**Just Breathe Green Worksheet** **Example Answers**

**10:30am 74° 75% 65°**

Time of Day \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Temperature \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Humidity \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Dew point \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Clear skies**

Weather conditions \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Condensed water**

What do you predict that you will see accumulate on the bottle/bag? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Clear**

Predict the color of water as it evaporates from the plant. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| --- |
| Plant ID # \_\_\_\_\_\_\_\_Common name: Horsetail *Scientific name*: *Equisetum hyemale* |
| **Time (minutes)** | **Weight (g)** | **Observations (What do you see?)** |
| 0 min | 20.0 g | The bottle is clean, clear and dry. |
| 5 min | 21.5 g | You can begin to see water condensing on the bottle surface. |
| 10 min | 23.2 g | The bottle is no longer transparent. |
| 15 min | 24.0 g | Drops of water can be seen collecting on the sides of the bottle. |

**Determine the amount of transpiration:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Trial 1 weight | 21.5 g | Trial 2 weight | 23.2 g | Trial 3 weight | 24.0 g |
| minus | minus | minus |
| Initial weight | 20.0 g | Initial weight | 20.0 g | Initial weight | 20.0 g |
| equals | equals | equals |
| Trial 1 transpiration mass (g) | 1.5 g | Trial 2 transpiration mass (g) | 3.2 g | Trial 3 transpiration mass (g) | 4.0 g |
| Trial 1transpiration rate | 0.30 g/min | Trial 2transpiration rate | 0.32 g/min | Trial 3transpiration rate | 0.27 g/min |
| **Average transpiration rate (1 g=1 ml)** | **0.296 ml/min** |

**Draw and describe this plant species:**

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| Plant speciesCommon name: Horsetail *Scientific name*: *Equisetum hyemale* |
| Light requirements | Full sun to partial shade | Sketch with details: |
| Height | 1-4 ft |
| Soil conditions | Wet |
| Transpiration rate (ml/min) | 296 |

**Draw and describe plant species selected by two other classmates and record the transpiration rate below:**

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| Plant speciesCommon name: Tickseed *Scientific name: Coreopsis leavenworthii* |
| Light requirements | Full sun | Sketch with details: |
| Height | 1-3 ft |
| Soil conditions | Average to moist |
| Transpiration rate (ml/min) | 150 |

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| Plant speciesCommon name: Tropical Sage *Scientific name: Salvia coccinea* |
| Light requirements | Full sun to partial shade | Sketch with details: |
| Height | 2-3 ft |
| Soil conditions | Well drained |
| Transpiration rate (m/min) | 406 |

**Plant species common name: Tickseed**

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| --- | --- | --- | --- | --- | --- |
| Trial 1 transpiration mass (g) | 0.7 g | Trial 2 transpiration mass (g) | 1.7 g | Trial 3 transpiration mass (g) | 2.2 g |
| Trial 1transpiration rate  | 0.14 g/min | Trial 2transpiration rate  | 0.17 g/min | Trial 3transpiration rate  | 0.15 g/min |
| **Average transpiration rate (1 g=1 ml):** | **0.152 ml/min** |

**Plant species common name: Tropical Sage**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Trial 1 transpiration mass (g) | 1.9 g | Trial 2 transpiration mass (g) | 4.1 g | Trial 3 transpiration mass (g) | 6.5 g |
| Trial 1transpiration rate | 0.38 g/min | Trial 2transpiration rate | 0.41 g/min | Trial 3transpiration rate | 0.43 g/min |
| **Average transpiration rate (1 g=1 ml)”** | **0.407 ml/min** |

**Graphing**

**In one graph, plot the transpiration rate data as volume over time for each plant species. Use different colors
and/or line styles for each plant species and create a key. The slope of the line is the transpiration rate.**

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**Analysis Questions**

**Did one plant species have a higher rate of transpiration than the other? If so, what were the physical differences in the plants? Why might this make a difference? Refer to your drawings and observations of the plants and the data you collected.**

Tropical sage had the highest transpiration rate. Its physical characteristics include a high leaf surface area to overall plant ratio compared to tickseed, and its leaves have a rough textured surface compared to the horsetail. The increase in leaf surface area provides more area for transpiration to occur.

**What was the color of the condensed water? Why?**

The condensed water was clear. Only pure water can evaporate. Any pollutants in the water are adsorbed by soil or remain in the plants’ organic biomass.