

1. Which of the following is **not** a behaviour of a worker honeybee?

- A Producing eggs
- B Defending the hive
- C Gathering pollen
- D Feeding offspring

2. The list shows behaviours carried out by honey bees.

- 1. Fertilising eggs
- 2. Collecting pollen
- 3. Carrying out waggle dances to show the location of food

Which of these behaviours are carried out by drones?

- A 1 only
- B 3 only
- C 1 and 2 only
- D 2 and 3 only

3. On returning to their roost after feeding, vampire bats may regurgitate blood to feed an unrelated individual in the same social group.

This is an example of

- A mutualism
- B altruism
- C social hierarchy
- D kin selection.

4. Honeybees are social insects that live in colonies.
Which row in the table identifies activities carried out by drones and workers?

	Drones	Workers
A	fertilise eggs	produce eggs
B	fertilise eggs	defend hive
C	collect pollen	care for young
D	care for young	defend hive

5. Which of the following is an example of kin selection?

- A Worker leafcutter ants raising young ants in their colony.
- B A vampire bat regurgitating blood to feed an unrelated bat.
- C A dominant lion feeding on a zebra kill before its offspring.
- D A young orangutan spending a long period in parental care to learn complex social behaviours.

6. Altruistic behaviour between closely related animals

- A reduces competition between individuals in the population
- B increases the survival chances of the donor animal
- C increases the frequency of shared genes in the next generation
- D reduces unnecessary aggression and conflict in social groups.

1. Honeybees (*Apis mellifera*) are social insects that live in large colonies.
- (a) Most of the bees in a colony are sterile and co-operate to raise the young in the colony.
- (i) Name the type of bees that raise the young. 1
- _____
- (ii) Explain why this behaviour can be described as kin selection and state an advantage to the bees of raising the young. 2
- Explanation _____
- _____
- Advantage _____
- _____
- (iii) Describe one other role of these sterile bees. 1
- _____

2. Explain why giving alarm calls can be described as altruistic behaviour. 2

3. Related meerkats (*Suricata suricatta*) live in large social groups. Some act as lookouts and make alarm calls when a predator is detected.
- (a) Explain why the behaviour of the lookouts could be described as altruistic. 1

- (b) State why behaviour, which appears to be altruistic, is more common in related animals. 1

4. The honey bee (*Apis mellifera*) is a social insect that lives in colonies. The queen is the only female in a colony that reproduces. Other females are workers that collect food, maintain the colony and care for the developing offspring.

Explain the advantage to the worker bees of caring for the offspring of the queen. 2

5. Most of the wild dogs in a pack are related. Usually only one dominant female has offspring which other members of the pack will feed. Explain why pack members feed offspring which are not their own. 1

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- ☐ B increases the survival chances of the donor animal
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- (a) Most of the bees in a colony are sterile and co-operate to raise the young in the colony.
- (i) Name the type of bees that raise the young. 1
Worker bees
- (ii) Explain why this behaviour can be described as kin selection and state an advantage to the bees of raising the young. 2
Explanation They are related
Advantage Increase survival of shared genes in next generation
- (iii) Describe one other role of these sterile bees. 1
Defend hive/collect pollen/build hive
2. Explain why giving alarm calls can be described as altruistic behaviour. 2
They put themselves in danger as donor
This warns & benefits others to escape as recipients

3. Related meerkats (*Suricata suricatta*) live in large social groups. Some act as lookouts and make alarm calls when a predator is detected.
- (a) Explain why the behaviour of the lookouts could be described as altruistic. 1
Lookout (donor) harmed while rest benefit as recipients
- (b) State why behaviour, which appears to be altruistic, is more common in related animals. 1
Increase survival of shared genes in next generation
4. The honey bee (*Apis mellifera*) is a social insect that lives in colonies. The queen is the only female in a colony that reproduces. Other females are workers that collect food, maintain the colony and care for the developing offspring. Explain the advantage to the worker bees of caring for the offspring of the queen. 2
They are related/are sisters
Increase survival of shared genes in next generation
5. Most of the wild dogs in a pack are related. Usually only one dominant female has offspring which other members of the pack will feed. Explain why pack members feed offspring which are not their own. 1
Increase survival of shared genes in next generation