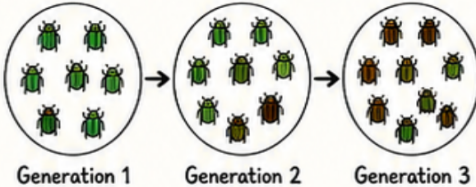


1. WHAT IS EVOLUTION?

- Populations (not individuals) evolve.
- Evolution occurs over many generations.
- It results from changes in allele frequencies in a population.

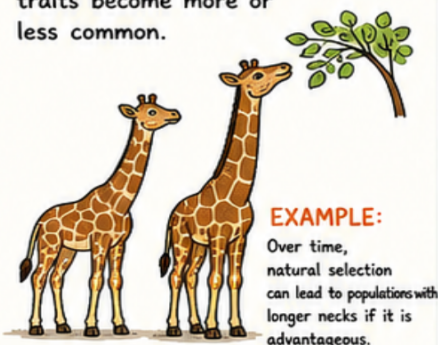
POPULATION: A group of organisms of the same species living in the same area at the same time.



Allele frequencies change → evolution occurs.

3. MECHANISMS OF EVOLUTION

- 1) Mutation – New genetic variation is introduced.
- 2) Natural Selection – Individuals with advantageous traits survive and reproduce more.
- 3) Genetic Drift – Chance changes in allele frequencies, especially in small populations.
- 4) Gene Flow – Movement of alleles between populations through migration.
- 5) Non-random Mating – Certain traits become more or less common.



≡ GRADE 12 BIOLOGY. ≡ EVOLUTION

DEFINITION:

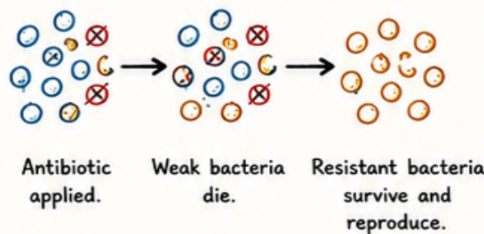
Evolution is the change in the inherited characteristics of populations over successive generations.

WHY IS EVOLUTION IMPORTANT?

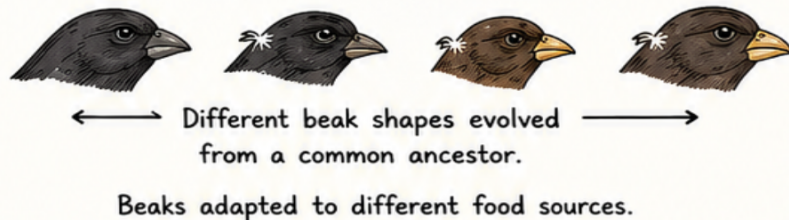
- Explains the diversity of life.
- Helps us understand relationships between organisms.
- Important for medicine, agriculture, conservation, and many other fields.

4. EXAMPLES OF EVOLUTION

- Antibiotic Resistance in Bacteria



- Galápagos Finches



2. EVIDENCE FOR EVOLUTION

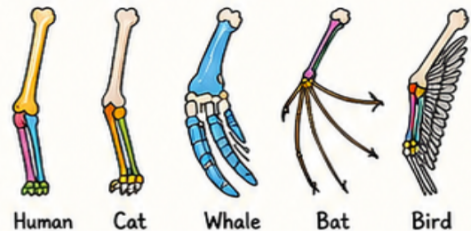
1) Fossil Record

- Shows changes in organisms over time.



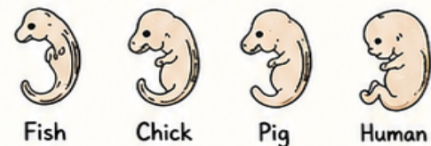
2) Comparative Anatomy

- Similar structures in different species suggest common ancestry.



3) Embryology

- Embryos of different species look similar in early stages.



4) Molecular Evidence

- Similarities in DNA and proteins indicate common ancestry.



KEY TAKEAWAY

Evolution is driven by changes in genetic variation and natural processes that shape populations over time. It explains both the unity and diversity of life on Earth.



REMEMBER

Evolution does NOT mean individuals change during their lifetime. Evolution is a change in populations over many generations.

GRADE 12 BIOLOGY: EVOLUTION

1. What is Evolution?

- Populations (not individuals) evolve.
- Evolution occurs over many generations.
- It results from changes in allele frequencies in a population.

Population: A group of organisms of the same species living in the same area at the same time.

Definition:

Evolution is the change in the inherited characteristics of populations over successive generations.

Why is Evolution Important?

- Explains the diversity of life.
- Helps us understand relationships between organisms.

- Important for medicine, agriculture, conservation, and many other fields.

2. Evidence for Evolution

1) Fossil Record

- Shows changes in organisms over time.

2) Comparative Anatomy

- Similar structures in different species suggest common ancestry.
- Examples: Human, Cat, Whale, Bat, and Bird forelimbs.

3) Embryology

- Embryos of different species look similar in early stages.
- Examples: Fish, Chick, Pig, and Human embryos.

4) Molecular Evidence

- Similarities in DNA and proteins indicate common ancestry.

3. Mechanisms of Evolution

1) Mutation

- New genetic variation is introduced.

2) Natural Selection

- Individuals with advantageous traits survive and reproduce more.

3) Genetic Drift

- Chance changes in allele frequencies, especially in small populations.

4) Gene Flow

- Movement of alleles between populations through migration.

5) Non-random Mating

- Certain traits become more or less common.

Example:

Over time, natural selection can lead to populations with longer necks if it is advantageous.

4. Examples of Evolution

Antibiotic Resistance in Bacteria

- Antibiotic applied.
- Weak bacteria die.
- Resistant bacteria survive and reproduce.

Galápagos Finches

- Different beak shapes evolved from a common ancestor.
- Beaks adapted to different food sources.

Key Takeaway

Evolution is driven by changes in genetic variation and natural processes that shape populations over time. It explains both the unity and diversity of life on Earth.

Remember

Evolution does **not** mean individuals change during their lifetime. Evolution is a

change in populations over many generations.

GRADE 12 BIOLOGY – EVOLUTION

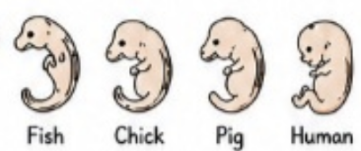
ACTIVITY

Name: _____ Date: _____

1. MULTIPLE CHOICE: Circle the correct answer.

- Evolution occurs over:
 - One lifetime
 - Many generations
 - A few days
 - One year
- Which of the following is evidence from fossil records?
 - Similar DNA sequences
 - Changes in organisms over time
 - Similar structures in different species
 - Embryos in early stages
- What is a population?
 - A group of different species in one area
 - A group of the same species living in the same area at the same time
 - All living things on Earth
 - A single organism

2. LABEL THE EVIDENCE: Write the type of evidence (Fossil Record, Comparative Anatomy, Embryology, or Molecular Evidence) for each picture.

-  _____
-  _____
-  _____
-  _____

3. MATCHING: Match the mechanism of evolution (Column A) with the correct description (Column B).

Column A	Column B
1. Mutation _____	A. Individuals with advantageous traits survive and reproduce more.
2. Natural Selection _____	B. Movement of alleles between populations.
3. Genetic Drift _____	C. Chance changes in allele frequencies, especially in small populations.
4. Gene Flow _____	D. New genetic variation is introduced.
5. Non-random Mating _____	E. Certain traits become more or less common.

4. SEQUENCE THE EXAMPLE: Number the steps (1–3) to show how antibiotic resistance develops in bacteria.

- ☐ Resistant bacteria survive and reproduce.
- ☐ Weak (non-resistant) bacteria die.
- ☐ Antibiotic is applied.



5. SHORT ANSWER: Answer the questions in the space provided.

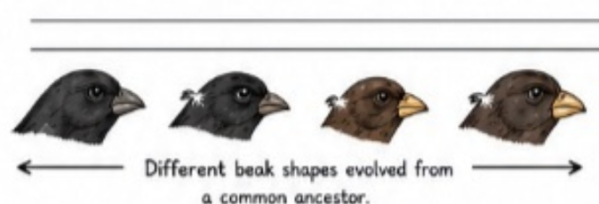
1. Why is evolution important for medicine and conservation?

2. Give an example of evolution in action in nature.

6. TRUE OR FALSE: Write T for True or F for False.

- Evolution means individuals change during their lifetime. _____
- Evolution occurs in populations over many generations. _____
- All living things share a common ancestor. _____
- Natural selection always makes organisms weaker. _____
- Embryos of different species look similar in early stages. _____

3. How do the beaks of Galápagos finches show evolution?



Beaks adapted to different food sources.



CHALLENGE!

Explain in 2–3 sentences how evolution leads to biodiversity.



REMEMBER: Evolution does NOT mean individuals change during their lifetime. Evolution is a change in populations over many generations.

