Family edition

Watershed Lab: What Washes Into the Creek?

Ages 11-14 · about 45 minutes, in one sitting

Your child builds farms and a town on a valley in Watershed Lab, rains on it with a colored dye that shows where the creek's pollution comes from, and tests changes that keep it out.

What you need

- A computer or Chromebook with a current browser.
- The lesson link: mytekdev.com/try/watershedlab?lesson=what-washes-into-the-creek&ref=fam-watershedlab-4. No account, no email and nothing to install.

Before you start: try it once yourself

Open mytekdev.com/try/watershedlab?lesson=what-washes-into-the-creek&ref=fam-watershedlab-4. A short guide opens over the app, on Millbrook Valley, rained once, with Cover the land open.

1. **A farm.** Pick `Cornfield` and paint the valley floor. Press `Rain`.
2. **The dye.** Turn on `Dye`: green fertilizer swirls into the creek below the field. The card lists what the storm's water tested at the creek mouth.
3. **A feedlot and a town.** Under `Put on the land`, pick `Feedlot` and click beside the creek; paint a `Town`. Rain: brown manure and dark oil join. Zoom in on the town: grates, a dashed pipe under the street, a pipe end on the bank.
4. **A fix.** Paint `Meadow` over half of the field, or `Forest` over a parking lot, and rain the same storm. Compare the creek mouth.

> The moment that lands is the storm drain: the pipe goes straight to the creek. Go back to the warm-up answers.

The ideas, in plain words

Point source pollution enters at one place, like a factory pipe or a wastewater plant; it can be measured, permitted and fixed at the pipe. Nonpoint source pollution washes off a wide area with the rain: fertilizer and soil from fields, manure from feedlots and pastures, oil and grit from streets and parking lots. In the United States it is the leading cause of water quality problems, and the hardest to clean up.

In most towns the storm drain pipe is separate from the sewer pipe that takes water from toilets and sinks to the treatment plant, so what washes into a grate reaches the creek untreated. Some older cities have combined sewers, where storm water does go to the plant except in heavy rain. Buffer strips of grass or trees along creeks, cover crops, and less pavement keep some pollution out.

Simplifications to know: the app does not model a buffer strip catching runoff, so a strip of meadow below a field changes little there; its fixes work by changing what covers the land. Algae in a real pond often depends more on phosphorus than on nitrate, which is the only nutrient the app tests; and in tile-drained farmland much of the nitrate reaches creeks underground between storms. The valley is a model with numbers of the right size, not a real place. The runoff uses the curve numbers engineers use, and the storms are real ones for central Iowa.

Do it together

1. Open mytekdev.com/try/watershedlab?lesson=what-washes-into-the-creek&ref=fam-watershedlab-4 together. A short guide opens over the app. Pick `Cornfield` and paint the valley floor, then press `Rain`.

   > **You'll know it worked when:** The storm runs over the field and into the creek.

2. Turn on `Dye`. Ask: where is the green coming from?

   > **If you get stuck:** Green is fertilizer, washing off the whole field with the rain.
   >
   > **You'll know it worked when:** Green swirls in the creek below the field.

3. Pick `Town` and paint a patch, rain again, and zoom in on the town. Ask: where does the water in the grates go?

   > **If you get stuck:** Follow the dashed pipe under the street.
   >
   > **You'll know it worked when:** It comes out of a pipe on the creek bank, untreated.

4. Paint `Meadow` over half of the cornfield, and rain the same storm. Ask: did it help?

   > **You'll know it worked when:** The creek mouth readings on the card go down.

Talk about it

Ask these while you work together. A child who has understood it can answer them without help:

- Point to the green in the creek. Where did it start?
- Where does the water in a storm drain go?
- Which of your sources is a point source, and which are nonpoint?
- Did you rain the same storm before and after your change?
- Why is nonpoint pollution harder to clean up?

> The second question is the real test: a child who says the storm drain goes straight to the creek, untreated, has the idea.

For younger and older kids

Younger: For a younger child, open Setup and pick grades 2 to 5, and stop after the dye.

Older: For a teenager, compare two fixes by how much nitrate each keeps out of the creek mouth.

Keep going

- Find the change that keeps the most nitrate out for the least land.
- Explain why the feedlot shows brown only in a storm.
- Write a rule for the town that would keep the creek mouth under the swimming line.

Bring it into other subjects

- Civics: find who looks after storm drains in your town, and whether the drains near school are marked "drains to creek".
- Math: compare the creek mouth's nitrate before and after your fix. What fraction did the fix keep out?
- Art: design a storm drain marker for the school that tells people where the water goes.
- English: write a short public service announcement about what not to pour down a storm drain.

For your records

Ready to copy into an hour log, a portfolio or a transcript.

LESSON	Watershed Lab: What Washes Into the Creek?
SUBJECTS	Earth science
TIME	45 minutes
WHAT WE DID	Modeled how fertilizer, manure, oil and soil wash off a valley into a creek, followed a storm drain to the creek, and tested land changes that keep pollution out.
SKILLS PRACTICED	Nonpoint source pollution; Storm drains; Testing solutions

Activity sheet (optional)

Name: _____ Date: _____

Open the app: scan the QR code, or go to mytekdev.com/try/watershedlab?lesson=what-washes-into-the-creek

Essential question: No single pipe is to blame. How does pollution from a whole valley get into the creek, and what keeps it out?

Warm-up: Where does the water go when it runs off a street into the grate at the curb?

_____

1. **Vocabulary.** Nonpoint source pollution, point source pollution, storm drain, fertilizer, buffer strip: write each in your own words.

2. **The before-and-after table.** Before your change: the creek mouth readings _____. Your change _____. After, with the same storm: the readings _____.

1. Name one point source and one nonpoint source in your valley. Why is the nonpoint one harder to clean up?

2. Which change kept the most out of the creek? Use your numbers.

Quick check

Name: _____

1. Fertilizer washing off a whole cornfield in the rain is (A) point source pollution (B) nonpoint source pollution (C) not pollution

2. In most towns, water in a street storm drain goes (A) to the wastewater plant (B) straight to a creek, untreated (C) into the ground under the street

3. Name one change to the land that keeps pollution out of a creek, and explain how it works.

Answers

QUESTION	ANSWER	WHY
1	B	It comes from everywhere on the field at once, not from one pipe.
2	B	In most towns the storm drain pipe is separate from the sewer, so nothing cleans it.
3	For example, meadow or forest in place of part of a field or a parking lot	Less fertilizer or oil is on the land, and more rain soaks in. A buffer strip along a real creek also slows runoff and catches some of what it carries. Naming a change without how it works is half.

If your state or umbrella school asks, this lesson covers NGSS MS-ESS3-3.

Terms of use

This lesson was made by mytekDev. You may print and copy it for the children you teach at home, and change it for them. You may not sell it, share it with other families, or post it publicly.

The app this lesson uses is free and runs in the browser, with nothing to install and no account needed. It is at mytekdev.com.

© 2026 mytekDev. All rights reserved.