



The Family Tree of Life: Closer Than You Think

Reading Worksheet — Level F | tahricteaches.com

One of the most counterintuitive facts in biology is this: the mushroom on your dinner plate is more closely related to you than it is to the broccoli beside it. This claim sounds absurd at first — mushrooms grow in soil, look nothing like animals, and cannot move. But the evidence is written in the **phylogenetic tree**, the scientific map of evolutionary relationships between all living things.

Biologists classify organisms by analyzing shared genetic sequences in their **DNA**. The more genetic material two species share, the more recently they diverged from a common ancestor. Fungi — the kingdom that includes mushrooms, mold, and yeast — and animals (including humans) are both members of a larger group called **Opisthokonta**. Plants, by contrast, split from that lineage far earlier. This means fungi and humans share a more recent common ancestor than fungi and plants do.

The same logic explains another stunning fact: humans share approximately **29% of their DNA** with bananas. A banana's cells perform many of the same fundamental processes as human cells — energy production, protein synthesis, cell division. The genes responsible for those processes are ancient and have been **conserved** across billions of years of evolution. In other words, the genetic code for basic cellular chemistry works so well it has barely needed to change.

These genetic connections reveal something profound about the tree of life. Every organism alive today — from bacteria to blue whales — is the product of an unbroken chain of reproduction stretching back to the first life on Earth roughly 3.8 billion years ago. There have been no gaps, no new beginnings. We are all cousins, separated only by degrees of genetic distance.

Neil deGrasse Tyson uses these biological connections to make a larger philosophical point. When we understand that we share DNA with fungi and fruit, our sense of human uniqueness shifts. We are not separate from nature — we are an expression of it. The same evolutionary forces, the same chemistry, the same ancient code runs through all living things on this planet. We didn't arrive in the world. We grew from it.



A. Vocabulary Matching

1. **phylogenetic**
 2. **Opisthokonta**
 3. **diverge**
 4. **conserved**
 5. **synthesis**
- a. to develop in different directions from a shared common starting point
 - b. the biological process of combining simpler molecules into complex ones
 - c. the biological supergroup that includes both animals and fungi
 - d. relating to the evolutionary history and family relationships of organisms
 - e. unchanged across a long period of evolutionary time



B. True or False

1. T F Fungi and animals both belong to the supergroup Opisthokonta.
2. T F Mushrooms are more closely related to plants than to humans.
3. T F The more DNA two species share, the more recently they diverged.
4. T F Bananas perform energy production using similar genes to human cells.
5. T F The first life on Earth appeared approximately 3.8 billion years ago.
6. T F Conserved genes change rapidly over evolutionary time.
7. T F All living things today share an unbroken reproductive lineage.
8. T F Humans share about 29% of their DNA with bananas.
9. T F The phylogenetic tree shows evolutionary relationships between organisms.



C. Fill in the Blanks

Word Bank: phylogenetic diverge conserved Opisthokonta synthesis

1. The _____ tree maps the evolutionary relationships between all living things.

2. Fungi and animals are grouped together in a supergroup called _____.

3. When two species _____, they develop in different directions from a shared ancestor.

4. Ancient genes responsible for basic cell functions have been _____ across billions of years.

5. Protein _____ is one of the fundamental cellular processes shared by humans and bananas.

D. Comprehension Questions

1. What does it mean for fungi and animals to belong to the same supergroup (Opisthokonta), and what does that imply about their evolutionary relationship?

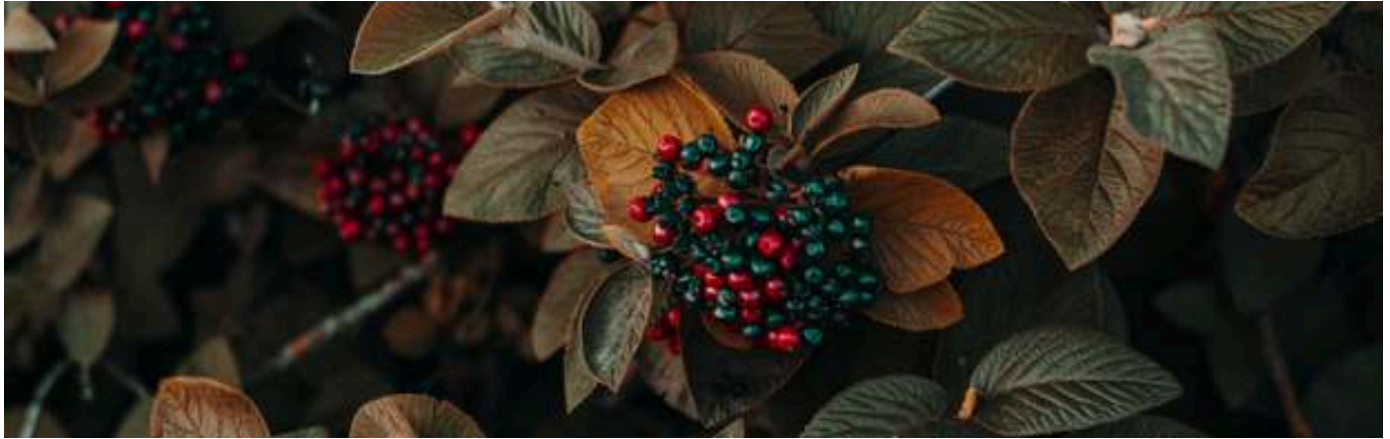
2. Why do humans share 29% of their DNA with bananas, and why have those particular genes been conserved?

3. What philosophical point does Neil deGrasse Tyson draw from the genetic connections between all living things?

E. Discussion Questions

1. Does knowing that you share nearly a third of your DNA with a banana change how you think about other living things? Why or why not?

2. The article says we "didn't arrive in the world — we grew from it." What do you think this means, and do you agree?



Answer Key

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A. Vocabulary

1-d, 2-c, 3-a, 4-e, 5-b

B. True or False

1-T, 2-F, 3-T, 4-T, 5-T, 6-F, 7-T, 8-T, 9-T

C. Fill in the Blanks

1-phylogenetic, 2-Opisthokonta, 3-diverge, 4-conserved, 5-synthesis

D. Comprehension Questions

1. They share a more recent common ancestor than either group shares with plants, meaning fungi and animals diverged from each other more recently than fungi and plants did.
2. They share ancient genes responsible for basic cellular processes like energy production and cell division. These genes have been conserved because they work so well — basic cellular chemistry hasn't needed to change.
3. That humans are not separate from nature but an expression of it — the same evolutionary forces and ancient genetic code runs through all living things, so we are deeply connected to every organism on Earth.