

WHAT ARE SOME TYPES OF PLANTS IN YOUR AREA, AND HOW ARE THEY USED?



Overview

Students will practice making dichotomous keys, and then make one for five different types of edible berries found in Alaska.

Objectives

On successful completion of this lesson, students will be able to:

- make a dichotomous key of edible berry plants found in Alaska; and
- explain how dichotomous keys are used in science.

Alaska Standards

Alaska Science Standards / Grade Level Expectations

[6] SA1.1 The student demonstrates an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring, and communicating.

[6] SC2.1 The student demonstrates an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms by using a dichotomous key to classify animals and plants into groups using external or internal features.

Alaska Cultural Standards

[E] Culturally knowledgeable students demonstrate an awareness and appreciation of the relationships and processes of interaction of all elements in the world around them.

Bering Strait School District Scope & Sequence

M.S. sequence 6.3: Cycling of Matter & Energy

M.S. sequence 6.7: Classification

Materials

- OVERHEAD: Wheeled Transportation Sample Key
- STUDENT WORKSHEET: Wheeled Transportation
- STUDENT WORKSHEET: Edible Berries

Additional Resources

Glencoe Life Science Ch 20

Glencoe Life Science Ch 1



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Activity Preparation

1. Read through the entire lesson plan, including the Whole Picture section for teacher background information.
2. Make copies of student worksheets.

Whole Picture

Western and northern Alaska have fewer trees than are found in other parts of the state. Plants that are found in northern and western Alaska are adapted to short growing seasons, cold or frozen soils, and cold windy conditions. This area is referred to as tundra, which means “treeless heights”.

Even with the difficult growing conditions there are many different kinds of plants found in western Alaska. In order to determine the name of an unfamiliar plant, scientists either ask a person with local knowledge, or use a field guide or dichotomous key. A dichotomous key is a written set of choices that leads to the name of an organism. Each question on the key offers only two categories. Many times field guides and keys are written for specific areas, such as “Plants of Northwest Alaska”, or environments such as “Aquatic Plants”.

Often times, common names are used describe an organism, however this can lead to confusion. For example, crowberries are also called blackberries or mossberries. Lowbush cranberries are also called lingonberries. There are over a dozen different species of blueberries, so a blueberry found in Alaska will be a different species than one found in Europe. In order to eliminate this confusion scientists use the genus and species of an organism to name it. Dichotomous keys will give the genus and species of an organism and some will provide the common name as well.

Different types of plants with edible berries grow in Alaska. For many, berry picking in the fall is an important part of a subsistence life style, along with hunting and fishing. Berries are an excellent source of antioxidants and fiber that provide a healthy source of calories in the daily diet. Plants use energy from the sun for photosynthesis. The plant uses the energy for growth and flower production. Berries are the fruit of the plant’s flower that contain seeds. By eating the fruit we obtain the energy stored in the fruit, which is measured in units called calories. Blueberries provide 61 calories per 100 grams (approximately 3.5 oz.), cranberries provide 55 calories per 100 grams. Other berries provide a similar amount of calories.

Vocabulary

dichotomous key used to identify plant or animals based on series of distinguishing characteristics

Activity Procedure

1. Introduce the lesson by explaining the importance of organism identification. Explain to students there are millions of different species of plants and animals on earth. For



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example, currently over 900,000 species of insects have been identified. Scientists estimate that there could be over 3 million species of insects alone. For scientists, having a logical way to identify an organism is essential. Sometimes they will depend on local knowledge for the identification of an organism, and sometimes they will use a field guide or a dichotomous key.

2. Demonstrate how to make a dichotomous key by using student's shoes. Have students remove one shoe and place them in a pile at the front of the room. Ask students how the pile could be divided into two groups. List some of the different ways on the board. For example, they could be separated by left/right, gym/street, greater than size 8/ less than size 8, etc. Discuss the importance of dividing them by characteristics that everyone agrees on. Dividing them by no odor/has an odor, popular brands/not popular brands could lead to confusion because what is popular, or has an odor, may be different for different people.
3. Have students continue to divide one of the groups until every shoe can be identified. Each time you divide a group, there must be only two choices or categories. While dividing the group of shoes draw a key with the divisions on the board until each shoe can be identified.
4. Ask for a student volunteer to make a key for the second group of shoes.
5. Hand out the STUDENT WORKSHEET "Wheeled Transportation" and display a blank copy. There are 6 different types of wheeled transportation shown. The first 4 blank boxes have been completed, in order to complete the key additional boxes will need to be added. Where the additional boxes are added will depend on the how the divisions are made. Working in small groups, or individually, have students make a key for the 6 items. If students have difficulty starting the key work through part of the key with the whole class then ask them to complete it on their own.
6. When the keys are complete have students share some of the different methods used to make their key.
7. Show the OVERHEAD: Wheeled Transportation Sample Key - Page 1, then show the text version of the key on Page 2. Demonstrate how the text version flows like the graphical version. Many dichotomous keys are done as text, not graphically.
8. Ask students what types of edible berries are found in the local area. List them on the board. Ask students how they can tell the difference between the different types of berries.
9. Show students the STUDENT WORKSHEET Edible Berries showing five different types of berries found in Alaska. Using the characteristics of the plants have students make a key of the berries and complete their own copy of the worksheet. Encourage students to use characteristics they are familiar with, such as leaf size, arrangement, and plant size when making the key.



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Answers

- Student Worksheet “Wheeled Transportation”: Answers will vary. The key should be completed with each wheeled item in a separate box.
- Student Worksheet “Edible Berries”: Answers will vary. The key should be completed with each type of berry in a separate box.
 - 1-5. Answers will vary
 6. Dichotomous keys use characteristics of the organisms to identify them.



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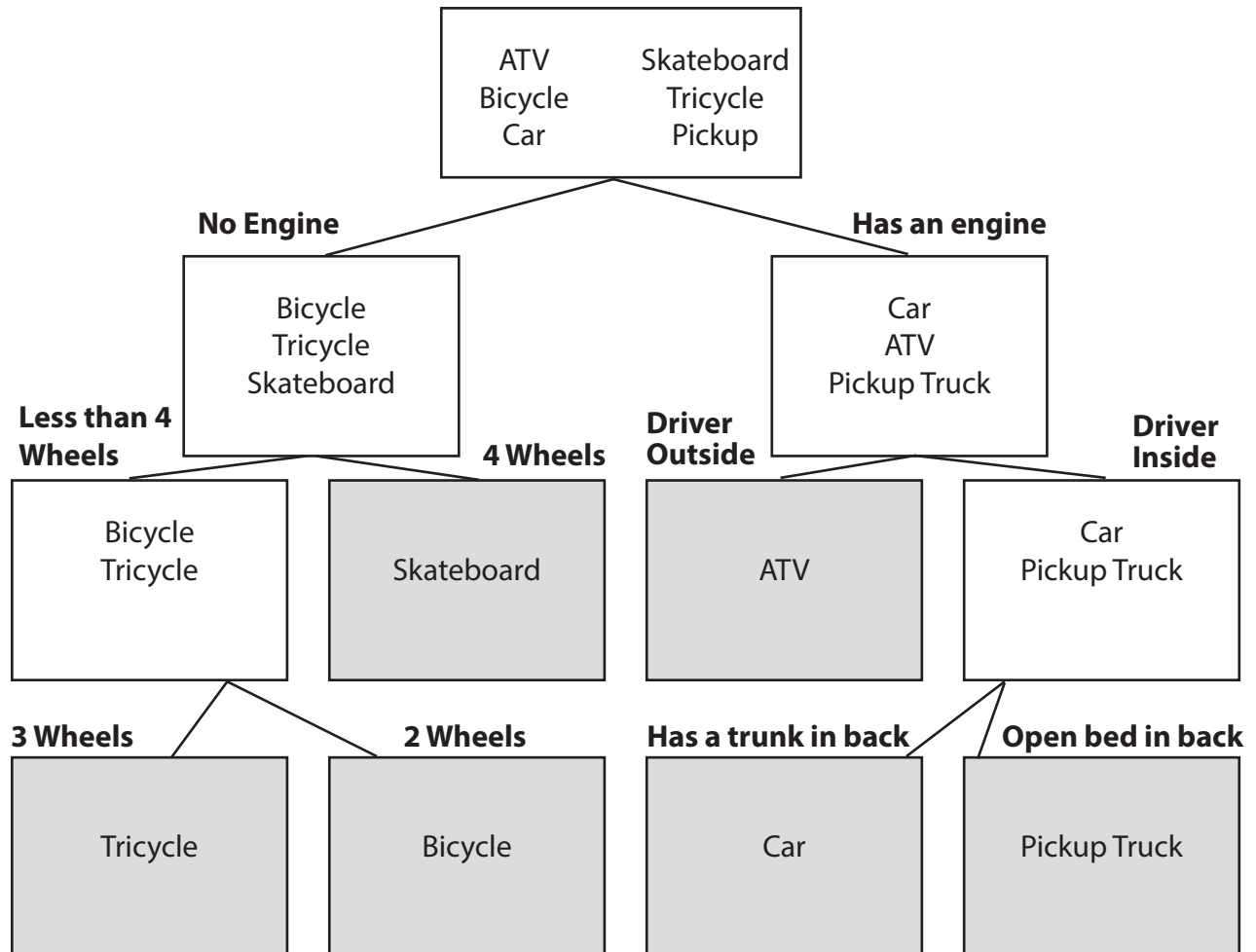


Overhead: Wheeled Transportation

Sample Key - Page 1 of 2



Wheeled Transportation



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Overhead: Wheeled Transportation Sample Key - Page 1 of 2

1a Has an engine.....go to 2a

1b No engine.....go to 4a

2a Driver outside.....**ATV**

2b Driver inside.....go to 3a

3a Has a trunk in back.....**Car**

3b Has an open bed in back.....**Pickup Truck**

4a Has 4 wheels.....**Skateboard**

4b Has < 4 wheels.....go to 5a

5a Has 3 wheels.....**Tricycle**

5b Has 2 wheels.....**Bicycle**



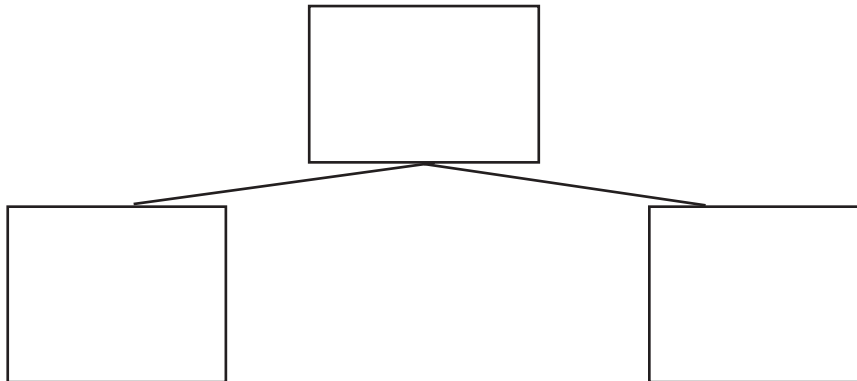
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Student Worksheet: Wheeled Transportation

Name _____

Make a key for the 6 types of wheeled transportation. Add additional boxes and lines as needed. When finished, each wheeled item should be in its own box.



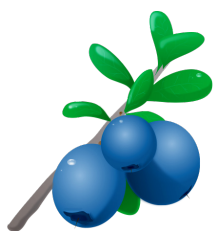
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Student Worksheet: Edible Berries

Name _____

1. Complete the key for some common edible berries found in Alaska. Besides the color and shape of the berries, you should use your own knowledge of the plants, such as the plant height, and leaf shape in making your key. Add boxes and lines as needed. When the key is finished each type of plant should be in its own box.



Blueberry



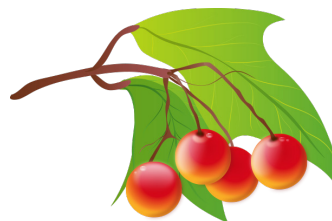
Blackberry



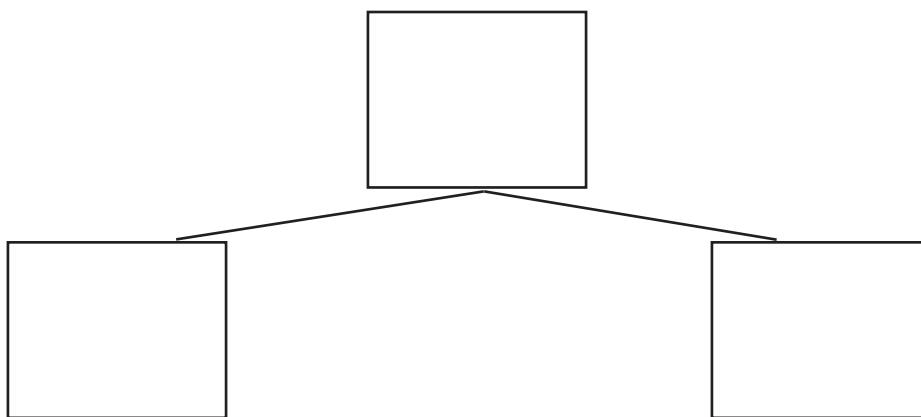
Salmonberry



Lowbush Cranberry



Highbush Cranberry



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Student Worksheet: Edible Berries

2. What types of berries are found near your community?
3. What type of berry is the most common in your community and where do you find them (ex. on a hillside, near a river)?
4. What type of berry is the most difficult to find and where can you find them (ex. on a hillside, near a river)?
5. How does weather, such as a rainy, or hot summer, affect the amount of berries found in the fall?
6. Explain how dichotomous keys are used in science?

