

Animal behaviour

(2016, 2) THE SPOTTED HYENA

The spotted hyena (*Crocuta crocuta*) is one of the most social of all carnivores.

It lives in groups containing up to 90 individuals, and exhibits the most complex social behaviour.

These animals live in social groups called clans that defend group territories. Females are dominant over males, and even the lowest ranking female is dominant to the highest ranking male.



Although males typically disperse from the clans they were born into, when they are between two and six years of age, females usually remain in their natal clan, so large clans may contain several different female lines of descent.

Females give birth at any time of year to litters containing one or two cubs. At the communal den, cubs are maintained for a period of 8 to 12 months; during this period the major source of food for cubs is milk provided solely by their mother.

Although cubs of both sexes 'inherit' their mothers' social ranks, males voluntarily forsake those to assume much lower ranks in the neighbouring clans to which they disperse.

The following set of data shows the interactions of six female hyenas.

		Hyenas doing the biting					
		A	B	C	D	E	F
Hyenas being bitten	A	-	0	10	11	9	20
	B	7	-	18	8	6	8
	C	0	0	-	0	0	0
	D	0	0	17	-	12	11
	E	0	0	6	4	-	27
	F	0	0	18	0	0	-

Compare and contrast the advantages and disadvantages of belonging to the hierarchy of a clan or living a solitary lifestyle.

In your answer you should:

- describe what a linear hierarchy is, and give the order of the linear hierarchy in the table above
- explain how a hierarchy is maintained, and identify which hyena is challenging for a higher position in the hierarchy
- explain factors that could influence an individual's position in the hierarchy
- discuss the advantages and disadvantages to individual male and female hyenas belonging to a social hierarchy in the clan, compared to living a solitary lifestyle.

(2016, 3) WETA

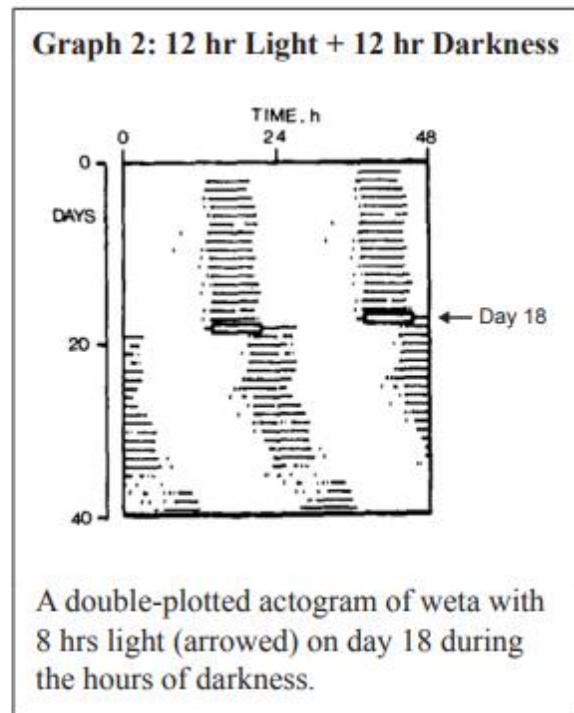
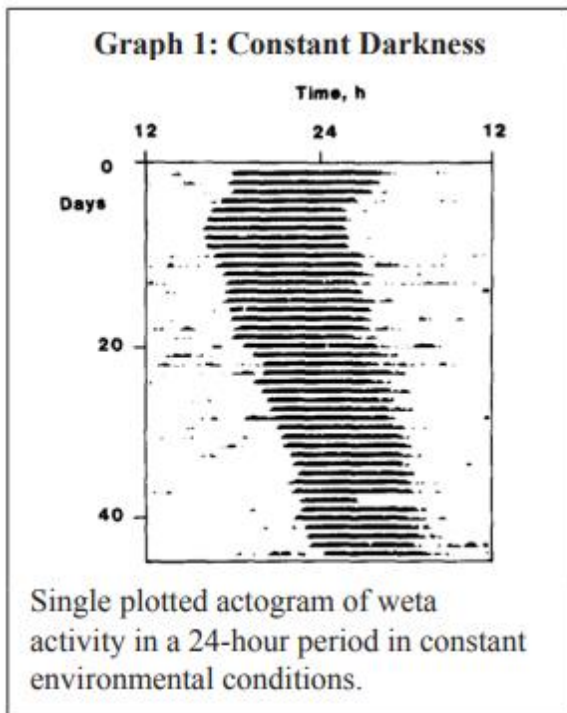
The Auckland tree weta (*Hemideina thoracica*) tokoriro remains secluded in the daytime under bark or in holes in trees in dim light.

It emerges from cover soon after sunset to forage for mainly plant material, to return before dawn. In the experiment below, the environmental conditions were maintained at 20°C in constant darkness for an experiment to observe its biological timing.

The results are shown in Graph 1 below left. The dark bars show when the weta is active.

The weta was then placed in 12 hours of light followed by 12 hours of darkness until day 18 (when it was exposed to 8 hours of light during the dark period), after which it was left in constant darkness.

The results are shown in Graph 2 below right.



Analyse the findings from these actograms to explain how the responses shown above help the weta adapt to its ecological niche.

In your analysis you should:

- describe the activity and rhythm shown by the weta
- explain how this rhythm is controlled
- explain the effect of the additional 8 hours of light on day 18 on the weta
- evaluate the adaptive advantage that this rhythm and control mechanism have for the weta.

The questions below are collated from the now expired AS90716 Describe animal behaviour & plant responses in relation to environmental factors.

However they may still be useful for **AS91603** Demonstrate understanding of the responses of plants & animals to their external environment

(2010: 3)

Olive baboons (*Papio anubis*) are widespread throughout equatorial Africa, where they occupy a variety of habitats, from open grassland, to moist evergreen forests. Baboons have a highly developed social structure with a dominance hierarchy. Olive baboon troops each occupy a distinct home range.



- (a) Explain what the term **home range** means.

Home ranges and daily ranges have been recorded for some olive baboon troops in Africa. The data for troops in four areas is recorded in the table.

Area	Approximate home range size (km ²)	Approximate daily range (km)	Average troop size	Habitat	Yearly rainfall (mm)
Bole Valley, Ethiopia	0.745–1.12	0.3–2.0	15–24	Mixed forest and grassland	2000
Ishasa, Uganda	3.88–5.18	0.2–2.4	60	Forest and shrub-land	1100–1600
Gilgil, Kenya	19.7	2.2–7.8	49	Open grassland and shrub-land	500–1000
Laikipia Plateau, Kenya	43.8	5.64	100	Dry grassland	400–600

Home range sizes and approximate daily ranging distances of olive baboons from four different areas.

Questions collated from AS 90716 Describe animal behaviour & plant responses in relation to environmental factors

(b) Explain how environmental factors impact on BOTH the **home range** size and the **daily range** of olive baboons.

You **must** include the given information in your explanations.

(c) The social structure of a baboon troop can be described as a **complex dominance hierarchy**.

Discuss how being a part of a **troop** can **benefit** the survival chances of individual olive baboons.

In your answer include:

- an explanation of **complex dominance hierarchy**
- a justification of why this increases the **survival chances** of the individual.

(2009:3)

The breeding behaviour of African starlings is affected by their environment. Birds living on the open grasslands often breed in large, cooperative groups, while birds in the forests breed in pairs.

In cooperative breeding, although only one pair of individuals may actually produce offspring, all the members of the group help to raise the young.

The African savannah is a highly seasonal habitat, with wide variation in rainfall from year to year, and this would have an impact on the availability of food.

Discuss reasons for the differences in intraspecific relationships within each of the two groups of African starlings. In your discussion you should consider:

- territoriality
- co-operative interactions
- competition for resources.

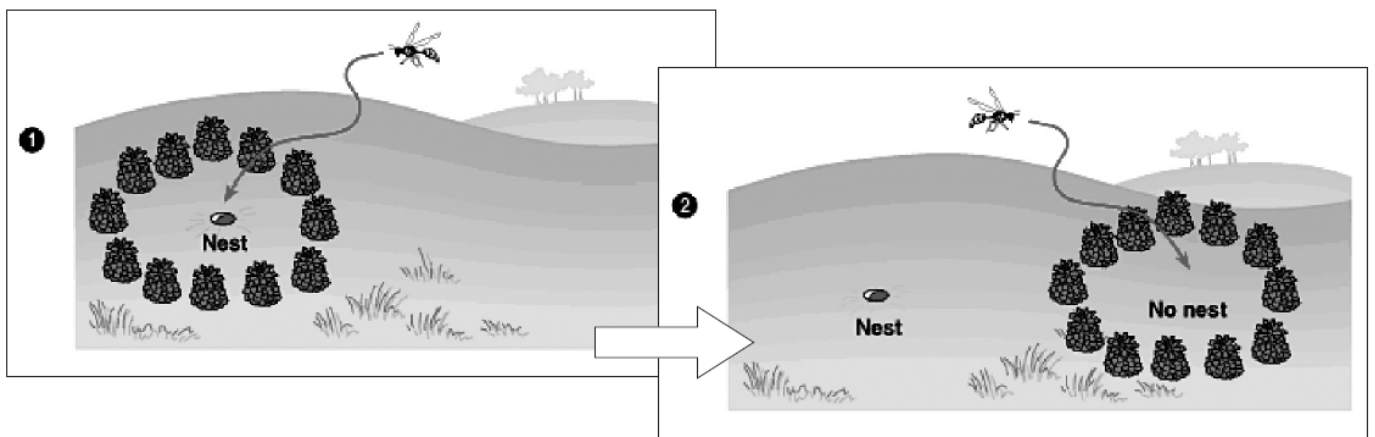
(2006:2)

Much of animal behaviour is innate, or inborn. Such behaviour patterns may be quite simple, or are produced in response to simple stimuli. They include kinesis and taxes.

(a) Describe an example of kinesis in a **named** animal.

(b) Explain why this behaviour would be an **advantage** to your named animal in its normal environment.

The diagram shows the results of an experiment carried out to study homing behaviour in a hunting wasp. This wasp digs a burrow and then flies off to capture a caterpillar, which it will leave in the burrow as food for its own young.



(1) Pine cones placed round burrow while wasp inside; wasp leaves and returns to nest;

(2) Pine cones moved while wasp away on hunting trip.

(c) Explain how the wasp finds its way when returning to its burrow from a hunting expedition.

(2006: 4)

Black swans were introduced to New Zealand in the 1800s and have since spread throughout the country. On smaller ponds and lagoons, they occupy territories during the breeding season.

(a) Describe TWO **advantages** of holding a territory.

Newly hatched black swan cygnets have very short necks, and are unable to feed in deeper water

As the adult birds do not actively feed their young, this restricts the areas in which cygnets can feed.

The swans breed in territories on Pukepuke Lagoon, a 15 ha wetland in the Manawatu. The size of their territories varies considerably, from 0.1 ha to 1.5 ha.

(b) Explain why the territories vary so much in size.

Black swans use a range of aggressive displays to defend their territories, to settle disputes with other swans, or to indicate position in a social hierarchy.

(c) Explain why the swans use these displays, rather than fighting over resources.