**Welcome to Speciation Island…Population YOU**

**Purpose**: To observe the mechanisms involved in the development of a new species.

**Procedure**:

1. Your teacher will randomly divide you into groups of 3-5 students.

2. Your group will be isolated on an island (lab table) that has a unique environment. Write out your habitat description. You have 5 minutes to research on your phone or laptop.

3. As a group you must select and write down all phenotype characteristics (your traits) that exist in your group that may improve your group’s survival on your island. Remember you are limited to phenotypes that are in your group only!!! Think about your traits that you may have that might help you survive. Think like Nature would (clothes are not necessary).

4. Imagine that your group has been able to reproduce for 500+ generations (assume no mutations occurred), describe the typical member of your population. (Create the “perfect person” based on all of your phenotypes listed in #3!) Only use those traits that you and your group have to create the perfect person!!

5. Now assume that many small mutations occurred over the next 500+ generations. If a mutation improves survival in your environment it will be passed through future generations. Use your imagination... anything that nature could potentially create using DNA (no moving parts, like gun-hands!!) List 6 - 10 visible mutations that would improve survival for your species:

 6. Now draw a picture of a typical member of your population following the 1000+ generations of mutations and natural selection that have occurred in this exercise. Use the info from number 4 and 5 to make the most FIT individual.

\* Have one person in your group Draw a picture of your “new person” on the white board.

1. Grassland Ecosystems

A [grassland ecosystem](https://www.eartheclipse.com/ecosystem/temperate-grassland-biome.html) is characterized by mixed non-woody vegetation cover and is dominated by grass or grass-like plants. The ecosystem is normally found in areas that are too dry for forests but have enough soil water to support closed herbaceous plant canopy, which cannot be found in deserts.

Grasslands occur mainly on plains or rolling topography in the interiors of expansive land masses, and from sea level to altitudes of about 16,400 feet in the Andes. These ecosystems are usually inhabited by grazing animals, and can be further subdivided into:

* **Savannas** – found in the tropics
* **Prairies** – located in temperate regions
* **Steppes** – Can occur in both the tropics and temperate regions

## 2. Tropical Rainforest Ecosystems

[Tropical rainforest ecosystems](https://www.eartheclipse.com/ecosystem/tropical-rainforest-biome.html) are found in tropical regions, and they boast a greater diversity of flora and fauna compared to any other type of ecosystem. The term “rainforest” means that these are one of the wettest ecosystems in the world. Namely, these ecosystems generally receive very high rainfall every year, which varies across different rainforests.

The heavy rainfall results in dense, leafy vegetation. The trees grow incredibly tall as they compete for sunlight. Animals live in the tree canopies. Contrary to popular belief that soils in rainforest ecosystems are fertile, rainforest soils are actually nutrient-poor. Any explanation for this?

Nutrients are normally not stored in the soils for very long. The heavy rains experienced in these ecosystems washes organic material from the soil, rendering them nutrient-poor. It is also worth noting that rainforests have high humidity – about 88 percent and 77 percent in the wet and dry season, respectively.

## 3. Temperate Forest Ecosystems

[Temperate forest ecosystems](https://www.eartheclipse.com/ecosystem/temperate-rainforest-biome.html) are common in regions where winters are cold and summers are warm. The ecosystems normally comprise deciduous trees, which shed their leaves every autumn, and coniferous trees that remain green all year round.

You should realize that in many regions the original temperate forest ecosystems have been altered by human activities, giving way to farming. However, one important temperate forest ecosystem, the Great Smoky Mountains, is a protected area and has been labelled a World Biosphere Reserve.

25 percent of the remaining major temperate forests are located on the British Columbia coast of Canada. You can find the other remnants in eastern U.S., Europe, Australia, New Zealand, southwest South America, Japan, and China. Some common naturally-occurring plants in temperate forests include apples, chestnuts, maple sugar, and mushrooms.

## 4. Taiga Ecosystems

[Taigas](https://www.eartheclipse.com/ecosystem/taiga-boreal-forest-biome.html) are a kind of forest ecosystem found in the far northern regions of the world. Also known as [boreal forests](https://www.eartheclipse.com/ecosystem/taiga-boreal-forest-biome.html), these ecosystems comprise mainly evergreen, coniferous trees, such as spruce and pine. These conical or spire-shaped needle trees are adapted to the cold and the physiological drought of winter as well as to the short growing season.

It is worth noting that the largest taiga ecosystem covers the better part of northern Russia and Siberia. Other notable taiga ecosystems are found in Canada, Alaska, Norway, Sweden, and Finland.

5. Desert Ecosystems

[Deserts ecosystems](https://www.eartheclipse.com/ecosystem/desert-biome.html) are characterized largely by relatively sparse vegetation. Animal and insect population is also quite limited. In light of the fact that deserts are not necessarily hot, we have two major types of desert ecosystems – hot or subtropical desert ecosystem and temperate or cold desert ecosystem.

While temperate desert and subtropical ecosystems have different characteristics, they bear some similarities, which include the following:

* Both receive less than 10 inches of rainfall annually
* Both are characterized by harsh living conditions, which affect people or animals living there.
* Dry air is found in both types of ecosystems
* Animals have adapted to the ecosystem conditions as far as energy, food consumption, and when to be active is concerned.
* Plants have adapted to surviving with insufficient water and extreme temperatures.

Generally, desert ecosystems are composed of several abiotic components, including, high temperatures, and insufficient moisture. As earlier stated, there are also several biotic factors, such as animals and plants.

## 6. Tundra Ecosystems

[Tundra ecosystems](https://www.eartheclipse.com/ecosystem/tundra-biome.html) are found in Polar Regions or on the summits of high mountains. They are characterized by harsh living conditions since they are frozen and covered by snow virtually throughout the year. In the white, treeless tundra, the soil could be frozen all year round, making life really hard. The condition is known as permafrost.

However, during the brief summer and spring, snows could melt, producing shallow ponds that attract migrating waterfowl. The melting snow also exposes lichens and small flowers. The word “tundra” most commonly refers to polar regions. At lower latitudes, however, tundra-like ecosystems known as alpine tundra could be found at high altitudes.