

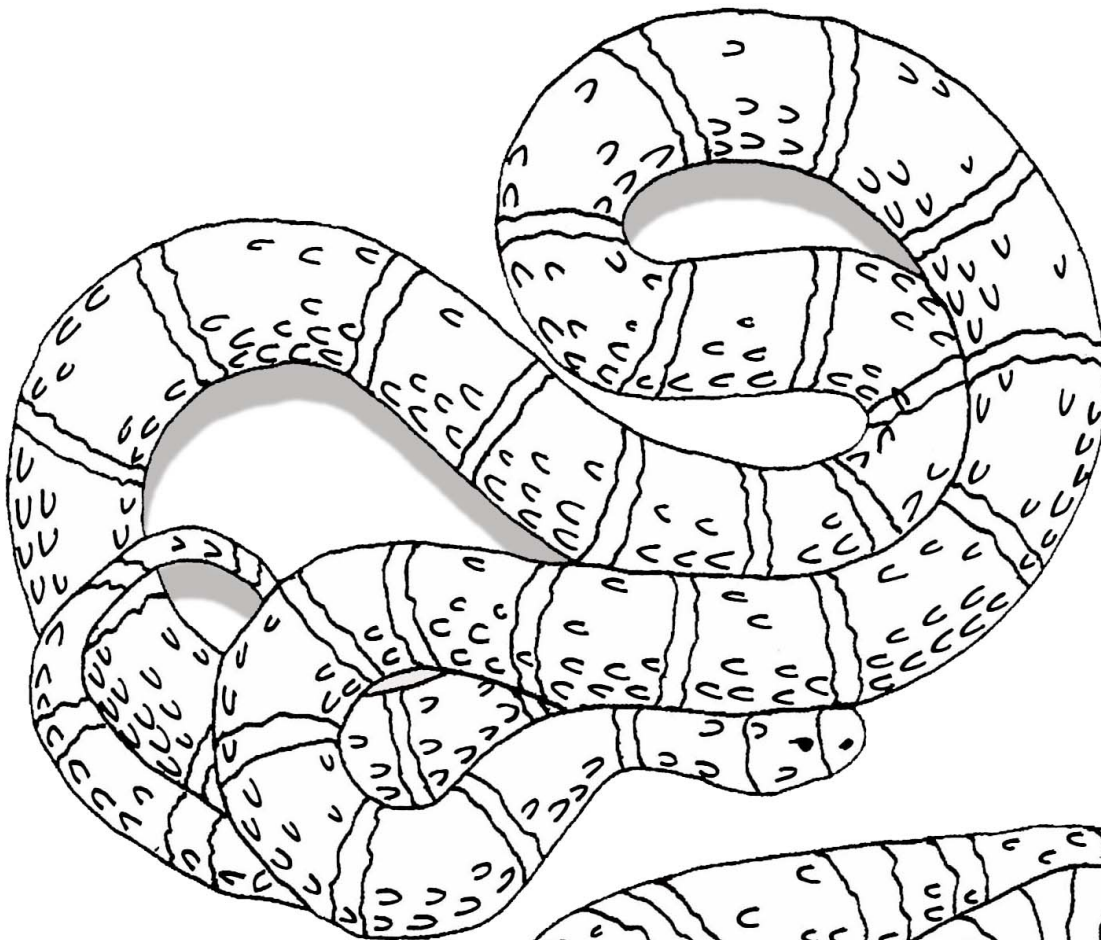
**THE ASSOCIATION
FOR THE STUDY OF
ANIMAL BEHAVIOUR**

Colouring Book

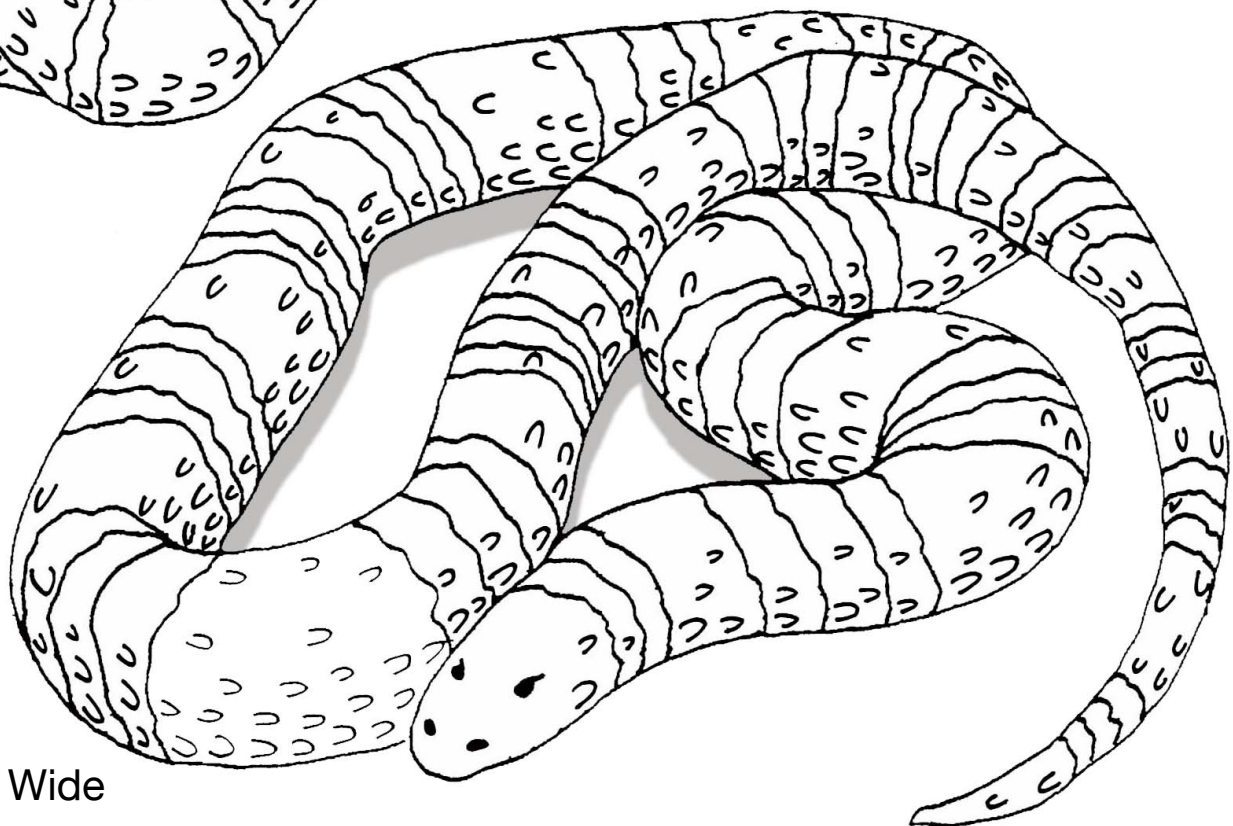


Batesian mimicry

This is when a harmless species has evolved to look like a harmful species. This puts off predators and increases the animal's chance of survival. Use the descriptions below to colour in the snakes and then use this rhyme to help work out which one of these snakes is deadly and which one is the mimic. 'Red next to black - poison lack, red next to yellow - kill a fellow...'

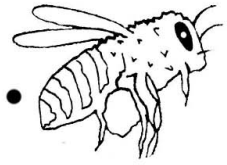


Coral snake: Thin yellow stripes and then alternate wide red and black bands.

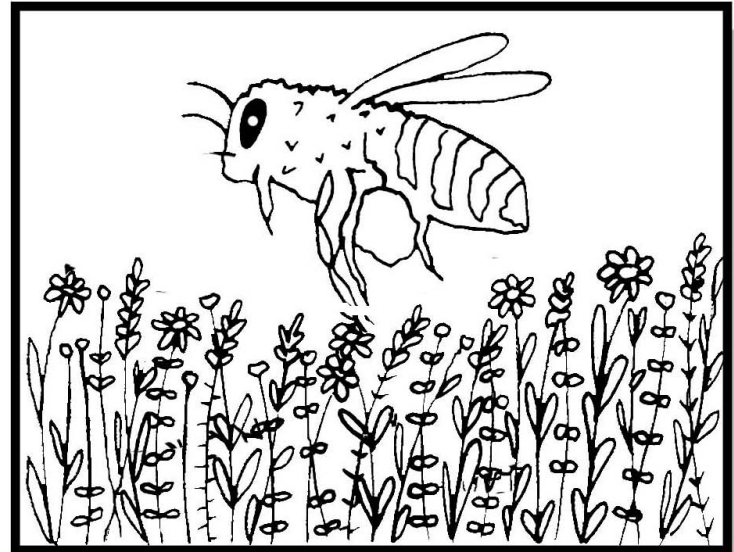


Mexican milk snake: Wide red bands, thin yellow ones, with black stripes each side.

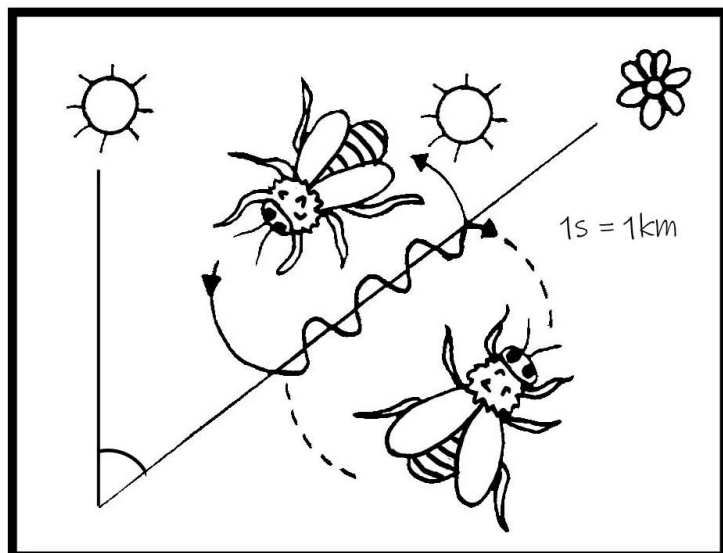
...Brilliant... ...Bees...



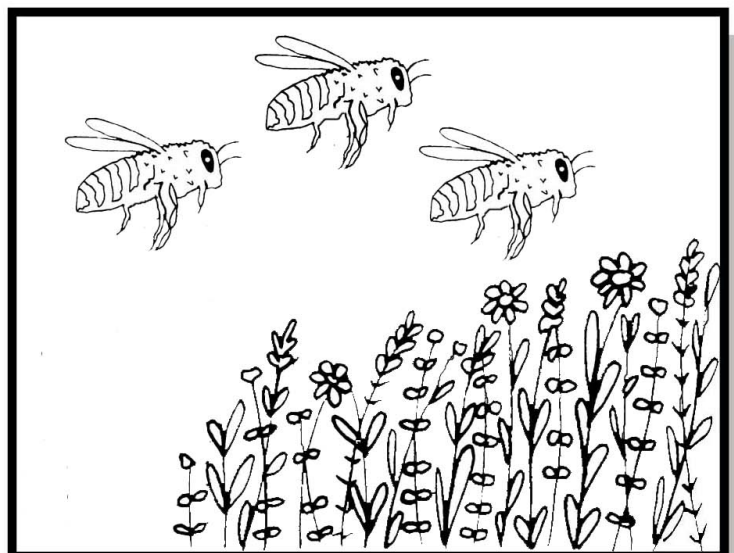
1. A worker bee searches for flowers to collect nectar and lots of pollen, food for the bee hive.



2. She flies back to her hive with a full pollen sac, ready to tell the other bees where to find the flowers.



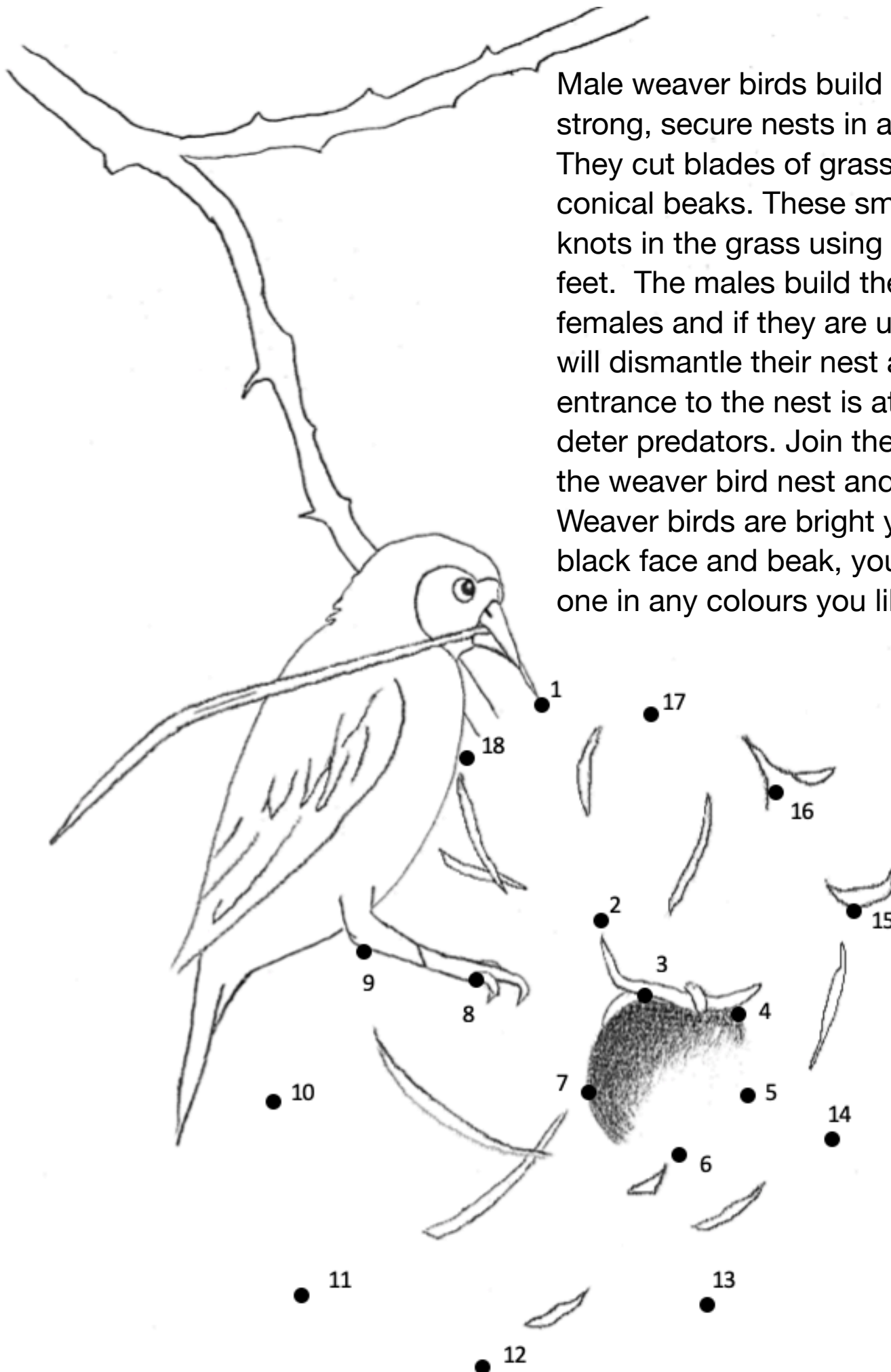
3. At the hive her worker bee sisters gather round to watch her do the waggle dance. The direction of the dance tells them the direction they must fly to find the good flowers, and the duration of the dance tells them the distance they must fly - it's a visual code!



4. Her worker bee sisters take off to fly to the flowers and bring back more food for the hive.

Nest building

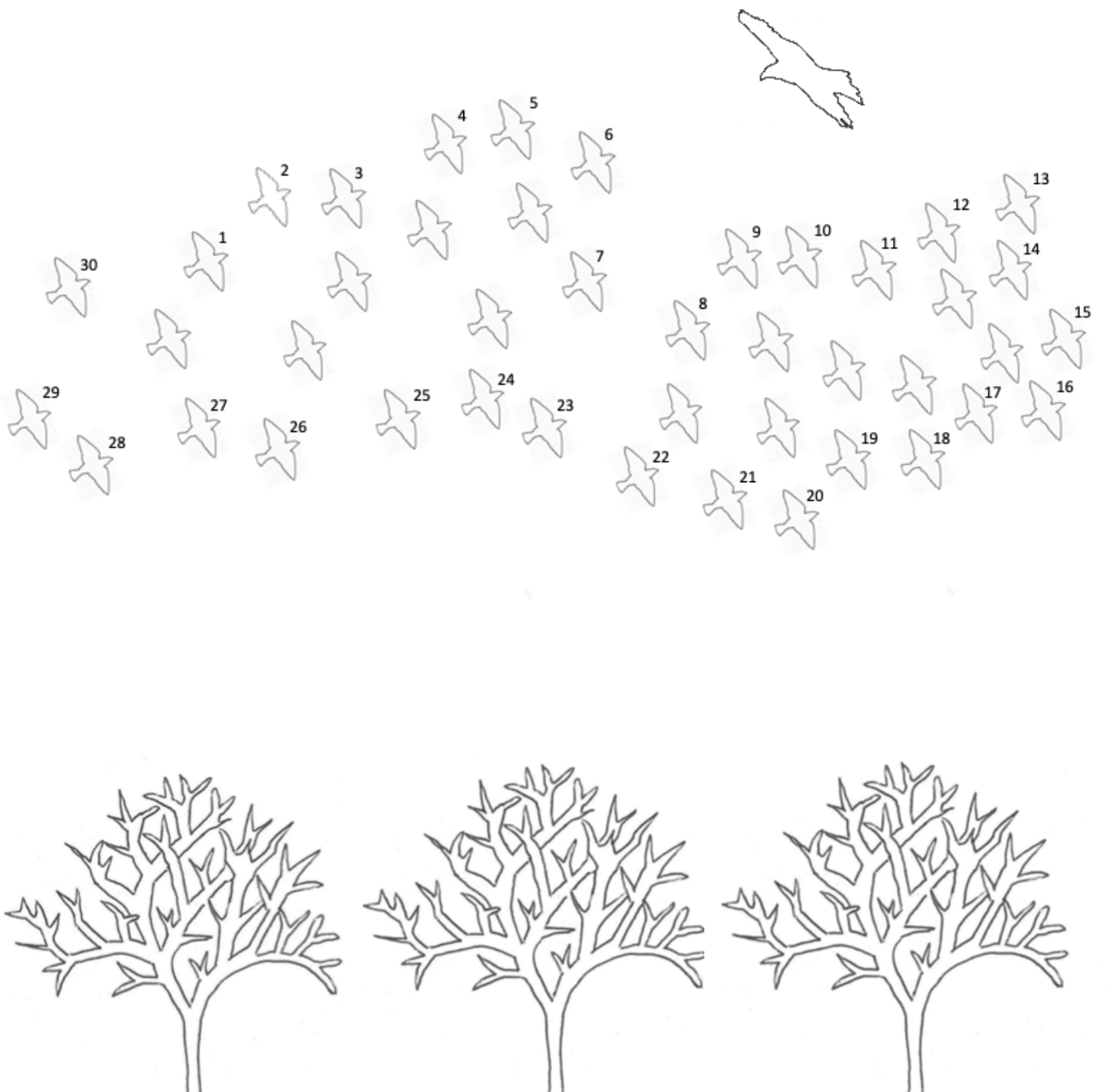
Male weaver birds build waterproof, strong, secure nests in about two days. They cut blades of grass with their sharp conical beaks. These small birds can tie knots in the grass using their beaks and feet. The males build their nests to attract females and if they are unsuccessful they will dismantle their nest and try again. The entrance to the nest is at the bottom, to deter predators. Join the dots to complete the weaver bird nest and then colour in. Weaver birds are bright yellow with a black face and beak, you can colour this one in any colours you like!



Murmurations

A murmuration is a flock of starlings (*Sturnus vulgaris*) that come together in the sky after feeding while they search out the best roosting site for the night. These dazzling displays can contain thousands of birds that appear to move as one. But why do they flock together in this way? There is safety in numbers and starlings need to keep as many eyes out as possible for predators such as Peregrine falcons (*Falco peregrinus*). By sticking together each individual reduces the risk of them being the target and they can also share information with each other. Murmuration flocks also have a very characteristic shape, they are wider than they are deep. This gives more birds the best view of the roosting trees below, but also saves energy as they don't need to keep flying up and down against gravity.

Join the birds in number order using their beaks and tails, not all birds have a number. This will give you the characteristic shape of a murmuration in mid-flight. Why not add some more birds to the flock- but remember it shouldn't be deeper than it is wide!



Camouflage

Many animals want to avoid being eaten. In order to do this, some camouflage themselves within their environment. For others, they make themselves stand out against their background. Normally this is combined with some form of chemical defence, or unpleasant taste, also known as aposematism. Examples of this include ladybirds and bees, which often combine warning colours, such as red, yellow and orange, with an unpleasant taste. In the picture below are several butterflies, can you colour them to camouflage or stand out from their background?

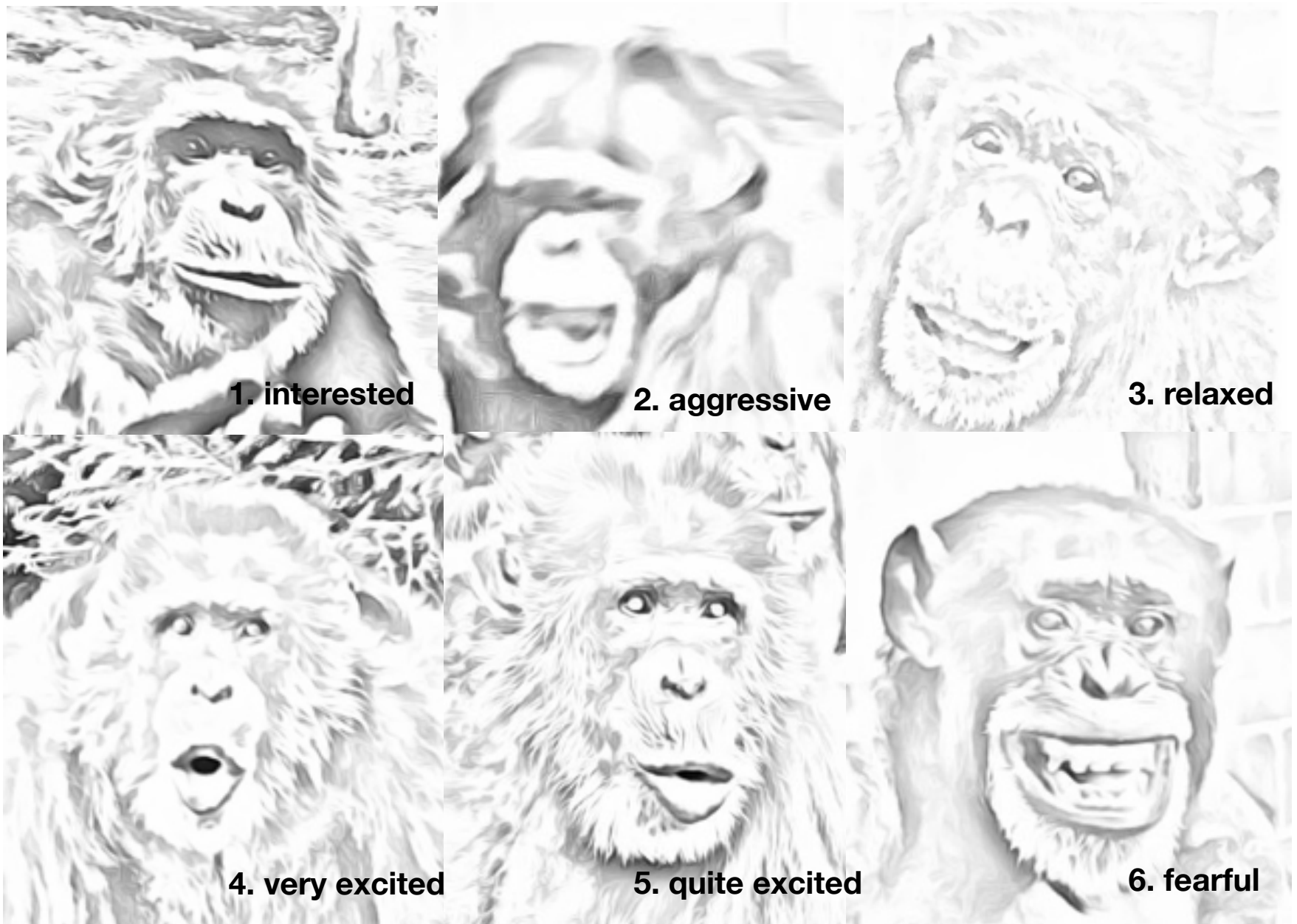


Can you tell how chimpanzees portray emotions in their facial expressions?

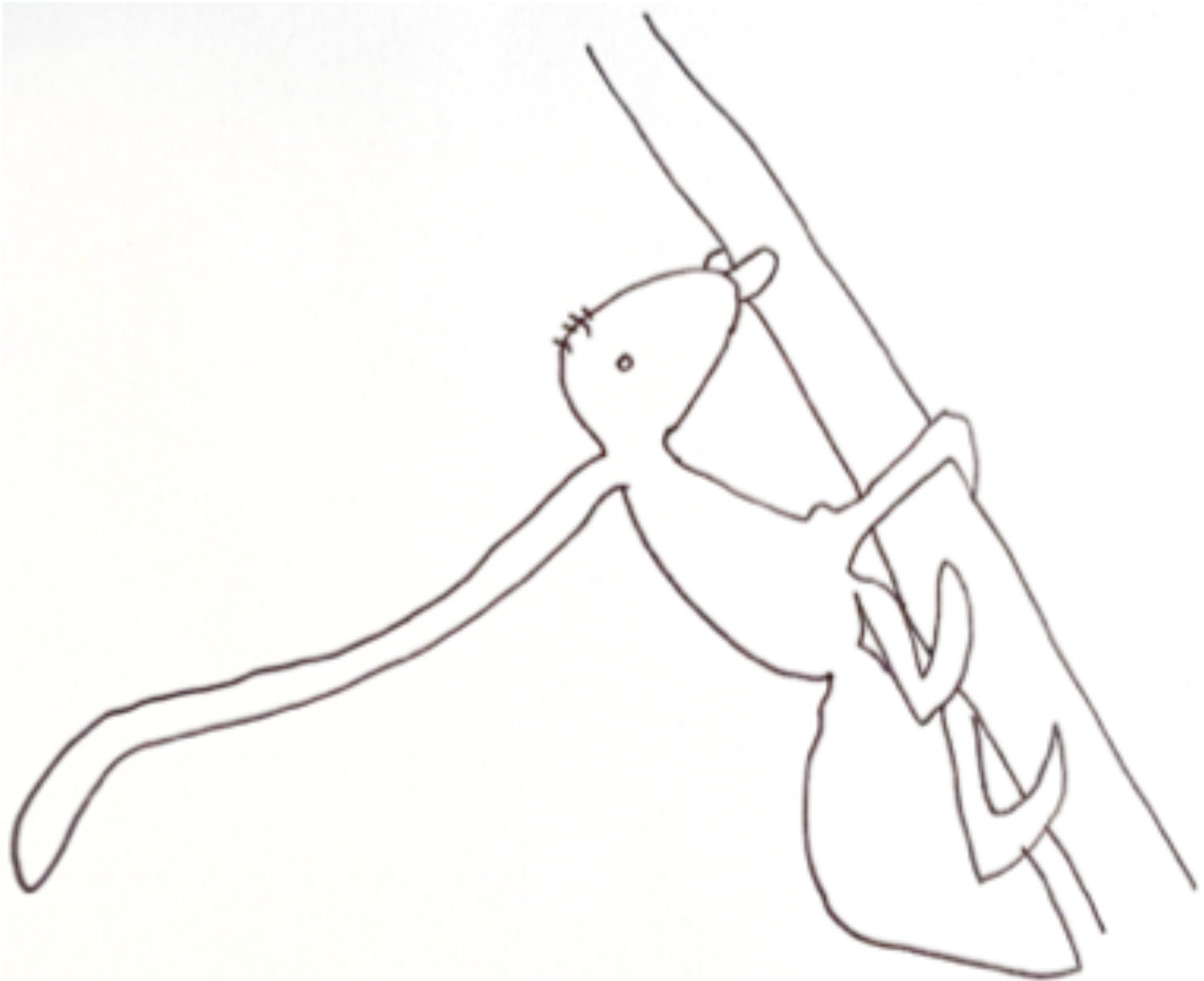
Chimpanzees (*Pan troglodytes*) are our closest relatives, sharing over 98% of our DNA. They also share similar emotions, cognitive abilities, social relationships and even personalities! One of the few nonhuman animals to recognise themselves in mirrors, they have an understanding of morality and social exchanges. Being so like us, it's no wonder that we can easily read their facial expressions – or can we?!

1. Look at the following photos. Can you tell how the chimps are feeling? Choose from: Relaxed, interested, quite excited, fearful, aggressive and very excited.
2. Add some colour and definition to the pictures - just like painting by numbers.
3. Can you spot which three pictures show the same chimpanzee?





The same chimpanzee is shown in pictures 1, 4 and 5. He is Boris, a chimp who has become quite famous through the TV series 'Secret Life of the Zoo'. He was a wild-born chimp whose family would have been killed to capture him for the pet trade. A lady in New York bought him from a pet shop and raised him in her apartment for three years, until he became too big and boisterous to keep. She looked around the world to find Boris a great home and decided upon Chester Zoo in the UK. Boris did exceptionally well, not only integrating into a large group of chimpanzees, and learning to be a chimp, but rising to the top and becoming the dominant – or alpha – male of the group. He still loves watching the human visitors at the zoo and will sometimes clap hands and blow raspberries, signs of his early humanization. The zoo commissioned a bronze statue to celebrate his 50th birthday in 2016. I am proud to call this amazing character one of my best friends. *Dr Lindsay Murray, Senior Lecturer in Animal Psychology, University of Chester*



Parasitism

Parasites are fascinating organisms that require another animal to live on or in. *Cordyceps*, the thing sticking out of this ant's head, is a type of parasitic fungi. It sprouts long stems from the infected body of the ant. The fungi makes the ant travel to a spot about 30 cm off the ground and sink its jaws into a vein of a plant, here the ant can only wait for death. Several days after the ant has died the fungus makes a fruiting body which contains new fungus spores. This fruiting body then explodes, raining down spores and potentially infecting other animals when they land.

More nest building

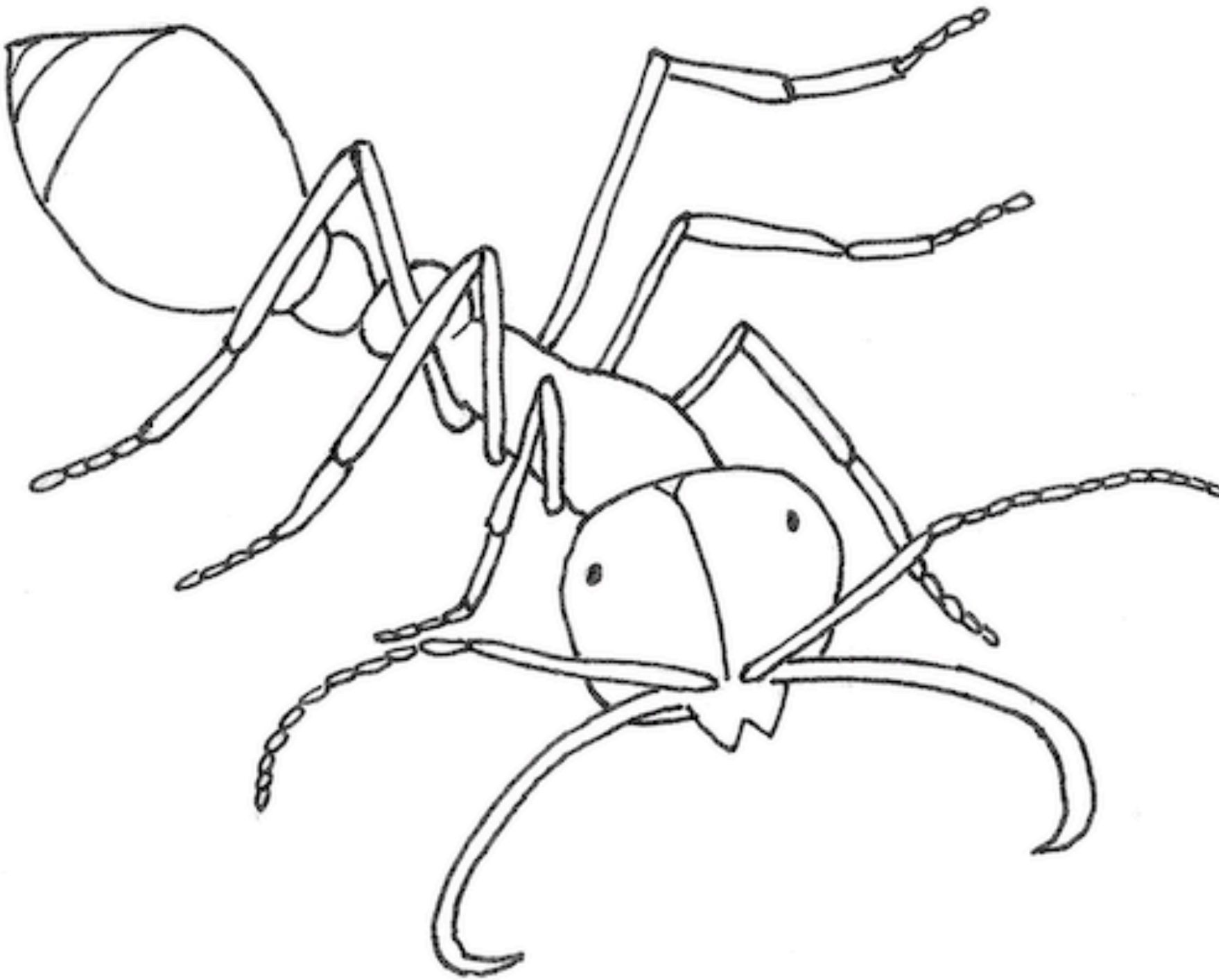
Mice are highly motivated to build nests.

Nests allow mice to create a controlled micro-environment in which they can shelter from adverse environmental conditions and from aggressors.



They also provide a sanctuary in which females can safely rear their young.

Social Behaviour



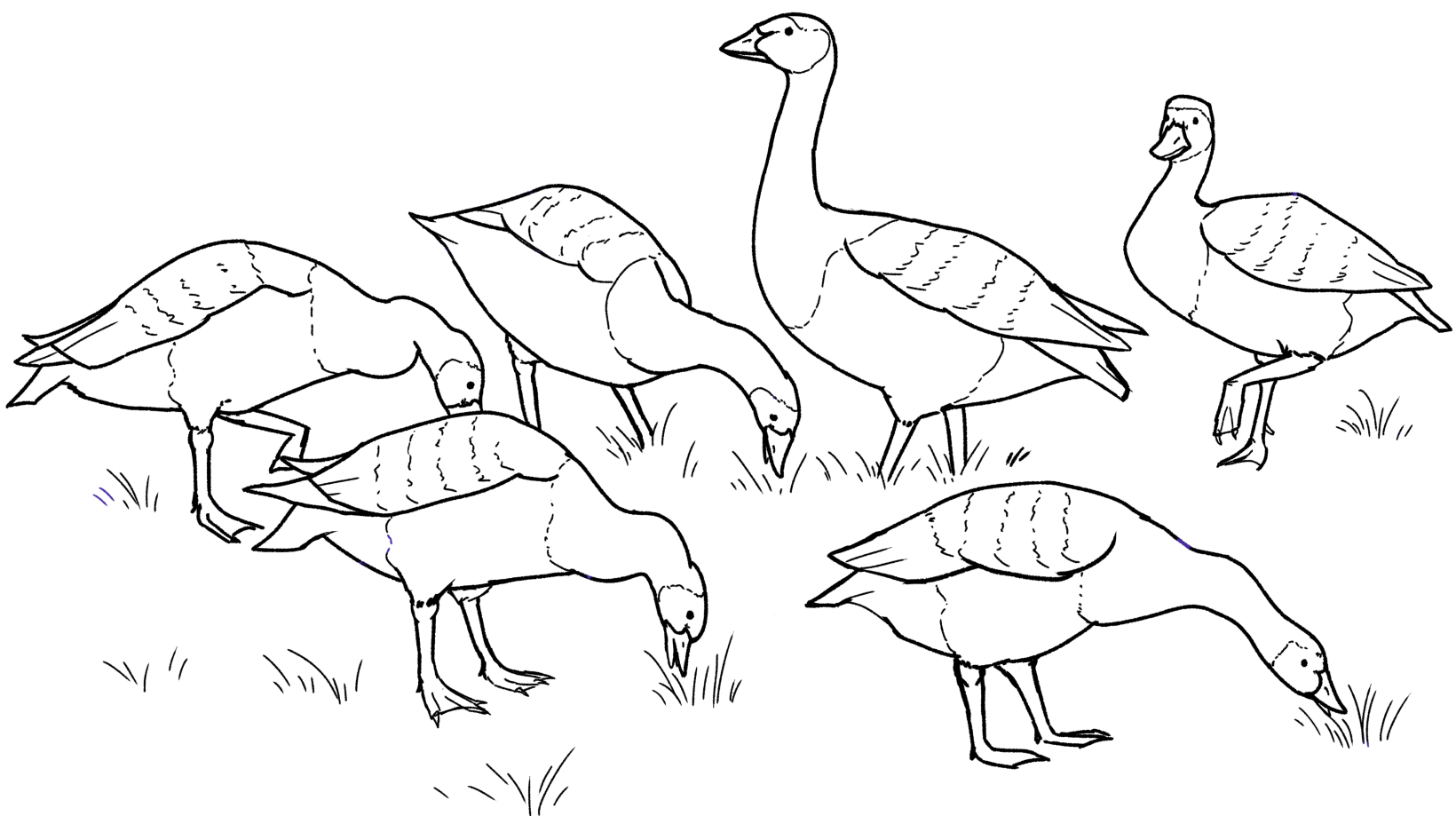
Ants show amazingly social behaviour! They live together in big families called colonies. This army ant is a soldier, and uses her huge jaws to hunt. Army ant colonies don't have a nest; they just keep moving on from place to place. When they need to rest, workers like this one cooperate with their sisters to form a living nest out of their bodies.

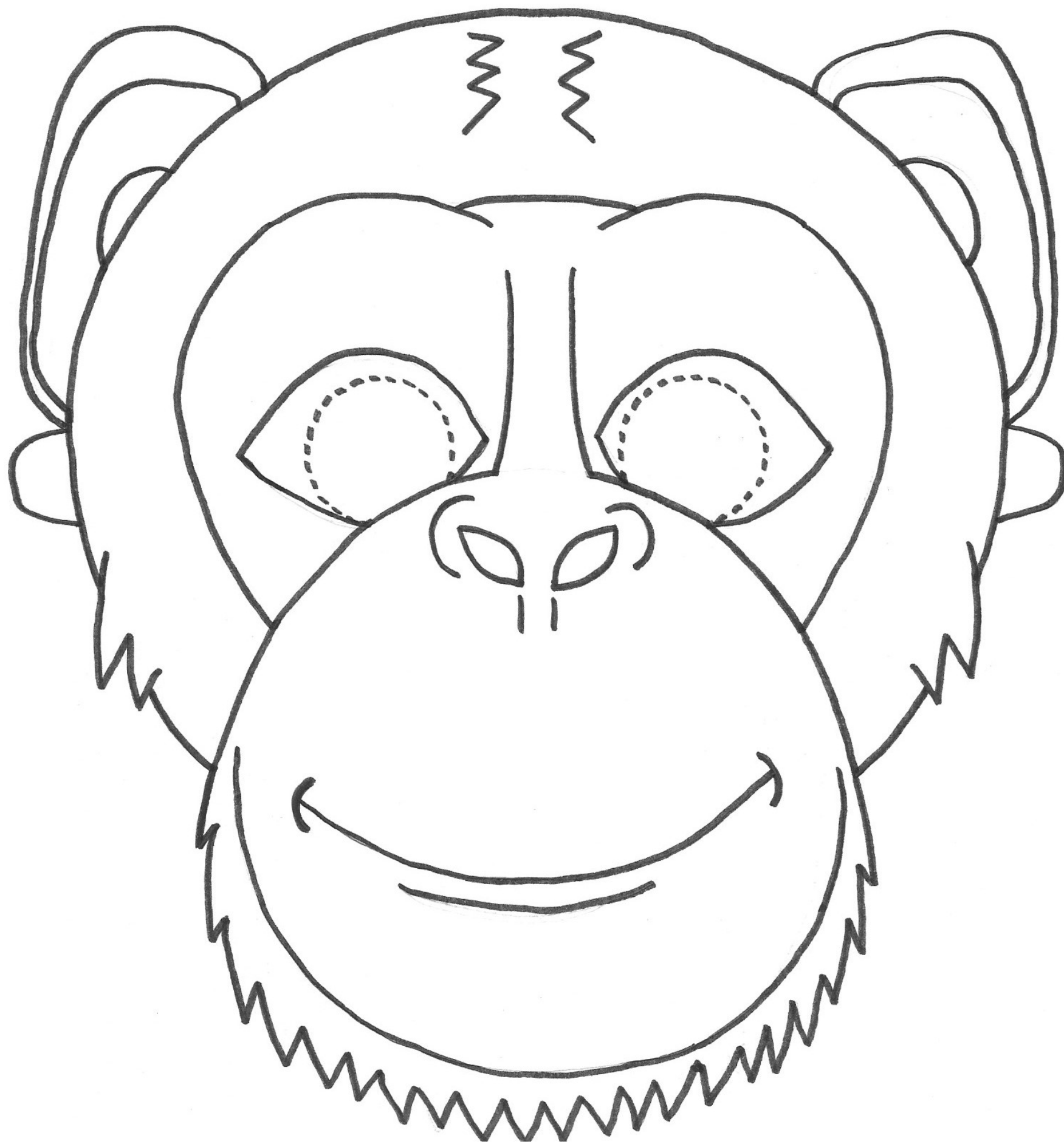
Vigilance

Barnacle geese feed on grassland in the winter, staying together in groups to keep safe from predators. Each goose must balance feeding with the risk of predators.

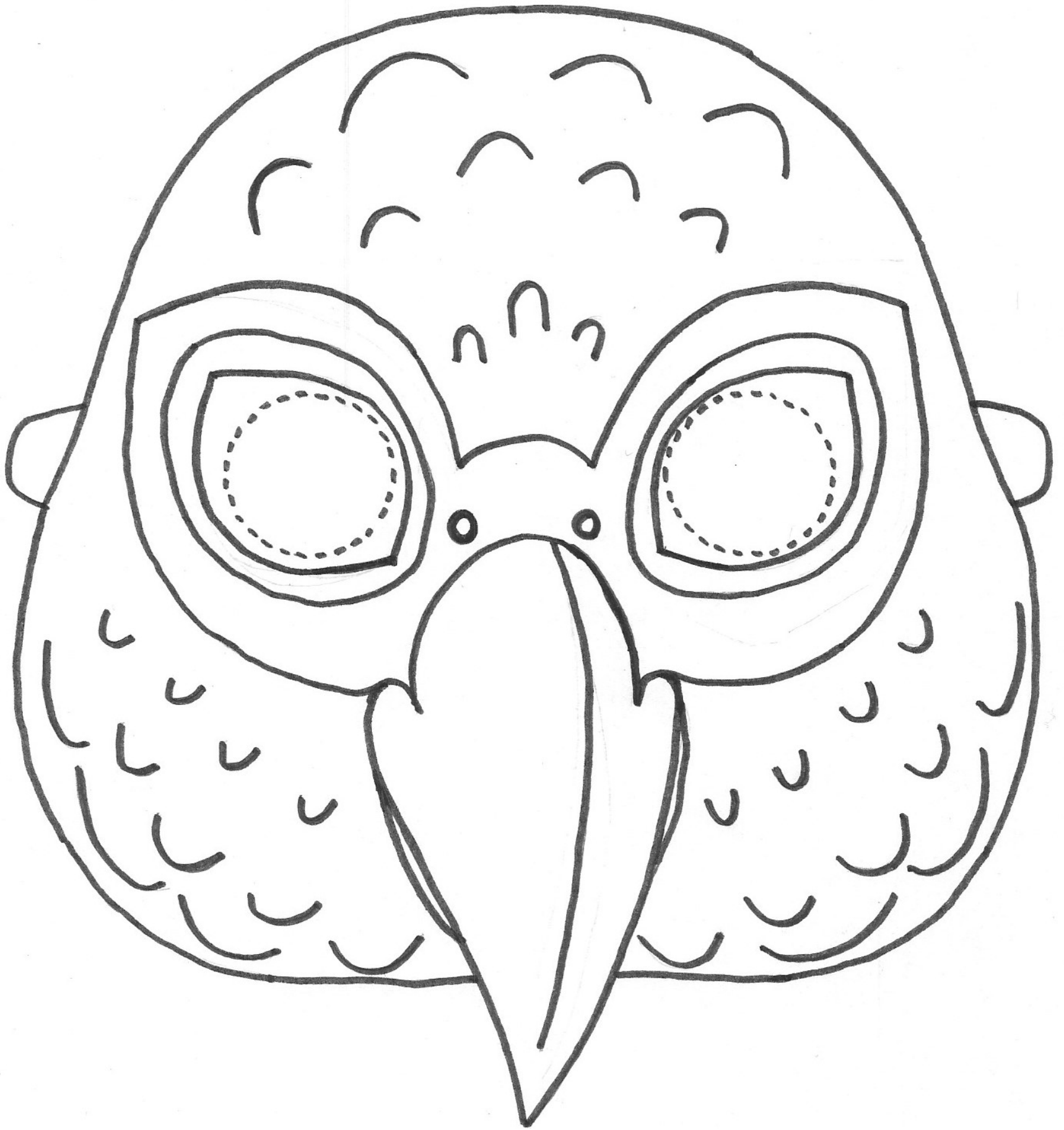
The geese take turns to keep a watch out for danger, standing up tall in a classic pose to see over the flock. If they see danger, they will warn the rest of the group! This behaviour is called “vigilance”.

Can you see which goose is being vigilant?





A chimpanzee mask - colour in, cut out and attach some string. Make sure you make appropriate chimp calls while wearing...



A Parrot mask - colour in,
cut out and add some
ribbon to tie it on. Make
sure you perform
appropriate arm flaps
while wearing...

Index and acknowledgements

The ASAB Education Committee would like to thank all the contributors to the ASAB colouring book. They are great and generous and talented - **Thank You**

Page 2: Batesian Mimicry: Contributed by Charlotte Evans, ASAB Education Officer [@ASABeducation](#) and drawings by Mari Lloyd, Artist

Page 3: Bee Behaviour: Contributed by Evie Bentley, Teacher of Psychology and drawings by Mari Lloyd, Artist

Page 4: Nest Building: Contributed and drawn by Dr Lucy Garrett, Lecturer in Animal Ecology and Conservation, Hartpury University [@garrettlucy1](#)

Page 5: Murmurations: Contributed and drawn by Dr Julia Myatt, Director of Natural Sciences for Liberal Arts and Natural Sciences, University of Birmingham [@JuliaPMyatt](#)

Page 6: Camouflage: Contributed and drawn by Dr Rebecca Jones, Lecturer in Animal Behaviour and Statistics, University of Liverpool [@RSJonesScience](#)

Page 7&8: Chimp Emotions: Pictures and words contributed by Dr Lindsay Murray, Senior Lecturer in Animal Psychology, University of Chester

Page 9: Parasitism: Contributed and drawn by Dr Rebecca Jones, Lecturer in Animal Behaviour and Statistics, University of Liverpool [@RSJonesScience](#)

Page 10: More Nest Building: Contributed and drawn by Naomi Latham, Primary School Teacher

Page 11: Social Behaviour: Contributed and drawn by Dr Elva Robinson, Senior lecturer in Ecology, University of York [@Elva_Robinson](#)

Page 12: Vigilance: Contributed and drawn by Dr Robyn Womack, Researcher, University of Glasgow [@RobynWomackArt](#)

Page 13 & 14: Chimp Mask and Parrot Mask: Contributed and drawn by Dr Kirsty Graham, Researcher at The University of St Andrews [@kirstyegraham](#)