

Class: Grade 12 Biology

Lesson Title: Natural Selection Kinulation

Class Size: 24

Time: 60 mins

Curriculum Outcomes:

316-3 Analyze evolutionary mechanisms such as natural selection, genetic variation, genetic drift, artificial selection, and biotechnology and their effects on biodiversity and extinction.

Learning Objectives:

1. Students will understand the mechanism of natural selection and Darwin's theory of evolution.
 - a. They will understand that individuals best suited for their environment survive and reproduce, therefore passing along genetic traits that are advantageous. This results in changes in the population over time.

Materials:

- Ostri-king costume includes: red wings, red beak, and a crown
- Bumble-lion costume which includes: bumble bee wings and lion mask
- Buff-i-gator costume which includes: buffalo horns and an alligator snout
- Cards with different blood types written on them (each student will need to have one)

Preparation beforehand:

- Have costumes ready for students to play the role of the animals
- Have cards ready with different blood types on them

Introduction:

- Introduce the topic. Possible prompt questions include:
 - What is a population? How does a population survive? How can a population be destroyed?
 - What does diversity mean?
 - In terms of genetics and diversity, what would you be considered to be as a class? (a population)
 - What does natural selection mean?
- Explain what a kinulation is (broken up into kinesthetic and simulation). Tell them that these are used to help students learn difficult concepts that are otherwise difficult to picture. It allows students to become part of the demonstration, and therefore easier to remember and learn. Ask students if they would like to try one.

Activity #1:

1. Ask students to pretend they are on a deserted island and they are the only population on this island.
 - a. What are some different characteristics do you have? Where is the variation?
2. Ask for 3 student volunteers. These students will be playing the roles of the animals. Do not reveal their animal names to the rest of the class. Take them to a separate part of the room (or in the hallway) and explain what they are going to do and give them their costumes.
3. The rest of the class needs to stand up and form a line. Pass out a card to each of these students with a blood type written on it.
4. Tell students that a never before seen mutated creature is about to enter the room. It is called a bumble-lion. It is a mutated animal, part bumblebee part lion. This vicious animal's method of hunting is to sting and roar until their prey falls dead. The bumble-lion is attracted to the sweet scent of O- blood.
 - a. Ask students to look at their cards to see what blood type they are. Ask them to turn their card facing forward so when the bumble-lion comes in they can see the blood types.
 - b. If the bumble-lion attacks you, go back to your seat as you are no longer part of the population
5. Ask students what has changed about their population now?

- a. What would the population look like if you kept reproducing? Would there be any more humans with the O- blood type?
6. Next, ask the students that remain in the population to stand in a line shortest to tallest.
 - a. Once they are organized, asked if anything has changed about the population now?
7. Tell students that another never before seen creature enter the room. It is called an ostri-king, a bird with a wingspan of 12 feet. It can reach down between 5'6 and 5'8 above the ground, killing the tallest people with its sharp talons.
 - a. Ask the student playing the role of this animal to remove around 4 students from the population
 - b. If the ostri-king attacks you, go back to your seat as you are no longer part of the population
8. Ask students what they notice about their population now? What has changed?
 - a. What would the population look like if you kept reproducing? Would you have taller people existing in your population?
9. Next, introduce the next mutated creature. Its name is the buff-i-gator. This creature preys on humans with blonde hair by throwing them into the air with its horns and catching them in their mouth.
 - a. The student playing the role of the buff-i-gator will come in and remove all the students who have blonde hair.
 - b. If the buff-i-gator attacks you, go back to your seat as you are no longer part of the population
10. Ask students what they notice about their population now? What has changed?
 - a. What would the population look like if you kept reproducing? Would you have any blonde hair?

Conclusion – Possible wrap-up questions:

1. What characteristics do you have to have to survive in this population? If this keeps occurring what will the population look like over time?
2. Is the DNA changing during this process?
3. Can anything else take out a population other than animals?
4. Can you think of any examples of natural selection?