

## Sophienburg Grant: Naturalists of Texas

# Dichotomous Key

### Time Frame:

1 hour class period

### Subjects

**Science**  
**Art**

**Social Studies**  
**Technology Applications**

**Language Arts**  
**Music**

**Math**

### Lesson Overview

Students will use a dichotomous key to classify random objects, letters, and plants. The dichotomous key is a series of "either/or" observations that are used to identify plants, animals, microbes, diseases, fossils, rocks and birds' nests. "Dichotomous" refers to the branching nature of the key, with each branch point splitting off into only 2 branches each time. When used in the classification of organisms, either/or decisions are usually based on distinguishing physical features of the organisms being studied.

### TEKS

#### Science 5<sup>th</sup> Grade

5.10A compare the structures and functions of different species that help them live and survive

5.10B differentiate between inherited traits of plants and animals

### Objectives

#### The student will...

- identify defining structures of plants and determine how plants can be classified based on these common genetic traits.
- understand how a dichotomous key allows scientists to identify plant species

### Vocabulary

Dichotomous key

Observations

Genus

Identify

Organism

Species

Describe

Binomial Name

### Materials

- 8 different typed of candy
- Student Worksheet: "Sweet Science" (pdf)
- Key: "Sweet Science" (pdf)
- Student Handout: "Lindheimer's Dichotomous Key" (pdf)
- Key: "Lindheimer's Dichotomous Key" (pdf)
- Alphabet Page letters A-J

## Sophienburg Grant: Naturalists of Texas

# Dichotomous Key

### Activity Process

Dichotomous key = a key used to identify an organism, usually a plant or animal, in which each stage presents descriptions of two distinguishing characters, with a direction to another stage in the key, until the species is identified.

### Engage The Learner

Have students solve a dichotomous key on types of candy. Note that this key uses terms with which students are not familiar and so they can't just find the candy's common name but must follow the steps.

Teach them to choose one item or organism shown on the page. Read the first set of paired statements and choose the one that best describes the first organism's characteristics. Follow to the next step indicated and read that set of statements. They must continue to refer to the same item or organism and follow the directed path until they come to a name for that organism. Then they will start over with another organism or picture on the page. Students must always start and read and choose between the first set of paired statements. Confusion can exist if an organism is #6, they may want to start with the 6th step. It may be best to solve the first candy together. Then have them continue as a group or individually and then compare with their team.

### Activity/ Activities

Using the Lindheimer Naturalist card set, have students look at the plants cards. Have students list characteristics that could be used to identify and classify plants (leaf shape, flowering/nonflowering, root type, etc.)

Look at the Texas Prickly Pear card as a group. Using the "Lindheimer's Dichotomous Key", follow the steps to correctly identify the prickly pear.

Complete the Lindheimer's Dichotomous Key worksheet with partners.

### Evaluation

Provide the list of the letters A-J and instruct student groups to create a dichotomous key. They must create new groups for the letters, such as curvy or loopy, based on the shapes and lines used to write the letters. After the students have the first ten letters classified, give the students 3 to 4 additional letters. The students must use the key they created to determine the classification for the new letters. If the letter doesn't match one of the original groups, students must readjust their keys to make room for the "new species".

# Sweet Science

Name \_\_\_\_\_

A dichotomous key is a valuable tool that can be used to identify many objects, including plants and minerals. Use the key below to discover the sweet scientific name that identifies these common candies!

- 1a. Candy is hard..... go to 2
- 1b. Candy is not hard (flexible)..... go to 4
- 2a. Candy is spherical..... go to 3
- 2b. Candy is not spherical..... go to 4
- 3a. Candy is on a stick..... *Fracker*
- 3b. Candy is not on a stick..... *Knacker*
- 4a. Candy melts in your hand..... *Wocka*
- 4b. Candy does not melt in your hand..... go to 5
- 5a. Candy has right angles..... go to 6
- 5b. Candy has no right angles..... *Floopy*
- 6a. Candy breaks down when chewed..... *Chompy*
- 6b. Candy does not break down when chewed..... *Wheezy*



Lollipop \_\_\_\_\_

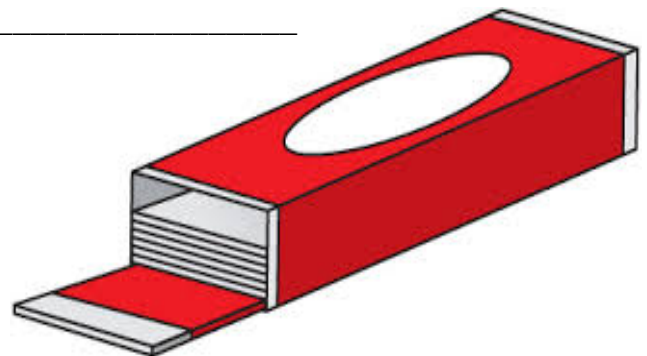
Jawbreaker \_\_\_\_\_

Gummy Worm \_\_\_\_\_

<sup>TM</sup>  
Starburst \_\_\_\_\_

Chocolate Kiss \_\_\_\_\_

Gum \_\_\_\_\_





# LINDHEIMER'S DICHOTOMOUS KEY



Every recognized species on earth is given a two-part scientific name that consists of a genus and species. This system is called "binomial nomenclature." Scientific names usually come from Latin or Greek. *The scientific name is usually printed in italics, with the **Genus** capitalized and the **species** lowercase.* An example is ***Homo sapiens***, the scientific name for humans.

A **dichotomous key** is a series of "either/or" observations that scientists use to identify plants, animals, microbes, diseases, fossils, rocks and birds' nests. Use the dichotomous key below to identify some of Ferdinand Lindheimer's plant collection and then check your work with the plant cards from the card set

1a Leaves have blades that are placed in an alternate or opposite pattern on the stem.....	Go to 2
1b Leaves are narrow with fountain-like form.....	<b>Binomial Name:</b> <i>Muhlenbergia lindheimeri</i>
2a Stem segments are thick and have spines.....	<b>Binomial Name:</b> <i>Opuntia lindheimeri</i>
2b Stem appears differently.....	Go to 3
3a Plant height is 6-24 inches tall.....	Go to 6
3b Plant height is 2-6 feet tall.....	Go to 4
4a Grows as a bush or vine.....	Go to 5
4b Grows as a weed.....	Go to 6
5a Flower is pale-blue to lavender colored.....	<b>Binomial Name:</b> <i>Ipomoea lindheimeri</i>
5b Flower is yellow with 5 oval petals crimped at the edges.....	<b>Binomial Name:</b> <i>Senna lindheimeriana</i>
6a Stamen is conspicuously long.....	<b>Binomial Name:</b> <i>Guara lindheimeri</i>
6b Stamen is relatively short.....	<b>Binomial Name:</b> <i>Lindheimera texana</i>



**Binomial Name:**



**Binomial Name:**



# LINDHEIMER'S DICHOTOMOUS KEY



**Binomial Name:**



**Binomial Name:**



**Binomial Name:**



**Binomial Name:**

**A**

**B**

**C**

**D**

**E**

**F**

**G**

**H**

**I**

**J**

# Sweet Science

Name \_\_\_\_\_

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Lollipop \_\_\_\_\_ *Fracker*

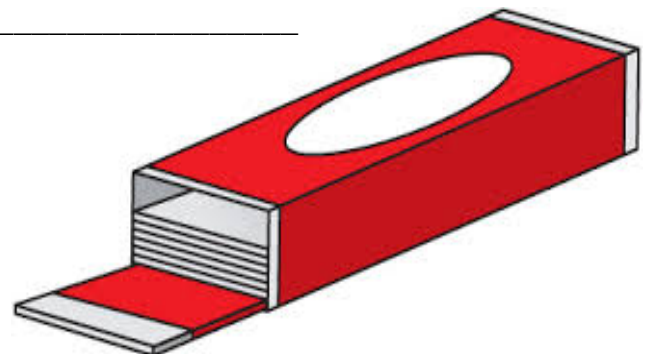
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Gummy Worm \_\_\_\_\_ *Floopy*

Starburst<sup>™</sup> \_\_\_\_\_ *Chompy*

Chocolate Kiss \_\_\_\_\_ *Wocka*

Gum \_\_\_\_\_ *Wheezy*







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**Binomial Name:**

*Ipomoea lindheimeri*



**Binomial Name:**

*Lindheimera texana*



# LINDHEIMER'S DICHOTOMOUS KEY



**Binomial Name:**

***Opuntia lindheimeri***



**Binomial Name:**

***Muhlenbergia lindheimeri***



**Binomial Name:**

***Guara lindheimeri***



**Binomial Name:**

***Senna lindheimeriana***