



# Year 10 Science Sample Resources



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# Evolution Worksheet 1

Property of Prestige Tuition

1. **State** whether adaptations are developed during the life of an animal or are inherited.

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2. **List** three basic types of adaptations with an example of each.

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3. **State** two reasons why individuals within a species are not identical to one another.

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4. **Describe** three examples each of an adaptation that is:

a) Structural

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b) Behavioural

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5. **Describe** three:

a) inherited characteristics in a polar bear

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b) acquired characteristics in a human

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6. **Identify** three similarities and three differences that exist between different members of your own family.

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7. **Identify** whether the red bristles on Cuddles the shark are an adaptation to its tank environment or its original environment of dark ocean caves.

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8. **Analyse** the adaptations in the table below and match them with their likely survival values and the habitats in which they are likely to occur.

<b><u>Adaptation</u></b>	<b><u>Survival Value</u></b>	<b><u>Habitat</u></b>
Body colour that blends with the background	Avoidance of the hottest parts of the day	Saltwater
Production of small volumes of concentrated urine	Avoids dislodgement by moving fluids	Desert
Hooks and suckers on the head end of the organism	Enables waste removal with minimal water loss	Rainforest
Broad, flat, bright green leaves	Avoidance of predators	Intestines of a sheep
Lives underground by day, and is active at night	Maximum absorption of sunlight	Any

9. **Classify** the following as inherited or acquired characteristics:

a) a suntan

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b) black hair

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c) high resistance to a bacterial infection

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d) blue eyes

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e) the athletic ability of a gymnast

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**10. Propose** what the survival advantage is of animals:

a) being able to intimidate

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b) being camouflaged

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c) forming packs

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d) hibernating through a harsh winter

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**11.** When African wildebeest cross a crocodile-infested river, they do it as a herd and not as individuals. **Propose** reasons why.

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**12.** Like the males of many bird species, male peacocks are very colourful and carry out spectacular displays with their tail feathers.

a) **Classify** each adaptation as structural, functional or behavioural.

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b) **Propose** how these adaptations allow the species to survive.

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**13.** Jackrabbits, bilbies and fennec foxes all live in desert habitats, have very large ears and are nocturnal. **Propose** ways in which their adaptations allow them to live in their hot and dry environments.

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# Electricity, Electromagnetism and Communications Technology

## Worksheet 1

Property of Prestige Tuition

1. **List** the four parts of a simple circuit.

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2. **State** the units for voltage, current and resistance.

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3. **List** three examples of a load that could be included in a circuit.

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4. **State** Ohm's law in both words and symbols.

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5. **Clarify** what is meant by a 'circuit'.

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6. **Define** the terms:

a) Voltage

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b) Current

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c) resistance

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**Electricity, Electromagnetism and Communication Technology  
Worksheet 1**

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*Property of Prestige Tuition*

7. Draw a diagram to **outline** how components in a circuit are connected:

- a) in series
- b) in parallel

8. **Explain** what an electrical appliance marked with 240 V, 50 Hz means.

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9. A series circuit and a parallel circuit each have two globes in them. **Describe** what would happen in each if one of the globes was to blow.

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10. Use the same key above to determine the order of colours of the first three bands for each of the following resistors:

a) 560  $\Omega$

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b) 3300  $\Omega$

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c) 470 000  $\Omega$

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d) 1 200 000  $\Omega$

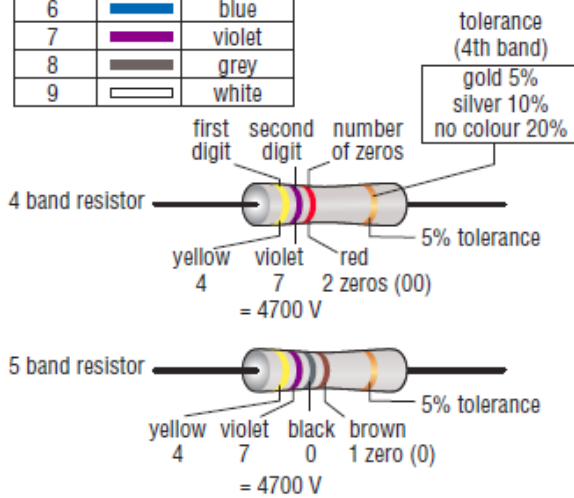
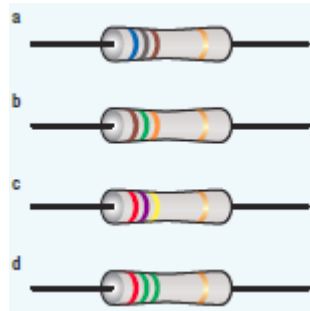
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11. Use the key at left (below) to determine the resistance of the resistors below (at right).

Digit	Colour
0	black
1	brown
2	red
3	orange
4	yellow
5	green
6	blue
7	violet
8	grey
9	white




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*Electricity, Electromagnetism and Communication Technology*  
**Worksheet 1**

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*Property of Prestige Tuition*

**12.** Draw diagrams to **demonstrate** all of the components in both the water pump and electric circuits. Label each component.

**13.** Sketch a graph to **demonstrate** Ohm's Law, showing the relationship between voltage, current and resistance in Ohm's law.

**14. Identify** whether AC or DC electricity is being used:

a) in the washing machine

b) in a torch

c) in an iPod

d) your bedroom light





**Electricity, Electromagnetism and Communication Technology  
Worksheet 1**

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*Property of Prestige Tuition*

15. Use Ohm's law to **calculate** the missing values in the table.

<u>Current (amps)</u>	<u>Voltage (volts)</u>	<u>Resistance (ohms)</u>
8	15	
5		6
	240	18
10	240	
0.5		14
	12	1.5

16. A circuit has a 12 volt battery connected to a 50 ohm resistor. **Calculate** the current in the circuit.

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17. Ming constructed a series circuit with a 75 ohm resistor. She connected the circuit to an 8 volt battery.

a) Draw a diagram to **demonstrate** the circuit.

b) **Calculate** the current in the circuit.

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**Electricity, Electromagnetism and Communication Technology  
Worksheet 1**

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*Property of Prestige Tuition*

18. Complete the following table to **compare** an electrical circuit with a water pump circuit.

<u>Electrical Circuit</u>	<u>Water Pump Circuit</u>
Battery	
	Pipe
Voltage or energy	
Switch	
	Water flowing through pipe
	Waterwheel

19. A series circuit and a parallel circuit were set up, each with two globes. **Compare** the brightness of the globes in each case.

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20. **Contrast** direct current with alternating current.

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21. **Propose** reasons why the lights in a home are wired in a parallel circuit.

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22. Another way of labelling a 3800  $\Omega$  resistor is 3K8. **Predict** the size of a resistor of resistance:

a) 4K9

b) 2M5

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**23. Construct** diagrams for the following circuits:

a) two lights and a switch in series

b) two lights in parallel and a switch to turn both lights off at once

c) three lights in parallel, each of which can be turned off individually



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- d) two lights in series, parallel to a single light. One switch should turn off all lights at once, and another switch should turn off the single light only

A large, empty rectangular box with a thin black border, intended for the student to draw a circuit diagram based on the problem statement.



# Evolution Exam

Property of Prestige Tuition

Name: \_\_\_\_\_ Date: \_\_\_\_\_

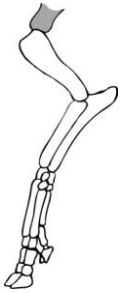
Instructions: Write answers in the right-hand column. Score: \_\_\_\_\_ / 67 marks

## Section A—Multiple choice (12 marks)

1	<p>Which of the following ideas is most closely associated with Jean Baptiste Lamarck's theory?</p> <p>A sudden speciation followed by long periods of stability</p> <p>B evolution by natural selection</p> <p>C evolution by inheritance of acquired characteristics</p> <p>D evolution as a result of a change in the frequency of certain genes in a population</p>		1
2	<p>Who developed the theory of natural selection while on board HMS <i>Beagle</i> in the Galapagos Islands?</p> <p>A Snoopy the beagle</p> <p>B Jean Baptiste Lamarck</p> <p>C Alfred Russell Wallace</p> <p>D Charles Darwin</p>		1
3	<p>Alfred Russell Wallace and Charles Darwin were the first to:</p> <p>A explain the source of the natural variation occurring within a species</p> <p>B challenge the idea of the 'fixity of species'</p> <p>C propose the idea of natural selection to explain how organisms evolve</p> <p>D suggest that characteristics acquired during a lifetime could be passed on to offspring.</p>		1
4	<p>Which type of evolution best explains the observation that the South American anteater and the African aardvark have several similarities but are not genetically closely related?</p> <p>A divergent evolution</p> <p>B convergent evolution</p> <p>C parallel evolution</p> <p>D punctuated equilibrium</p>		1



5	<p>Which of the following organisms is genetically most similar to <i>Homo sapiens</i>?</p> <p>A chimpanzee B monkey C gorilla D virus</p>		1
6	<p>Flying squirrels of North America and Australia's gliding possums have structures that look similar but have come from different ancestors. These similarities are known as:</p> <p>A homologous structures B analogous structures C vestigial organs D examples of adaptive radiation.</p>		1
7	<p>Which of the following is <i>not</i> an inherited characteristic?</p> <p>A the long neck of a giraffe B a person's blue eyes C a person's acquired immunity to the measles virus D the ability of a spider to spin a web</p>		1
8	<p>Which of the following statements concerning reproductive isolation and geographic isolation of two populations is correct?</p> <p>A Reproductive isolation of two populations always occurs before their geographic isolation. B Two populations that are geographically isolated must be two different species. C Subspecies form when two populations are reproductively isolated. D Speciation occurs when two populations become reproductively isolated.</p>		1

<p><b>9</b></p>	<p>The pentadactyl limb shown is modified for:</p>  <p>A walking          B tearing          C grasping          D flying.</p>		<p>1</p>
<p><b>10</b></p>	<p>When the myxoma virus was first introduced into Australia, 90 per cent of rabbits in certain areas died, and less than 1 per cent of infected rabbits survived. Ten years later, only 25 per cent of rabbits in the same areas died, and 40 per cent of infected rabbits survived. Natural selection for which favourable characteristics explains these changes?</p> <p>A high resistance in the rabbits and high virulence for the virus          B high resistance in the rabbits and low virulence for the virus          C low resistance in the rabbits and high virulence for the virus          D low resistance in the rabbits and low virulence for the virus</p>		<p>1</p>
<p><b>11</b></p>	<p>Fossilisation is most likely to occur under:</p> <p>A anaerobic conditions in sedimentary rock in a lake          B anaerobic conditions in sedimentary rock on land          C anaerobic conditions in igneous rock in a lake          D aerobic conditions in sedimentary rock on land.</p>		<p>1</p>
<p><b>12</b></p>	<p>Which of the following is <i>not</i> an essential requirement for natural selection to occur?</p> <p>A genetic variation among the members of a species          B variation in the characteristics of members of a species          C sexual reproduction by members of a species          D more offspring being produced by each generation</p>		<p>1</p>



Section B—Written answers (55 marks)

1	<p>Organisms living in the desert are adapted to the hot, dry conditions.</p> <p>i) <b>Explain</b> what is meant by the phrase ‘adapted to’.</p> <p>ii) <b>Produce</b> <i>two</i> examples of adaptations likely to be found in desert organisms.</p>		6
2	<p>In hospitals, populations of bacteria resistant to certain antibiotics may develop because this resistance has been ‘selected for’ in previous generations.</p> <p><b>Explain</b> carefully what is meant by ‘selected for’ in the statement above.</p>		3





<b>3</b>	Complete the following table showing adaptations and their survival value.		5								
	<table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%; text-align: center;">Adaptation</th> <th style="width: 50%; text-align: center;">Survival value</th> </tr> </thead> <tbody> <tr> <td>production of large quantities of dilute urine by freshwater fish</td> <td></td> </tr> <tr> <td>blubber found in marine mammals</td> <td></td> </tr> <tr> <td></td> <td>enables an intestinal parasite to remain attached to its host</td> </tr> </tbody> </table>			Adaptation	Survival value	production of large quantities of dilute urine by freshwater fish		blubber found in marine mammals			enables an intestinal parasite to remain attached to its host
	Adaptation			Survival value							
	production of large quantities of dilute urine by freshwater fish										
blubber found in marine mammals											
	enables an intestinal parasite to remain attached to its host										
<b>4</b>	<b>Describe</b> <i>two</i> ways in which a population may become geographically isolated to form two populations.		2								
<b>5</b>	<p><b>a Explain</b> the term ‘reproductively isolated groups’.</p> <p><b>b Describe</b> <i>two</i> ways in which two populations of a species may become reproductively isolated.</p>		4								

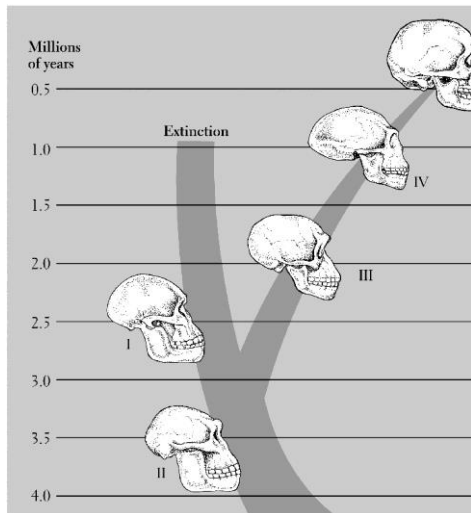


6	<b>State</b> <i>two</i> reasons why individuals in a species may have differences in appearance.		2
7	<b>Select</b> the appropriate term (from the <i>two</i> <u>underlined</u> alternatives) to correctly complete each of the following statements.  <b>a</b> Life on Earth is thought to have begun around <u>3500</u> / <u>4500</u> million years ago. <b>b</b> Dinosaurs became extinct around <u>248</u> / <u>65</u> million years ago. <b>c</b> Trilobites were characteristic organisms of the <u>Cenozoic</u> / <u>Palaeozoic</u> era. <b>d</b> The earliest known land organisms were <u>vascular plants</u> / <u>reptiles</u> . <b>e</b> The first clear representation of the genus <i>Homo</i> is <u>Homo erectus</u> / <u>Homo habilis</u> . <b>f</b> <i>Homo sapiens</i> is thought to have first appeared around <u>4</u> / <u>0.2</u> million years ago.		6



8	Darwin observed 14 species of finches during his travels around the Galapagos Islands. <b>Identify</b> <i>two</i> possible explanations for the existence of these 14 species.		2
9	Place the following events in the order in which they occurred. <b>a</b> Neo-Darwinism is formulated. <b>b</b> Darwin studies medicine. <b>c</b> Lamarck proposes his theory of evolution. <b>d</b> Darwin travels on HMS <i>Beagle</i> . <b>e</b> Wallace presents a paper on the theory of evolution by natural selection. <b>f</b> Georges Buffon questions the idea of the ‘fixity of species’. <b>g</b> Darwin publishes <i>The Origin of Species</i> . <b>h</b> Mendel’s work on genetics is first recognised.		4

**10** The diagram below shows a possible family tree for humans.



**Identify** the labelled species (I to V) as:

- a *Homo habilis*
- b *Australopithecus afarensis*
- c *Homo erectus*
- d *Homo sapiens*
- e *Australopithecus africanus*.

5

<p><b>11</b></p>	<p>The diagram below shows several pentadactyl limbs.</p> <p><b>a Define</b> the term ‘pentadactyl limb’.</p> <p><b>b Explain</b> the similarities of these limbs.</p> <p><b>c</b> Using the numerals I to VI, <b>identify</b> which limb is modified for:</p> <ul style="list-style-type: none"> <li><b>i</b> running</li> <li><b>ii</b> tearing.</li> </ul>	<p style="text-align: right; color: red;">5</p>
<p><b>12</b></p>	<p>The group of flightless birds, known as ratites, occur in Australia (cassowary and emu), New Zealand (kiwi), South America (rhea) and Africa (ostrich). <b>Explain</b> the distribution of these related species.</p>	<p style="text-align: right; color: red;">3</p>



13	<p><b>a</b> <b>State</b> <i>two</i> anatomical changes between <i>Homo sapiens</i> and <i>Australopithecus afarensis</i>.</p> <p><b>b</b> <b>State</b> <i>two</i> non-anatomical changes between <i>Homo sapiens</i> and <i>Australopithecus afarensis</i>.</p>		4
14	<p>Humans can be said to be undergoing a cultural evolution.</p> <p><b>a</b> <b>Explain</b> what this means.</p> <p><b>b</b> <b>Produce</b> an example of cultural evolution taking place.</p>		2
15	<p>The theory of evolution is an explanation for the existence and diversity of life on Earth. <b>State</b> <i>two</i> alternative theories to account for life on Earth.</p>		2