Unit 19 · Evidence of Evolution

WORKSHEET

Full marks 35

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 35

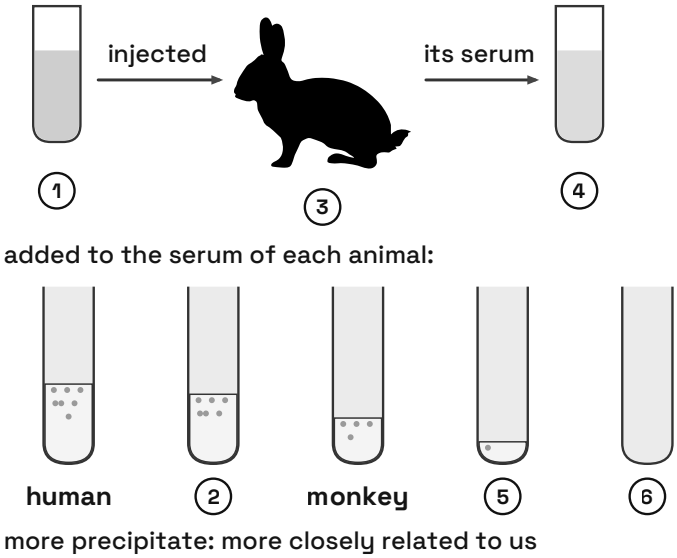
1 Key words [4]

Match each term in column A with its meaning in column B. Two items in column B are not needed. Each match carries 0.5 mark.

Column A		Column B
1. organic evolution	☐	**a.** the sudden reappearance of a lost ancestral character in one individual
2. microevolution	☐	**b.** a mineral pattern that looks like a fossil but is not one
3. retrogressive evolution	☐	**c.** the study of how animals behave
4. atavism	☐	**d.** the time in which half of a radioactive atom decays
5. paleontology	☐	**e.** small changes in gene frequencies within a population
6. pseudofossil	☐	**f.** a common, widespread, short-lived species that dates a rock layer
7. index fossil	☐	**g.** descent with modification of populations over many generations
8. half-life	☐	**h.** a fossil formed when an animal is frozen in ice
		i. the study of fossils
		j. a trend from complex to simple, losing structures no longer needed

2 Label the diagram [3]

The diagram shows the precipitin test. Write what belongs in place of 1 to 6. Each carries 0.5 mark.



1. _____ **2.** _____

3. _____ **4.** _____

5. _____ **6.** _____

3 Multiple choice [5]

Choose the correct option for each of the following questions.

i. What is microevolution primarily concerned with? [1]

a. formation of new species **b.** small-scale changes in gene frequencies

c. evolutionary trends from simple to complex **d.** adaptation to changing environments

ii. What type of fossilization involves the preservation of hard parts like bones and teeth through mineralization? [1]

a. intact fossils **b.** petrified fossils

c. molds/casts fossils **d.** compression fossils

iii. Bats, birds and insects all have wings, but their wings evolved separately. This is an example of: [1]

a. divergent evolution **b.** convergent evolution

c. parallel evolution **d.** retrogressive evolution

iv. A baby born with a short tail is an example of: [1]

a. a vestigial organ **b.** atavism

c. an analogous organ **d.** convergent evolution

v. In a cliff of undisturbed sedimentary rock, a fossil fish is found in a layer 20 m below a layer with fossil leaves. The fish is: [1]

a. older than the leaves

b. younger than the leaves

c. the same age as the leaves

d. impossible to compare without carbon dating

4 Very short answers [3]

Write very short answers to the following questions.

a. Name the connecting link between annelids and arthropods. [1]

b. What is the half-life of carbon-14, and up to what age can carbon-14 date remains? [1]

c. Why are most fossils those of water animals or of animals that died near water? [1]

5 Short answers [9]

Write short answers to the following questions.

a. Distinguish between homologous and analogous organs, with one example of each. [2]

b. A piece of charcoal from an old hearth has one-sixteenth of the carbon-14 that the same mass of carbon from a living tree has. How old is it? Show your working. [2]

c. Which dating method would you use for: a. a human skull about 20,000 years old; b. the ash layer beneath a fossil ape about 9 million years old? Give a reason for each. [2]

d. What is the precipitin (serological) test? How does it show relationship between animals? [3]

6 Long answers [8]

Write long answers to the following questions.

a. Explain the characteristic features of *Archaeopteryx* and its role as a connecting link between reptiles and birds. [4]

b. Describe the key evolutionary changes that occurred in the lineage leading from *Hyracotherium* to modern *Equus*. [4]

7 Think [3]

Whales look like fish, but in serological tests their serum proteins react most strongly with those of pigs, cattle and hippos. What does this tell us about the whale's ancestry, and what kinds of evidence have confirmed it? Why is the whale's fish-like shape not evidence of a close kinship with fishes?

8 Activity: Building a fossil record (Activity 7.2)

(not marked)

Lay a book on the table, a pen on it, another book, another pen, and so on. Then fill in the table.

Question	Your answer
Which pen was buried first?	
Which is the “youngest fossil”?	
What does the pile tell: the order or the age in years?	
What would you need to know the age in years?	
What happens if the pile is turned over?	

Which principle of dating does the pile show?