

Natural Selection is a mechanism of evolution wherein organisms that are “fit” to their environment are able to survive and reproduce. Species characteristics, the abiotic environment, and competition are few of the agents of Natural Selection.

These activities demonstrate how intra-specific and inter-specific competition as well as some of the physical and/or behavioural traits of organisms makes them more “fit” to the environment than other organisms.

It is composed of two parts: Part I is intra- specific competition and Part II is inter-specific competition. This maybe an additional activity which can be used for the third Quarter of the Grade 10 science of the K to 12 Curriculum under the topic on Biodiversity and Evolution.

Who is the fittest?

Overview:

Students will simulate how organisms of the same species and of different species compete for available food resources.

Objective:

At the end of these activities, learners will be able to:

1. Infer from the activity why certain organisms are naturally selected to survive in an environment;
2. Identify physical and/ or behavioural traits that affect competition for food resources within the same species and among different species.

Materials

- 5 bags of kidney beans with at least 100 pieces (or any other similar objects e.g. beans)
- Large tray/any container for holding the beans
- 5 paper boxes per group (can be prepared before the activity)
- Timer (depending on the number of groups)
- Clothespins
- Plastic spoons
- Plastic forks
- Colored stickers (blue, yellow, green; to be pinned/pasted to the shirt/blouse of the participants)
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Part I

Preliminary procedure:

1. Form at least three (3) groups with at least 14 members each. Three members from each group will act as first generation organisms in a population. One member should act as a timer and the other as a recorder.
2. Assign a type of tool (i.e. clothespin, plastic spoon, and plastic fork) for each group.
3. Distribute the materials. Each group should have one set of materials: one bag of kidney beans, a large tray for holding the beans, a timer, paper boxes, colored stickers and at least three (3) pieces/sets of tools.
4. Put all the beans in a large tray or container.
5. Distribute the tools to all the members who will act as “organisms.”

- Instruct the first generation organisms to put their stickers on their shirts/blouses. Each colored sticker corresponds to the type of tool they will be using (i. e. blue for clothespin, yellow for the plastic fork, green for the plastic spoon).

ROUND 1

Procedure:

- Hold the materials so that everybody will start picking beans as soon as the timer starts. Set the timer to one (1) minute and begin picking. **Aim: To pick a minimum of 15 beans.**
- After one minute, stop and let the recorder count and record in Table 1 the number of beans each organism picked using their tool.
- Those with 15 beans or more will continue for Round 2. They will be given one (1) “offspring” who will pick beans together them. All surviving members should keep track of their own offspring.

Table 1. Number of beans picked.

Organism No.	Number of beans picked

ROUND 2

Procedure:

- Hold the materials so that everybody will start picking beans as soon as the timer starts. **Aim: To pick a minimum of 15 beans.**
- Set the timer to one (1) minute and tell the members to begin picking. After one minute, stop and let the recorder count and record in Table 2 the number of beans each organism picked using their tool.
- Only the surviving organisms and their offspring will have data for Table 2 (with 15 beans or more) and will continue for Round 3. They will be given one (1) “offspring” who will pick beans together with them. All surviving members should keep track of their own offspring.

Table 2. Number of beans picked.

Surviving Organisms	Number of beans picked

ROUND 3

Procedure:

1. Hold the materials so that everybody will start picking beans as soon as the timer starts. **Aim: To pick a minimum of 15 beans.**
2. Set the timer to one (1) minute and tell the members to begin picking. After one minute, stop and let the recorder count and record in Table 3 the number of beans each organism picked using their tool.
3. Only the surviving organisms and their offspring will have data for Table 2 (with 15 beans or more) and will continue for Round 3. They will be given one (1) "offspring" who will pick beans together with them. All surviving members should keep track of their own offspring.

Table 3. Number of beans picked.

Surviving Organisms	Number of beans picked

Processing questions:

- a. What do the plastic spoons, plastic forks, and a set of tweezers represent?

- b. What does the bag of beans represent?

- c. Based on the game, which organism “died” first?

- d. Why did he/she “die” immediately?

- e. Which group of organisms continued picking beans until the last round?

- f. Why did this group/s of organism/s able to continue until the last round?

- g. What physical and/or behavioural traits do/es this organism/s has/have that allowed them to reach the last round?

Part II

Preliminary Procedure

1. Ask for five (5) volunteers from the class who will serve as first generation organisms. Assign each “organism” its tool (i.e. clothespin, plastic fork, plastic knife, a set of tweezers).
2. Distribute each tool to the first generation organisms.
3. Put all the beans in a large tray or container.

ROUND 1

Procedure:

1. Hold the materials so that the five first generation organisms will start picking beans as soon as the timer starts. Set the timer to one (1) minute and begin picking. **Aim: To pick a minimum of 15 beans.**
2. After one minute, stop and let the recorder count and record in Table 1 the number of beans each organism picked using their assigned tool.
3. Those with 15 beans or more will continue for the Round 2. They will be given one (1) “offspring” who will pick beans together them. All surviving organisms should keep track of their own “offspring.”

Table 2. Number of beans picked by each organism.

Type of Organism	Number of beans picked

ROUND 2

Procedure:

1. Hold the materials so that everybody will start picking beans as soon as the timer starts. **Aim: To pick a minimum of 15 beans.**
2. Set the timer to one (1) minute and tell the members to begin picking. After one minute, stop and let the recorder count and record in Table 2 the number of beans each organism picked using their assigned tool.
4. Those with 15 beans or more will continue for the Round 3. They will be given one (1) "offspring" who will pick beans together with them. All surviving organisms should keep track of their own "offspring."

Table 2. Number of beans picked.

Type of Organism	Number of beans picked

