

# STORMWATER RUNOFF MAPPING



## Purpose & Goals

**Purpose:** To attain a deeper understanding of how water runs off the landscape. To use this understanding to think like an engineer and make decisions in context with the water cycle.

**Goal:** Visually map the school yard's runoff patterns and use the map to make a plan of action for how to capture and treat school yard stormwater.

## Standards

STEM Science: 4.1.2.1.1., 4.1.2.2.1., 4.3.2.3.1., 4.3.4.1.1., 5.1.1.1.4., 5.3.1.2.2., 5.1.3.4.2., 6.1.2.1.1., 7.1.3.4.1., 7.1.3.4.2., 8.1.3.4.2., 8.3.2.3.1., 8.3.2.3.2., 8.3.4.1.2., 9.1.2.2.2.

**Time:** 1 hr

**Grades:** 3-5

## Preparation & Materials

Before the lesson, acquire a map of the schoolyard from VLAWMO.

- 5-8 milk gallon jugs full of water
- Clipboards for each group
- Photos of stormwater best management practices (BMP's)

## Terms

**Best management practice (BMP):** A strategy to harness, store, and treat stormwater.

**Impermeable:** A surface that doesn't allow water to soak into the ground.

**Permeable:** A surface that allows water to soak (permeate) into the ground.

**Runoff:** Water that collects on a surface during a rain event.

**Water table:** Where saturated soil meets unsaturated soil above it. The water table can move up and down depending on rainfall from year to year. A "high water table" means saturated soil is up closer to the surface. It marks the start of shallow groundwater.



## Procedure

1. Introduce the activity using a map of the schoolyard. Explain different surfaces in terms of stormwater runoff: water runs off pavement and even grass, picking up nutrients, salt, or other pollution such as motor oil or garbage.
2. Divide students into groups of 2-3, each equipped with a gallon of water.
3. Send students around the schoolyard to pour the water on a variety of surfaces. With a clipboard, students draw arrows to depict the directions water drains. Students should cover a variety of surface types (pavement, turf grass, sand/gravel, long grass or wooded areas).
4. Students return to the classroom to analyze their maps and form a hypothetical plan for where to place BMP's on the school yard, and which BMP's to use. Describe and hand out BMP sample cards for reference.
5. Students present their findings or combine their findings on a collective map to cover all areas of the schoolyard that were surveyed in step 3. Collective map includes arrows for drainage direction and taped-up BMP cards at the location selected by the groups.

## Reflection

1. Which surfaces shed water quickly? How far did it go from where it was poured?
2. What would the quick surfaces look like during a rainfall?
3. Which section of the schoolyard has the most runoff? Which area has the least?
4. Imagine you're the building planner at your school long ago. What's your strategy for runoff - is there a certain direction you want water to go?
5. What are the positives and negatives of fast runoff drainage?
6. What's the nearest water body that would receive runoff from your school yard? What will you do differently knowing this?
7. Which surfaces would you create more of, which would you create less of?
8. What stormwater BMP's are already on the school yard? Are they in the right place according to your findings?

## Assessment

At the end of the activity, students will have assigned locations for each BMP and be able to cite a reason for their placement. They may hand in their map, a combination of reflection questions, or both.