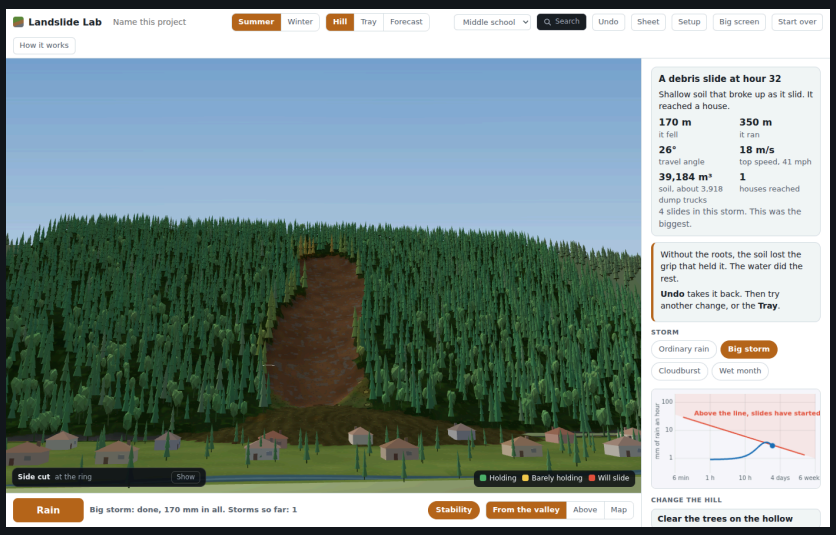
mytekDev

Landslide Lab: Why Did the Hill Let Go?

Grades 6-8 · 45 minutes

Earth science



Slides, rubric and answer key **Print and go** **No student accounts**

Chromebook friendly

What's included

- A one-page overview: objectives, essential question, vocabulary, standards and assessment
- A 45-minute lesson sequence: warm-up, direct instruction, guided practice, independent practice, closure
- Slides for the board: a PowerPoint file that also opens in Google Slides
- A student worksheet with a QR code and a storm table
- A 3-question exit ticket, two to a page, with an answer key
- A rubric: 3 criteria, 4 levels, scored out of 12
- Differentiation for English learners, students with IEPs or 504 plans, and students who need more support or more challenge
- Cross-curricular extensions, and notes for teaching it in grades 4 and 5 and in high school earth science
- Standards: NGSS

Landslide Lab: Why Did the Hill Let Go?

Grades 6-8 · 45 minutes · Earth science

Students rain on a forested hill above a road and houses, and watch the water rise in the soil in a side cut. The big storm leaves the hollow barely holding. They clear its trees and the same storm brings it down, then try cutting the road deeper instead, and explain each result as the pull of the weight against the grip.

At a glance

ESSENTIAL QUESTION

The same rain falls on the whole hill. Why does one part of it slide?

OBJECTIVES

Students will be able to:

- describe a slope as a balance: the pull of the weight down the slope against the grip that holds it
- explain why water gathering in a hollow brings it closest to sliding
- explain what roots do for a slope, and why clearing them matters
- compare two human changes to a hill and the slides each one caused

VOCABULARY

Landslide, Hollow, Water table, Grip, Pull

STANDARDS

MS-ESS3-2, MS-ESS2-2

TIME AND MATERIALS

45 minutes, grades 6-8.

- One computer or Chromebook per student
- A projector
- The worksheet and exit ticket, one copy each per student
- The rubric, one copy per student if you grade the work

PREP

Make copies of the worksheet and exit ticket. Before class, open mytekdev.com/try/landslidelab?lesson=why-did-the-hill-let-go&ref=tpt-landslidelab-1 once on a student computer: it opens on Cedar Hollow with an ordinary storm, and checks that your school's filter allows the app. Run it yourself, about ten minutes: the ordinary storm, the big storm, Clear the trees on the hollow and the big storm again, then Undo, Cut the road deeper and the big storm.

ASSESSMENT

- Formative: the questions under What to look for, asked while students work, and the exit ticket (answer key included).
- Summative: the worksheet, scored with the rubric.

TECHNOLOGY AND PRIVACY

Runs in any browser, Chromebooks included, with nothing to install. Students need no account and no email: the link works signed out, and nothing they do is stored on our server unless they choose to save.

Lesson sequence

MINUTES	STAGE	WHAT YOU DO	WHAT STUDENTS DO
0 to 5	**Warm-up** Hook	Show the title, essential question and Today I can slides (about 1 minute). Then the warm-up: which part of a forested hill slides first in heavy rain? Write every answer on the board.	Answer the warm-up on the worksheet.
5 to 12	**Direct instruction (I do)** Model it	Project the app with the starter open. Press Rain and point at the side cut in the corner: the blue layer rising from the rock up. Show Inside the hill, then Grip divided by pull: the ordinary storm leaves the hill at 1.38 where it is weakest. **It's working when:** Ask where the water goes after it soaks in. It drains downhill through the soil, into the hollow, from the whole hill above it.	Watch, and fill in the vocabulary on the worksheet.
12 to 22	**Guided practice (We do)** The big storm together	Students open the link or scan the QR code. A short guide walks them through: Rain, the Big storm, Clear the trees on the hollow, Rain. Check that every screen shows the hollow barely holding in the big storm, and slides after the trees are cleared. **Watch for:** Students who think the trees were holding the soil up like a wall. Roots tie the soil together and to the rock, and only as deep as they reach.	Fill in the first three rows of the storm table: the change, the storm, and whether it held or slid.
22 to 38	**Independent practice (You do)** A different change	Students press Undo, cut the road deeper, and run the big storm. Then each picks one more change: the Burn brush on the hollow with the Cloudburst storm, or Plant trees on a cleared hollow. Walk the room with the What to look for questions. **If they ask:** "The cut road made slides, but the hollow did not slide. What did the cut take away from the slope above it?" Road cut	Fill in the storm table for each run, with how far the biggest slide ran and whether it reached a house.
38 to 45	**Closure** Showcase and exit ticket	Show the Showcase slide. Two students explain why the hollow slid first, then go back to the warm-up answers. Hand out the exit ticket.	Answer the exit ticket.

Before you teach: a ten-minute walkthrough

Open mytekdev.com/try/landslidelab?lesson=why-did-the-hill-let-go&ref=tpt-landslidelab-1. A short guide opens over the app. A forested hill rises above a road and a row of houses, seen from the valley floor. The side cut in the corner is a slice through the hill.

1. **The ordinary storm.** Press `Rain`. The blue layer in the side cut rises from the rock up. The hill holds: at its weakest place the grip is 1.38 times the pull.
2. **The colors.** After the first storm the hill takes colors: green holds easily, yellow barely holds, red would slide. `Stability` turns them off and on.
3. **The big storm.** Pick `Big storm` and press `Rain`. The hollow turns yellow: 1.04.
4. **Clear the hollow.** Press `Clear the trees on the hollow`, then `Rain`. Four slides run. The biggest falls 170 m, runs 350 m, crosses the road and reaches a house.
5. **Cut the road.** Press `Undo`, then `Cut the road deeper`, and `Rain`. The steep bank above the road slumps onto it in short slides, and the hollow holds.

> The moment that lands is the hollow. Students expect the steepest place to slide. The hollow slides because it is the wettest, and the colors show it before anything moves.

Background for the teacher

A slope holds while the grip of its soil is bigger than the pull of its weight down the slope. The grip comes from grains rubbing on each other, a little stickiness, and roots. The pull grows as the slope gets steeper. The ratio of grip to pull is the factor of safety: above 1 it holds, below 1 it slides.

Rain that soaks in drains downhill through the soil and gathers in hollows. Water filling the spaces between the grains pushes them apart, so they press on each other less and grip less. That is why a hollow full of water slides before a steeper, drier slope beside it. Roots tie the soil together and to the rock; after logging they rot over a few years and that grip is gone. A road cut takes away the soil at the bottom of a slope that held up the soil above it.

Common mistakes: thinking the water makes the soil slippery like oil; thinking only the steepest slopes slide; and thinking trees hold a hill up like a wall. The app is a model of a made-up hill and mountain. It is not a tool for judging a real slope.

What to look for

Ask these while students work. A student who has understood the lesson can answer them without help:

- Point to the water in the side cut. Where did it come from?
- Why is the hollow yellow when the slope beside it is green?
- Which arrow got smaller in the big storm, the pull or the grip?
- What did clearing the trees take away?
- What did cutting the road take away?

> The third question is the real test: the water changes the grip, not the pull. A student who says so has the idea.

Cross-curricular extensions

- Math: the biggest slide moved 39,184 cubic meters of soil. A dump truck carries about 10. How many trucks is that, and how long would it take to clear the road at one truck every ten minutes?
- Social studies: read a news report of a landslide that closed a road after heavy rain, and find the trigger and the human changes it names.
- English: write the county's warning to the people in the houses below the hollow, in five sentences.
- Engineering: sketch one way to protect the road from the cut bank, and say what it would change in the balance.

Vocabulary

Landslide	Soil and rock moving down a slope all at once.
Hollow	A low fold in a hillside, like a shallow valley, where water drains to.
Water table	The top of the water in the soil. In the side cut it is the top of the blue layer.
Grip	What holds the soil on the slope: the grains rubbing, a little stickiness, and roots.
Pull	The part of the soil's weight that pulls it down the slope. Steeper slopes pull harder.

Differentiation

ENGLISH LEARNERS

- Keep the vocabulary slide up, and point at the screen as you say each word: the side cut, the colors and the pit carry the meaning.
- Pair each learner with a partner for the big storm; the stability colors and the words Holding, Barely holding and Will slide are on the screen.
- Accept the storm table as Held or Slid, without sentences.

STUDENTS WITH IEPS OR 504 PLANS

- Pair students for the independent part, one pressing the buttons and one filling in the table.
- Zoom the browser to 125%; the side cut and the card stay readable.
- Allow the guided runs and one change, where the IEP allows a modified assignment.

STUDENTS WHO NEED MORE SUPPORT

- A sentence starter: "The hollow slid because ___."
- A check-in after the guide: every student has seen the cleared hollow slide before anyone moves on.
- Point at the two arrows in the side cut and ask only which one is longer.

STUDENTS READY FOR MORE

- Switch the level to high school and read the grip and the pull in kilopascals in the side cut.
- Find the smallest change to the hill that makes the ordinary storm bring it down.
- Plant trees on the cleared hollow and run the big storm: explain why the young trees do not hold it yet.

Adapting for other grades

Younger students: In grades 4 and 5, pick Grades 2 to 5 in the level menu: the hill uses words only, Holding, Barely holding, Will slide. Do the guide together and stop there; skip the third rubric row; total 8, and 6 meets the objectives.

Older students: In high school, pick High school in the level menu: the side cut gives the grip and the pull in kilopascals, and the rain chart adds a second threshold line. Students type their own storm in millimeters an hour and find the smallest one that brings the cleared hollow down.

Student worksheet

Name: _____ Date: _____

Open the app: scan the QR code, or go to mytekdev.com/try/landslidelab?lesson=why-did-the-hill-let-go

Essential question: The same rain falls on the whole hill. Why does one part of it slide?

Warm-up: Which part of a forested hill slides first in heavy rain, and why? _____

1. **Vocabulary.** Landslide, hollow, water table, grip, pull: write each in your own words.

2. **The storm table.** For each run: what you changed _____; the storm _____; held or slid _____; how far the biggest slide ran _____; did it reach a house? ____. One run on each line.

1. The hollow is not the steepest place on the hill. Why did it come closest to sliding?

2. Clearing the trees and cutting the road both made slides. What did each change take away from the slope?

Landslide Lab: Why Did the Hill Let Go?

Exit ticket

Name: _____

1. Water in the soil makes a slope weaker because it (A) makes the soil slippery like oil (B) pushes the grains apart, so they grip less (C) makes the soil lighter

2. After the trees on a slope are logged, the slope is weakest (A) the same day (B) a few years later, when the roots have rotted (C) never, because the stumps stay

3. The same storm falls on a whole hill and only the hollow slides. Explain why.

Landslide Lab: Why Did the Hill Let Go?

Exit ticket

Name: _____

1. Water in the soil makes a slope weaker because it (A) makes the soil slippery like oil (B) pushes the grains apart, so they grip less (C) makes the soil lighter

2. After the trees on a slope are logged, the slope is weakest (A) the same day (B) a few years later, when the roots have rotted (C) never, because the stumps stay

3. The same storm falls on a whole hill and only the hollow slides. Explain why.

Answer key: exit ticket

QUESTION	ANSWER	WHY
1	B	Water between the grains pushes them apart, so they press on each other less. It does not oil them.
2	B	Roots keep their grip for a while after the trees are cut, then rot. The app takes that time as passed.
3	Water gathers in the hollow	Rain soaks in and drains downhill through the soil into the hollow, so it fills with water first and grips least. Naming the water alone is half.

Rubric

Score each row from 1 to 4.

Name: _____

CRITERIA	4 EXCEEDS	3 MEETS	2 APPROACHING	1 BEGINNING
The storm table	Every run recorded with the change, the storm, held or slid, and the biggest slide's distance, with one change at a time.	Every run recorded with the change, the storm, and held or slid.	Some runs recorded.	No runs recorded.
Water and the hollow	Explains that rain soaking in drains through the soil into the hollow, and that the water pushes the grains apart so they grip less.	Explains that water gathers in the hollow and makes it weaker.	Says the hollow was wetter, with no reason.	No explanation, or says the steepest place slid first.
Comparing changes	Compares clearing and cutting with the result of each, and names what each took away: roots, or the toe of the slope.	Compares the two changes with the result of each.	Describes one change only.	No comparison.

Total: ____ / 12. A score of 9 or more meets the objectives.

Standards

The lesson is built for MS-ESS3-2 and MS-ESS2-2: a natural hazard read from data, and a fast process that changes the surface.

FRAMEWORK	CODE	GRADES	STANDARD	HOW THE LESSON MEETS IT
NGSS	**MS-ESS3-2**	6-8	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.	Students read stability data from a model of a hillside and compare the changes that make a landslide more likely.
NGSS	**MS-ESS2-2**	6-8	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.	Students explain a landslide, a rapid change to the surface, from evidence in the side cut.

Checked November 2026 against: NGSS MS-ESS3-2, Earth and Human Activity, NGSS MS-ESS2-2, Earth's Systems.

Optional: save student work in a free class

The whole lesson runs at the link on the worksheet, with no accounts and no sign-up.

To keep students' work, and see it all in one place, make a free class. It takes about ten minutes, once, and covers every lesson in this series: mytekdev.com/tools/class-setup

Students in a class open mytekdev.com/tools/landslide-lab/lessons/why-did-the-hill-let-go/start instead of the worksheet link. Each one gets their own copy of the starter, and the same link reopens it next time.

Terms of use

Thank you for downloading this lesson. The plan, the handouts and the art were made by mytekDev.

You may:

- print and copy it for your students
- change it for your own classes
- post it on your class website or learning management system
- share this file with other teachers, whole and unchanged, with this page included

You may not:

- sell it, or put it in a product you sell
- share a changed copy
- claim it as your own

The app this lesson uses is free and runs in the browser. Students need no account. It is at mytekdev.com.

Questions, or found a mistake? Ask on the Teachers Pay Teachers Q&A for this resource, or write to us at mytekdev.com/contact.

© 2026 mytekDev. All rights reserved.