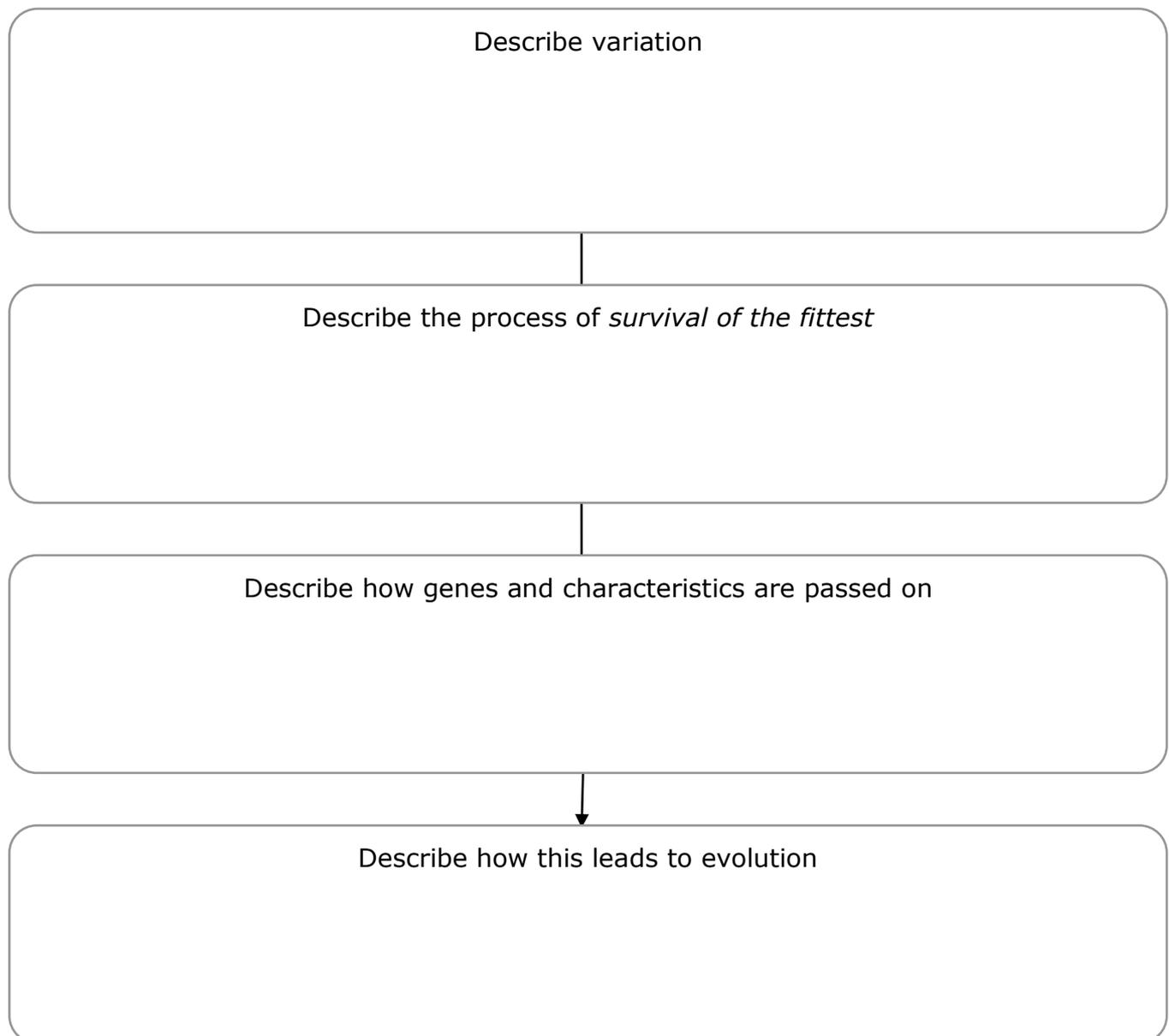


Genes

Task 1

Natural selection and evolution

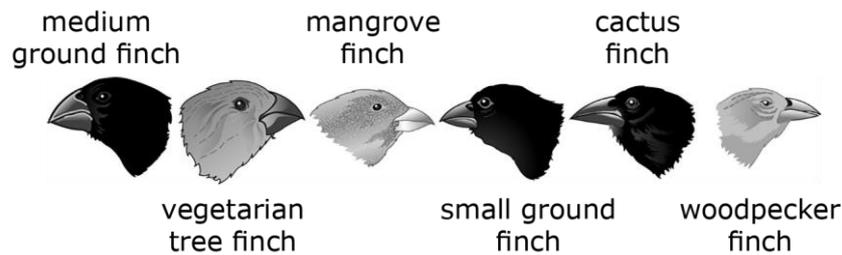
Natural selection is a process. When you describe a process, you can think about the order it happens in, to help you to structure your description. Complete the boxes in this flow chart to describe the theory of natural selection.



Task 2

Evaluating evidence for evolution

Use the types of finches found on the Galapagos Islands (shown in the picture below), and your own knowledge, to answer questions about Darwin’s theory of evolution.



1 Describe, briefly, how the finches found on the Galapagos Islands differ.

.....

.....

2 Suggest possible factors that that determined how finches have adapted and evolved.

.....

.....

3 Complete these sentences to describe evidence for Darwin’s theory of evolution.

The different types of finches all descended from a common ancestor.

This means that the finches have to their surroundings.

The variation shown within the species over time is as a result of selection.

These changes are also observed in other organisms, including in microorganism populations. An example of this is the development of antibiotic-..... bacteria.

Fossil records can also be used to demonstrate changes in organisms over time, and the fact that some organisms have become shows how species that do not adapt to environmental changes eventually die out.

4 Describe two sources of evidence for evolution.

.....
.....
.....
.....
.....
.....

5 Describe the process of peer review. Use these key words to help you.

published	checks	scientist	similar area
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Task 3

Extinction

Animals can become extinct or endangered for different reasons.

1 Read the following information about animals that are extinct or endangered. For each example, choose the most likely reasons for extinction, from:

- changes to the organism’s environment
- destruction and loss of habitat
- outbreak of a new disease
- introduction of new predators and competitors.

Dodos used to live on the island of Mauritius, which was uninhabited. Dodos had no natural predators. In the 17th century, people arrived on the island, and dodos were hunted for food. Rats that came on the ships ate the dodos' eggs. In less than a century, the dodo became extinct.

Reason for extinction

The black rhino is an endangered species. They are poached for their horns. Some rhino habitats have also been taken over by landless people with nowhere else to live.

Reason for extinction

Christmas Island was uninhabited until 1888. When people inhabited the island, rats from the people's ships also inhabited the island. The native rat population became extinct within a decade.

Reason for extinction

2 Describe how animals, such as the woolly mammoth, became extinct, while other species survived.

.....
.....
.....

3 Biodiversity is the name given to all the species living in a particular ecosystem. Within an ecosystem, having many different species ensures resources are available for other populations, such as humans.

Explain how a lack of biodiversity can lead to a species dying out in an area.

.....
.....
.....

4 Draw lines to link the techniques used to prevent extinction and maintain biodiversity with their descriptions.

seed banks

animals are bred in human-controlled environments; this creates a stable, healthy population of a species before reintroducing it back into its natural habitat

captive breeding

the protection of natural environment to ensure that habitats are not lost; this reduces disruption to food chains and webs

conservation

conserves plants by storing seeds of many different plant species under carefully controlled conditions; in the event that a plant species becomes extinct, the seeds can be used to reintroduce the species

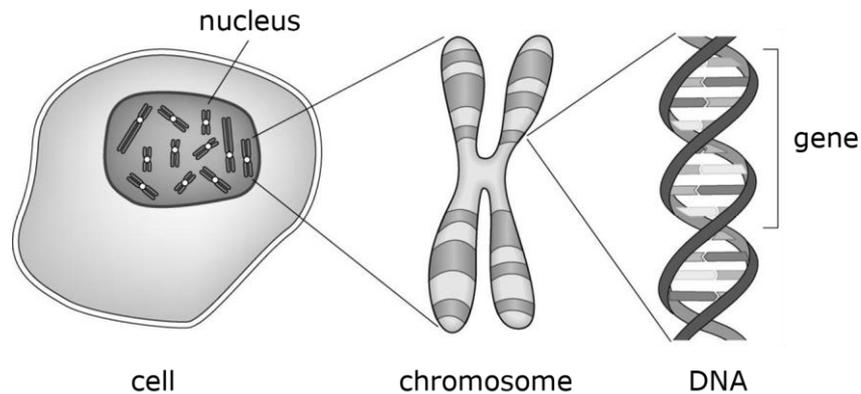
5 Describe how preserving biodiversity can provide three useful products and services for humans.

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.....

Task 4

Inheritance

This diagram shows how the DNA inside your cells is organised.



1 Fill in the gaps using these key words. You can use each word more than once.

genes	characteristics	chromosomes	DNA
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You inherit characteristics from your parents through genetic material stored in the nucleus of your cells. This material is a chemical called deoxyribonucleic acid (.....). It contains all the information needed to make an organism.

Inside the nucleus, your DNA is arranged into long strands called

Humans have 46 You inherit half of your from your mother and half from your father. This is why you share some of your with your mother and some with your father. Each chromosome is divided into sections of DNA. The sections that hold the information to produce a characteristic are

2 Explain why brothers and sisters with the same parents look similar but not identical.

.....

.....

3 State what is meant by a *mutation*.

.....
.....

4 State one possible positive effect and one negative effect of a mutation.

Positive:

Negative:

5 Most mutations cannot be passed on. Explain how DNA which has been mutated can be passed on to an organism's offspring.

.....
.....
.....

Task 5

Genetics

1 Complete the Punnett square to show the inheritance of flower colour.

The allele for red flowers is **R**. The allele for white flowers is **r**.

		Parent 2: white flower	
		r	r
Parent 1: red flower	R		
	R		

2 Describe, in detail, the difference between **R** and **r** in the genetic cross above.

.....
.....
.....
.....

3 Use your results from the completed Punnett square to help you to describe the appearance of possible offspring in this genetic cross.

.....

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