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Welcome back for lesson five:
Communication & Senses

In today's lesson we will be investigating:

- The methods primates use to communicate with each other
- The reasons why primates need to communicate with each other

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Today we're going to explore the different ways primates communicate with each other and why they do it: we're going to find out why gibbons sing, how capuchins flirt, and what a stink fight is!

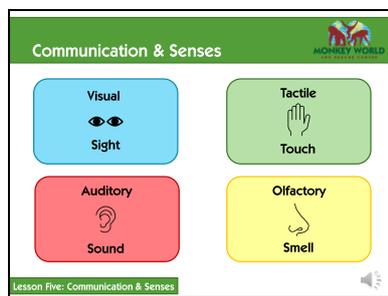
Communication is something we all do every day; it is an adaptation that helps animals to survive. Any action can be described as communication if it has an effect on the current or future behaviour of another animal. It's the method of transmitting messages to one another, sent by specially-evolved signals (i.e. speech and gestures) and received by the sense organs (i.e. ears and eyes).

Animals communicate to:

- Advertise their identity
- Establish and maintain social hierarchies
- Attract a mate
- Mark their territory
- Discourage predators
- Work as a group

These are just some of the functions of communication of course!

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Primates use four main methods of communication. Each method of communication requires one of our **senses** and one of our **sense organs**:

- **Visual communication** uses the sense of sight; messages are seen by the eyes
- **Tactile communication** uses the sense of touch; messages are felt by the hands/skin etc.
- **Auditory communication** uses the sense of sound; messages are heard by the ears
- **Olfactory communication** uses the sense of smell; messages are smelled by the nose

We're going to look at each of these types of communication in detail, and investigate how and why they are used. Let's start with visual communication.

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Visual communication describes messages received by the eyes, which includes facial expressions, gestures, physical displays, and colours. A lot of information can be conveyed in a **visual signal**, but they cannot be seen from far away and require a direct line of sight unlike sound & smell signals.

Primates' visual communication appears in two forms. They communicate via their behaviour, using body language and gestures in a **display**, or a message can be communicated via their natural size, shape or colour – this is called a **badge**. Let's look at an example using some of our apes...

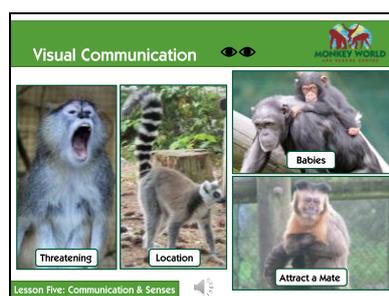
Adult male and female orang-utans look very different from each other. The males are larger – they weigh around 85kg on average, compared to the females at around 40kg - with longer hair and large fatty cheek pads. These physical differences between the sexes are called **sexual dimorphism** and it generally occurs when there is strong competition between the males to attract the females. The larger and more impressive a male orang-utan looks, the more likely a female is to want to breed with him as these qualities will be passed on to her baby. A male orang-utan's size and cheek pads are part of his physical structure, so it is a **badge** used to help him attract a mate.

Visual communication is also used by primates to assert their dominance and keep order within their family. This will occur when an individual is trying to intimidate a lower ranking primate, or trying to push their way

up the social ladder. In a chimpanzee's dominance display they will make themselves look larger and more intimidating to put trouble-makers back in line. They will stand upright, with their hair on end, shoulders hunched, and face and lips pursed; they will also sway, pushing or throwing objects out of their path as they run and at the recipient. Although they might seem loud and violent, these dominance displays rarely result in fighting and the misbehaving chimp will submit to the dominant individual. In this situation, a message is being conveyed through a chimpanzee's facial expressions, body language and movements, so it is a **display** to assert his dominance.

Let's have a look at a few more examples of visual communication and what it's used for.

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Primates use visual communication to threaten or intimidate predators or rivals of the same species. Patas monkeys, like Mica who was rescued from the illegal pet trade, signal when they are feeling threatened by opening their mouths widely, as if yawning. If you see Mica using this facial expression, it is likely that she feels someone nearby is a potential threat to her, or more likely, her companion George, and she is trying to warn them off.

A ring-tailed lemur's stripy tail is more than just a pretty sight. Ring-tailed lemurs are terrestrial

quadrupeds, so they spend the majority of their time walking on the ground on all fours. They are native to Madagascar and occupy its dry tropical forests when there are long grasses and lots of bushes in the shrub layer. If a group of ring-tailed lemurs are walking through thick grass and it is difficult to keep sight of everyone, all one needs to do is briefly stand on their legs and they will be able to see the distinctive black and white striped tails bobbin above the grass.

Visual communication can also be used to help to protect baby primates from over-enthusiastic family members. In some species of primates, the babies are born a different colour than the adults which reminds them that the youngster needs to be handled with care. As the baby matures and their colouration becomes like the adults, it indicates that their position in the group has changed as well as their age. For example, chimpanzees are born with pale skin and a white tuft of hair above their bottom; their skin darkens as they mature and their tuft disappears; and stump-tailed macaques are born with creamy white fur that darkens as they age.

We touched on attracting a mate using visual communication a moment ago, but as with everything else we've been learning so far, there is lots of variation between the species. Capuchin monkeys flirt by using a combination of facial expressions – including “smiling” and flashing their eyebrows – and gestures such as rubbing their chests with their hands and tails. In chimpanzees, the females' bottoms

become pink and swollen to indicate when they are ready to breed, and female marmosets quickly open and close their mouths (sometimes sticking their tongue out too) to attract male attention.

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Messages received through touch are **tactile communication**. Primates are social animals and often live in large family groups, so physical contact is very important. Tactile communication is used to enhance social bonds, to reassure each other, to chastise someone, or to indicate status.

Probably the most important social behaviour in primates is **grooming**, where primates will comb through another individual's hair with their fingers and mouths. Grooming is also used for hygiene purposes, but it is also one of the most important types of tactile communication that can be used to form bonds, strengthen friendships and calm nervous or tense others. In the top-left picture, red-bellied guenon Nia is grooming her infant daughter Biff. Family bonds are very important for primates, as infants generally require a lot of time and parental investment before they mature. Biff's mum shows her affection and keeps her calm through close physical contact and grooming.

Close physical contact, including huddling up together, hugging, and

touching each other also helps primates improve their relationships, reassure each other, show affection, and promote peace in the group. In the top-centre photo, Tutti is tickling an infant Thelma – enhancing her closeness to both the baby and her mother. Smaller primates will often live in larger groups for security, and will also huddle together when relaxing or resting, like our ring-tailed lemurs (bottom-centre) and stump-tailed macaques (top-right).

As we have already learnt, most primates have low reproductive rates and their babies require a lot of time, care and attention from their parents before they grow up. For a baby orang-utan like Mimi, she needs to learn lessons of survival from her mother, but equally she needs to be given comfort and reassurance. Just like in humans, one of the best ways to show love and affection is with a cuddle.

Hugging and embracing isn't just important for babies and their parents to show reassurance. The bottom-right photo was taken whilst the chimpanzees in Bart's group (then Cindy's) were investigating a rubber snake, placed there by PCS to test how the chimps would react to predator. The group stand closely together with arms over each others' backs, giving reassurance and solidarity in the face of danger.

Tactile communication is also used to chastise, or tell off misbehaving primates. For example, an adult marmoset will chastise a youngster with a "cuff and snap bite" or a light scratch with their nails. They don't cause damage, but are

uncomfortable enough to get the naughty primate to adjust their behaviour.

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Auditory communication refers to when **sound signals** are used to send a message to another animal. Sound signals don't travel as far as scent signals, but they are easier to direct and control. If you've visited Monkey World, it's likely you've heard our gibbons, chimpanzees and monkeys using auditory communication. Primates use auditory communication to establish and defend their territory, keep contact with group individuals, and attract mates.

Gibbons sing loudly to communicate through the dense tropical forests of their native southeast Asia. They will sing a loud song to attract a mate and then, once successfully paired with another gibbon, they will sing a loud, beautiful duet together to keep other gibbons away from their territory. As gibbons have large territories within dense forests, these calls are loud enough to travel for up to 3km! Each species' song sounds different, and each pair develops its own unique version; Siamang gibbons (top-right) have the loudest and most complex songs of all the gibbons, and the sound is amplified by a throat sac that

inflates when they sing. Researchers studying gibbons will use their songs to track and find them in the wild, but unfortunately poachers use the same technique to find and hunt the gibbons.

Most people won't have heard an orang-utan make much noise, but these quiet apes can make noise when necessary! Similarly to gibbons, orang-utans will live in large territories and need to send a sound signal across a long distance to attract a mate. Adult male orang-utans will make a bellowing "loud call", which is enhanced by a throat sac, to reach through the forest and communicate his location to female orang-utans.

Much of the auditory communication that happens at Monkey World will blend into the background noise of the park, but if you listen closely you'll notice that our monkeys keep in contact with each other (even between different enclosures) using a variety of sounds. Marmosets use a range of sounds to maintain contact – the most common sounds like a high-pitched whistle. Woolly monkeys regularly talk to each other by making a soft "eeolk" sound which basically means "I'm ok, how are you?". They will also make a high pitched **trill** to signify when they are particularly happy or excited.

Another key function for auditory communication is to make **alarm calls** which inform others of a nearby predator or danger. Ring-tailed lemurs tend to shout their alarm call in unison and have different sounding calls for an aerial predator

(in the sky) or a terrestrial predator. Chimpanzees call out with a loud **bark** that warns other group members of an impending danger. Chimpanzees also **pant-hoot** or make a series of loud calls which rise and fall in pitch, and often end with a scream! They do this at abundant feeding sites, but they might also do it when smaller groups are reunited after time apart.

Make sure to check out both Monkey World's and Primate Planet Productions' YouTube channels to see and hear some of this communication in action!

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Primates also communicate with each other by using their sense of smell to detect and understand **scent signals** – this is called **olfactory communication**. Scent signals can travel very far and can last a long time, but it is not very easy to make sure they go in the right direction. Most primates tend to use visual and tactile communication more than olfactory, but (if you remember from our Primate Taxonomy lesson) prosimians rely more on their sense of smell, and so use olfactory communication regularly. Many prosimians have scent glands so they can secrete their own natural smells to communicate with one another, but primates will also use their own urine and other smelly substances found in their environment.

Ring-tailed lemurs regularly use olfactory communication to send smelly messages to other lemurs. They have scent glands on their wrists and near their bottoms, which

they can rub on trees and other objects to demarcate their foraging routes. The male ring-tailed lemurs also have a horny spur on each wrist gland, so they can pierce a hole in a tree branch so their scent permeates deeper. In the picture, one of our male ring-tailed lemurs, Al, is scent marking a tree in the lemurs' woodland enclosure. Lemurs also used their scent glands to establish and maintain their rank in the group hierarchy in an odd practice called **stink fighting**. During a stink fight, two lemurs will rub their tails through their armpits and across their wrists, so their scent is smeared thoroughly across it. They will then stand across from one another and shake their tails above their heads in each others' direction. It isn't quite clear how they decide who wins, but it helps them to determine dominance and settle disagreements during breeding season.

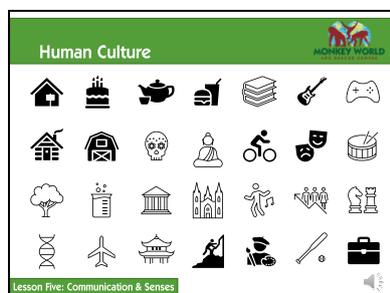
Scent marking is used by many primates to mark their territory, leave trails for others, and establish their identity. Capuchin monkeys and squirrel monkeys often urinate on their hands, then rub their feet and fur to give themselves a unique smell that leaves a **scent trail** as they move around their territory. Capuchins also particularly like to rub onions and other smelly foods over their fur for scent marking purposes – if you ever see the capuchins at Monkey World onion-rubbing, you'll see that they often drool while doing so.

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We can't discuss primate communication without considering how humans compare. Humans have the most developed brains of all the primates, and we have evolved far beyond any other animal on the planet. Like the rest of the primates, humans are able to communicate their feelings without words, but through the use of facial expressions and body language. Humans are unique in that we are the only animals on Earth who have evolved articulate speech with defined languages, with approximately 6,500 different languages spoken across the world today. As we have evolved, so has technology. Mobile phones, computers, tablets, televisions and even cars give us the ability to communicate with our friends and families, even if they live on the other side of the planet.

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Our highly developed brains give us the ability to reason as well as speak. This major difference between us and non-human primates has led to human beings having a highly developed **culture** unlike any other animal. Culture is the combination of ideas, beliefs, customs and behaviours of people. It encompasses art, literature, religion, tradition, myths, rituals, history, clothing, technology – it's everything that makes us human beyond the biological sense. We also communicate to share these ideas, our knowledge and experiences, using the methods we discussed a moment ago.

There is little information on culture in non-human primates, but wild chimpanzees do exhibit a culture of

their own. Their culture dictates what tools they use, what food and other resources they depend on, how they hunt, and how they defend their family – these traits will be different across different chimpanzee communities, thus exhibiting their own different cultures.

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Recap!

Visual  Sight	Tactile  Touch	<ul style="list-style-type: none"> • Identity • Social hierarchies • Attract a mate • Territory • Predators • Work as a group • Social bonds
Auditory  Sound	Olfactory  Smell	

Lesson Five: Communication & Senses

Let's recap what we've learned today:

Communication is how animals send messages to one another. Primates use four main types of communication – each of the main types of communication relies on one of the senses:

- **Visual communication** uses the sense of sight; messages are seen by the eyes
- **Tactile communication** uses the sense of touch; messages are felt by the hands/skin etc.
- **Auditory communication** uses the sense of sound; messages are heard by the ears
- **Olfactory communication** uses the sense of smell; messages are smelled by the nose

Primates communicate so they can:

- Advertise their identity
- Establish and maintain social hierarchies
- Attract mates
- Mark their territory
- Discourage predators
- Work as a group
- Form bonds and friendships

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These lessons have been designed alongside our Education Pack which is full of comprehensive information on primate classification, habitats, family groups, diets and more. It is perfect for learning more about primates at home! It is available from our online Gift Shop, along with curriculum-linked workbooks available in Keystages 1, 2 and 3!