Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_

**CSI: Leaf Style**

In this activity, you will compare the amount and type of damage by organisms to leaves of at least two tree species. Select two different tree species with at least 20 leaves on each plant (depending on your class, this may be done within your plot or in another area).

Species one: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Species two: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Before you begin, make a prediction about whether you will have more damage on Species 1 or 2:

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Randomly select five leaves from each plant.

1. Place the leaves in separate, labeled bags (species 1, species 2) and take them back to the classroom. In the classroom, estimate the amount of herbivory of each leaf by using the plastic overlay with the gridlines.
2. Count the number of total squares that show any evidence of herbivory/damage. Record your data below. Keep in mind that if you have a leaf with lots of edge herbivory, you’ll have to estimate the original leaf shape.
3. It may be helpful to use dry/wet erase markers to mark which squares you have counted.
4. If a leaf is partially covering a square, count that as a full square.

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| **Leaves from species #1** | # squares with herbivory | total # squares | **Leaves from species #2** | # squares with herbivory | total # squares |
| 1 |  |  | 1 |  |  |
| 2 |  |  | 2 |  |  |
| 3 |  |  | 3 |  |  |
| 4 |  |  | 4 |  |  |
| 5 |  |  | 5 |  |  |
| **Total** |  |  | **Total** |  |  |
| **Average** |  |  | **Average** |  |  |

**Percent herbivory:** For example, if an average of 12 squares damaged out of a leaf size of 24, the % herbivory for that plant is 50%.

Species #1: average % herbivory = \_\_\_\_

Species #2: average % herbivory = \_\_\_\_

Next, see if you can figure out who is doing the damage to the leaves you have. Choose one leaf from each species to evaluate.

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| **Type of Damage** | **Mark “x” if you see evidence of this type of damage** |
|  | Species #1:  | Species #2:  |
| Chewed |  |  |
|  | Interior holes only |  |  |
|  | Edge damage only |  |  |
|  | Both interior and edge holes |  |  |
| Mined |  |  |
|  | Serpentine mine |  |  |
|  | Blotch/patch mine |  |  |
|  | Needle mine |  |  |
| Skeletonized |  |  |
| Rolled |  |  |
| Galled |  |  |
| Fungal or bacterial damage |  |  |
| Other:  |  |  |
| Other:  |  |  |

**Analysis Questions**

Using the data you collected and the data shared by your classmates, answer the following questions.

1. Based on your results only, which tree species had more evidence of herbivory?

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1. Create a graph of your class results.
2. Based on the entire class’s results, which tree species had more evidence of herbivory? Use reasoning to explain why you might have obtained these results.

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1. Describe the differences you noticed in the types of herbivory between species #1 and species #2.

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1. What type of herbivory was the most common in your class data?

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1. Using the reading on herbivory, can you make an argument, supported by evidence and with appropriate reasoning, about why you got your results?

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