**Day 1 Magic Sidewalk Worksheet Answer Key**

**10:30am 70°F 60% 62°F**

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

**Clear skies with scattered cumulonimbus clouds**

Weather \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **List the types of materials used to create a concrete sidewalk.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Material 1****aggregate (limestone)** | **Material 2****sand** | **Material 3****cement** | **Material 4****water** |

**2. What material from the list above would you remove to create a magic sidewalk?** \_\_\_**\_\_\_\_\_\_\_**\_\_\_

**cement**

**3. Magic Sidewalk Mix Trial 1**

|  |  |  |
| --- | --- | --- |
| **Material 1****limestone** | **Material 2****sand** | **Material 3****water** |
| **Amount (volume/ratio) of Material 1****2 parts** | **Amount (volume/ratio) of Material 2****2 parts** | **Amount (volume/ratio) of Material 3****1 part** |

**Observe** Does Magic Sidewalk Trial 1 stick together? \_\_\_\_\_
Does Magic Sidewalk Mix Trial 1 look magical? \_\_\_\_\_

**no**

**no**

**4. Magic Sidewalk Mix Trial 2. What material would you remove?** \_\_\_\_\_\_\_\_**\_\_\_\_\_\_\_\_\_**\_\_\_\_\_\_\_\_\_\_\_\_

**limestone**

|  |  |  |
| --- | --- | --- |
| **Material 1****sand** | **Material 2****cement** | **Material 3****water** |
| **Amount (volume/ratio) of Material 1****1 part** | **Amount (volume/ratio) of Material 2****1 part** | **Amount (volume/ratio) of Material 3****1 part** |

**Observe** Does Magic Sidewalk Trial 2 stick together? \_**\_\_**\_
Does Magic Sidewalk Mix Trial 2 look magical? \_\_**\_\_**\_\_

**yes**

**no**

**5. Magic Sidewalk Mix Trial 3. What material would you remove?** \_\_\_\_\_\_\_\_\_\_\_\_\_**\_\_\_\_\_\_**\_\_\_\_\_\_\_\_\_\_

**yes**

**sand**

|  |  |  |
| --- | --- | --- |
| **Material 1****limestone** | **Material 2****cement** | **Material 3****water** |
| **Amount (volume/ratio) of Material 1****2 parts** | **Amount (volume/ratio) of Material 2****1 part** | **Amount (volume/ratio) of Material 3****1 part** |

**Observe** Does Magic Sidewalk Trial 3 stick together? \_\_\_\_\_
Does Magic Sidewalk Mix Trial 3 look magical? \_\_\_\_\_

**yes**

**Day 2 Magic Sidewalk Worksheet Answer Key**

**10:30am 72°F 68% 65°F**

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

**Overcast with 40% chance of rain**

Weather \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Magic Sidewalk Infiltration Testing**

1. **Infiltration Rate**

Use the same amount of water for each trial and keep track of the time it takes for the water to disappear.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Volume of water (ml)** | **Time to drain (sec)** | **Infiltration rate (ml/sec)** |
| **Trial 1** | **1000 ml** | **8.5 seconds** | **117 ml/second** |
| **Trial 2** | **1000 ml** | **13.5 seconds** | **74 ml/second** |
| **Trial 3** | **1000 ml** | **10 seconds** | **100 ml/second** |

1. ***Observations*:
Describe what happens to the water when you pour it onto the surface of your “magic” sidewalk.**

The poured water “magically” moves through the pervious pavement into the underlying media layer. The water is quickly removed from the biodegradable planter ponding area and infiltrated into the media layer that was created in the previous activity. Here, the water percolates through the media layer into the underdrain zone prior to draining out of the planter.

1. **What magic sidewalk mix would you recommend for reducing the amount of stormwater runoff?**

Expect students to recommend a magic sidewalk mix combination that has a high infiltration rate while remaining structurally sound to traffic loading. The recommendation is dependent on the ratio selected and class discussions about different pervious pavement attributes and mix combinations.