

Advance Preparation for Optional In-Class Demonstration

Tips for a successful demonstration

- *Choose a good space to do the demonstration.* Consider where you can set up the demonstration in a place that all students can watch.
- *Use live moss material for Setup B.*
- *Use slightly wet sand, but not too wet.* In a plastic bin, pour and evenly spread dry sand up to a depth of 1.5-2 inches. Then, add approximately 5 cups of water to the dry sand. Mix thoroughly and spread the wet sand evenly. The sand should feel damp and hold its form without collapsing like dry sand.
- *Pour the water for 20-25 seconds.* If you pour too slowly, the water will percolate deeper into the sand and little channeling will occur. If you pour too quickly, the water may splash and the desired effects will not be observed.

Materials for the demonstration

- ☐ 1 50-lb bag of sand
- ☐ 3 41-quart plastic bins filled $\frac{1}{3}$ (or about 1.5-2" deep) with wet sand
- ☐ wood or books to raise one end of each bin up so the top of the sand is 15 cm above the ground
- ☐ 1 12" x 12" patch of moss or similar material
- ☐ 1 12" x 12" piece of concrete or impermeable plastic
- ☐ 1 funnel
- ☐ 1 ruler
- ☐ 1 1-cup measuring cup
- ☐ 1 1-L water bottle
- ☐ water
- ☐ 1 turkey baster
- ☐ 1 bucket

Note: You can reuse sand from Lesson 3. You will want to make sure it's not too wet, so leave it out to dry after Lesson 3.

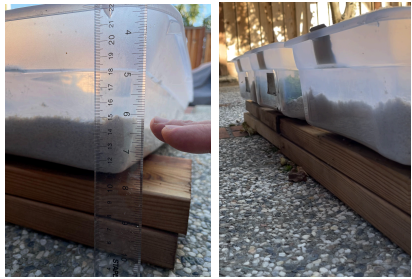
Lesson 6a: Advance Preparation for Optional In-Class Demonstration

Preparation Steps

First, watch the Lesson 6a demonstration video to see how everything should look to begin the investigation. Then, watch the Lesson 6a Advance Prep for Optional Live Demonstration video for details on how to prepare this as a live demonstration in the classroom. After watching both videos, follow these steps to set up the live demonstration.

Step	Procedures	Reference image
1	Collect all the supplies: ● 1 50-lb bag of sand ● 3 41-quart plastic bins ● wood or books ● enough moss or similar plant material to form a 12" x 12" square ● 1 12" x 12" piece of concrete ● 1 funnel ● 1 ruler ● 1 1-cup measuring cup ● 1 1-L water bottle ● water (approximately 1 liter of water per trial) ● 1 turkey baster ● 1 bucket	
2	Pour and spread the dry sand evenly until you have 1.5-2 inches of sand in each plastic bin.	
3	Pour approximately 5 cups of water into each bin to wet the sand. Thoroughly mix the water and dry sand until the sand feels damp and can hold its shape. (Note: The sand should not be soaked and should not be dripping with water when picked up.)	

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4	Place pieces of wood or books under one end of each plastic bin in order to raise the height of the sand inside the bins to approximately 15 cm above the ground or table.	
5	Setup A contains only sand.	
6	Setup B contains moss and sand. Arrange approximately 12" x 12" of moss at the elevated end of the plastic bin.	
7	Setup C contains concrete and sand. Place the 12" x 12" concrete at the elevated end of the plastic bin. Tip • So the concrete doesn't sit too high over the sand, move some of the sand from where the concrete will rest. This sand can then be spread evenly throughout the plastic bin. • Push some of the sand up against the lower edge of the concrete so that the sand and concrete are approximately the same height.	

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In-Class Steps (for teacher use)

Watch the Lesson 6a: Virtual Demonstration video: Setups A, B, and C for an example of what this looks like.

Step	Procedures	Reference image
1	Distribute the <i>Lesson 6a: Investigating Water Flow Effects</i> handout to each student.	
2	Measure 900-1,000 mL of water into a bottle or container. Remind students to make observations.	
3	Hold the funnel over the center of the bin, near the elevated end, and above the sand (Setup A). Pour the water into the funnel for 20-25 seconds, being sure to keep the funnel in the same position for the entire pour. Give students time to discuss and record observations.	
4	Repeat the above steps for Setup B and Setup C.	

Cleanup

- If puddling occurs near the lower end of the plastic bin, remove as much water as possible using a turkey baster. Place the sandy water in a bucket and dispose of this water outside. *Do not* pour the waste water down any drain.
- Leave the wet sand uncovered to dry before storing.
- When the sand is dry, gently remove the moss from Setup B. Dispose of the moss with other garden waste. To remove any leftover moss debris from the sand, gently remove the top layer of dry sand from Setup B and dispose of the moss mixed with sand outside.