

2.3

Grade Level

6-9

Subjects

Health
Science

Time Frame

Multiple Class
Periods

Teacher Materials

- Food Origins map
- Food Origins notetaker
- My Native Plate Packet
- Computers for each student

My Native Plate

In this lesson, students learn about their individual nutritional needs, and practice designing nutritious meals using Native foods. Students build awareness around where their food comes from and continue to consider the impact of their food choices.

Teacher Background

Building off of **lesson 2.2**, students continue to explore the diversity of foods within their diets. While **Section 1** of this curriculum explores the local food web and local Native food sources in Sonoma County, consuming a diet of only local Native foods is not necessarily realistic in the 21st Century. Returning to an entirely Native and localized diet requires massive shifts in the way the local economy and ecosystem are currently structured and handled, as many Indigenous foods are inaccessible or endangered due to Westernized land management and extractive industrial practices. Despite this, many Native communities actively work to protect, revitalize, and consume their traditional foods.

This lesson begins by introducing students to a map highlighting the origin of the world's top 151 crops. Interestingly, although California has hundreds of edible Indigenous plants and animals, it is the origin of only six of the world's most common crops. This is due to a variety of factors, such as the increased in large scale industrial farming, a decrease in traditional land stewardship methods, and an overall lack of visibility of the Native community.

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Showing students the origins of their foods illuminates a few things. The first is that it highlights just how many foods come from the Americas. Tomatoes, for example, come from Mexico, despite being a staple in Italian food. Secondly, it shows how much of the typical diet in the United States relies on imported food. Indigenous food in the United States is diverse enough to satisfy a range of dietary needs and desires, if only it is given the attention it deserves.

Once students examine the map of food origins, they move into a lesson that requires them to reflect on their own eating practices and consider ways to incorporate more Native/Indigenous foods into their diets.

Note: If you completed the **Section 1** exercises that examine ecosystem health, this is a great place to remind students of the role that we play in supporting the ecosystem and protecting food webs that provide healthy Indigenous foods.

To complete this lesson, students will need a basic understanding of **carbohydrates**, **fats**, and **proteins**, which are defined here as well as in the “Explain” section of the lesson:

- **Protein:** 4 calories per gram, used to build healthy muscles and fuels important processes in your body.
- **Carbohydrates:** 4 calories per gram, used as a quick and easily available energy. Carbohydrates include sugar molecules which are broken down in digestion and are stored as fat if they are not burned within a few hours after eating.
- **Fat:** 9 calories per gram, stored in your body and burnt for energy when carbohydrates are not readily available. Fat is also stored in your abdomen to help cushion and protect your organs.

In addition, students will be introduced to the **three major diseases** that occur due to unhealthy eating and exercise habits. These diseases are pervasive in Native communities that do not have access to affordable, healthy food options that align with cultural norms and values. These three health outcomes are repeated in future lessons that address food insecurity and access.

- **Type 2 Diabetes:** When a person eats too many sugary foods for a long time, their body can no longer digest the sugar. The sugar they eat then builds up in their blood. High levels of sugar in a person's blood can damage their kidneys, liver, and other important organs

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- **High Cholesterol:** When a person eats too many fatty foods, plaque can build up in their arteries and veins, stopping blood from getting where it needs to go.
- **Heart Disease:** There is an ideal size your body is meant to be, and it is normal to have a large body. When a person eats too many calories without exercising enough to burn off those calories their body can become larger than it is naturally meant to be, and their heart and other organs can become damaged. When the heart is damaged from having to work too hard to support a body that is larger than it is meant to be, there can be serious consequences.

By learning to design their own “**Native Plates**,” students learn the necessary elements of a nutritious diet, and begin to take control of their own relationships with food in a way that considers the needs of the ecosystem and traditional food ways for the Indigenous community at large.

It is important to note that, although the diseases listed above can be linked to food/eating habits, diet is only one of many factors that lead to disease. Within the Native community specifically, prolonged periods of historical trauma, poverty, and removal from Indigenous lands all work to contribute to negative health outcomes within the community.



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Vocabulary

- **Indigenous:** Produced, growing, living, or occurring Natively or naturally in a particular region or environment.
- **Nutrition:** Related to eating foods that provide the nutrients needed to live. Nutrients found in food and drink help provide energy to the body.
- **Immune System:** The system in the body that protects one from becoming ill or negatively impacted by foreign substances like viruses and bacteria, tissues, etc.
- **Indigenous Foods:** Locally grown food that is originally from the area and has been eaten by Native people for thousands of years. This food is grown with no chemicals or pesticides, food is grown in just the right amount.
- **Import:** Goods that are brought into one place from another place for the purpose of selling or trading.
- **Introduced Foods:** Foods that come from other countries or from outside the local ecosystem. Foods are sometimes healthy and sometimes damaging to health. Sometimes these plants can harm the local ecosystem.
- **Processed Foods:** Foods that have been altered or changed from their original form. They often have added flavors, or artificial substances added, and might taste much different than their original form.
- **Whole Foods:** Foods that have very little, or no processing/have not been changed from their original form. Foods do not have additives, or any artificial substances added.

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Engage

Provide students with the **Food Origins worksheet** and the **CIAT Food Origins map**.

Explain that this map only highlights the most popular plant crops in the world and excludes animal products and crops that are less popular or common.

Ask students to explore the map, noticing where their favorite foods come from, the number of imported foods they eat, and which food origins are surprising.

Ask students why they think North America has so few foods included on the map.

If students are unsure, ask how many of them knew much about Native foods before these lessons? Probably few. Like them, many people in the world are unfamiliar with foods Indigenous to the United States or California.

If you worked through **Section 1** with your students, ask them to remember how colonization changed the way people tended their natural landscapes. How did these changes impact Native/Indigenous foods?

Explain to students that although North America, and especially California, has a wide variety plants that are able to be consumed, and have been consumed by Native peoples since time immemorial, little attention is given to these foods. Instead, many people eat lots of introduced and imported foods without realizing that they are missing out on all the foods Indigenous to their local region.

Explore

Introduce the “**My Native Plate**” activity to students and pass out the packet. Explain that students will get to explore Native foods and practice incorporating them into their diets.

Explain that they will first take a survey that lays out their personal nutrition needs based on their weight, age, and other factors.

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They will then use the resources provided to build a healthy, nutritious meal for themselves using only Native or Indigenous Foods. Why Indigenous foods? Because they are usually less processed/whole, contain low amounts of added sugar, and low levels of cholesterol. They are also a major part of the local ecosystem and so it is important to have an awareness of them.

Direct students to **Step 1** of the **My Native Plate activity**.

Have students to go to the website provided and fill in the individualized nutrition information they receive into their **My Native Plate graphic**.

TEACHER NOTE: Provide students with the option of using information other than their own when completing the survey. Students may feel body conscious and unwilling to use their personal information. In addition, refrain from requiring students to share their My Plate work with the class, unless they volunteer.

Explain

Explain that diversity is critical to the resilience of ecosystems. The same can be said about a person's diet. We need to eat many different foods to obtain the energy, as well as vitamins, and nutrients needed to live long, healthy, and happy lives. There are three macronutrients that provide our body with energy (measured in calories) that can be found at different levels in different foods.

- **Protein:** 4 calories per gram, used to build healthy muscles and fuels important processes in your body.
- **Carbohydrates:** 4 calories per gram, used as a quick and easily available energy. Carbohydrates include sugar molecules which are broken down in digestion and are stored as fat if they are not burned within a few hours after eating.
- **Fat:** 9 calories per gram, stored in your body and burnt for energy when carbohydrates are not readily available. Fat is also stored in your abdomen to help cushion and protect your organs.

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We need specific amounts of these macronutrients to have enough energy and biological building blocks to keep our bodies active and healthy. Micronutrients like vitamins and minerals help our body stay healthy by assisting the body in everyday processes and supporting the immune system.

When a person does not consume a diverse diet (whether through choice, lack of access, or by not knowing what makes a diet diverse) poor health results.

Some poor health outcomes from not having a diverse and healthy diet include:

- **Type 2 Diabetes:** When a person eats too many sugary foods for a long time, their body can no longer digest the sugar. The sugar they eat then builds up in their blood. High levels of sugar in a person's blood can damage their kidneys, liver, and other important organs
- **High Cholesterol:** When a person eats too many fatty foods, plaque can build up in their arteries and veins, stopping blood from getting where it needs to go.
- **Heart Disease:** There is an ideal size your body is meant to be, and It is normal to have a large body. When a person eats too many calories without exercising enough to burn off those calories their body can become larger than it is naturally meant to be, and their heart and other organs can become damaged. When the heart is damaged from having to work too hard to support a body that is larger than it is meant to be, there can be serious consequences.

Eating a healthy diverse diet is easier said than done. Today we will be exploring what makes a diet diverse, how to practice healthy eating habits, and how to choose the best foods to nourish your body.

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Elaborate/ Extend

Have students put this information into practice through the **My Native Plate activity**. Students use the nutritional information they received through the **Choose My Plate website** to explore new, Indigenous, healthy food options.

Choose My Plate website:

<https://www.myplate.gov/myplate-plan>

Evaluate

Lead a class discussion exploring the following questions:

1. **What are some Native or Indigenous foods you are interested in trying?**
2. **When deciding what you will eat when hungry, what are some things you should consider?**
3. **Do you know where to obtain some of the Native ingredients you chose for your plate? What are some possible options?**



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Lesson Resources

Supporting resources for educators:

- **Tongvapeople.org:** This source provides information on some of the tools and methods used to prepare traditional foods. It is anthropological in nature, focusing only on historical perspectives, and leaves out contemporary people and traditions. <http://www.tongvapeople.org/wp-content/uploads/2016/05/Hearst-Museum-teaching-kit.pdf>

Sources:

- <https://www.fws.gov/program/endangered-species>
- <https://www.myplate.gov/myplate-plan>
- <https://www.ihs.gov/>
- <https://www.ousd.org/>
- Tending the Wild by Kat Anderson
- Food in California Indian Culture by Ira Jacknis



My Native Plate

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Learning Standards

CA Indian Essential Understandings

Essential Understanding 2: California Indian identity is individual and the range of Tribal identity from assimilated to traditional is unique to each individual.

Essential Understanding 4: California Indian peoples' histories and cultures have been and continue to be impacted by foreign, state, and federal policies.

Essential Understanding 5: Land and place are unique and inextricably tied to Tribal cultures.

CA Content Standard

California Health Standards

1.1.N Describe the short- and long-term impact of nutritional choices on health.

1.2.N Identify nutrients and their relationships to health.

1.5.N Differentiate between diets that are health-promoting and diets linked to disease.

1.10.N Identify the impact of nutrition on chronic disease.

4.1.N Demonstrate the ability to use effective skills to model healthy decision making and prevent overconsumption of foods and beverages.

5.1.N Use a decision-making process to evaluate daily food intake for nutritional requirements

7.1.N Make healthy food choices in a variety of settings.

Name: _____

Date: ____/____/____

Food Origins

Directions: The CIAT map shows the origins of the world's top 151 crops. Use the map to analyze the origins of the food you consume.

Note: Although North America only has six crops listed in the world's top 151 crops, it is home to many more Indigenous foods that are less popular on a global scale.

1. Identify at least one food that you enjoy eating from each of the continents represented: (Neither Australia nor Antarctica are represented)
 - a. North & Central America
 - b. South America
 - c. Europe
 - d. Africa
 - e. Asia
2. Name five foods whose origins surprise you.
 - a.
 - b.
 - c.
 - d.
 - e.
3. Based on your family's diet, which region of the world most influences your eating choices?

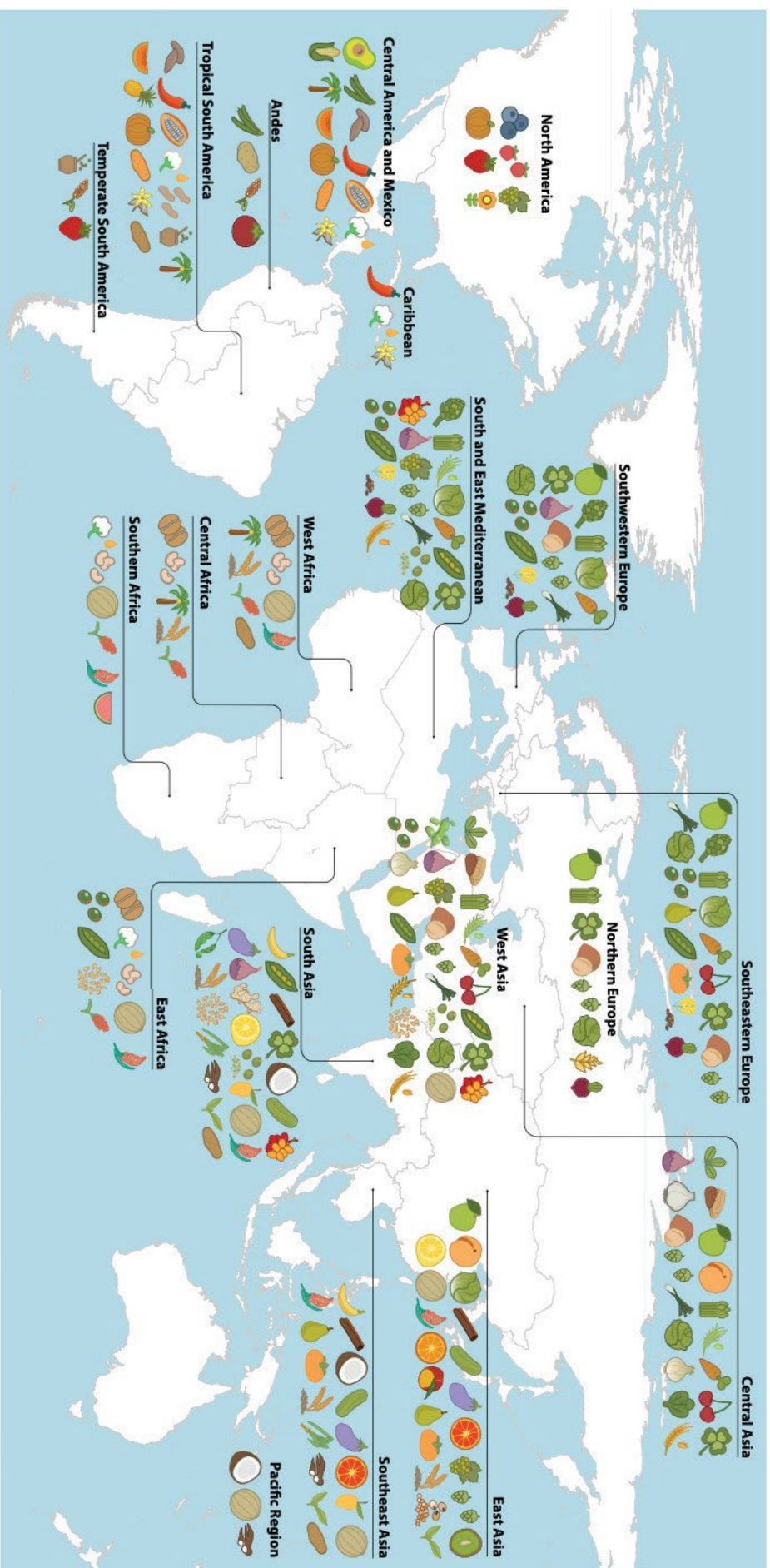
Today, you will practice incorporating more Indigenous foods into your diet.

ORIGINS AND PRIMARY REGIONS OF DIVERSITY OF AGRICULTURAL CROPS



Khoury CK, Achicanoy HA, Björkman AD, Navarro-Rachnes C, Guarino L, Flores-Palacios X, Engels MM, Wierssema JH, Dempewolf H, Soto S, Ramirez-Villegas J, Castañeda-Alvarez NP, Fowler C, Jarvis A, Riesberg LH, and Strulik PC (2016). Origins of food crops connect countries worldwide. *Proc. R. Soc. B* 283: 20160792. DOI: 10.1098/rspb.2016.0792.

International Center for Tropical Agriculture
Since 1967 Science to cultivate change



- | | | | | | | | | |
|---------------------|--------------------|----------------|------------|----------------|----------------------|---------------------|------------|----------------|
| Alfalfa | Beans | Clover | Eggplants | Hops | Melons | Pears | Rice | Sunflower |
| Almonds | Blueberries | Cocoa beans | Faba beans | Kiwi | Milllets | Peas | Rye | Sweet potatoes |
| Apples | Cabbages | Coconuts | Figs | Leeks | Oats | Pigeonpeas | Sesame | Taro |
| Apricots | Carrots | Coffee | Garlic | Lemons & limes | Olives | Plum | Sorghum | Tea |
| Artichokes | Cassava | Cottonseed oil | Ginger | Lentils | Onions | Potatoes | Soybean | Tomatoes |
| Asparagus | Cherries | Cowpeas | Grapefruit | Lettuce | Palm oil | Pumpkins | Spinach | Vanilla |
| Avocados | Chickpeas | Cranberries | Grapes | Maize | Papayas | Quinoa | Sugar beet | Watermelons |
| Bananas & plantains | Chillies & peppers | Cucumbers | Groundnut | Mangoes | Peaches & nectarines | Rape & mustard seed | Sugarcane | Wheat |
| Barley | Cinnamon | Dates | Hazelnuts | Mate | | | | Yams |

Name: _____

Date: ____/____/____

My Native Plate

Step 1:

Visit <https://www.myplate.gov/myplate-plan>

1. Click on **“Get Your MyPlate Plan”**
2. Fill in your Age, Sex, weight, height, and Physical Activity
 - Unfortunately, this tool does not allow for non-binary gender identities. If you do not identify as Male or Female, choose whichever option you feel most comfortable with reporting.
 - If you do not feel comfortable putting in your personal height/weight information, ask your teacher for alternative information to use.
3. Click the calorie amount the tool prints out
4. Click **“view as PDF”**
5. Download the PDF

Step 2:

Fill out the Native Plate Graphic by going through each of the food categories listed.

Name: _____

Date: ____/____/____

My Native Plate Graphic

Fruits
---- Cups per day

Grains & Starch
---- Ounces per day

Vegetables
---- Cups per day

Protein
---- Ounces per day

Water

9 inches

Name: _____

Date: ____/____/____

My Native Plate Fruits & Veggies!

Fruits and veggies are loaded with fiber. Fiber is important to keep your digestive system healthy. Fruits and veggies are also great sources of important vitamins that are used to keep your **eyesight** and **immune system** strong!

1. Using your **My Plate Plan PDF** fill in your recommended cups of fruit and vegetable you should be eating every day in the **My Native Plate graphic**.
2. The **My Native Plate graphic** shows 50% of the plate filled with fruits and vegetables.
3. How much of your plate is normally taken up by fruits and veggies?
4. On a scale from 1-10, how open are you to trying new fruits and veggies?

1	2	3	4	5	6	7	8	9	10	
Ew!										I'm open!

5. Draw your 2 favorite fruits and 2 favorite vegetables.

6. Using the **California Indigenous Foods List**, choose 2 Indigenous fruits and 2 Indigenous vegetables that you either enjoy eating already or would be interested in trying. Draw your choices in the space below.

Name: _____

Date: ____/____/____

My Native Plate Grains & Starch!

Whole grains are high in fiber, vitamins, and minerals. Fiber is important to keep your **digestive system** healthy and the carbohydrates in grains provide energy to our bodies. Nutritionists recommend that at least half of the grain choices we make should be whole grains.

The **ORIGINAL** form of all grains are **WHOLE** grains. In the un-processed, whole form, grains contain 3 parts:

- **Bran:** This is the outermost part of the grain. It protects the seed and is high in fiber and B vitamins.
- **Endosperm:** This is the middle of the grain. It provides nutrients to the grain as it grows and is high in carbohydrates and protein.
- **Germ:** This is the innermost part of the grain. It is the part of the grain that sprouts when it is planted. It is high in antioxidants, vitamins, and healthy fats.

Processing grains removes the **bran** and **germ** leaving only the **endosperm**.

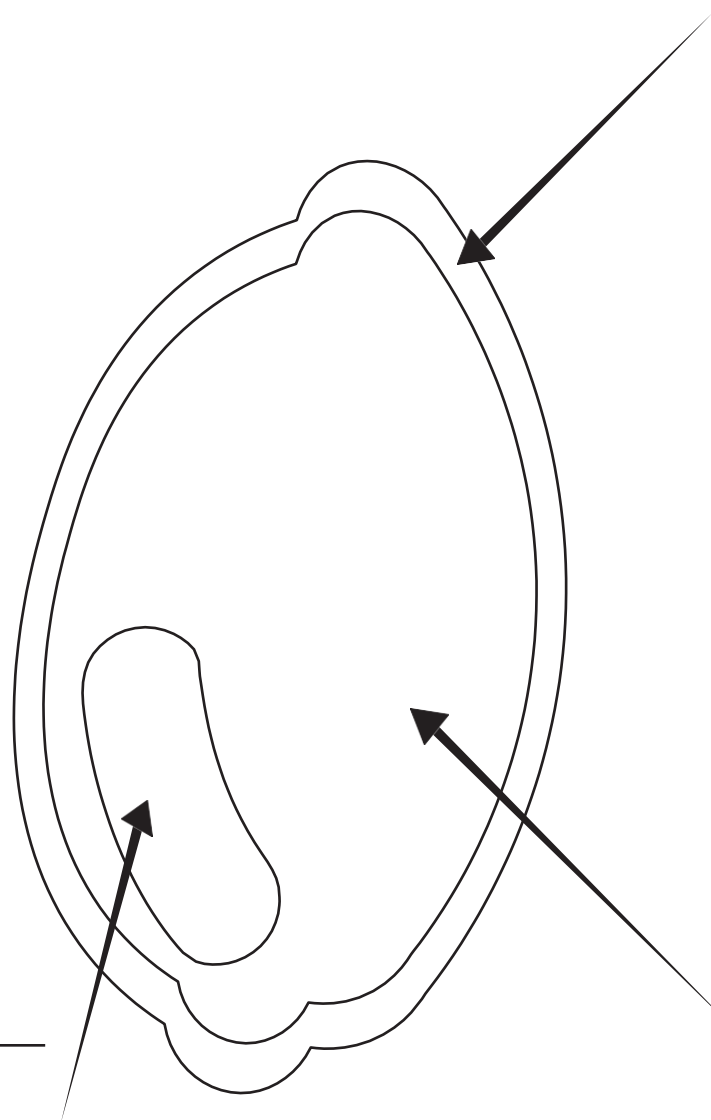
You can tell if a product you are eating is made with **whole grains** by checking the back of the package. In the ingredients section of the package label, whole grain will be listed at or near the top. Check the **California Indigenous Foods List** to see examples of whole grains.

1. Using your **My Plate Plan PDF** fill in your recommended ounces of grains you should be eating every day in the **My Native Plate graphic**.
2. Color in the following graphic and label the different parts of the whole grain. List the nutrients that each part is rich in.
3. Draw your 2 favorite sources of grains (i.e. bread, crackers, corn). Are either of them sources of whole grains.
4. Using the **California Indigenous Foods List**, choose 2 Indigenous sources of grains that you either enjoy eating already or would be interested in trying. Draw your choices in the space below.

Name: _____

Date: ____/____/____

The Whole Grain



What nutrients is this part of the whole grain high in?
.....
.....

What nutrients is this part of the whole grain high in?
.....
.....

What nutrients is this part of the whole grain high in?
.....
.....

Name: _____

Date: ____/____/____

My Native Plate Proteins!

Protein is used by the body for many processes and helps us build strong and healthy muscles. Protein doesn't only come from meat. Nuts, acorns, and seeds are all healthy plant-based sources of protein.

Many protein sources also provide important vitamins and minerals. Fish and other seafood are especially rich in healthy fatty acids that are needed to keep our brains healthy.

Although it is important to consume a diverse array of proteins, not all proteins are healthy options. Protein sources should be lean (meaning low in fat) and if your protein is coming from meat, that meat should be grilled or broiled not fried.

1. Using your **My Plate Plan PDF** fill in your recommended ounces of protein you should be eating every day in the **My Native Plate graphic**.
2. In the space below, list as many sources of protein as you can in **1 minute**.
3. Exchange lists with another student.
4. Circle the top three healthiest choices on your partner's list. (i.e. nuts, seeds, acorns, grilled or broiled meats)
5. Using the Indigenous **California Indigenous Foods List** put a star next to all Indigenous foods on your partner's list.

Name: _____

Date: ____/____/____

My Native Plate Exercise!

Being healthy requires more than having a diverse diet. You also need to stay physically active. When we eat, we obtain energy. That energy is used when we are physically active. If we don't use the energy we get from eating, it gets stored as fat to be burned later when we need it.

There is an ideal size your body is meant to be, and It is normal to have a large or small body. When a person eats too many calories without exercising enough to burn off those calories their body can become larger than it is naturally meant to be, and their heart and other organs can become damaged. This can lead to bad health outcomes like type 2 diabetes, high cholesterol, and heart disease.

1. On a separate sheet of paper write out as many forms of exercise as you can think of in **2 minutes**.
2. Find another student to partner with.
3. Together with your partner pick an exercise that is on both of your lists and you can do in the classroom (or space you are in) and practice that exercise for **1 minute**. (If you and your partner don't have an exercise that is on both of your lists try to pick one together.)
4. Share your favorite way to be active and why it's your favorite.
5. List at least 2 ways to be active with your friends and family.

Be Physically Active Your Way Every Day!

California Indigenous Foods

Below is an incomplete list of foods Indigenous to California. All Tribal communities have different traditions and norms regarding what they eat, how, and when. Just because one tribe consumes one food does not necessarily mean another tribe does.

Fruits and Vegetables:

tarweed
wild grapes
cacti
cherries
wild plums
wild strawberries
wild raspberries
wild blackberries
wild apricots
thimbleberries
sourberry
Manzanita
California fan palm
prickly pear cactus
elderberry
huckleberry
wild onion
agave
yucca
Dandelion
wild celery
clover
cattail
milkweed
Indian rhubarb
Watercress
water parsley
bracken fern

Proteins:

walnut (fat, protein)
hazelnut (fat, protein)
buckeye (fat, protein)
acorn (fat, protein)
pine nut (fat, protein)
deer
elk
antelope
mountain sheep
quail
grasshoppers
salmon
mussels
seaweeds
clams
scallops
trout
sturgeon
abalone

Grains and starches:

brome grass (carb, whole wheat)
oats (carb, whole wheat)
ricegrass (carb, whole wheat)
chia seeds
Buckwheat
Bear-grass
yampah