

Name: _____ Date: _____ Class: _____

Just Breathe Green Worksheet Example Answers

Time of Day 10:30am Temperature 74° Humidity 75% Dew point 65°

Weather conditions Clear skies

What do you predict that you will see accumulate on the bottle/bag? Condensed water

Predict the color of water as it evaporates from the plant. Clear

Plant ID # <u>1</u>		
Common name: Horsetail		Scientific name: <i>Equisetum hyemale</i>
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 1 transpiration rate	0.30 g/min	Trial 2 transpiration rate	0.32 g/min	Trial 3 transpiration rate	0.27 g/min
Average transpiration rate (1 g=1 ml)					0.296 ml/min

Draw and describe this plant species:

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

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

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

Plant species		Common name: Tropical Sage		Scientific name: <i>Salvia coccinea</i>	
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**

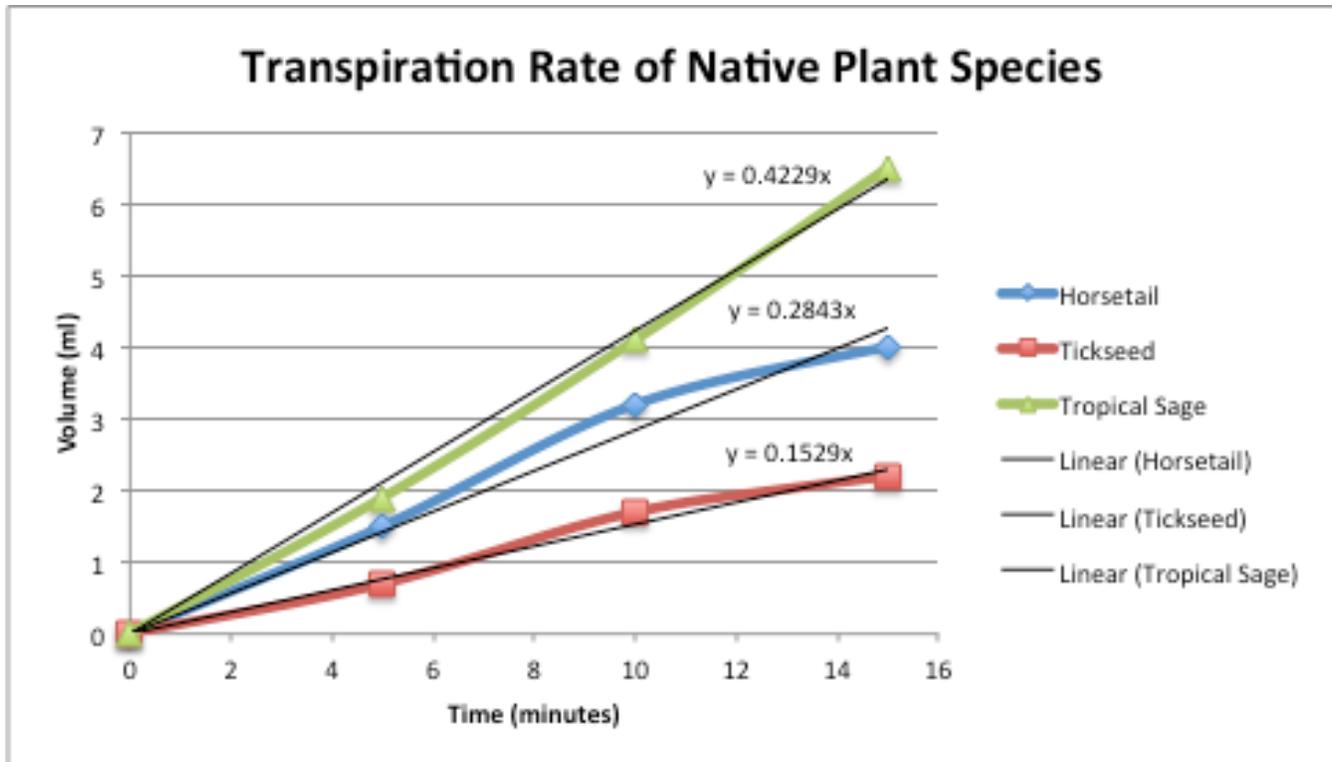
Trial 1 transpiration mass (g)	0.7 g	Trial 2 transpiration mass (g)	1.7 g	Trial 3 transpiration mass (g)	2.2 g
Trial 1 transpiration rate	0.14 g/min	Trial 2 transpiration rate	0.17 g/min	Trial 3 transpiration rate	0.15 g/min
Average transpiration rate (1 g=1 ml):					0.152 ml/min

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 1 transpiration rate	0.38 g/min	Trial 2 transpiration rate	0.41 g/min	Trial 3 transpiration 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.



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.