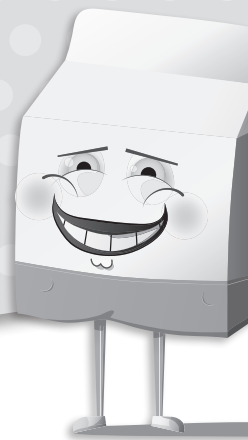


INCR-EDIBLES FRESH FROM THE FARM

TEACHER GUIDE GRADES 3-5



THE INCR-EDIBLES worksheets give an in-depth look at farming practices and nutrition facts for one food from each of the Five Food Groups. This workbook is part of the Dairy Farmers of Washington's **INCR-EDIBLES** series which also includes a poster and set of bookmarks highlighting 30 foods produced right here in Washington State.

INTRODUCTION TO WASHINGTON STATE AGRICULTURE:

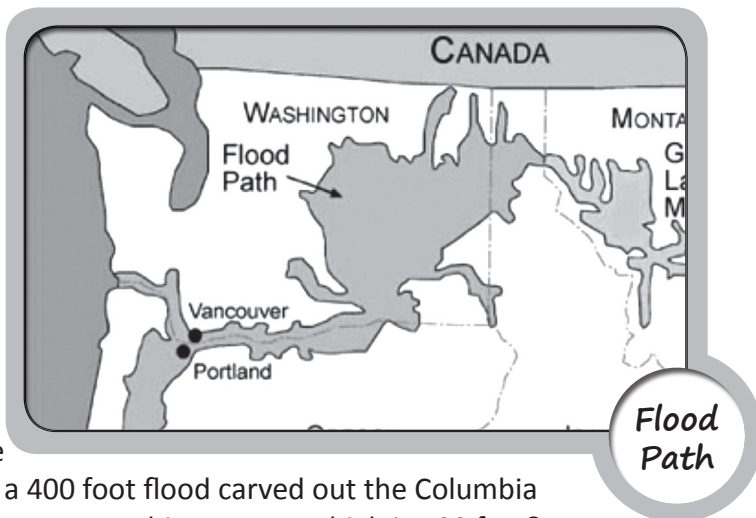
Rich soil, diverse climates and an abundance of natural resources makes Washington one of the most productive farming regions in the world. Agriculture is a corner stone of Washington State's economy with more than 300 different crops and products produced right here.

Washington farmers work hard to be good stewards of the land and environment to ensure long-term sustainability of their farms and communities. They want to make sure the land, water and air are protected and preserved for future generations.

Top ten food commodities produced/raised in Washington:

- | | |
|-------------|-------------------|
| 1. Apples | 6. Hay |
| 2. Milk | 7. Sweet Cherries |
| 3. Wheat | 8. Grapes |
| 4. Potatoes | 9. Pears |
| 5. Cattle | 10. Hops |

The positive economic impact of Washington's agriculture is felt in every region of the state, but what gives our state the edge in food production? The answer to this question started over 15,000 years ago in the ice age. In what is now Missoula, Montana there was a huge glacial lake formed by an ice dam. When the dam broke, a 400 foot flood carved out the Columbia Valley and created deposits of nutrient rich soil all over Eastern Washington. How high is 400 feet? Seattle's Space Needle is 604 feet tall, so the Missoula floods would have been nearly three quarters of the way to the top of the Space Needle. Archeologists believe this flooding happened many times over thousands of years!



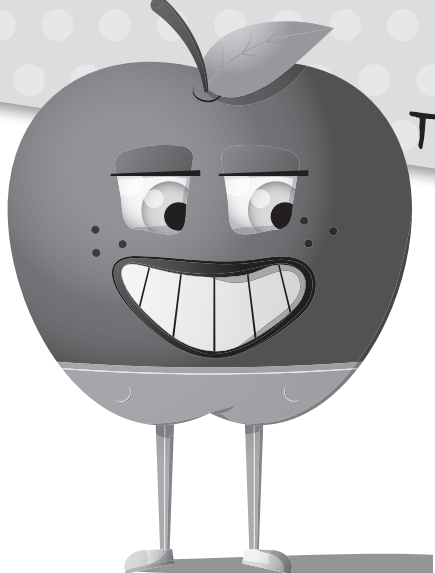
SUPPORTING COMMON CORE STANDARDS IN ENGLISH LANGUAGE ARTS

Reading Standards: Informational Text Grades 3-5

- Key Ideas and Details
- Craft and Structure
- Integration of Knowledge and Ideas
- Range of Reading and Level of Text Complexity

Reading Standards: Foundational Skills Grades 3-5

- Phonics and Word Recognition
- Fluency



TEACHER GUIDE AND BACKGROUND INFORMATION

INCR-EDIBLES
FRESH FROM THE
FARM

APPLES

FRESH FROM THE FARM

IT STARTS WITH LAND, SEEDS AND WATER

Washington growers tend over 175,000 acres of apple orchards statewide at elevations of 500 to 3,000 feet above sea level. The orchards are irrigated with water from the many rivers and streams that flow from the Cascade Mountains. Most apple growing areas are located on the banks of major rivers like the Yakima, Columbia and Snake.

Apples first came to Washington with early American settlers in the early 1800's. By 1826 they had discovered that the rich soil, sunshine and climate were perfect for growing apples. Now most commercial apple orchards average 50 acres but some cover as many as 3,000 acres.

1. PRUNING

Branches on an apple tree are removed to make sure the tree can handle the crop load and the fruit gets plenty of light. Pruning is done during the winter when the tree is dormant to prepare for the next growing season.

2. BLOSSOMS

Apple trees bloom in the spring. Buds on the tree turn into leaves and flowers. The flowers are pollinated by bees and will grow into apples. If it gets too cold in the spring months blossoms and fruit buds can die. Growers sometimes have to protect their orchards from cold spring weather. Huge fans mounted on towers are used to create an inversion, raising the orchards temperature.

3. THINNING

When apples have grown to the size of golf balls, orchard workers hand-pick the small misshapen fruit and only the best apples are left to mature. Apples need sun, water and nutrients to continue growing.

4. HARVEST

Apple harvest is August through November. Apples are picked by hand and placed in bags slung on workers' shoulders because the fruit bruises easily. The picked fruit is then carefully placed in large wooden or plastic bins and shipped to a cold warehouse for storage. This keeps the apples fresh and crunchy.

5. PACKING AND TRANSPORTATION

Bins full of apples are hauled to a warehouse. The apples are sorted by color, size and quality before they are shipped. Horticulturists carefully monitor the refrigerated rooms to make sure the apples stay cold and crunchy. Packed apples are then transported to your grocery store, school and around the world using cold trucks, railcars and ships.

6. ENJOY

Keep apples in your refrigerator at home to enjoy. An apple is an excellent choice for any meal or as a tasty snack because it provides fiber to keep you feeling full.



VOCABULARY WORDS:

Pollination: is the process by which plant pollen is transferred from one apple tree to another, leading to fertilization and the beginning of a new seed.

Fiber: is found in plant foods and our bodies can't digest it. It pushes through our digestive system, absorbing water along the way to help our bodies remove waste.

Nutrients: are substances that provide nourishment essential for growth and the maintenance of life.

GOING FURTHER

Here is a fun and delicious activity! Go to the grocery store and get two of each variety of apple listed below. When you are ready to start the activity, take one apple of each variety, wash and slice it into small enough pieces to give each student a taste. Put the slices on six plates labeled for each variety.

Break the class into six groups, one for each variety of apple. Provide each group with a whole apple as an example of the variety for their group. Have each student write the variety of apple as the heading on a piece of paper. Have the students then write down the five senses (sight, sound, taste, touch, smell), leaving room for a description under each sense.

Using descriptive language, ask the students to describe the look and feel of the apple.

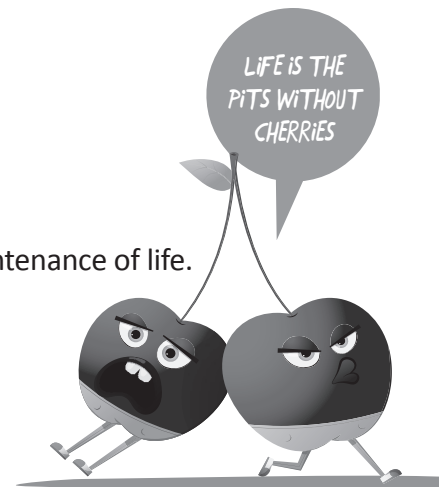
Ask the class to wash their hands. Hand each student a napkin and a small slice of the kind of apple their group has been assigned. Ask the class to now finish their five senses descriptions for smell, taste and sound (does the apple crunch?)

Finally, allow the class to try the other types of apples. Lead a discussion about what the students observed for each of the five senses.

You will need:

2 Golden Delicious
2 Granny Smith
2 Pink Lady
2 Fuji
2 Gala
2 Red Delicious
1 knife for slicing the apples
1 cutting board
Napkins, one for each student
6 plates or containers for apple slices
Paper and pencil for each student

NOTE: Copy the worksheet in color because it is difficult to complete the "How Many Apples Can You Identify," activity in black and white.



APPLES FRESH FROM THE FARM

1. Pruning
2. Blossoms
3. Thinning
4. Harvest
5. Packing
6. Enjoy

APPLES IN ORDER FROM RIGHT TO LEFT

Granny Smith
Fuji
Golden Delicious
Red Delicious
Gala
Pink Lady

WORDS TO LEARN

3. NUTRIENTS: are substances that provide nourishment essential for growth and the maintenance of life.

2. FIBER: is found in plant foods and our bodies can't digest it. It pushes through our digestive system, absorbing water along the way to help our bodies remove waste.

1. POLLINATION: is the process by which plant pollen is transferred from one apple tree to another leading to fertilization and the beginning of a new seed.



INCR-EDIBLES
FRESH FROM THE
FARM

TEACHER GUIDE AND BACKGROUND INFORMATION

CARROTS

FRESH FROM THE FARM



IT STARTS WITH LAND, SEEDS AND WATER

Carrots came to North America with early voyagers long before the arrival of the Mayflower. Carrots are mentioned in early colonist records as a staple food grown in many gardens. Favorite recipes for carrots in the early days of our nation included carrot jam, stew and even carrot pie. We also know that one of the United States' founding fathers, Thomas Jefferson, kept a garden book where he described the different varieties of carrots he was growing in his garden as early as 1774.

Today Washington State grows about 10,000 acres of carrots every year and ranks second out of 50 states, right behind California, in carrot production.

1. PLANTING

The part of the carrot we eat is the root that grows underground. Carrots are planted as seeds in early spring. The tiny seeds are planted in rows just below the surface. Carrots are biennial meaning it takes two years from the time a carrot seed is planted to complete their lifecycle and produce seeds. Unpicked carrots will send up a tall stem in the second year of life, which produces flowers and eventually seeds.

2. IRRIGATION

Carrots grow best in fine soil with good water-holding ability. A regular water supply is needed for good color and growth. Carrots are watered using sprinklers and need about 1 inch of water per week.

3. GROWING

The soil is tested to make sure it is uniform and has the nutrients the carrot needs to grow. As the carrot matures, carotene collects causing the root to change from white to yellow and then to orange.

4. HARVESTING

Carrots are ready when they reach the right size. This usually takes less than 3 months. Carrots are harvested using a machine that digs them up or pulls them out by their tops. The tops are cut off right away because carrots can keep growing.

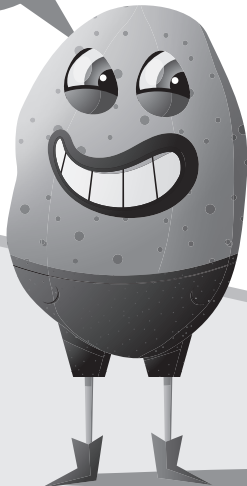
5. PACKING AND TRANSPORTATION

Carrots are washed and inspected when they arrive at the cold storage warehouse. Any damaged or diseased carrots are removed. Carrots are then packed and transported in cold trucks and railcars to grocery stores or processing plants.

6. ENJOY

Carrots are a sweet snack having more natural sugar than all other vegetables. Carrots are a good source of vitamins A, C, K, and fiber.

PO-TAY-TO
PO-TAH-TO



VOCABULARY WORDS:

Carotene: is found in carrots and protects plant cells from being damaged. The human body converts carotene into vitamin A.

Slicers: is another name for the Emperor carrot. These carrots have a long skinny root and are usually sold whole at the store.

Dicers: is another name for the Chantenay carrot. These carrots are short and thick making them popular for processing into frozen meals or soups.

Irrigation: the application of water to land to assist in the production of crops.

GOING FURTHER

Food Detective: Fruit or Vegetable

According to scientists who study plants, a fruit is defined as the part of the plant that develops from a flower. It's also the part of the plant that contains the seeds. All other parts of the plant are considered vegetables. These include the stems, leaves, roots and even the flower bud. Use this *Going Further* lesson to discover which foods are fruits or vegetables and why.

You will need: 1 head of broccoli (the part we eat is the flower bud)
1 carrot 1 potato 1 pear
1 onion 1 grape 1 plum
1 asparagus 1 apple 1 avocado

Procedure:

Take each of the foods listed above and cut them in half. Let students examine the foods to determine if each food is a fruit or a vegetable using the information above. On the board write out the following table or have each student draw their own table.

Encourage the class to explore each of the foods and think about the questions in the table below. Remember to provide the students with the scientific or botanical definitions for fruits and vegetables to help them unlock the mystery behind the 10 foods under examination.

Fruits are the part of the plant that develop from a flower and contain the seeds.

Vegetables are the stem, leaf, root or flower bud of a plant.

	Apple	Asparagus	Avocado	Broccoli	Carrot	Grape	Onion	Pear	Plum	Potato
Is this food the stem of a plant?										
Does this food contain seeds?										
Is this food the root of a plant?										
Does this food grow from a flower?										
Is this food the flower bud of the plant?										

Lead a class discussion on fruit and vegetable identification by answering the questions above. Your food detectives will unlock the scientific mystery behind the foods they eat by identifying the fruits and vegetables.

ANSWERS to CARROTS Activity Sheet

CARROTS FRESH FROM THE FARM

1. Planting
2. Irrigation
3. Growing
4. Harvesting
5. Packing
6. Enjoy

WORDS TO LEARN

1. CAROTENE: is found in carrots and protects plant cells from being damaged. The human body converts it into vitamin A.

3. DICERS: is another name for the Chantenay carrot. These carrots are short and thick making them popular for processing into frozen meals or soups.

2. SLICERS: is another name for the Emperor carrot. These carrots have a long skinny root and are usually sold whole at the store. Perfect for slicing at home.

FIND THE CARROT:

On the bottom left the dicers are pictured.

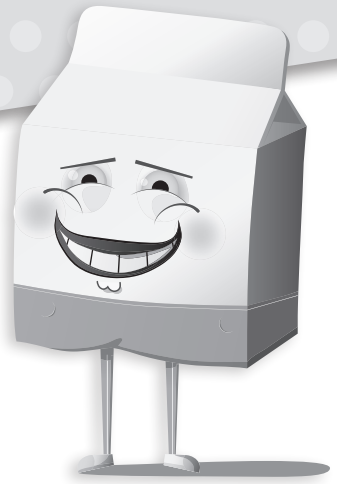
CROSS WORD

ACROSS: **DOWN:**

2. Carotene
2. Damaged
3. Sugar
4. Root
5. Cold
7. Fiber
6. Top
8. Rows

MILK

FRESH FROM THE FARM



IT STARTS WITH LAND, CROPS AND WATER

Dairy farmers are stewards of the land. Delicious dairy products begin at the farm where farmers protect the well-being of the animals, land and water. Crops use the valuable organic nutrients found in cows' manure when the farmer uses it as fertilizer. This allows farmers to use less water and keep the soil healthy.

Dairy farmers depend on water for their cows. Like people, it's important for cows to stay hydrated. The water used on the farm is recycled several times a day, from cooling the milk before it goes into the bulk tank, to washing the barn, to irrigating crops.

MILK PRODUCTION

1. HEALTHY COWS

Cows are the most important part of a dairy farm. Dairy farmers are sure to provide the right amount of nutritious food, plenty of fresh, clean water and comfortable bedding so cows can lead relaxing, comfortable lives.

Dairy farmers work with a nutritionist who monitors what cows eat. Many cows have individualized diets. They also work with veterinarians who give cows regular check-ups. Healthy comfortable cows produce nutritious, high-quality milk.

2. MILKING

Cows are milked at least twice a day by machines. From cow to you, milk is never touched by human hands and never exposed to the air. Milk is pumped directly from the cow into a large storage tank on the farm and quickly cooled to keep it fresh.

On-farm quality testing for bacteria is performed to make sure the milk is 100% pure and safe.

3. TRANSPORTATION

Cold milk from the storage tanks is pumped into tanker trucks every one to two days for transportation to the processing plant.

4. SAFETY TESTING

Milk and dairy products go through numerous quality checks along the way from the farm to you, making them one of the most highly-regulated and safest foods available.

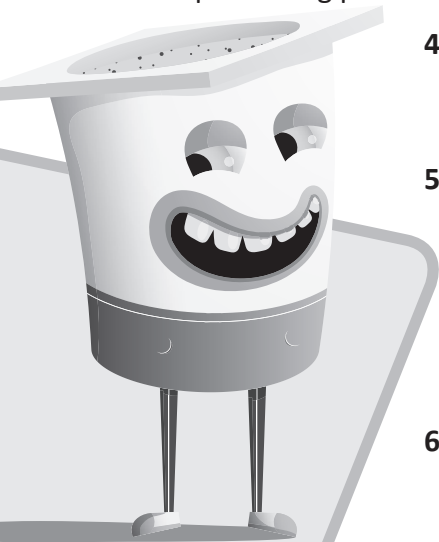
5. PROCESSING

Not a drop of milk enters the plant before undergoing another round of stringent testing to ensure quality and safety. The milk is then pasteurized by heating it to kill any pathogens and ensure the milk is healthy and fresh.

Packaged milk, cheese, yogurt and other dairy products are then loaded onto refrigerated trucks for delivery.

6. ENJOY

Milk delivered to schools and grocery stores was on the farm just two days before reaching its final destination. This makes milk a fresh, local and healthy product for all to enjoy.



VOCABULARY WORDS:

Pasteurize: to heat milk to 160°F or above for 15 seconds to destroy bacteria and keep milk safe and wholesome.

Bacteria: They are everywhere. Some are good for you but others can be harmful. Like many other foods, milk is always tested to make sure it is completely safe before it goes to the grocery store.

Nutrients: Your body needs nutrients to perform at its best. Milk is a power house providing 9 essential nutrients: calcium, potassium, magnesium, vitamin D, vitamin A, protein, riboflavin, vitamin B12, and niacin.

Calcium: a mineral the body needs. Calcium is a nutrient essential for healthy bones and is also important for muscle contraction, heart action, and normal blood clotting.

GOING FURTHER

Go to www.wadairy.org and participate in the dairy farm to school program. It is called The Dairy Story: From Moo to You. Check out the video on Washington dairy farming to learn more about the families, their cows and the milk produced locally. You will discover additional nutrition education resources to reinforce the importance of including dairy products and other healthy foods in your diet.

ANSWERS
to MILK Activity Sheet

MILK'S JOURNEY

1. Healthy Cows
2. Milking
3. Transportation
4. Safety Testing
5. Processing
6. ENJOY!

DAIRY FOODS WORD SEARCH

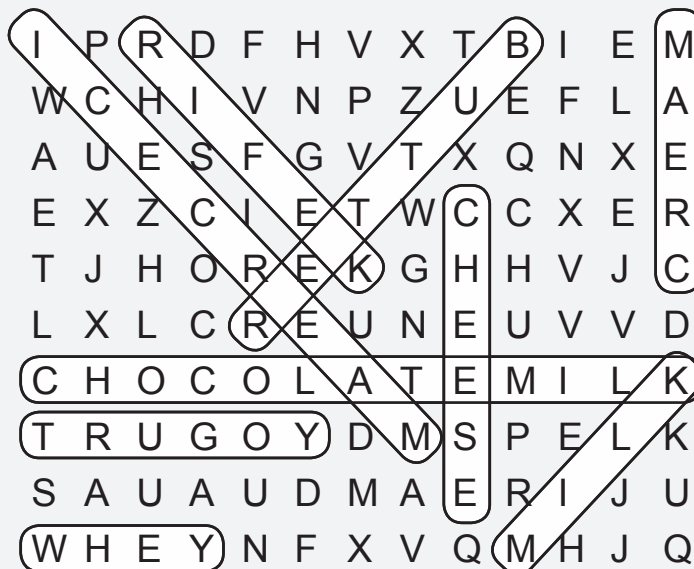
Milk
Chocolate milk
Ice cream
Cheese
Kefir
Cream
Butter
Whey
Yogurt

WORDS TO LEARN

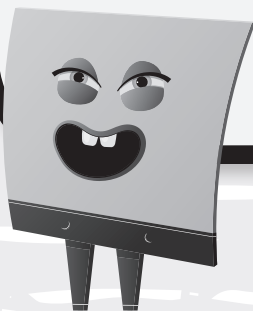
2. BACTERIA: are everywhere. Some are good for you but others can be harmful. Like many other foods, milk is always tested to make sure it is completely safe before it goes to the grocery store.

1. PASTEURIZE: means to heat milk to 160°F or above for 15 seconds to destroy bacteria and keep milk safe and wholesome.

3. NUTRIENTS: Your body needs nutrients to perform at its best. Milk provides calcium, potassium, magnesium, vitamin D, vitamin A, protein, riboflavin, vitamin B12 and niacin.



SHOW ME THE
CHEDDAR!



INCR-EDIBLES
FRESH FROM THE
FARM

TEACHER GUIDE AND BACKGROUND INFORMATION

SALMON

FRESH FROM THE FARM



THE HISTORY OF SALMON

The area now known as Kettle Falls was considered by the native Salish people to be one of the most important salmon fishing areas in the Pacific Northwest. The falls are located about 40 miles south of the Canadian border on the Columbia River. Before 1941, when Grand Coulee Dam was erected, it was said that the salmon were so thick during their spawning runs that you could not throw a stick in the water without hitting a fish. After the dam was finished, the salmon run ended. More salmon are still caught in the Columbia River and its tributaries than any other region in the state.

Salmon play an important role in the legends of the Duwamish, Muckleshoot, Snoqualmie and other tribes of the Puget Sound region. In many of these stories, salmon of the area are represented as individual people. The salmon were essential to the health of the villages around Puget Sound. Their prevalence in everyday life is conveyed by numerous mentions of salmon in their stories.

Today Washington retains a vibrant salmon fishing industry. Commercial salmon fishing accounts for a significant portion of the state's economy. Washington also has a rich sport-fishing tradition.

1. EGGS TO ALEVIN

Salmon lay their eggs in the gravel of stream beds for insulation from the cold water and protection from predators. When an egg hatches the baby salmon is called an alevin. The alevin stays buried in the gravel living off the food in its yolk sac.

2. FRY

The alevin becomes a fry when the yolk sac has been used up. The small fry are not strong enough to spend time in the main current. You can find them in backwater pools and at the edge of the stream where there are places to hide and grow into a smolt.

3. SMOLT

As the smolt begins its journey downstream toward the ocean it goes through changes. The smolt loses its dark spots and its gills change so it can breathe in saltwater. Smolt may spend many months growing in an estuary. An estuary is the part of the river where it meets the ocean.

4. FISHING

Adult salmon live in the ocean where there is more food and the fish can grow quickly. Commercial fishermen catch adult salmon using nets. About 10% of the salmon caught in Washington is wild while the rest have been raised in hatcheries.

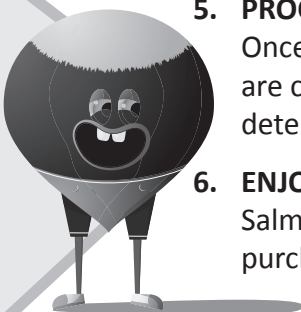
5. PROCESSING

Once caught, salmon are transported to a processing plant. At the plant the fish are cleaned, inspected, processed and graded. The grade of the salmon will help determine if it will be canned, packaged or sent fresh to your local grocery store.

6. ENJOY

Salmon is a healthy, local source of lean protein whether it is in a can, frozen or purchased fresh.

HAZEL, ARE
YOU NUTS?



VOCABULARY WORDS:

Commercial: fish sold in the marketplace.

Grade: is the system used to mark the quality of the meat by looking at the handling, order, eyes, gills, skin and belly.

Protein: is found in all cells and is an essential part of our diets for building muscle, skin, hair and cartilage.

GOING FURTHER

Salmon Lifecycle Mobile

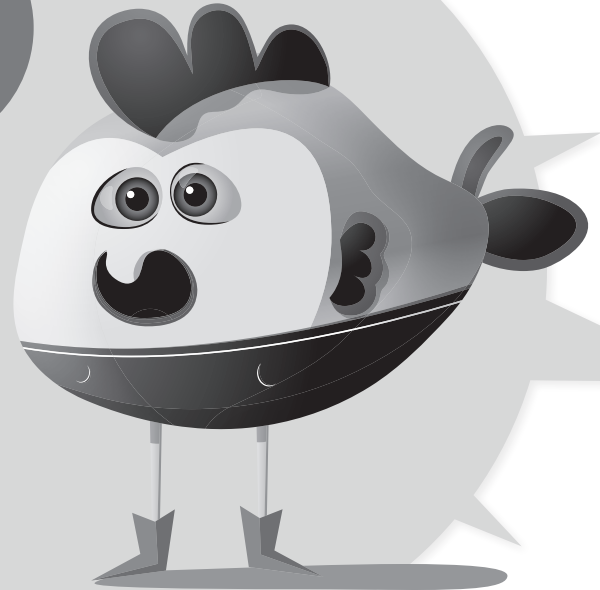
You will need:

A clothes hanger for each student
Butcher paper
Paint or colored pencils
String or light weight wire
Staples
Glue

Procedure:

Have the students create a picture or model of each of the six stages of the lifecycle.
A mobile can then be constructed using the pictures or models.

SALMON SWIM
UPSTREAM



EGG -
CELLENT



SALMON FRESH FROM THE FARM

1. Eggs to Alevin
2. Fry
3. Smolt
4. Fishing
5. Processing
6. Enjoy

ARE THESE SALMON WILD OR NOT?

1. Wild
2. Hatchery

ANSWERS
to SALMON Activity Sheet

WORDS TO LEARN

3. COMMERCIAL: fish sold in the marketplace.

2. GRADE: is the system used to mark the quality of the meat by looking at the handling, odor, eyes, gills, skin and belly.

1. PROTEIN: is found in all cells and is an essential part of our diets for building muscle, skin, hair and cartilage.



TEACHER GUIDE AND BACKGROUND INFORMATION

INCR-EDIBLES
FRESH FROM THE
FARM

WHEAT

FRESH FROM THE FARM

IT STARTS WITH LAND, SEEDS AND WATER

Wheat was brought to North America during the colonial period in the early 1600's and gradually spread across the United States as farmers moved west. Wheat production changed in 1941 at the National Nutrition Conference for Defense when recommendations were made for enrichment of wheat flour with vitamins, folic acid and iron. Enrichment led to the reduction of nutrient deficient diseases like beriberi, pellagra, neural tube defects and iron deficiency anemia.

Today over 2.25 million acres of wheat is harvested in Washington State. There are six commonly farmed varieties. Washington is best known for high quality, soft white wheat and club wheat production.

1. PLANTING

Before planting the seeds, wheat farmers test the soil to make sure all the nutrients are there for a healthy crop. Seeds are planted 2-3 inches below the surface and should be evenly spaced throughout the field. Wheat is usually planted in the spring and fall.

2. IRRIGATION

Compared to other crops, wheat needs little water to grow, but this depends on the type of wheat, climate and rainfall. Most wheat needs between 18 and 21 inches of water from seed to harvest.

3. GROWING

Most of the wheat grown in the Northwest is found on the east side of the Cascade Mountains. About 80% of this crop is soft white wheat which is made into flour and used to make cookies, crackers and cakes.

4. HARVESTING

When the wheat kernel is hardened, it is ready for harvest. Wheat is always harvested in the summer months using a machine called a combine. The farmer will adjust the combine to get the largest amount of wheat kernels.

5. MILLING

At the mill wheat kernels are cleaned and inspected. The outer bran layer is left on the kernel to make whole grain products or removed by soaking the kernel in water to make refined flour. The wheat is then run through the mill, where it is broken into tiny pieces and sifted into different types of flour.

6. ENJOY

Wheat is used in all types of grain products and provides about 20% of the world's overall calorie intake. Whole wheat has more protein, fiber and B vitamins, so try to eat more whole wheat foods than those made from refined flour.

BARLEY
HERE



VOCABULARY WORDS:

B vitamins: are a class of vitamins that play important roles in the breakdown of substances to make energy.

Climate: is the usual weather pattern and conditions in a place or region.

Whole grain: products are made from 100% of the original kernel – all of the bran, germ and endosperm – must be present.

GOING FURTHER

What is a whole grain?

You will need:

The packaging from 5 different grain products with a variety of health claims.

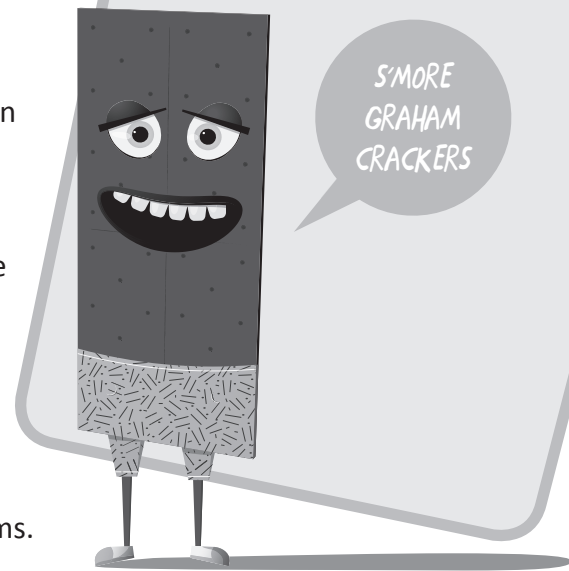
Procedure:

1. Check the Ingredient List.
The first or second ingredient on the list should have the word “whole” or “whole grain” before the type of grain, for example, whole wheat flour; whole oats; whole grain rye.
2. Check the front of the package.
The front of a package may say, “multi-grain”, “7-grain”, “100% wheat”, “bran”, or “cracked wheat”, but may not contain any or only small amount of whole grains. These products may have “unbleached enriched wheat flour” as the first (main) ingredient, which is the same as refined flour.
3. The color of the product and the fiber content can be a hint, but the ingredient list is the best place to look for accurate information.

Tip: The Whole Grain Council stamp can be found on many whole grain products, but not all. This is a good clue that the product you have selected is indeed made with whole grains. Select five different wheat products and bring them into the classroom for students to study the nutrition label, ingredient list and the product itself.

Ask students to answer the following questions about each of the products.

1. Is it a whole grain food?
2. How many grams of fiber can be found in one serving?
3. Can you tell by looking at the color if it is a whole grain or not?
4. Does the packaging make any whole grain marketing claims?
Example: 7 grain
5. Does the packaging have the Whole Grain Council stamp?



WHEAT FRESH FROM THE FARM

1. Planting
2. Growing
3. Irrigation
4. Harvesting
5. Milling
6. Enjoy

HOW HEAVY IS A BUSHEL?

How many pounds of wheat do you have? **120 pounds**

How many pounds of flour will you have? **84 pounds**

How many loaves of whole wheat bread can you make? **180 loaves**

WORDS TO LEARN

2. CLIMATE: is the usual weather pattern and conditions in a place or region.

1. B VITAMINS: are a class of vitamins that play important roles in the breakdown of substances to make energy.

3. WHOLE GRAIN: products are made from 100% of the original kernel – all of the bran, germ and endosperm – must be present.

INCR-EDIBLES FRESH FROM THE FARM

5 FOOD GROUP WORD SEARCH

ANSWERS
to BACK COVER of Booklet

DON'T YOU
CARROT ALL?

GOT MILK?

HOW DO YOU
LIKE THEM
APPLES?

WHOLE
WHEAT...NO
WONDER

SALMON SWIM
UPSTREAM

DAIRY

Cheddar
Chocolate milk
Swiss cheese
Milk
Ice cream
Yogurt

VEGETABLES

Asparagus
Corn
Peas
Carrot
Onion
Potato

FRUITS

Apple
Cherries
Raspberry
Pear
Grapes
Plum

GRAINS

Wheat
Graham crackers
Oatmeal
Tortilla
Barley
Pasta

PROTEIN

Chicken
Hazelnuts
Salmon
Beef
Lentil
Egg

