AT HOME ACTIVITY

ILLINOIS
Carl R. Woese Institute for Genomic Biology

Jelly Bean Biology

Overview:

Explore the flavor diversity of Jelly Bellies like a naturalist pro! One of the early ways that biologists distinguished between different species of living things was by using information they could gather through observation, especially by looking closely at the plants, animals, and other living things they collected. They created special guides called dichotomous keys to share with others how they distinguished between species. Now you can use that same kind of guide to explore your collection of jelly beans.

Learning Objectives:

- Practice using observation and a dichotomous key to help classify specimens into categories
- Consider the advantages and limitations of categorizing based on observable physical features

Activity Materials:

- At least 5 Jelly Belly jelly beans. If you have another kind of jelly bean or flavored candy, this main activity unfortunately will not work. However, you may be able to adapt it by inventing your own dichotomous key (see Follow-up Questions)
- The Jelly Belly dichotomous key
- The Jelly Belly dichotomous key worksheet

Background:

Before scientists could read the DNA that makes up genes and genomes—before they even knew that DNA existed—they could see that there were many different kinds of living things. An important step toward modern biology was when scientists began inventing classification systems, ways to organize all the different living things and decide which ones belonged in the same group as one another. Part of this effort was trying to make sure that any scientist, anywhere in the world, could discover a specimen (an example of a living thing) and figure out whether it was part of a known group or a new group. One way scientists came up with to share this kind of information was a dichotomous key: a guide that walks a person step by step through observing features of the specimen they've found and figuring out what group it might belong to.

If you have a field guide to living things available to you at home or online, it probably contains a dichotomous key. But if you have Jelly Bellies at home, you can try out our dichotomous key for jelly bean flavors! Like a true scientist, once you have your hypothesis for what group each jelly bean belongs to, you can test it by tasting it (we don't recommend this strategy for specimens of living things though!)

Procedure:

1) Get your dichotomous key ready by printing it out or just looking at a digital copy. Print out a copy of the worksheet or just find a blank sheet of paper and copy down the column headings so you are ready to take notes.
2) Examine your first bean. What color is it? What features does it have? Use this information to answer the first question on the dichotomous key, and then any questions that follow that you are directed to.
3) Record your findings on your paper.
4) Taste your bean. Do your findings match your prediction based on the key?
5) Repeat as many times as you wish and have more jelly beans for!

During/Follow-up Questions:

- What made the dichotomous key easier or harder to use?
- How often did the key lead you to the correct answer? In cases where it did not, what do you think went wrong? Could the key be improved to prevent this error? Would changing the key create the possibility of any different kinds of errors?
- What are some other food or non-food items that might be fun to categorize? What questions could you include on a dichotomous key to help people classify them?

Jelly Belly Dichotomous Key

The bean is….

1a. yellow, orange, red, or pink:	go to line 2
1b. blue, purple, or green:	go to line 16
1c. black or brown:	go to line 24
2a. yellow or orange:	go to line 3
2b. pink or red:	go to line 11
3a. Yellow:	go to line 4
3b. Orange:	go to line 7
4a. solid yellow:	go to line 5
4b. yellow with brown spots:	Top Banana
4c. yellow with white or yellow spots:	Lemon Drop
4d. white with yellow spots:	Popcorn
4e. yellow with green spots:	Mango
5a. dark yellow:	Lemon
5b. bright or pale yellow:	go to line 6
6a. bright yellow:	Pina colada
6b. pale yellow:	Pineapple
7a. Solid orange:	go to line 8
7b. orange with red spots:	Peach
8a. bright orange:	go to line 9
8b. light or pale orange:	go to line 10
9a. Orange, orange:	Orange Juice
9b. creamy orange:	Orange sherbet
10a. light orange:	Cantaloupe
10b. pale orange:	Tangerine
11a. Pink:	go to line 12
11b. Red:	go to line 13
12a. bright pink:	Cotton Candy
12b. light pink:	Bubble Gum
12c. pale orange pink:	Pink Grapefruit
12d. pink with red spots:	Strawberry Daiquiri
12a. solid red:	go to line 14
13b. red with light spots:	Sizzling cinnamon
13c. red with dark spots:	Strawberry Jam
14a. bright red:	Very Cherry
14b. Red:	Red Apple
14c. dark red:	go to line 15
15a. deep red:	Raspberry
15b. cinnamon red:	Cinnamon
16a. blue or purple:	go to line 17
16b. Green:	go to line 20
17a. Purple:	go to line 18
17b. Blue:	go to line 19
18a. purple or lavender:	Island Punch
18b. dark or blackish purple:	Grape Jelly
18c. purple with spots:	Plum
19a. bright blue:	Berry Blue
19b. dark blue:	Blueberry
20a. solid green	g: o to line 21
20b. green with spots:	go to line 22
21a. dark green:	Jalapeno
21b. light or pale green:	go to line 23
22a. dark green with red spots:	Watermelon
22b. pale green with dark spots:	Juicy Pear
22c. light green with green spots:	Margarita
23a. bright green:	Green Apple
23b. light green:	Kiwi
23c. yellow green:	Lemon Lime
24a. Black:	go to line 25
24b. Brown:	go to line26
25a. Black:	Licorice
25b. dull purple black:	Blackberry
25c. shiny purple black:	Dr. Pepper
26a. Brown:	go to line 27
26b. light brown:	go to line 28
26c. dark brown with spots:	Cappuccino
27a. Brown:	A&W Root Beer
27b. dark brown:	Chocolate Pudding
28a. light brown:	Caramel Apple
28b. light orange-brown:	Peanut butter
28c. pale brownish-white:	Café Latte

***Note: Watch for new species!!

Jelly Belly Identities

Dichotomous key route (example: 1a, 2b, 4a, 8a)	What kind do you think it is?	Were you right?	Was it delicious?
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			