Ecological Succession Lab

Name _____

Date _____

Period _____

mrsajdak.com/succession · Low-write · © Ryan Sajdak · CC BY-NC-SA 4.0

Succession = the slow change in which living things live in a place. Primary: it starts with no soil. Secondary: the soil is still there.

☐ I can compare primary and secondary succession using numbers for time and soil.

☐ I can use inertia and resilience to predict how a community changes after a disturbance.

Part 1. Fast-forward a place (Tab 1)

SEP 5 Using Math · CCC Scale, Proportion, and Quantity

Pick **Bare rock**. Press **Play** to the end. Then pick **Empty city lot** and do the same. Copy from **Stages reached**.

1. The year each stage begins.

Example: rock takes 400 years, lot takes 20 years. 400 ÷ 20 = 20 times as long.

Stage	Bare rock (year)	City lot (year)	Rock ÷ lot = times as long
1. Pioneers			
2. Grasses and wildflowers			
3. Shrubs			
4. Sun-loving trees			
5. Mature forest			

2. Set the year, press **Measure this year** , copy the numbers.

Place and year	Soil depth (cm)	Plant species	Tallest plant	Plant cover (%)
Bare rock, year 20				
Bare rock, year 100				
City lot, year 20				
City lot, year 100				

READ FIRST. In the lab, find the green **Learn It** box and read it. Then answer 3 to 5.

3. The first living things on bare rock (the **pioneer species**) are:

☐ lichens ☐ maple trees ☐ goldenrod

They start soil by (tick two):

☐ breaking the rock into small bits

☐ adding dead plant matter when they die

☐ bringing soil from the lake

4. At year 20, the lot has _____ cm of soil. The rock has _____ cm.

The lot is faster because

☐ its soil was already there ☐ it gets more rain

5. Graph **Plant species** for the lot. Highest: _____ species. Year 150: _____ species. Tall trees make ☐ shade ☐ more sunlight, so some sun-loving plants die out.

Part 2. Disturb it (Tab 2)

SEP 2 Using Models · CCC Stability and Change

Pick the community, the disturbance and **Large (all)**. Pick a prediction. Press **Skip to the end**. Copy from **Your runs**.

6. Write the numbers. If it never comes back, write NEVER.

Community	Fire: change (%)	Fire: years back to 90%	Cleared: change (%)	Cleared: years back to 90%
Grassland				
Temperate forest				
Rain forest				

7. Temperate forest, windstorm. Small (25%): _____% change. Large (all): _____% change. Temperate forest, invasive plant, Large. Year 80: _____% native plants.

READ FIRST. In the lab, find the green **Learn It** box and read it. Then answer 8 to 11.

CLUE: Change = the drop. Small = high **inertia**. **Back to 90%** = years to recover. Fast = high **resilience**.

8. Highest inertia to fire (smallest change): ☐ Grassland ☐ Temperate forest ☐ Rain forest It changed only _____%.

9. After clearing, most resilient (fastest back): ☐ Grassland ☐ Temperate forest ☐ Rain forest in _____ years.

Least resilient: ☐ Grassland ☐ Temperate forest ☐ Rain forest

10. "An ecosystem that is hard to damage will also bounce back fast." The rain forest changed _____% in a fire but after clearing came back in _____ years. So the claim is ☐ right ☐ wrong

11. Look at your Q7 numbers. A bigger disturbance makes ☐ a bigger change ☐ a smaller change

The forest does not come back after the invasive plant because
☐ the invader stays and keeps spreading ☐ there is no soil

Part 3. Mount St. Helens (Tab 3)

SEP 4 Analyzing Data · CCC Stability and Change

Real data from study plots after the eruption of May 18, 1980. Pick a site, move the slider, press **Record this year**.

12. Plant cover (%) at each site.

Example: first year at 10% or more = 1986. Years after 1980: 1986 – 1980 = 6.

Site	First year measured: cover	1990 cover	Last year measured: cover	First year at 10% or more	Years after 1980
Studebaker Ridge					
Pine Creek					
Butte Camp					

READ FIRST. In the lab, find the green **Learn It** box and read it. Then answer 13 to 15.

13. Read what 1980 left at each site. Tick one box in each row.

CLUE: no soil left = primary. Soil and roots left = secondary. Plants still alive = mostly survived.

Site	What it is
Studebaker Ridge	☐ primary succession ☐ secondary succession ☐ plants mostly survived
Pine Creek	☐ primary succession ☐ secondary succession ☐ plants mostly survived
Butte Camp	☐ primary succession ☐ secondary succession ☐ plants mostly survived

14. Most common plant at Studebaker Ridge, 1986 to 1994: _____

WORD BANK Pacific lupine · Douglas-fir · Roadside rock moss

Its root bacteria do **nitrogen fixation** . That helps ☐ the plants that come after it ☐ only the lupine

15. Studebaker Ridge in 2040: cover will be ☐ higher ☐ about the same ☐ lower than in 2009.

Next to move in: ☐ shrubs and young trees ☐ tall old forest ☐ only lichens

Wrap it up

SEP 7 Argument from Evidence · CCC Stability and Change

16. "When a forest is destroyed, it always grows back the same way, at the same speed." Tick one:
☐ I agree ☐ I disagree

From Part 2: after clearing, the temperate forest came back in _____ years, but the rain forest _____.

From Part 3: Pine Creek reached 10% cover _____ years after 1980, but Studebaker Ridge took _____ years.

So the speed depends on ☐ whether soil is left and how bad the damage is ☐ nothing: it is always the same

NYSSLS: building toward HS-LS2-1, HS-LS2-2 and HS-LS2-6 (DCI LS2.C). Environmental Science, Chapter 5, Lesson 5.2: How Do Ecosystems Respond to Changing Conditions? Tab 1 and Tab 2 numbers come from tuned models; Tab 3 numbers are real data from Roger del Moral's Mount St. Helens plots.