

# **Green Down at Frank D. Spaziano Elementary Outdoor Classroom**

**Grade 4 Bilingual- Room 8**  
**Ms. S. Santana**



## **Study Site**

### **Lugar de la Investigación**

**Frank D. Spaziano Elementary School Outdoor Classroom**

**Providence, Rhode Island**

**Site ID: 133391**

**Latitude/ Latitud: 41.814798°**

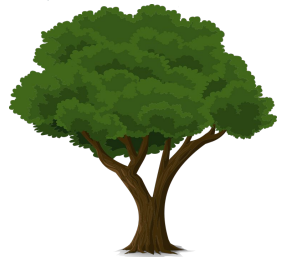
**Longitude/ Longitud : 71.45739°**

**Elevation/ Elevación: 31.0 M**

**Data Source/ Fuente de datos: GPS**

## Rationale

We know that trees are important, but if we do not know how they work, we can end up cutting down too many of them. The way we handle trees, same as animals, depends on the knowledge we have about their jobs and importance in the universe. We also know that the leaves change colors and fall off the trees during the fall. This change depends on the temperature and time of the year. We want to investigate how air and surface temperature affect trees. Also, we are observing the hours of daylight to find out if that is related to these changes. Investigating trees is important because other people can learn from what we study, observe, and discover.



# Razón Para Nuestra Investigación

Sabemos que los árboles son importantes, pero si no sabemos cómo funcionan, podemos terminar cortando muchos de ellos. La forma en que manejamos los árboles, al igual que a los animales, depende del conocimiento que tenemos acerca de sus funciones e importancia en el universo. También sabemos que las hojas cambian de colores en el otoño y caen del árbol. Este cambio depende de la temperatura y tiempo del año. Queremos investigar cómo la temperatura del aire y la superficie afectan los árboles. Además, estaremos observando las horas de luz solar para ver si esto está relacionado a estos cambios. Investigar los árboles es importante porque otras personas pueden aprender de lo que nosotros estudiamos, observamos y descubrimos.

# Research Questions

## Preguntas de Investigación



- How changes in temperature affects the color of the leaves?
- Why do trees change depending on the season?
- How does the amount of sunlight affect trees?
- Why is the surface temperature next to the tree different from the one away from the tree?



- ¿Cómo los cambios en la temperatura afectan el color de las hojas?
- ¿Por qué los árboles cambian dependiendo de la estación del año?
- ¿Cómo la cantidad de luz solar afecta los árboles?
- ¿Por qué la temperatura de la superficie al lado del árbol es diferente a cuando estamos alejados del árbol?

# Hypothesis

## Hipótesis

We predict that as the temperature changes and it gets colder, the leaves will change colors and fall. The trees need sunlight for the leaves to grow. The tree grows faster when there is more sunlight , so we think that the hours of daylight do affect the trees and the leaves.



Nosotros predecimos que cuando la temperatura cambie y se ponga más frío, las hojas cambiarán de color y se caerán. Los árboles necesitan luz solar para que las hojas crezcan. El árbol crece más rápido cuando hay más luz solar, así que pensamos que las horas de luz solar sí afectan los árboles y las hojas.

# Materials / Materiales

## Globe Plant Color Chart



## Infrared Thermometer



## Data Recording Sheets

My Fall Leaf Data: Room Number: 6

On the last 3 columns, check the box that BEST describes your tree.

If you cannot see your leaf, check the box  that explains why.

Date	If you CAN see your leaf: What color is your leaf?	If you cannot see your leaf:
10/5/19	My leaf is the GLOBE Color: blue green 56y 4a	<input type="checkbox"/> I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
10/7/19	My leaf is the GLOBE Color: olive green 56y 4a	<input type="checkbox"/> I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
10/12/19	My leaf is the GLOBE Color: apple green 56y 2b2	<input type="checkbox"/> I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
10/16/19	My leaf is the GLOBE Color: apple green 56y 2b2	<input type="checkbox"/> I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
10/18/19	My leaf is the GLOBE Color: apple green 56y 2b2	<input type="checkbox"/> I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow

My Fall Leaf Data: Room Number: 6

Date	Air Temp (°C)	Surface Temperature on ground just to tree (°C)	Surface Temperature on ground away from tree (°C)	Time of Sunrise	Time of Sunset
10/5/19	72°	X	X	6:23am	6:38pm
10/7/19		17	15.7	6:28am	6:24pm
10/12/19	77°	20.4	22.7	6:13am	6:26pm
10/16/19	61°	14.7	14.4	6:43am	6:15pm
10/18/19		15.5	14.4	6:52am	6:04pm
10/19/19	56°	13.7	11.9	7:1	5:51pm

## Trees!



# **Methods: GLOBE Protocols and Sources**

## **Métodos: Protocolos de GLOBE y Fuentes de Datos**

### **GLOBE Protocols:**

- **Green Down**
- **Surface Temperature**

### **Other Sources:**

- **Timeanddate.com (for air temperature, sunset, sunrise times, and daylength)**



# Little Scientists in action!

## ¡Pequeños Científicos en acción!





# Observations - Data Collection Sheets




## Observaciones - Hojas de Recolección de Datos

Name: Keily **My Fall Leaf Data:** Room Number: #8

*In the last 3 columns, check the box that BEST describes your tree*

Date	If you CAN see your leaf: What <u>color</u> is your leaf?	The GLOBE Color is	If you cannot see your leaf: Check the box <input checked="" type="checkbox"/> that explains why
<u>9/25/19</u>	My leaf is the Color: <u>olive green 56 and 4/8</u>	<u>5GY 4/8</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>9/27/19</u>	My leaf is the Color: <u>olive green 5G and 4/8</u>	<u>5GY 4/8</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/2/19</u>	My leaf is the Color: <u>apple green 5G and 7/12</u>	<u>5GY 7/12</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/5/19</u>	My leaf is the Color: <u>apple green 5G and 7/12</u>	<u>5GY 7/12</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/15/19</u>	My leaf is the Color: <u>apple green 5G and 7/12</u>	<u>5GY 7/12</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/18/19</u>	My leaf is the Color: <u>apple green 5G and 7/12</u>	<u>5GY 7/12</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/23/19</u>	My leaf is the Color: <u>apple green</u>	<u>apple green 5gy 7/12</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>11/1/19</u>	My leaf is the Color: <u>apple green and orange</u>	<u>5gy 7/12</u> <u>apple green whith orange</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow

Name: keily **My Fall Leaf Data:** Room Number: \_\_\_\_\_

Date	Air Temp (°F/°C)	Surface Temperature on tree (°F/°C)	Surface Temperature on ground next to tree (°F/°C)	Surface Temperature on ground away from tree (°F/°C)	Time of Sunrise	Time of Sunset
<u>9/25/19</u>	<u>72°</u>				<u>6 : 35 am</u>	<u>6 : 38 pm</u>
<u>9/27/19</u>	<u>72</u>	<u>17</u>	<u>17</u>	<u>18.7</u>	<u>6 : 38 am</u>	<u>6 : 34 pm</u>
<u>10/2/19</u>	<u>77°</u>	<u>21.4</u>	<u>22.7</u>	<u>22.3</u>	<u>6 : 43 am</u>	<u>6 : 26 pm</u>
<u>10/8/19</u>	<u>61°</u>	<u>14.7</u>	<u>14.4</u>	<u>16.6</u>	<u>6 : 49 am</u>	<u>6 : 15 pm</u>
<u>10/15/19</u>	<u>64</u>	<u>15.5</u>	<u>14.4</u>	<u>16.0</u>	<u>6 : 57 am</u>	<u>6 : 04 pm</u>
<u>10/18/19</u>	<u>56°</u>	<u>13.7</u>	<u>11.9</u>	<u>14.5</u>	<u>7 : 01 am</u>	<u>5 : 59 pm</u>
<u>10/23/19</u>	<u>68°</u>	<u>18.3</u>	<u>15.8</u>	<u>16.7</u>	<u>7 : 06 am</u>	<u>5 : 52 pm</u>
<u>11/1/19</u>	<u>56°</u>	<u>50.5</u>	<u>48.2</u>	<u>59.1</u>	<u>7 : 17 am</u>	<u>5 : 40 pm</u>




# Observations - Data Collection Sheets

## Observaciones - Hojas de Recolección de Datos

Name: Ashley Nicole Lux Perez **My Fall Leaf Data:** Room Number: Room #8

*In the last 3 columns, check the box that BEST describes your tree*

Date	If you CAN see your leaf: What <u>color</u> is your leaf?	If you cannot see your leaf: Check the box <input checked="" type="checkbox"/> that explains why
<u>9/25/2019</u>	My leaf is the Color: <u>Apple Green</u> The GLOBE Color is <u>56Y 7/12</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>9/27/2019</u>	My leaf is the Color: <u>Avocado Green</u> The GLOBE Color is <u>7.5 56Y 6/10</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/2/2019</u>	My leaf is the Color: <u>Pine Green</u> The GLOBE Color is <u>7.5 6Y 4/8</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/8/2019</u>	My leaf is the Color: <u>Green</u> The GLOBE Color is <u>7.5 6Y 6/10</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/15/2019</u>	My leaf is the Color: <u>Apple Green</u> The GLOBE Color is <u>5.6 11H</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/18/2019</u>	My leaf is the Color: <u>Buff</u> The GLOBE Color is <u>5Y 8/4</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/23/2019</u>	My leaf is the Color: <u>Deer Brown/Green apple</u> The GLOBE Color is <u>7.5YR6/4 / 5.6Y7/12</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>11/1/2019</u>	My leaf is the Color: <u>Pale Brown</u> The GLOBE Color is <u>7.5/R 5/4</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow

Date	Air Temp (°F/°C)	Surface Temperature on tree (°F/°C)	Surface Temperature on ground next to tree (°F/°C)	Surface Temperature on ground away from tree (°F/°C)	Time of Sunrise	Time of Sunset
X	X				X	X
<u>9/26/2019</u>	<u>72*</u>	_____	_____	_____	<u>6 : 35 am</u>	<u>6 : 38 pm</u>
<u>9/27/2019</u>	_____	_____	<u>27*</u>	<u>38*</u>	<u>6 : 38 am</u>	<u>6 : 34 pm</u>
<u>10/2/2019</u>	<u>71*</u>	<u>23*</u>	<u>23*</u>	<u>23*</u>	<u>6 : 43 am</u>	<u>6 : 26 pm</u>
<u>10/8/2019</u>	<u>55*</u>	<u>16*</u>	<u>16*</u>	<u>16*</u>	<u>6 : 49 am</u>	<u>6 : 15 pm</u>
<u>10/15/2019</u>	_____	<u>18*</u>	<u>16*</u>	<u>28*</u>	<u>6 : 57 am</u>	<u>6 : 04 pm</u>
<u>10/18/2019</u>	<u>56*</u>	<u>17.2*</u>	<u>14.2*</u>	<u>25.7*</u>	<u>7 : 01 am</u>	<u>5 : 59 pm</u>
<u>10/23/2019</u>	_____	<u>15*</u>	<u>14*</u>	<u>17*</u>	<u>7 : 09 am</u>	<u>5 : 55 pm</u>
<u>11/1/2019</u>	<u>56*</u>	<u>15.5*</u>	<u>12.6*</u>	<u>12.5*</u>	<u>7 : 17 am</u>	<u>5 : 40 pm</u>




# Observations - Data Collection Sheets

## Observaciones - Hojas de Recolección de Datos

Name: Kristel Mejia **My Fall Leaf Data:** Room Number: g

*In the last 3 columns, check the box that BEST describes your tree*

Date	If you CAN see your leaf: What <u>color</u> is your leaf?		If you cannot see your leaf: Check the box <input checked="" type="checkbox"/> that explains why
<u>09/25/19</u>	My leaf is the Color: <u>Apple Green 5GY 7/12</u>	The GLOBE Color is <u>Apple Green 5GY 7/12</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>9/27/19</u>	My leaf is the Color: <u>Apple Green 5GY 7/12</u>	The GLOBE Color is <u>Apple Green 5GY 7/12</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/02/19</u>	My leaf is the Color: <u>Apple Green 5GY 7/12</u>	The GLOBE Color is <u>Apple Green 5GY 7/12</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/08/19</u>	My leaf is the Color: <u>Apple Green 5GY 7/12</u>	The GLOBE Color is <u>Apple Green 5GY 7/12</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/15/19</u>	My leaf is the Color: <u>Apple Green 5GY 7/12</u>	The GLOBE Color is <u>Apple Green 5GY 7/12</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/18/19</u>	My leaf is the Color: <u>Apple Green 5GY 7/12</u>	The GLOBE Color is <u>Apple Green 5GY 7/12</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/23/19</u>	My leaf is the Color: <u>Buff 5Y 814</u>	The GLOBE Color is <u>Buff 5Y 814</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>11/01/19</u>	My leaf is the Color: <u>Buff 5Y 814</u>	The GLOBE Color is <u>Buff 5Y 814</u>	I cannot see my leaf because: <input checked="" type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow

Date	Air Temp (°F/°C)	Surface Temperature on tree (°F/°C)	Surface Temperature on ground next to tree (°F/°C)	Surface Temperature on ground away from tree (°F/°C)	Time of Sunrise	Time of Sunset
X	X				X	X
<u>09/25/19</u>	<u>72</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>6 : 35</u> am	<u>6 : 38</u> pm
<u>09/27/19</u>	<u>73</u>	<u>17</u>	<u>17</u>	<u>33</u>	<u>6 : 38</u> am	<u>6 : 34</u> pm
<u>10/02/19</u>	<u>77</u>	<u>24.1</u>	<u>23.5</u>	<u>23</u>	<u>6 : 43</u> am	<u>6 : 26</u> pm
<u>10/08/19</u>	<u>61</u>	<u>14.7</u>	<u>14.8</u>	<u>16.1</u>	<u>6 : 49</u> am	<u>6 : 15</u> pm
<u>10/15/19</u>	<u>64</u>	<u>59.4</u>	<u>58.3</u>	<u>76.1</u>	<u>6 : 57</u> am	<u>6 : 04</u> pm
<u>10/18/19</u>	<u>56</u>	<u>58</u>	<u>60</u>	<u>82.3</u>	<u>7 : 01</u> am	<u>5 : 59</u> pm
<u>10/23/19</u>	<u>68 F</u>	<u>19.2</u>	<u>20.7</u>	<u>21.6</u>	<u>7 : 06</u> am	<u>5 : 52</u> pm
<u>11/01/19</u>	<u>56 F</u>	<u>71.1</u>	<u>58.8</u>	<u>53.4</u>	<u>7 : 17</u> am	<u>5 : 40</u> pm

# Observations - Data Collection Sheets

## Observaciones - Hojas de Recolección de Datos

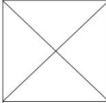

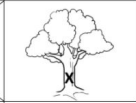
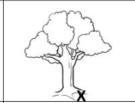
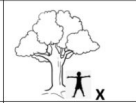


Name: Belkis sical

**My Fall Leaf Data:**

Room Number: Room 8

*In the last 3 columns, check the box that BEST describes your tree*

Date	If you CAN see your leaf: What <u>color</u> is your leaf?	If you cannot see your leaf: Check the box <input checked="" type="checkbox"/> that explains why
<u>9/25/19</u>	My leaf is the Color: <u>apple green 5gi 7/12</u> The GLOBE Color is <u>apple green 5gi 7/12</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>9/27/19</u>	My leaf is the Color: <u>apple green 5gi 7/12</u> The GLOBE Color is <u>apple green 5gi 7/12</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/2/19</u>	My leaf is the Color: <u>apple green 5gi 7/12</u> The GLOBE Color is <u>apple green 5gi 7/12</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/1/19</u>	My leaf is the Color: <u>apple green 5gi 7/12</u> The GLOBE Color is <u>apple green 5gi 7/12</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/15/19</u>	My leaf is the Color: <u>buff 5v 8/4</u> The GLOBE Color is <u>buff 5v 8/4</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/18/19</u>	My leaf is the Color: <u>buff 5v 8/4</u> The GLOBE Color is <u>buff 5v 8/4</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow

Date	Air Temp (°F/°C)	Surface Temperature on tree (°F/°C)	Surface Temperature on ground next to tree (°F/°C)	Surface Temperature on ground away from tree (°F/°C)	Time of Sunrise	Time of Sunset
						
<u>9/25/19</u>	<u>72'</u>	<u>x</u>	<u>x</u>	<u>x</u>	<u>6 : 35 am</u>	<u>6 : 36 pm</u>
<u>9/23/19</u>	<u>73'</u>	<u>21'</u>	<u>24'</u>	<u>34</u>	<u>6 : 38 am</u>	<u>6 : 34 pm</u>
<u>10/2/19</u>	<u>77'</u>	<u>22'</u>	<u>22'</u>	<u>28</u>	<u>6 : 12 am</u>	<u>6 : 26 pm</u>
<u>10/8/19</u>	<u>61'</u>	<u>14'</u>	<u>145' 14.5'</u>	<u>16'</u>	<u>6 : 49 am</u>	<u>6 : 15 pm</u>
<u>10/15/19</u>	<u>64'</u>	<u>12'</u>	<u>12:2'</u>	<u>28:3'</u>	<u>6 : 04 am</u>	<u>6 : 04 pm</u>
<u>10/18/19</u>	<u>56'</u>	<u>11'</u>	<u>12:7</u>	<u>24'</u>	<u>7 : 01 am</u>	<u>5 : 51 pm</u>

# Observations - Data Collection Sheets

## Observaciones - Hojas de Recolección de Datos




Name: Eduardo Lopez Zetino

**My Fall Leaf Data:**

Room Number: Room 8

*In the last 3 columns, check the box that BEST describes your tree*

Date	If you CAN see your leaf: What <u>color</u> is your leaf?	If you cannot see your leaf: Check the box <input checked="" type="checkbox"/> that explains why
<u>9/27/19</u>	My leaf is the Color: <u>Golden rode</u> The GLOBE Color is <u>morning green blue</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/5/19</u>	My leaf is the Color: <u>Green Goldenrod</u> The GLOBE Color is <u>pinkred</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/13/19</u>	My leaf is the Color: <u>Pink Red</u> The GLOBE Color is <u>eggshellpink</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/23/19</u>	My leaf is the Color: <u>orange</u> The GLOBE Color is <u>deep brown</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/23/19</u>	My leaf is the Color: <u>orange</u> The GLOBE Color is <u>Morning orange</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/18/19</u>	My leaf is the Color: <u>orange</u> The GLOBE Color is <u>orange</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/23/19</u>	My leaf is the Color: <u>Goldenrod</u> The GLOBE Color is <u>2.5Y 6/6</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>11/1/19</u>	My leaf is the Color: <u>orange</u> The GLOBE Color is <u>5YR 7/12</u>	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow

Date	Air Temp (°F/°C)	Surface Temperature on tree (°F/°C)	Surface Temperature on ground next to tree (°F/°C)	Surface Temperature on ground away from tree (°F/°C)	Time of Sunrise	Time of Sunset
X	X				X	X
<u>9/25/19</u>	<u>72 F</u>	<u>x</u>	<u>17.5</u>	<u>x</u>	<u>6 : 35 am</u>	<u>6 : 38 pm</u>
<u>9/27/19</u>	<u>73 F</u>	<u>24</u>	<u>24.7</u>	<u>35</u>	<u>6 : 38am</u>	<u>6 : 34 pm</u>
<u>10/2/19</u>	<u>77 F</u>	<u>22.8</u>	<u>15.0</u>	<u>23.8</u>	<u>6 : 43 am</u>	<u>6 : 26 pm</u>
<u>10/8/19</u>	<u>61 F</u>	<u>15.6</u>	<u>54.3</u>	<u>15.1</u>	<u>6 : 49 am</u>	<u>6 : 15 pm</u>
<u>10/15/19</u>	<u>56 F</u>	<u>61.7</u>	<u>53.6</u>	<u>83.3</u>	<u>6 : 57am</u>	<u>6 : 04 pm</u>
<u>10/18/19</u>	<u>56 F</u>	<u>60.20</u>	<u>62.1</u>	<u>80.8</u>	<u>7 : 61 am</u>	<u>5 : 04 pm</u>
<u>10/23/19</u>	<u>68 F</u>	<u>17.7</u>	<u>18.2</u>	<u>24.8</u>	<u>7 : 06 am</u>	<u>5 : 52 pm</u>
<u>11/1/19</u>	<u>56 F</u>	<u>18.0</u>	<u>17.7</u>	<u>26.4</u>	<u>7 : 17 am</u>	<u>5 : 40 pm</u>








# Observations - Data Collection Sheets

## Observaciones - Hojas de Recolección de Datos

Name: Haniseed **My Fall Leaf Data:** Room Number: 8

*In the last 3 columns, check the box that BEST describes your tree*

Date	If you CAN see your leaf: What color is your leaf?		If you cannot see your leaf: Check the box <input checked="" type="checkbox"/> that explains why
<u>09/25/19</u>	My leaf is the Color: olive green 5GY 4/8	The GLOBE Color is _____	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>09/27/19</u>	My leaf is the Color: olive green 5GY 4/8	The GLOBE Color is _____	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/02/19</u>	My leaf is the Color: olive green 5GY 4/8	The GLOBE Color is _____	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/08/19</u>	My leaf is the Color: olive green 5GY 4/8	The GLOBE Color is _____	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/15/19</u>	My leaf is the Color: olive green 5GY 4/8	The GLOBE Color is _____	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/19/19</u>	My leaf is the Color: avocado green 5GY	The GLOBE Color is _____	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>10/23/19</u>	My leaf is the Color: Avocado Green	The GLOBE Color is 7.5GY 4/8	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow
<u>11/1/19</u>	My leaf is the Color: Plum Purple	The GLOBE Color is 2.5R 4/8	I cannot see my leaf because: <input type="checkbox"/> My leaf has fallen off of the tree <input type="checkbox"/> My leaf is covered in snow

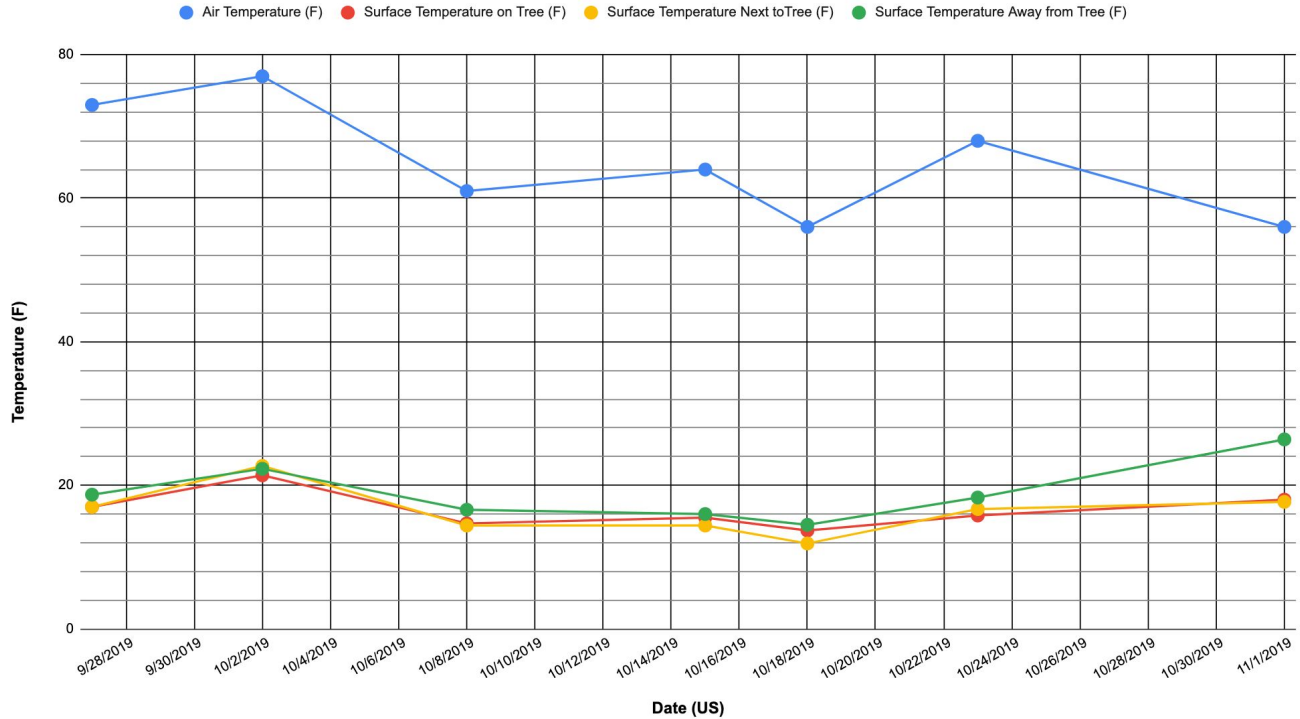
Date	Air Temp (°F/°C)	Surface Temperature on tree (°F/°C)	Surface Temperature on ground next to tree (°F/°C)	Surface Temperature on ground away from tree (°F/°C)	Time of Sunrise	Time of Sunset
						
<u>09/25/19</u>	<u>72°</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>6 : 35 am</u>	<u>6 : 38 pm</u>
<u>09/27/19</u>	<u>73</u>	<u>18</u>	<u>17°</u>	<u>35°</u>	<u>6 : 38 am</u>	<u>6 : 34 pm</u>
<u>10/02/19</u>	<u>77°</u>	<u>24°</u>	<u>23°</u>	<u>27°</u>	<u>6 : 43 am</u> <small>6 43</small>	<u>6:26</u> <u>x 5 : 25 pm</u>
<u>10/12/19</u> <sup>x</sup> <u>10/8/19</u>	<u>61°</u>	<u>15°</u>	<u>13°</u>	<u>16°</u>	<u>6 : 49 am</u> <small>6 49</small>	<u>6:15</u> <u>x 6 : 44 pm</u>
<u>10/18/19</u> <sup>x</sup> <u>10/15/19</u>	<u>56</u>	<u>60°</u>	<u>58°</u>	<u>88°</u>	<u>6 : 57 am</u>	<u>6:04</u> <u>x 5 : 59 pm</u>
<u>10/25/19</u> <sup>x</sup> <u>10/18/19</u>	<u>56°</u>	<u>63.5°</u>	<u>50.9°</u>	<u>75.1°</u>	<u>7 : 01 am</u>	<u>5:59</u> <u>x 5 : 43 pm</u>
<u>10/23/19</u>	<u>68</u>	<u>15.8</u>	<u>16.7</u>	<u>18.3</u>	<u>7 : 06 am</u>	<u>5 : 52 pm</u>
<u>11/1/19</u>	<u>56</u>	<u>16.4</u>	<u>16.2</u>	<u>19.7</u>	<u>7 : 17 am</u>	<u>5 : 40 pm</u>



# Results

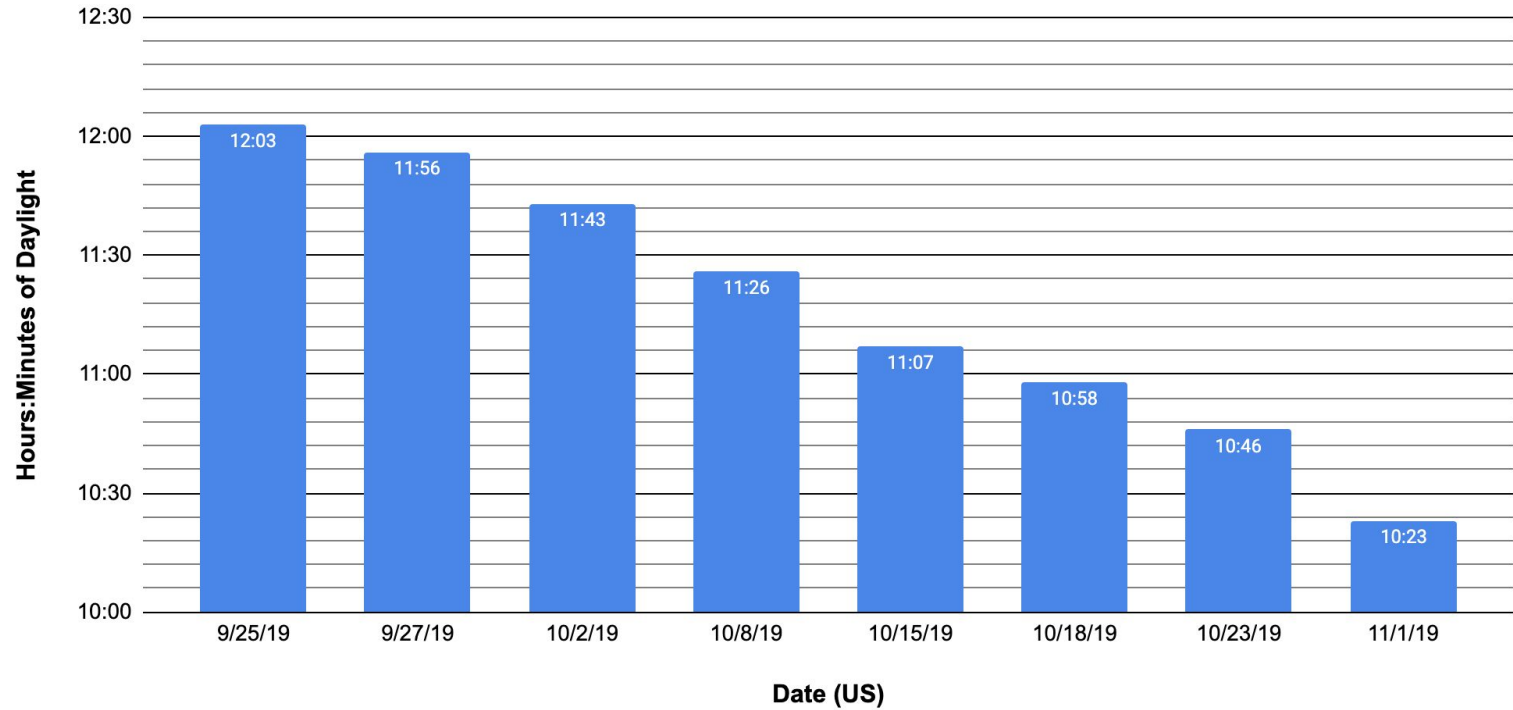
## Resultados

### Comparing Temperatures Around Our Tree



# Results Resultados

## Hours of Daylight



## Results

- **As the air temperature went down and it became colder, the leaves started to change their colors.**
- **As the air temperature went down, the surface temperature and the tree temperature went down, or decreased.**
- **The tree and next to the tree temperature measures were lower than the one away from the tree.**
- **When it turned colder, the sunrise was later and the sunset was earlier. There were less hours of sunlight.**
- **The leaves started falling.**

# Resultados

- Mientras la temperatura del aire bajaba y se ponía más frío, las hojas comenzaron a cambiar de colores.
- Mientras la temperatura del aire bajaba, la temperatura de la superficie y del árbol bajaron o disminuyeron.
- Las medidas de temperatura del árbol y al pie del árbol eran menores que las tomadas lejos del árbol.
- Cuando se puso más frío, amanecía más tarde y atardecía más temprano. Había menos horas de luz solar.
- Las hojas comenzaron a caer.

## Conclusion

We conclude that the changes in the air temperature affect the leaves and the trees because when the air temperature goes down or decreases, the leaves change colors and fall. When the air temperature goes down, the surface temperature decreases. The temperature next to the tree is lower because the tree gives us shade. The temperature away from the tree is higher because of the sunlight. When there are less hours of sunlight, the leaves change colors and fall. The tree needs sunlight, so the leaves can grow, and for it to produce food for itself. When the Winter is coming the tree prepares to become dormant. Like the animals, the tree stores food and energy to go through the Winter. The tree is not dead in the winter, it is dormant. When the Spring comes, the tree is ready to produce leaves again.

## Conclusión

Nosotros concluimos que los cambios en la temperatura del aire afectan las hojas y los árboles porque cuando la temperatura del aire baja o disminuye, las hojas cambian de colores y se caen. Cuando la temperatura del aire baja, la temperatura de la superficie disminuye. La temperatura al lado del árbol es más baja porque el árbol nos da sombra. La temperatura lejos del árbol es más alta por la luz solar. Cuando hay menos horas de luz, las hojas cambian de colores y se caen. El árbol necesita luz solar para que las hojas puedan crecer y para producir comida para sí mismo. Cuando el invierno se acerca, el árbol se prepara para invernar. Igual que los animales, el árbol almacena comida y energía para pasar el invierno. El árbol no muere en el invierno, si no que está invernando. Cuando llega la primavera, el árbol está listo para producir hojas otra vez.

## **Acknowledgements / Reconocimientos**

- **We want to thank the Boston University and GLOBE scientists and professors: Dr. Garik, Ms. Johnson, and Dr. DeRosa, who worked with us and helped us to learn more about plants and trees.**
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- **Gracias a todos los estudiantes del 4to grado, salón 8!**