOTAL and divide by number of team members for average.					



Personal Ecological Footprint Questionnaire

Complete each of the following categories for your typical day. Add the points in each category to obtain a subtotal, and transfer each subtotal to the summary chart. Use the grand total to calculate your ecological footprint.

Water Use

My Score

1. My shower (or bath) on a typical day is:

- No shower/bath (0)
- Short shower 3-4 times a week (25)
- Short shower once a day (50)
- Long shower once a day (70)
- More than one shower per day (90)

2. I flush the toilet:

- Every time I use it (40)
- Sometimes (20)

3. When I brush my teeth:

- I let the water run (40)

4. We use water-saving toilets(-20)

5. We use low-flow showerheads (-20)

Water Use Subtotal: _____

Food

My Score

1. On a typical day, I eat:

- Meat more than once per day (600)
- Meat once per day (400)
- Meat a couple times a week (300)
- Vegetarian (200)
- Vegan (150)

2. _____ of my food is grown locally or is organic:

- All (0)
- Some (30)
- None (60)

3. I compost my fruit/veg. scraps & peels:

- Yes (-20)
- No (60)

4. _____ of my food is processed:

- All (100)
- Some (30)
- None (0)

5. _____ of my food has packaging: _____
 All (100)
 Some (30)
 None (0)

6. On a typical day, I waste: _____
 None of my food (0)
 One-Fourth of my food (25)
 One-Third of my food (50)
 Half of my food (100)

Food Subtotal: _____

Transportation

My Score

1. On a typical day, I travel to work by: _____
 Foot or bike (0)
 Public transit (30)
 Private vehicle; carpool (100)
 Private vehicle; alone (200)

2. Our vehicle's fuel efficiency is: _____
 More than 30 mpg (-50)
 24-30 mpg (50)
 17-23 mpg (100)
 Less than 17 mpg (200)

3. The time I spend in vehicles on a typical day is: _____
 No time (0)
 Less than half an hour (40)
 Half an hour to 1 hour (100)
 More than 1 hour (200)

4. How big is the vehicle in which I travel on a typical day: _____
 No car (-20)
 Small (50)
 Medium (100)
 Large (SUV) (200)

5. Number of cars in our driveway: _____
 No car (-20)
 Less than 1 car per driver (0)
 1 car per driver (50)
 More than 1 car per driver (100)
 More than 2 cars per driver (200)

6. Number of flights I take per year: _____
 0 (0)
 1-2 (200)
 More than 2 (400)

Transportation Subtotal: _____

Shelter

My Score

1. My home is _____:

- Single house in a large town(50)
- Single house in a small town (0)
- Townhouse/attached house (0)
- Apartment/Condo (-50)

2. Divide number of rooms per person, no baths, by the number of people living at home: _____

- 1 room per person or less (-50)
- 1-2 rooms per person (0)
- 2-3 rooms per person (100)
- More than 3 rooms per person (200)

3. We own a second, or vacation home that is often empty: _____

- No (0)
- We own/use it with others (200)
- Yes (400)

Shelter Subtotal: _____

Energy Use

My Score

1. In cold months, our house temperature is: _____

- Under 15°C (59°F) (-20)
- 15 to 18°C (59 to 64°F) (50)
- 19 to 22°C (66 to 71°F) (100)
- 22°C (71°F) or more (150)

2. We dry clothes outdoors or on an indoor rack: _____

- Always (-50)
- Sometimes (20)
- Never (60)

3. We use an energy-efficient refrigerator: _____

- Yes (-50)
- No (50)

4. We have a second refrigerator/freezer: _____

- Yes (100)
- No (0)

5. We use 5 or more compact fluorescent or LED light bulbs: _____

- Yes (-50)
- No (100)

6. I turn off lights, computer, and television when they're not in use: _____

- Yes (0), No (50)

7. To cool off, I use: _____

- Air conditioning: car (50)
- Air conditioning: home (100)
- Electric fan (-10)
- Nothing (-50)

8. My clothes washer is: _____

- Top load (100)
- Front load (50)
- Laundromat (25)

Energy Use Subtotal: _____

Clothing

My Score

1. I change my outfit every day and put it in the laundry: (80) _____

2. I am wearing clothes that have been mended or fixed: (-20) _____

3. One-fourth of my clothes are handmade or secondhand: (-20) _____

4. Most of my clothes are purchased new each year: (200) _____

5. I give the local thrift stores clothes that I no longer wear: _____

- Yes (-50)
- No (100)

6. I never wear ___% of the clothes in my closet: _____

- Less than 25% (25)
- 50% (50)
- 75% (75)
- More than 75% (100)

7. I buy ___new pairs of shoes every year _____

- 0-1(0)
- 2 to 3 (20)
- 4 to 6 (60)
- 7 or more (90)

Clothing Subtotal: _____

Stuff

My Score

1. All my garbage from today could fit into a: _____

- Shoebox (20)
- Small garbage can (60)
- Kitchen garbage can (200)
- No garbage created today! (-50)

- 2. I recycle all my paper, cans, glass and plastic: (-100) _____
- 3. I reuse items rather than throw them out (-20) _____
- 4. I repair items rather than throw them out(-20) _____
- 5. I avoid disposable items as often as possible _____
 Yes (-50)
 No (60)
- 6. I use rechargeable batteries whenever I can (-30) _____
- 7. In my home we have__ number of electronics: (comp.,tv, stereo, vcr, dvd, xbox, gameboy, etc.) _____
 0-5 (25)
 5-10 (75)
 10-15 (100)
 More than 15 (200)
- 8. How many of your typical activities are dependent upon electronic devices: _____ **Stuff Subtotal:** _____
 None (0)
 Very little (20)
 Some (60)
 A lot (80)

Summary

Transfer your subtotals from each section and add them together to obtain the grand total.

Water Use _____
Food _____
Transportation _____
Shelter _____
Energy Use _____
Clothing _____
Stuff _____
Grand Total _____

Divide the grand total by 300. This gives an estimate of the total earths needed to sustain people of the world if everyone lived as you do.

Grand Total _____ ÷ 300 = _____ Earths

Multiplying the number of Earths needed by 4.7 gives the number of acres used to support my lifestyle. _____ acres.