Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Survival of the Fittest on Tree Island

**Purpose**

The purpose of this exercise is to test “survival” traits. Will you survive or not? [[1]](#endnote-1)

**Procedure**

 **Materials**

1. Graph paper (1 per student)
2. Challenge 1: Wall marked with leaves per minute at height increments
3. Challenge 2: Sour candy (1 per student)
4. Challenge 3: Cave opening taped or posted on wall
5. Challenge 4: Disposable cup of water (1 per student), Sharpie

**Sequence of steps**

1. Your teacher will guide you to assemble in Survivor teams of 4 people.
2. Meet with your Survivor team and select one person to read this overview out loud:
	1. Listen to instructions.
	2. Answer introductory questions.
	3. Perform all 4 challenges.
	4. ![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()Graph/answer questions.
3. Background Information: Answer background question under Observations.
4. ![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()Determine a name for your Survivor Team. Record on your data sheet.
5. Predict which member(s) of your team will survive the challenges.

***Procedure for Challenge #1: Let Us Leaf***

Imagine that your survivor team is a group of herbivores living on remote *Tree Island*. Your diet consists entirely of tree leaves. Your favorite leaves used to grow on a stubby tree that was found everywhere on the island, but those trees are gone now. You and the other herbivores ate all the leaves, and the short trees died.

You have no choice now. To live you must eat the leaves from the only kind of tree remaining. But this tree is much taller, and although it has branches near the ground, its upper branches have the most leaves.

A wall in your classroom has been marked to represent the heights of tree branches and labeled with the number of leaves available to one herbivore like you in an hour.

To thrive, you must be able to eat more than 125 leaves per hour.

Directions (each member of your team must perform the challenge)

1. Stand with your feet flat on the floor and your back against the mark on the wall below the “branches” on the tree.

2. Reach above your head as high as you can.

3. Another person on your team will call out the number of leaves per hour that you can reach with your raised hand.

![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()4. Record that number in the Data Sheet.

![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()

After completing the challenge:

How many leaves were you able to reach? *Answer in your Data Sheet*

How many group members survived? *Answer in your Data Sheet*

*Record this data on the board to share with the class.*

Graph the current distribution of reach heights in your class. How might the distribution or reach heights change in future generations of herbivores? *Answer this question on your graph.*

**Wait for direction from your teacher to move onto the next challenge!**

**Procedures for Challenge #2: There’s a Fungus Among Us**

Some of the leaves are tasty and some are not. Unfortunately, some of the leaves you and your herbivore friends are eating have a fungus growing on them. The fungus is very poisonous—eat too much of it and YOU DIE! But some individuals can taste the fungus. To them it tastes really bad, and they spit out the leaves. That’s good, because if the poisonous fungus isn’t swallowed, it does no harm!

Directions (each group member must participate in the challenge)

Place the sour candy in your mouth. If you can suck on the candy until it is gone without making a sour face then you pass the fungus test. You many not chew on the candy or make a sour face of any kind.

1. Place a piece of candy in your mouth. If do not make a sour face, you’re safe.
2. ![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()Record the data for you survivor team on the board.
3. Record the results on your data sheet.

![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()After completing the challenge:

Who survived the poisonous fungus? *Record in your Data Sheet*

**Wait for direction from your teacher to move onto the next challenge!**

**Procedures for Challenge #3: Caveberries**

A severe drought has recently struck Tree Island. All of the leaves on the trees that can be reached are GONE! There is another food you can eat though; the fruit of a plant called the *caveberry.* It grows just inside the island’s only cave. The opening to the cave is small and very low to the ground. To get in, the herbivores must kneel down and bend over. They cannot make their bodies any lower than that.

Directions (each group member must participate in the challenge)

1. Kneel next to the cave opening posted on the wall. If you head is lower than the top of the opening, you will survive the drought.
2. ![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()Record the information on your data sheet
3. Post the information on the board.

![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()After completing the challenge:

Who survived the drought? *Record in your Data Sheet*

**Wait for direction from your teacher to move onto the next challenge!**

**Procedures for Challenge #4: Slurp and Burp**

The ability to roll your tongue into a tube is a genetic trait that some people do not have. Try as they may, they will never be able to roll their tongues. They are not genetically “programmed” to do it.

It has not rained for months on Tree Island, and the lakes and rivers have dried up! Your survivor team of herbivores has found some water trapped in cracks in hard rock. The good news is that the cracks are filled with water, which you can reach with your tongues. The bad news, if you can’t roll your tongue, you must try to lap up the water.

Directions (each group member must participate in the challenge)

1. You cannot use your hands.
2. You cannot lift the cup in anyway (remember, the cup represents a water filled crack in a rock).
3. You may use only your tongue to drink. If you can roll your tongue, try to suck water up through your rolled tongue. If you cannot roll your tongue, try to use your tongue to slurp up the water.
4. Before you begin, measure from the top of the cup to the distance to the edge of the water. Mark a line with the sharpie. Record the distance measured.
5. You have 60 seconds to drink as much as you can without spilling any. *Spill any water and you do not survive!*
6. After drinking, again measure from the top of the cup the distance to the water. Record distance measured.
7. The difference between step 4 and step 6 must be greater than half an inch to survive.
8. ![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()Pour water out and change water between team members.
9. Record info on data sheet.
10. Post any survivors on the board.

![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()After completing the challenge:

Who survived? *Record in your Data Sheet*

**![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()**

**Observations**

Background Information: Think about the different features that make some organisms better equipped for the demands of their environment. What features would help humans survive in the wild?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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 **Survivor Island Data Sheet**

Survivor Team Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Herbivore Name(team member’s name) | # of leaves reached per hourFYI: must eat 125/hr to survive | Check if you CAN taste the sour candy | Check if you can get into Cave | Check if you slurp up more than ½ inch of water. |
|  |  |  |  |  |
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|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Analysis & Conclusion Questions:

1. If your team of herbivores survives on Tree Island, does that mean it has adapted to the changes?
2. Do individuals adapt to changes in their environment, or do populations adapt? Explain.
3. What is the vocabulary word for the ability of an individual to survive and reproduce in its specific environment:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. What is the definition of adaptation?
5. How does variation within a species increase the likelihood that at least some members of a species will survive under changed environmental conditions?
6. How do the Tree Island challenges relate to the process survival of the fittest?
7. What did Darwin refer to as survival of the fittest?
8. Graph the class herbivore height vs. number of leaves reached per hour.



1. Calculate what percentage of individuals in the class would have survived all of these challenges?
2. How might this population change over time?
1. (2008).Survival of the Fittest on Tree Island. *Atwater High School Agriculture Department*. [↑](#endnote-ref-1)