Family edition

Watershed Lab: Where Does the Rain Go?

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

Your child rains a storm on a forest valley in Watershed Lab, finds out how much of the rain soaked in, and follows raindrops down to the creek and over the divide into the next watershed.

What you need

- A computer or Chromebook with a current browser.
- The lesson link: mytekdev.com/try/watershedlab?lesson=where-does-the-rain-go&ref=fam-watershedlab-1. No account, no email and nothing to install.

Before you start: try it once yourself

Open mytekdev.com/try/watershedlab?lesson=where-does-the-rain-go&ref=fam-watershedlab-1. A short guide opens over the app. A forest valley sits on a wooden tabletop, about four kilometers across, its hills drawn five times taller than real so the shape reads.

1. **The storm.** Press `Rain` with the Big storm. Rain falls, the creeks swell, and the gauge draws the rain as bars from the top and the creek as a curve from the bottom.
2. **The card.** When it ends: 93% soaked in and 7% ran off, and the creek rose from 0.11 to 3.5 cubic meters a second, highest at hour 15, about two hours after the heaviest rain.
3. **The divide.** The yellow line appears after the first storm. `Divides` turns it off and on.
4. **A drop.** Pick `Follow a drop` and click high on the land: the path runs to the creek and out of the mouth, about 3 kilometers in about an hour. Click just outside the yellow line: it runs off the table into another watershed.
5. **The Map.** Press `Map`: the valley from straight above, a contour line every 10 meters.

> The moment that lands is the second drop. Children expect water to go to the nearest creek; a drop a step outside the line goes the other way entirely.

The ideas, in plain words

A watershed is all the land that drains to one place. Its edge, the divide, follows the high ground: rain landing on the ridge runs away from it on both sides. Every creek has a watershed, and small ones nest inside bigger ones.

Rain that reaches the ground either soaks in or runs off. Forest soil, covered in leaves and full of roots and holes, takes in most of an ordinary storm. What soaks in moves slowly through the ground and seeps into the creek over

days, which is why a creek keeps running between storms. The rest runs downhill over the surface to the nearest creek.

Common mistakes: thinking the divide is a river or a fence; thinking all rain ends up in the river at once; and thinking groundwater flows in underground rivers. 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=where-does-the-rain-go&ref=fam-watershedlab-1 together. A short guide opens over the app. Press `Rain` and watch the creeks and the gauge.

   > **You'll know it worked when:** The creeks swell, the storm ends, and a yellow line appears around the valley.

2. Read the card: how much soaked in, and how much ran off?

   > **If you get stuck:** Look for the green and blue bar under Of all the rain that fell.
   >
   > **You'll know it worked when:** About 93 of every 100 drops soaked into the forest.

3. Pick `Follow a drop` and click high on the land inside the yellow line.

   > **You'll know it worked when:** The drop's path is drawn to the creek, and the card says how far it ran and how long it took.

4. Now click just outside the yellow line. Ask: why did this one go somewhere else?

   > **If you get stuck:** The yellow line runs along the tops of the hills. Water runs downhill away from it on both sides.
   >
   > **You'll know it worked when:** The drop runs off the table into a different watershed.

Talk about it

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

- Point to the divide. Why is it there and not somewhere else?
- Where did most of the rain go?
- Your drop took about an hour to reach the mouth. Why did the creek peak after the rain did?
- Why did the drop outside the line go to a different place?
- On the Map, how can you tell where the ridge is?

> The fourth question is the real test: a child who says the drop ran downhill away from the high ground has the idea of a divide.

For younger and older kids

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

Older: For a teenager, try the Once in a hundred years storm on the same forest and compare how much runs off.

Keep going

- Switch to the Once in a hundred years storm: how much of it runs off the same forest, and why more?
- Pick Shape the land and raise a ridge across the valley: where does the divide move, and where does the water go now?
- On the Map, find the steepest slope by the spacing of the contour lines.

Bring it into other subjects

- Geography: find your own school's watershed on How's My Waterway (EPA, free), and the creek or river the rain on the parking lot ends up in.
- Math: the creek rose from 0.11 to 3.5 cubic meters a second. How many times as much is that? How many liters in one second at the peak?
- English: write the raindrop's trip from the hilltop to the beach in the first person, in eight sentences.
- Art: draw your neighborhood with its high ground and where the rain would run.

For your records

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

LESSON	Watershed Lab: Where Does the Rain Go?
SUBJECTS	Earth science
TIME	45 minutes
WHAT WE DID	Modeled a storm on a forest valley, measured how much rain soaked in and ran off, and traced raindrops to the creek and across the watershed divide.
SKILLS PRACTICED	Watersheds and divides; Runoff and infiltration; Reading contour maps

Activity sheet (optional)

Name: _____ Date: _____

Open the app: scan the QR code, or go to mytekdev.com/try/watershedlab?lesson=where-does-the-rain-go

Essential question: Rain falls on the whole valley. What decides which creek it ends up in?

Warm-up: A day of rain falls on a forest. Where do you think the water goes? _____

1. **Vocabulary.** Watershed, divide, runoff, infiltration, creek mouth: write each in your own words.

2. **The drop table.** For each drop: where it landed _____; inside or outside the line ____; how far it ran _____; how long it took _____; where it ended up _____. One drop on each line.

1. After the Big storm, how much of the rain soaked into the forest, and how much ran off?

2. Two drops land a step apart, on either side of the yellow line. Where does each end up, and why?

Quick check

Name: _____

1. A watershed is (A) a building where water is stored (B) all the land that drains to one place (C) a river and its banks

2. Most of the rain on the forest (A) ran off into the creek (B) soaked into the ground (C) dried up in the air

3. Rain lands just outside the divide. Explain why it does not end up in this creek.

Answers

QUESTION	ANSWER	WHY
1	B	Every bit of land inside the divide drains to the same creek mouth.
2	B	In the Big storm 93% soaked in. Forest soil takes in most of an ordinary storm.
3	The divide is high ground	Water runs downhill away from the ridge on both sides, so rain outside the line runs into a different watershed. Saying it is outside the line alone is half.

If your state or umbrella school asks, this lesson covers NGSS MS-ESS2-4, NGSS MS-ESS3-3.

Terms of use

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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.

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