

# Do Now

- What do you think would happen if the farm pictured to the right was not taken care of for 1 year, 5 years, 30 years, 100 years?



# Succession: Communities Change Over Time

10-14-10

# Objectives

## Content:

### **SWBAT**

1. **Explain** how limiting factors and ranges of tolerance affect the distribution of organisms and the size of populations
2. **Explain** the differences between primary and secondary succession
  - a) **Determine** if a community is in primary or secondary succession
3. **Interpret** a graph showing primary and secondary succession

## Language:

### **BY**

1. **Discussing** with their partners and **writing** responses to questions
2. **Note taking** and writing in a venn-diagram
  - a) **Applying** notes to pictures of communities
3. **Applying** notes to interpret the graph

# Agenda

1. Do Now
2. Objectives
3. Communities in the Environment
  - a) Limiting Factors
  - b) Range of Tolerance
4. Succession: Communities Change Over Time
  - a) Primary Succession
  - b) Secondary Succession
5. Compare and Contrast Primary and Secondary Succession
6. Graph Interpretation: Primary and Secondary Succession
7. Closing
8. Exit Slip
9. HW if time

# Communities in the Environment

- Some environmental conditions are more and less suitable for a communities of organisms
- **limiting factor:** (an environmental factor that affects an organism's ability to survive)
- Limiting factors will determine where a species is distributed (lives)



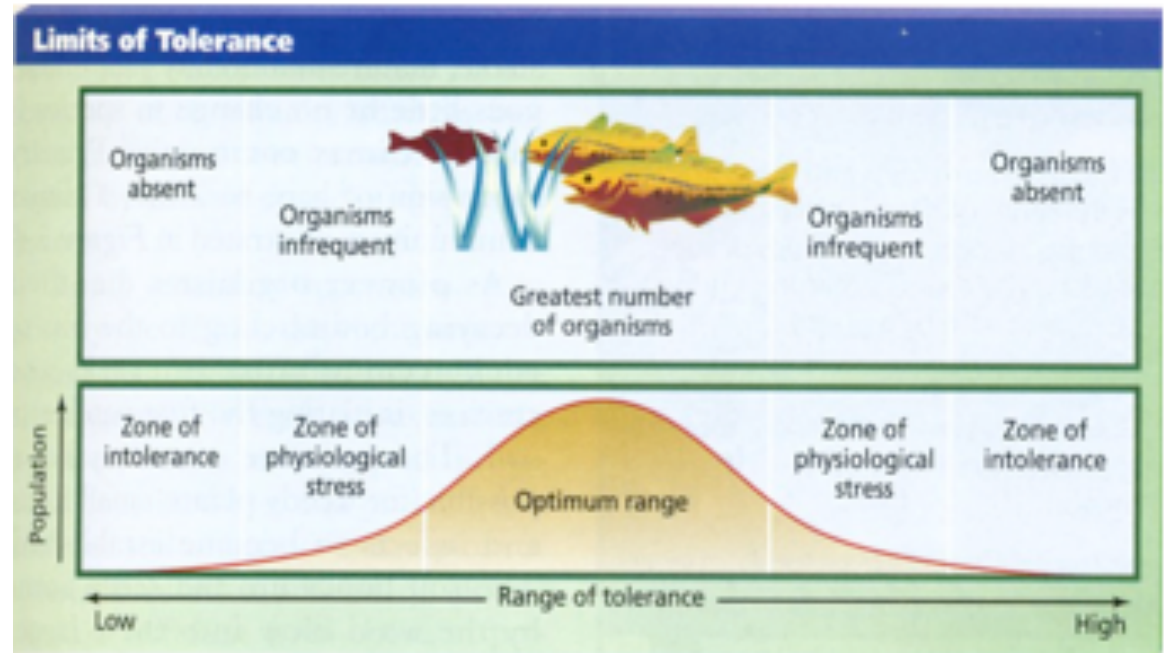
## Think/Turn/Talk

- What is one of the limiting factors for these trees and plants?
- Will a species with few or many limiting factors be able to be distributed over a very large area? Why?

# Communities in the Environment

-The limits of an organisms tolerance are reached when it receives either too much or too little of some environmental factor.

- Organisms live in environments that can change
- Organisms can tolerate some changes, and cannot tolerate other changes
- **range of tolerance:** (the ability of an organism to withstand changes in biotic and abiotic factors)
  - Ex:
    - catfish can tolerate warm water w/ little dissolved oxygen
    - Trout can tolerate cold water w/ lots of dissolved oxygen



## Think/Turn/Talk

1. Will a species with a large or small range of tolerance be able to be distributed over a wide area? Why?
2. What is the relationship between range of tolerance and the population size of a species

# Limiting Factors and Range of Tolerance

## Scenario #1:

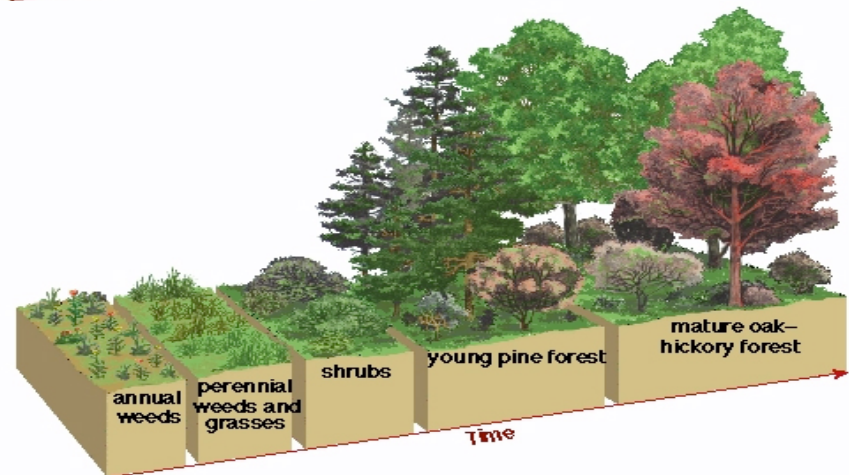
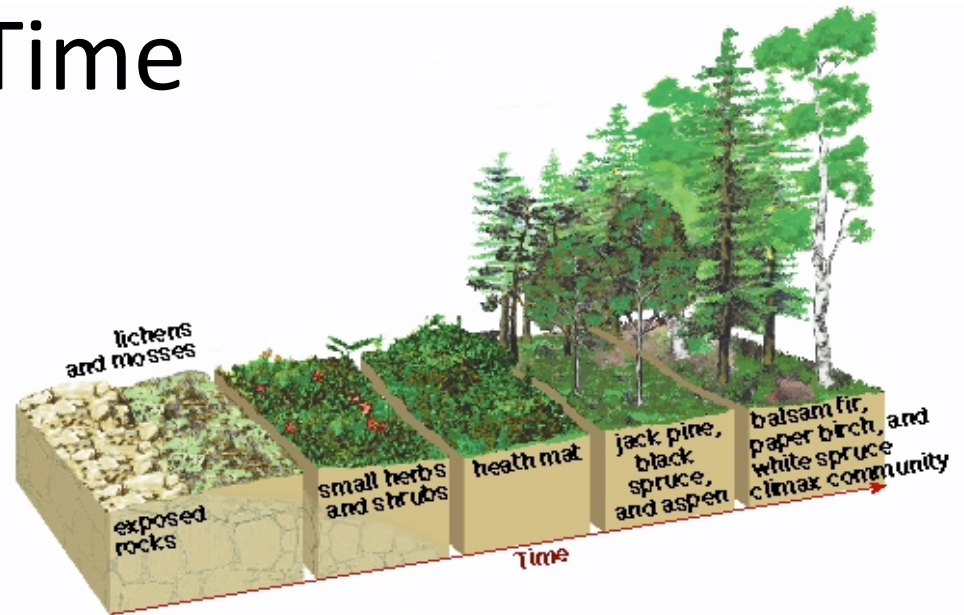
If a species has (many/few) **limiting factors** than that species is said to have a (large/small) **range of tolerance**. That means this species could be distributed over a very (large/small) area as still be able to survive.

## Scenario #2:

If a species has (many/few) **limiting factors** than that species is said to have a (large/small) **range of tolerance**. That means this species could be distributed over a very (large/small) area as still be able to survive.

# Succession: Communities Change Over Time

- Over time, communities change
  - (remember **community**: (a collection of several interacting populations))
- **Succession**: (the orderly natural changes and species replacement that take place in the communities of an ecosystem)
- Succession happens in stages



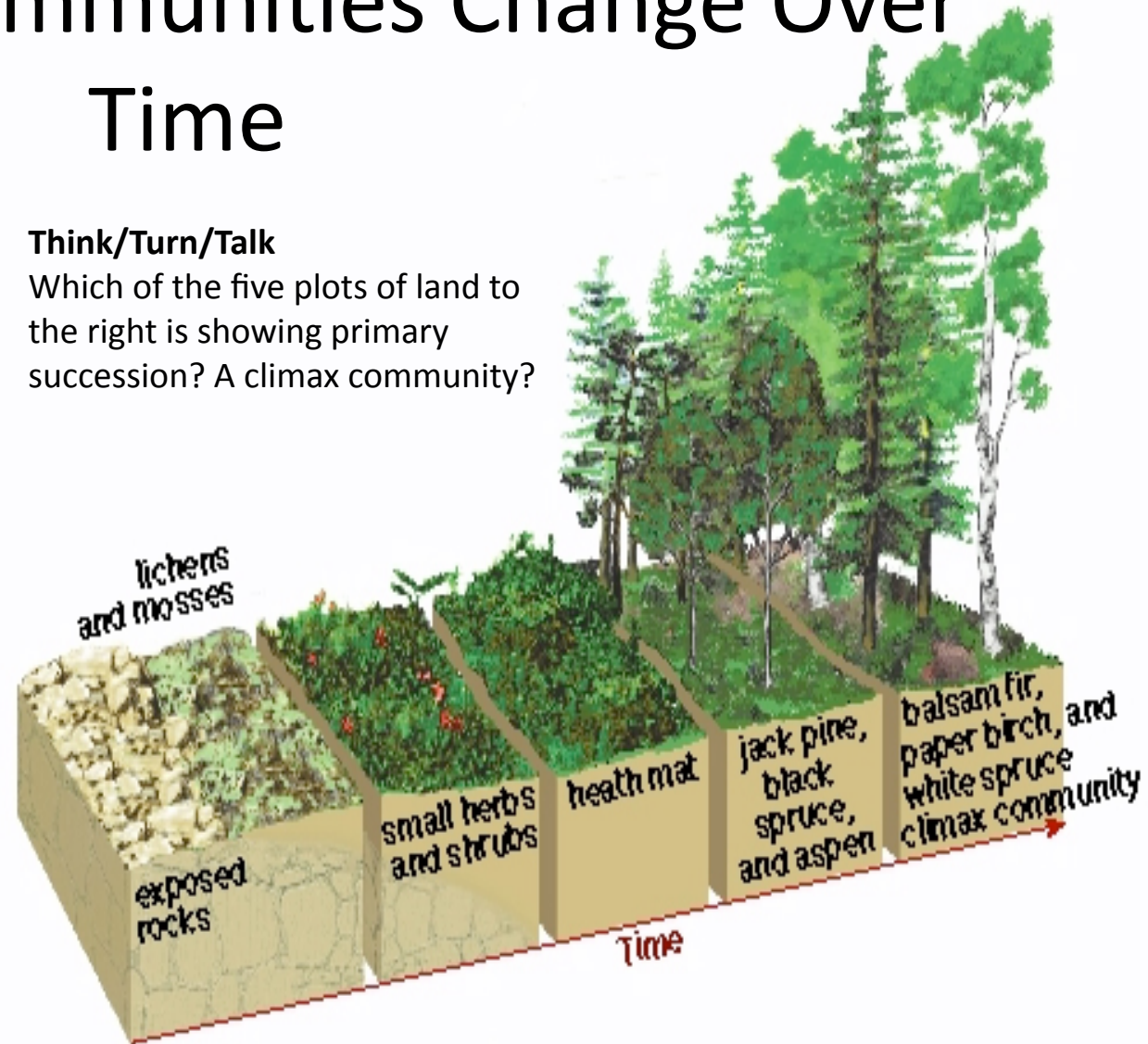


# Succession: Communities Change Over Time

- **Primary Succession:** (colonization of land that does not have existing soil)
- The colonization happens by **pioneer species:** (the first species to colonize an area)
  - Ex: lichen (lie-kin)
- Primary succession starts with low biodiversity
- Often times areas do not have existing soil after an avalanche, volcano, or earthquake
- These areas are usually made of exposed rock
- Over time the colonization slows down
- **Climax Community:** (a stable or mature community that undergoes little or no changes in species)

## Think/Turn/Talk

Which of the five plots of land to the right is showing primary succession? A climax community?



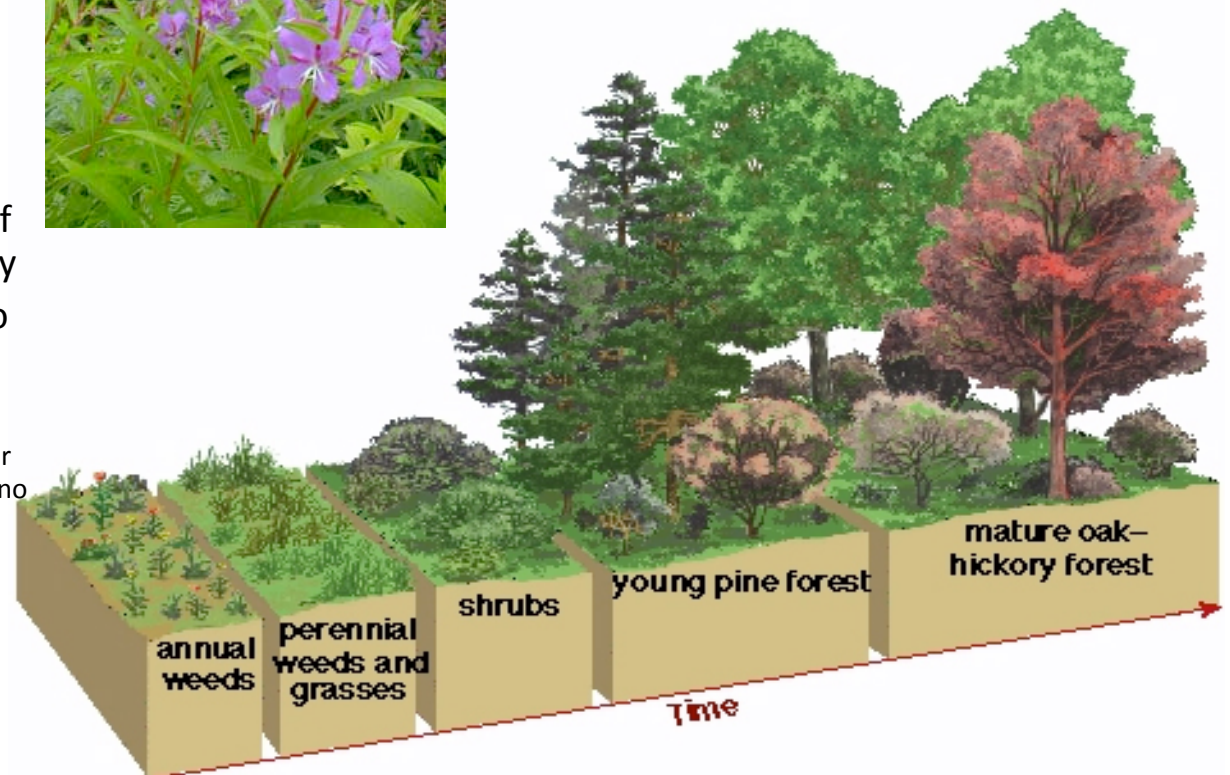
## Lichen on Rocks



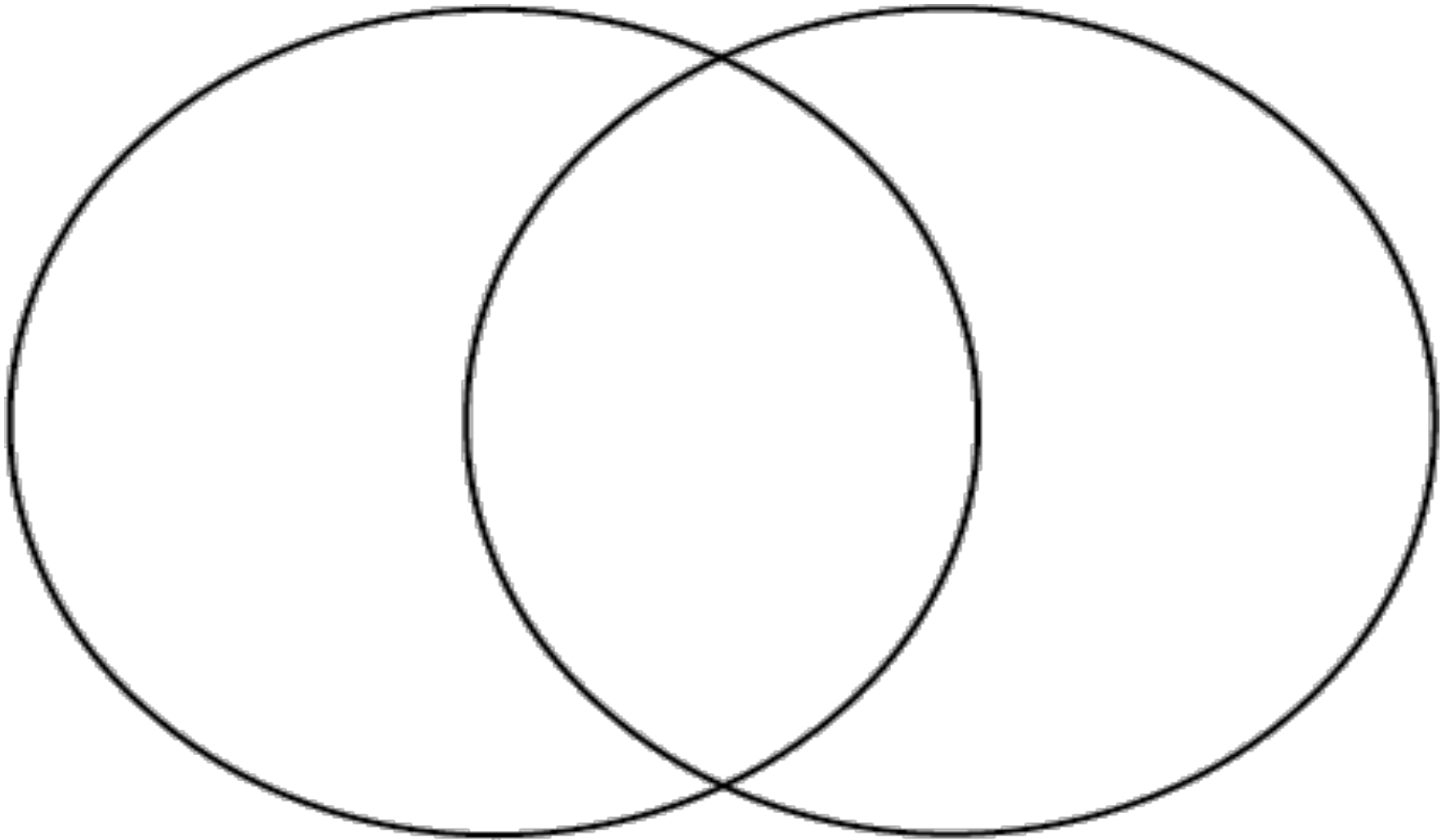


# Succession: Communities Change Over Time

- Often times due to natural disasters most plants are destroyed only leaving behind the dead plants and some soil
  - Ex:
    - forest fire
    - Logging
- The *pioneer species* are different for secondary succession
  - Ex:
    - Fire weed
- **Secondary Succession:** (colonization of land that already has soil)
- Secondary succession starts a point of high biodiversity compared to primary
- Secondary succession can also lead to *climax communities*
  - (Remember) **Climax Community:** (a stable or mature community that undergoes little or no changes in species)



# Compare and Contrast: Primary and Secondary Succession



## One Effect of Forest Fires



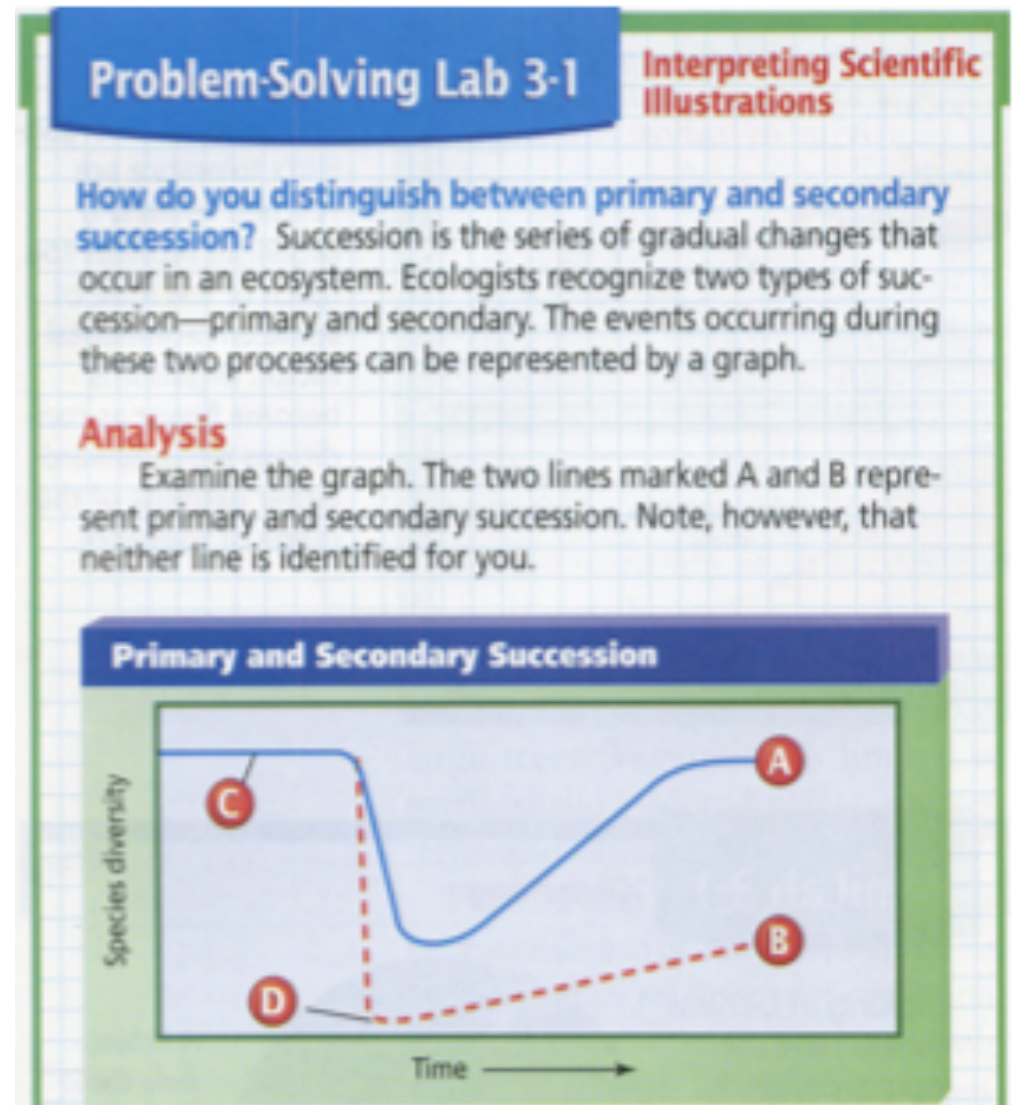
### Think/Turn/Talk

1. Why do you think before the fire there were no wild flowers in this forest, and why do you think after the fire there are wild flowers?
2. Is the above a picture of primary or secondary succession? How do you know?



# Graph Interpretation: Primary and Secondary Succession

- Lab Questions:
  - Write answers to these questions on a separate sheet of paper.
- 1. Which line best represents primary succession? Explain.
- 2. Which line best represents secondary succession? Explain.
- 3. Which label, C or D, best represents a climax community? Pioneer organisms? Explain.
- 4. What does the sudden drop in line C represent?



# Closing

- Limiting factors and range of tolerance affect the distribution of species as well as the size of the species' population
- Communities change over time due to succession
- There are two types of succession
- Primary and secondary succession have distinct characteristics
- These can be seen in pictures and graphs

Biology  
10-14-10  
Communities

**EXIT SLIP**

1. Will a species with few or many limiting factors be able to be distributed over a very large area? Why?

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1. Will a species with a large or small range of tolerance be able to be distributed over a large area? Why?

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2. What is the relationship between range of tolerance and the population size of a species?

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3. Why do you think before a forest fire there might be no wild flowers in a forest, and why do you think after a fire there would be flowers?

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In your textbook, read about living in a community.

Determine if the statement is true. If it is not, rewrite the italicized part to make it true.

1. The *interactions* of abiotic and biotic factors result in conditions that are suitable for some organisms but not for others. \_\_\_\_\_
2. Food availability and temperature can be *biotic factors* for a particular organism. \_\_\_\_\_
3. A limiting factor is any biotic or abiotic factor that *promotes* the existence, numbers, reproduction, or distribution of organisms. \_\_\_\_\_
4. At high elevations where the soil is thin, vegetation is limited to *large, deep-rooted* trees. \_\_\_\_\_
5. Factors that limit one population in a community may also have an *indirect* effect on another population. \_\_\_\_\_
6. *Tolerance* is the ability of an organism to withstand fluctuations in biotic and abiotic environmental factors. \_\_\_\_\_
7. A population of deer would become *larger* as conditions move away from optimal toward either extreme of the deer's range of tolerance. \_\_\_\_\_
8. Different species may have different ranges of tolerance. \_\_\_\_\_

In your textbook, read about succession: changes over time.

Use each of the terms below just once to complete the passage.

climax  
pioneer

primary  
succession

decades  
species

succeed  
slows down

The natural changes and (9) \_\_\_\_\_ replacements that take place in the communities of ecosystems are known as (10) \_\_\_\_\_. It can take (11) \_\_\_\_\_ or even centuries for one community to (12) \_\_\_\_\_, or replace, another. When new sites of land are formed, as in a lava flow, the first organisms to colonize the new area are (13) \_\_\_\_\_ species. This colonization is called (14) \_\_\_\_\_ succession. The species inhabiting the area gradually change. Eventually, succession (15) \_\_\_\_\_ and the community becomes more stable. Finally, a mature community that undergoes little or no change, called a (16) \_\_\_\_\_ community, develops.

Section 3.1 *Communities,  
continued*

For each item in Column A, write the letter of the matching item in Column B.

## Column A

## Column B

- |  |                           |
|--|---------------------------|
| _____ 17. Sequence of community changes where soil is formed, allowing small, weedy plants to inhabit the area | a. a severe drought       |
| _____ 18. Sequence of community changes occurring as a result of a natural disaster, such as a forest fire     | b. primary succession     |
| _____ 19. A stable, mature community with little or no succession occurring                                    | c. amount of plant growth |
| _____ 20. An example of a biotic limiting factor affecting a community of organisms                            | d. secondary succession   |
| _____ 21. An example of an abiotic limiting factor affecting a community of organisms                          | e. climax community       |

The statements below describe the secondary succession that occurred within an area of Yellowstone National Park. Number the events in the order in which they occurred.

- \_\_\_\_\_ 22. Grasses, ferns, and pine seedlings inhabited the area.
- \_\_\_\_\_ 23. Annual wildflowers grew from the bare soil.
- \_\_\_\_\_ 24. A fire burned thousands of acres of land.
- \_\_\_\_\_ 25. A climax community of lodgepole pines developed.
- \_\_\_\_\_ 26. Bare soil covered the area.