

Assignment title	<b>Is survival in the genes?</b>
Assessor	Mrs K Laurie
Date issued	1 <sup>st</sup> June 2020
Final deadline	7 <sup>th</sup> September 2020
Duration (approx)	5 hours
Qualification suite covered	BTEC Level 2 First Award in Principles of Applied Science
Units covered	Unit 4: Biology and Our Environment
Learning aims covered	Learning aim A: Investigate the relationships that different organisms have with each other and with their environment
Scenario	<p>You work alongside the curator (the person in charge of exhibits/specimens in a museum) in the Natural History Museum.</p> <p>You have been asked to make a display to describe how we currently classify organisms.</p> <p>You have also been asked to produce a display that describes and discusses how organisms interact with one another and with their environment.</p> <p>In another part of the display you will then need to produce materials to describe, explain and evaluate how the environment and genes can play a part in how an organism evolves and survives or becomes extinct.</p>
Task 1	<p>The museum has a large television monitor just inside the main entrance for showing visitors information as a PowerPoint® presentation, repeated at regular intervals.</p> <p>Produce a PowerPoint® presentation for the display that:</p> <ul style="list-style-type: none"> <li>• describes how all organisms are classified by putting them into one of five kingdoms. Includes two organisms from each of the following kingdoms: <ul style="list-style-type: none"> <li>○ monera (bacteria)</li> <li>○ protozoans (protists)</li> <li>○ fungi</li> <li>○ plants</li> <li>○ animals</li> </ul> </li> <li>• describes the features that are used to classify the organism as a member of that kingdom</li> <li>• describes the main characteristics of vertebrates and invertebrates</li> <li>• describes THREE key features of each of the FIVE classes (sub-groups) of vertebrates, naming some examples</li> <li>• describes some main characteristics of invertebrates and names some examples</li> <li>• shows TWO keys that you have constructed, one identifying SIX plants found in a forest and one identifying SIX animals that can be found in the forest.</li> </ul> <p>For the display:</p> <ul style="list-style-type: none"> <li>• Construct and annotate a food web, consisting of a number of food chains that link together to describe how the characteristics of the organisms determine their place and reliance on each other in the food chains and food web.</li> <li>• Underneath the food web, describe and discuss at least TWO other ways</li> </ul>

	<p>in which plants and animals in your food web need each other.</p> <ul style="list-style-type: none"> <li>Decide on a predator and an animal that is its prey. Use these to produce a poster to show how the numbers of these two organisms are likely to change over time and discuss at least two reasons why the numbers may go up or down.</li> <li>Find a picture of an animal that has changed over several hundred years or more. Use the picture to produce a poster that distinguishes and describes the role of genes, (you may wish to use a Punnett square in your description), the role of the environment, and the role of both genes and the environment together in causing variation.</li> <li>Provide diagrams or pictures for a poster showing an animal at different stages of evolution. (Remember to reference your sources.) Add notes to each of the stages to explain and evaluate how the genes and the environment have caused the animal to evolve to survive and how natural selection is one of the key processes in evolutionary change. Evaluate the role of genes and genetic mutation and how this and natural selection can influence the ability of the organism to evolve and survive or not.</li> </ul>
Evidence you must produce for this task	<ul style="list-style-type: none"> <li>A PowerPoint® describing characteristics of organisms and how they are used to create keys for identification purposes.</li> <li>Posters describing food chains and food webs and how organisms depend on each other for food and survival.</li> <li>Information on the poster discussing how a change in the environment can affect a population and the other organisms in the food web.</li> <li>A poster describing, explaining and evaluating the role of genes and the environment in evolution, natural selection, survival, and extinction.</li> </ul>

## Criteria covered by this task:

To achieve the criteria you must show that you are able to:	Unit	Criterion reference
Evaluate the impact of genes and the environment on the survival or extinction of organisms.	4	2A.D1
Explain the role of genes and the environment in evolution.	4	2A.M1
Discuss the factors that affect the relationship between different organisms.	4	2A.M2
Describe the role of genes and the environment in variation.	4	2A.P1
Describe how characteristics are used to classify organisms.	4	2A.P2
Describe the different ways in which organisms show interdependence.	4	2A.P3

Sources of information	<p><b>Textbooks</b> Any GCSE Science textbooks or revision guides. If you do not have any at home check your local library.</p> <p><b>Websites</b> BBC Bitesize – GCSE Science</p> <p><b>Stretch it:</b> Include resources relevant to your local area such as local employers, newspapers and council websites.</p>
------------------------	--



**Learner Assessment Submission and Declaration**

**This sheet must be completed by the learner and provided for work submitted for assessment.**

Learner name:		Assessor name:	
Date issued:	Completion date:	Submitted on:	
Qualification:			
Assessment reference and title:			

Please list the evidence submitted for each task. Indicate the page numbers where the evidence can be found or describe the nature of the evidence (e.g. video, illustration).

Task ref.	Evidence submitted	Page numbers or description
Comments for note by the Assessor:		

**Learner declaration**

I certify that the work submitted for this assignment is my own. I have clearly referenced any sources used in the work. I understand that false declaration is a form of malpractice.

Learner signature: \_\_\_\_\_ Date: \_\_\_\_\_

## Assessment criteria

Level 1	Level 2 Pass	Level 2 Merit	Level 2 Distinction
<b>Learning aim A: Investigate the relationships that different organisms have with each other and with their environment</b>			
1A.1 Distinguish between variation due to genes and variation due to environmental factors.	2A.P1 Describe the role of genes and the environment in variation.	2A.M1 Explain the role of genes and the environment in evolution.	2A.D1 Evaluate the impact of genes and the environment on the survival or extinction of organisms.
1A.2 Construct simple keys to classify organisms.	2A.P2 Describe how characteristics are used to classify organisms.	2A.M2 Discuss the factors that affect the relationship between different organisms.	
1A.3 Construct food chains and food webs.	2A.P3 Describe the different ways in which organisms show interdependence.		

## Assessment guidance

**Learning aim A: Investigate the relationships that different organisms have with each other and with their environment**

For 1A.1, learners will be expected to identify the different ways in which organisms vary and how this variation is brought about. They will be able to distinguish between simple genetic characteristics and characteristics that are a result of the environment. At this level, learners will not be expected to describe characteristics that are influenced by both genes and the environment. The information that learners submit could be presented in a simple, clear table.

For 2A.P1, learners will be expected to describe how genes and the environment influence variation with evidence to show understanding of how genetic factors can also be influenced by lifestyle or the environment. Learners will be able to draw on their knowledge and understanding of information gained in Unit 1 to describe how genes determine the basis for many characteristics and could demonstrate their understanding of this using genetic diagrams or Punnett squares. Learners should be able to identify genetic characteristics that can be altered by the environment, for example, weight or height – and give a brief description of how lifestyle or the environment affects these characteristics.

Learners at Merit grade, 2A.M1, will develop their understanding further to link strong characteristics with survival of the organism, showing in their evidence how natural selection is one of the key processes involved in evolutionary change.

For 1A.2, learners will be able to pick out key characteristics of organisms and use these characteristics to classify the organisms into appropriate groups. Learners will be expected to know the main characteristics of the five kingdoms, as well as the main characteristics of the vertebrates and invertebrates, giving examples of organisms that fall into each group. This will involve the construction and use of keys to cover the criterion for 1A.3 to help identify organisms, food chains and food webs.

For 2A.P2, learners need to classify organisms using characteristics and describe how to do this. Learners may link this information to the interdependence of organisms to provide evidence for 2A.P3 by stating how the characteristics of organisms determine their place in food chains and webs. Further evidence for this criterion could be provided in annotated diagrams, posters or flow charts that give details on the different ways in which organisms depend on each other, other than just feeding relationships. It is expected that learners will provide information on at least two different types of interdependent relationships, which will include the detail derived from food chains and webs.

At Merit level, 2A.M2, learners need to discuss how different factors affect the relationship between different organisms.

At Distinction level, 2A.D1, learners will provide clear evidence in their evaluation of how genes and the environment impact on evolution, including information on how these factors, as well as gene mutation, can lead to the extinction of species or the formation of new species.

Coverage of learning aim A could be obtained by producing wall displays, presentations or information leaflets that provide learners with the opportunity to use their imagination and creative talents, as well as to encourage tiered learning that promotes access to the higher grades.