



eduresourceza.com

WORKSHEET

Life Science 12

Week 17

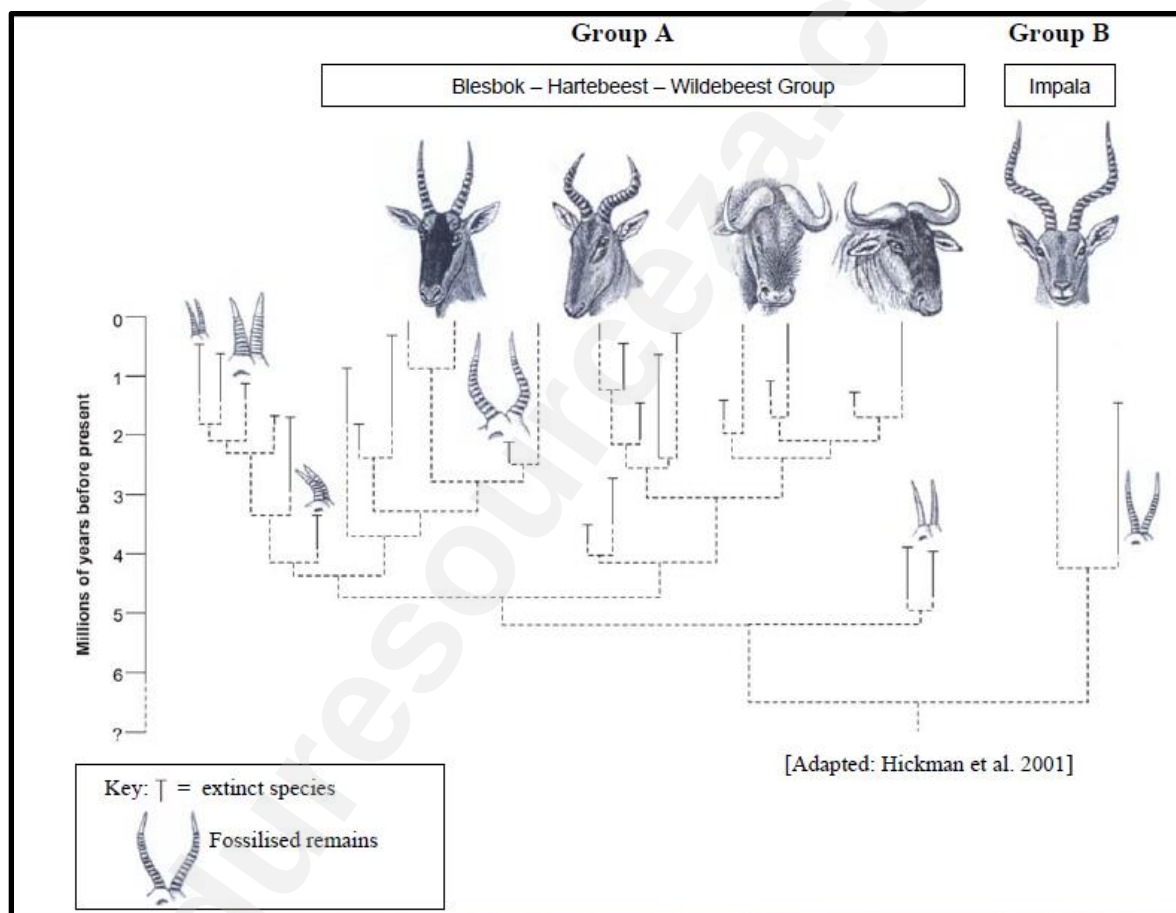
Once your work has been uploaded, I will choose a few questions at random, and it will be for marks.

Lesson 1-4

Question 1 [18]

{Adapted from: IEB Paper 2, 2010}

A cladogram illustrating the evolutionary development of southern African buck.



1. Explain what is meant by the term 'allopatric speciation'. (3)

Use the diagram (cladogram) above to answer the following questions concerning speciation.

2. What is the difference in the amount of speciation and frequency of extinction between group A and B? (4)

3. Organisms that eat a restricted range of food, such as blesbok, may be more subject to geographic isolation than generalised feeders, such as impala. This is because areas where food is scarce function as geographical barriers.

WORKSHEET

Life Science 12

Week 17

- (a) Using your knowledge of the principles of speciation and the information provided, explain how feeding specialisation caused increased speciation within group A. (4)
- (b) What advantage might this speciation be to the buck? (2)
- (c) Briefly describe an example that you studied where geographic barriers and food specialisation have played a role in speciation. (5)

Question 2 [30]

{Adapted from: IEB Paper 2, 2009}

The table provides information about seven different edible yellowfish species. The map shows the distribution of these fish species in Southern Africa. Use the information provided to answer the questions that follow. (Pictures not to scale)

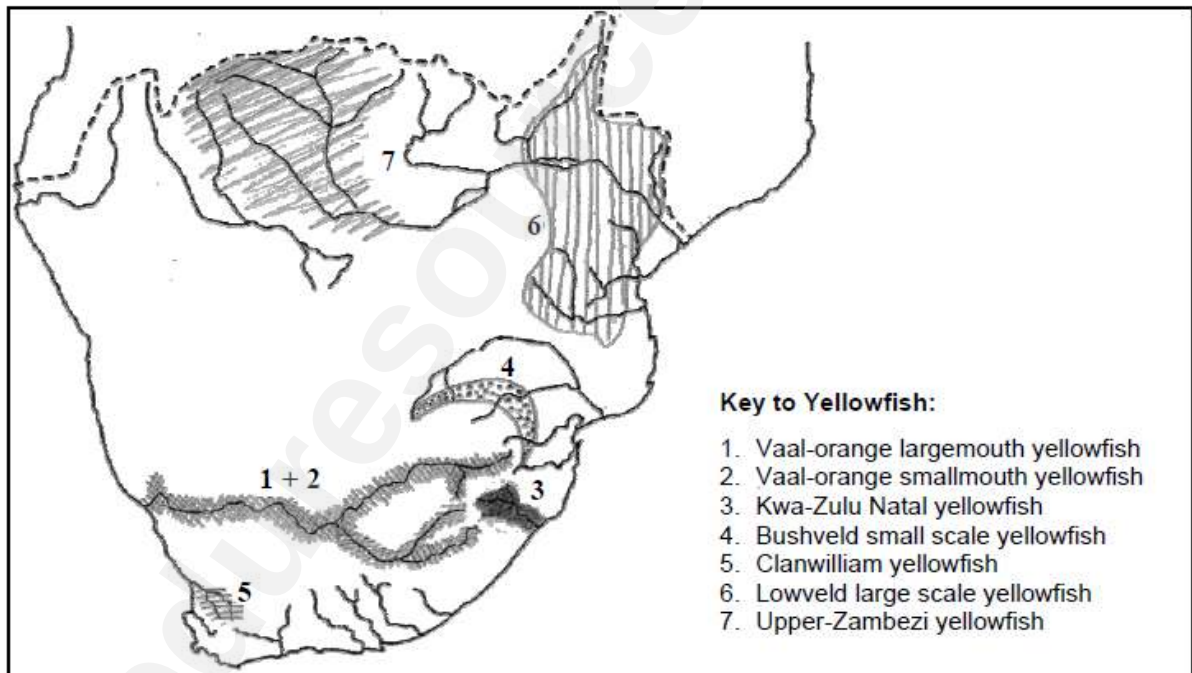
Yellowfish Species – Common Name	Description
1.  Vaal-orange largemouth yellowfish	Largest, scale-bearing, indigenous, freshwater fish. Vulnerable status. Carnivorous fish feeding on insects, crabs and other fish. Adults prefer flowing water in deep channels or below rapids. Live in dams. Breed in mid to late summer over gravel beds in running water.
2.  Vaal-orange smallmouth yellowfish	Omnivorous fish feeding on insects, clams, vegetation and algae. Adults prefer clear-flowing water of large rivers with sandy bottoms. Live in dams. Migrate upstream to breed in spring to mid-summer over gravel beds.
3.  KwaZulu-Natal yellowfish	Omnivorous fish. Found in a wide range of habitats including pools and rapids of clear streams. Breeds in summer.
4.  Bushveld smallscale yellowfish	Feeds on algae in winter and insects in summer. Found in cool water only above an altitude of 600 m. Breeds in spring and summer.

WORKSHEET

Life Science 12

Week 17

5.		Vulnerable status. Omnivorous includes frogs and small fish in the diet. Breeds in summer migrating upstream.
6.		Omnivorous fish. Breeds in spring and summer.
7.		Lips often thickened.



Map showing distribution of the Southern African yellowfish species in Southern African rivers.

1. Explain what is meant by the term 'species'. (3)
2. The pictures show the structural features of yellowfish. Give THREE structural features the scientists could use when comparing their appearance. (6)
3. Find the distribution of the KwaZulu-Natal yellowfish and the Clanwilliam yellowfish on the map. Use this information to explain the probable way in which these species formed. (5)

WORKSHEET

Life Science 12

Week 17

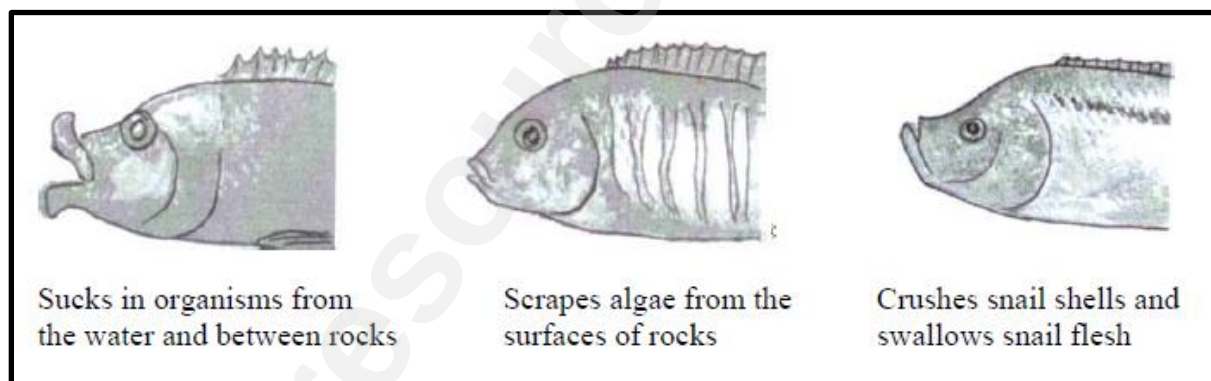
4.
 - a) Name the two fish species that live in the same river. (2)
 - b) What is the diet of these two fish? (2)
 - c) These two fish species live in the same area. Use the information from the table to suggest why they have not become one species over time. (4)
5. How could the preservation and resulting population growth of the yellowfish affect humans? (2)
6. Briefly describe an **example** of Darwin's theory of natural selection that you have studied. (3)
7. In what way is the evolution of the yellowfish similar to your example in 6.? (3)

Question 3 [6]

{Adapted from: IEB Paper 1, 2011}

Many species of **cichlid** fish are found in Lake Malawi in Africa. The lake provides a large range of habitats and few other competing organisms. The cichlids evolved from a single common ancestor.

The diagrams below show the heads of three different species of cichlid fish and provide information about their feeding methods.



1. Describe how the information given about these fish illustrates adaptive radiation. (3)
2. The evolution of these cichlid fish has involved an isolating mechanism.
 - (a) State the importance of isolating mechanisms in the evolution of new species. (1)
 - (b) Do you think these cichlid fish in Lake Malawi are an example of sympatric or allopatric speciation? Give a reason for your answer. (2)

WORKSHEET

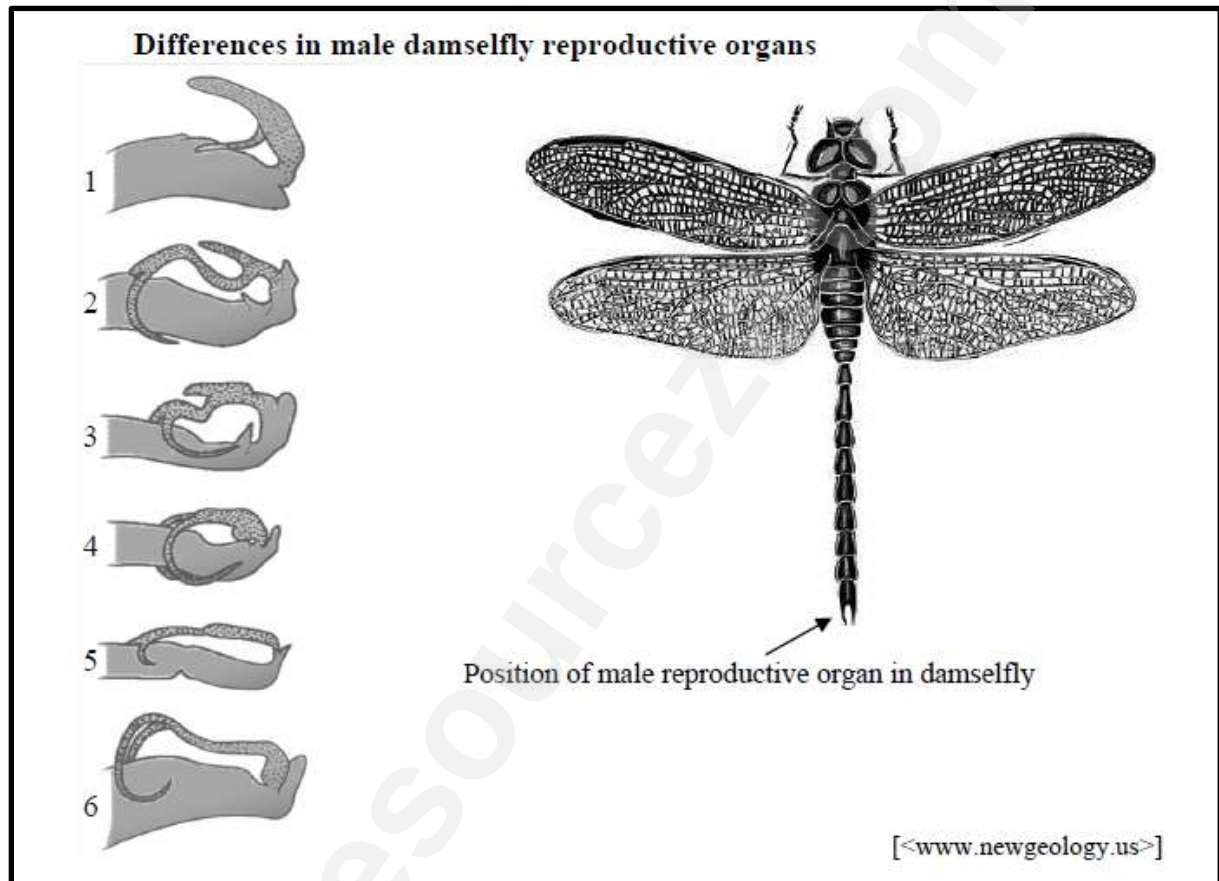
Life Science 12

Week 17

Question 4 [5]

{Adapted from: IEB Paper 1, 2014}

The diagrams below show the male reproductive organs of six different damselfly species, 1 to 6.



1. How do the structures in the diagrams above show that reproductive isolation takes place in damselflies? (1)
2. Explain how this isolating mechanism you mentioned in Question 1 would ensure that the six species of damselflies remained separate in a particular ecosystem. (2)
3. Explain why this is an example of sympatric speciation. (2)

[Total: 59 Marks]