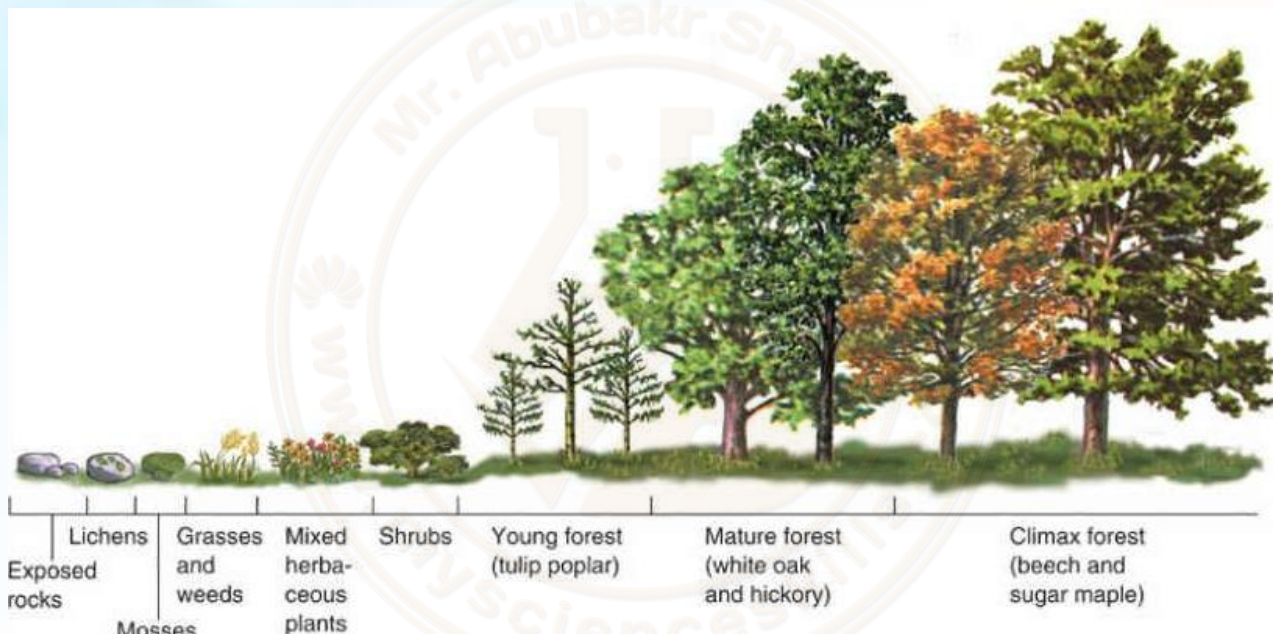


Changing Ecosystems

Name: Date:

Ecological succession is the natural, gradual process where one community of living things (an ecosystem) slowly and predictably changes over time into a different community. Think of it as an ecosystem growing up! This process is driven by changes in the environment, often following a **disturbance**.



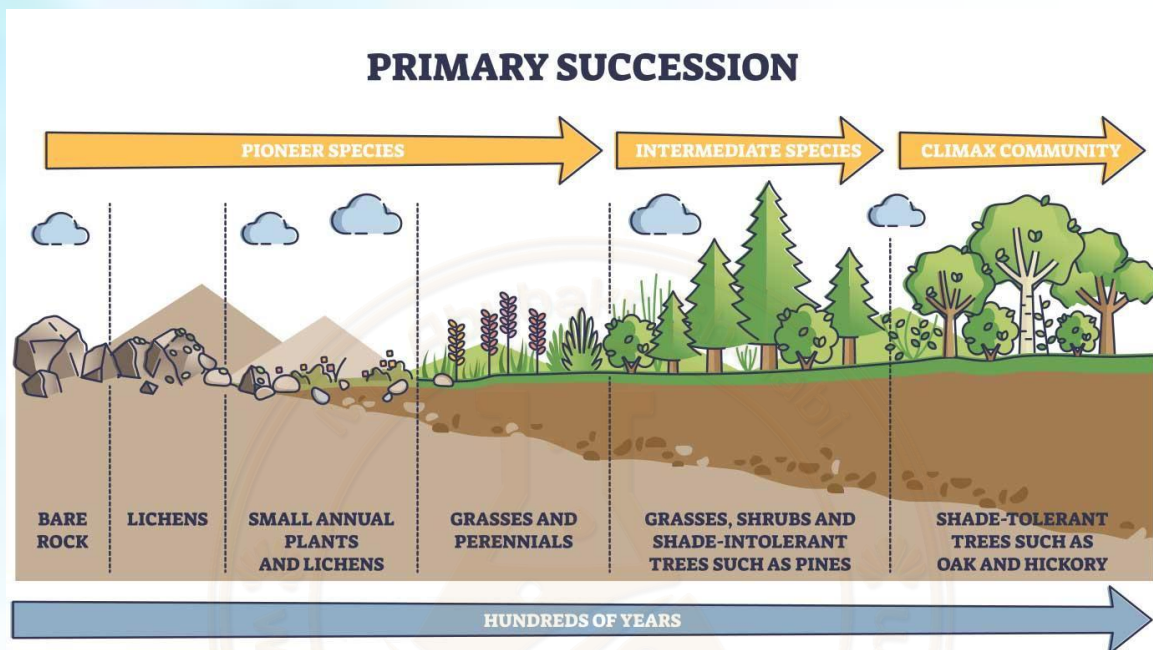
There are two main types of succession:

Primary Succession

- **Starts** on new, bare land where **no soil or previous life exists**, such as after a volcanic eruption or on bare rock.
- The first species to arrive are **early species** (also called pioneer species), like **lichens** and mosses.



- **Lichens** are crucial because they slowly break down the rock, helping to form the first, thin layer of **soil**.
- It is a **very slow process**, taking hundreds or even thousands of years.

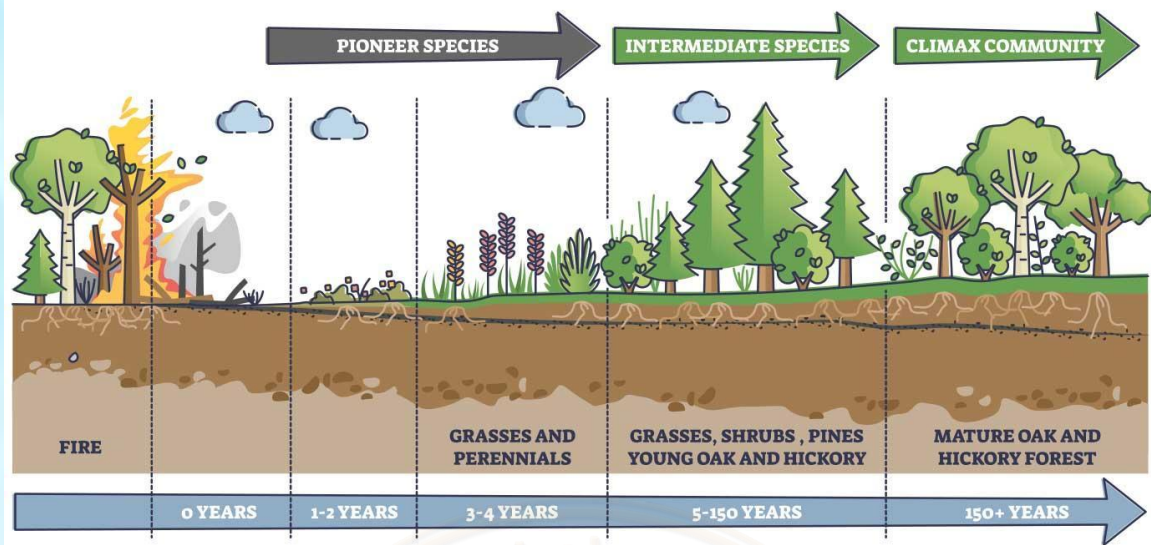


Secondary Succession

- **Starts** in an area where a previous ecosystem existed but was **disturbed** (like by a wildfire, flood, deforestation, or clear-cutting), but **soil remains**.
- Because the soil is already present, it happens **much faster** than primary succession.
- The first plants to grow are usually simple existing plants (like grasses and weeds) from seeds or roots left in the soil.

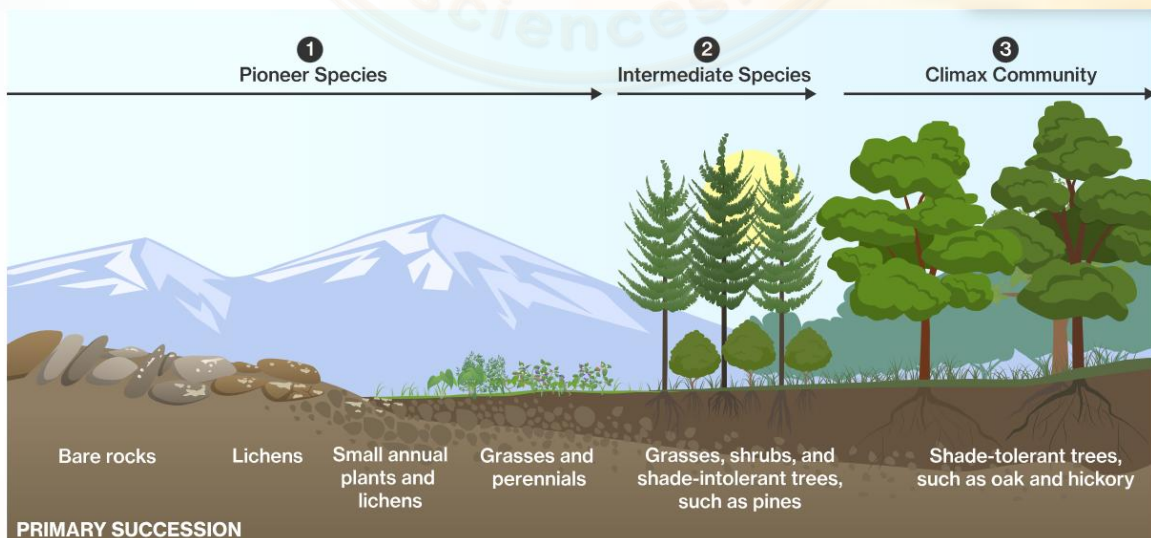


SECONDARY SUCCESSION



The Climax Community

- Both primary and secondary succession eventually lead to a relatively stable, mature community called a **climax community**.
- In a climax community, the populations of plants and animals are in **dynamic equilibrium**—a state of balance where changes still happen, but the overall ecosystem remains relatively consistent over a long period.



I. Multiple Choice Questions

Choose the best answer for each question.

1. After the volcanic activity, Iceland experienced what type of succession?

- a) Aquatic succession
- b) Secondary succession
- c) Primary succession
- d) Climax succession

2. What type of succession occurs after a clear-cutting of trees in a forest?

- a) Primary succession
- b) Aquatic succession
- c) Climax succession
- d) Secondary succession

3. Which of the following is most likely to cause secondary succession in an area?

- a) Bare rock appearance
- b) Volcanic activity
- c) A wildfire
- d) New land after an earthquake

4. What is the role of lichens in primary succession?

- a) Lichens provide shade for other species.
- b) Lichens inhibit the growth of early species.
- c) Lichens compete with other plants for resources.
- d) Lichens break down rock and lead to soil formation.



5. Which statement best defines ecological succession?

- a) When a community does not go through any more large changes.
- b) When a community is destroyed or disturbed over time.
- c) When new areas of landform where there is no soil or plant life.
- d) When a community of living things changes into another over time.

6. What is a climax community?

- a) A community that is at the beginning of recovery after its destruction.
- b) A community that goes through large changes to reach equilibrium.
- c) A community that does not go through any more large changes (or reaches a stable state).
- d) A community that can't be recovered after its total destruction.

7. What is the first type of species to grow in an area during primary succession?

- a) Native species
- b) Intermediate species
- c) Climax species
- d) Early species (or Pioneer species)

8. Which of the following is a characteristic of secondary succession?

- a) It begins on a new land, such as bare rock.
- b) It takes place in a newly formed volcanic land.
- c) It requires early species like lichens to start.
- d) It occurs after a disturbance in an existing ecosystem.

9. Which of the following is true about secondary succession?

- a) It begins on a new land, such as bare rock.



- b) The existing ecosystem has no remaining life.
- c) It happens faster than primary succession.
- d) It can take hundreds of years to occur.

10. In primary succession, what stage usually comes after the early species stage?

- a) Disturbance
- b) Dynamic equilibrium
- c) Climax community
- d) Intermediate species

11. How does eutrophication affect aquatic succession?

- a) Eutrophication stabilizes the water temperature.
- b) Eutrophication stops aquatic succession.
- c) Eutrophication increases the amount of water in a lake.
- d) Eutrophication accelerates aquatic succession.

12. Which of the following is a natural event that disrupts ecosystems?

- a) Nonnative species
- b) Resource extraction
- c) Eutrophication
- d) Lava flow

13. Which factor can disrupt dynamic equilibrium in an ecosystem?

- a) Equal distribution of resources
- b) Predator-prey relationships
- c) Water availability
- d) Natural disasters



14. What do resource extraction, pollution, and introducing nonnative species have in common?

- a) Are disturbances that speed up reaching a climax community.
- b) Are human disturbances that benefit ecosystems by reducing populations.
- c) Are disturbances that speed up the ecological succession of ecosystems.
- d) Are human disturbances that affect ecosystems and change populations.

15. What does dynamic equilibrium in an ecosystem refer to?

- a) The absence of change in an ecosystem.
- b) A state of complete ecosystem stability.
- c) The constant changes in ecosystems.
- d) A balance between different ecosystem parts.

II. Fill-in-the-Blank Questions

Fill in the blank with the correct term.

16. Following a flood, an ecosystem will most likely undergo

succession because is still present.

17. The process of a lake slowly turning into a landform over thousands of years

due to is an example of



18. The early species in primary succession help create which allows for the growth of larger plants, eventually leading to a

19. Kudzu, a plant brought to America, is an example of a that competes with native plants and upsets the of the ecosystem.

20. is a major that can damage and destroy existing populations, potentially leading to secondary succession.

III. Short Answer Questions

Answer the following questions in complete sentences.

21. Describe the key difference between primary and secondary succession.

.....

.....

.....

.....

22. Explain how a windstorm or fire can benefit an ecosystem even though it causes destruction

.....

.....

.....

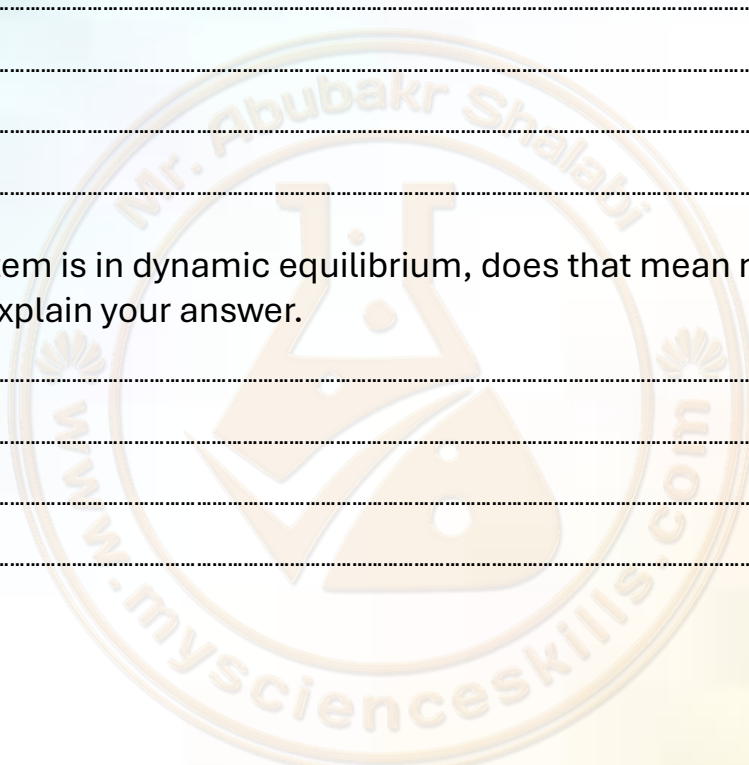
.....



23. What are two common consequences of eutrophication in an aquatic ecosystem?

24. Provide two examples of human disturbances and explain how they affect an ecosystem's populations.

25. If an ecosystem is in dynamic equilibrium, does that mean nothing is changing? Explain your answer.



Answer Key

1	c) Primary succession
2	d) Secondary succession
3	c) A wildfire
4	d) Lichens break down rock and lead to soil formation.
5	d) When a community of living things changes into another over time.
6	c) A community that does not go through any more large changes (or reaches a stable state).
7	d) Early species (or Pioneer species)
8	d) It occurs after a disturbance in an existing ecosystem.
9	c) It happens faster than primary succession.
10	d) Intermediate species
11	d) Eutrophication accelerates aquatic succession.
12	d) Lava flow
13	d) Natural disasters
14	d) Are human disturbances that affect ecosystems and change populations.
15	d) A balance between different ecosystem parts.
16	secondary, soil
17	sediment accumulation, aquatic succession
18	soil, climax community
19	nonnative species, dynamic equilibrium
20	Pollution, human disruption
21	Primary succession starts on land with no soil (e.g., bare rock, lava flow). Secondary succession starts on land where soil remains after a disturbance (e.g., wildfire, logging).
22	Windstorms or fires clear out old, large trees, allowing more sunlight to reach the forest floor. This allows new plants to grow and increases biodiversity.
23	Two common consequences are: decrease in oxygen levels and death of fish and aquatic plants.
24	Deforestation/Clear-cutting removes habitat and reduces population size. Pollution/Acid Rain harms plants and animals and decreases population size.
25	No, dynamic equilibrium means the ecosystem is balanced; changes still happen (e.g., predator-prey cycles, small weather variations), but the overall structure of the climax community stays relatively stable over time.

