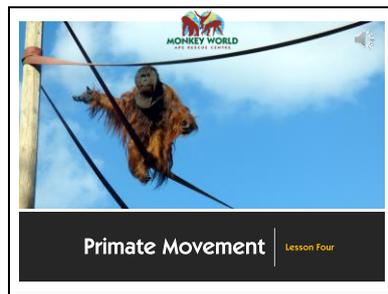


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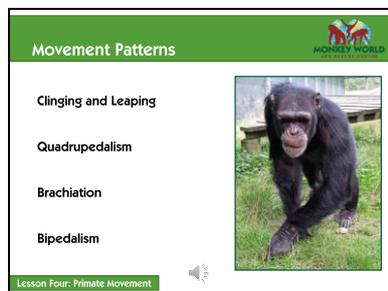
Slide 1



Today's lesson is all about Primate Movement – we're going to investigate:

- The four main primate movement patterns
- How primates' bodies and movement are related to their habitat

Slide 2



In our previous lesson we discussed how primates' bodies are adapted to help them travel, find food, and stay safe in their specific habitats. In this lesson we are going to explore how different species of primates move and use their bodies, and how this is related to their habitats.

The ways animals move are described as “movement patterns”. Primates exhibit more movement patterns than any other group of mammals. There are four main categories of movement, or locomotion, displayed by primates: **vertical clinging and leaping; quadrupedalism; brachiation; and bipedalism**. They will mainly use one of these four movement patterns, but might use all of the patterns at different times. Let's explore those four movement patterns.

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Slide 3



Prosimians differ from the Higher Primates in lots of ways: most are nocturnal, they rely more on their senses of smell & hearing, and tend to have large eyes and ears as a result. They also stand out by exhibiting a movement pattern known as vertical clinging and leaping, which is not seen in monkeys and apes. Leaping between the trees enables arboreal primates to safely travel between the trunks, even where there is no network of interconnecting branches. Tarsiers are prosimians native to Southeast Asia that travel via clinging and leaping. Their frog-like legs are longer than their arms, and they use them to propel themselves – forwards or backwards - from one trunk to another. Before they land, they swing their legs forward so their feet make first contact with the next tree.

Slide 4



The ring-tailed lemurs at Monkey World are prosimians, but unlike most lemurs they are mostly terrestrial and their movement pattern is categorised as quadrupedal, which means to walk on four limbs. However, primates will use different movement types when necessary. Ring-tailed lemurs will spend most of their time walking on all fours on the ground, but will also leap between trees where they choose. So when you next visit our Malagasy enclosure, you'll mostly see the ring-tailed lemurs walking on four limbs – but you might see them exhibit vertical clinging and leaping as they move between the trunks of their woodland home.

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Slide 5



This is the most common movement pattern in primates – **quadrupedalism** simply means walking on four limbs. If we break the word quadrupedalism down, it is made up of the word “quad” which means “four” in Latin and “ped” which means “foot”. A **quadruped** is an animal that has four feet, and **quadrupedalism** is a way of movement using four feet to walk or climb.

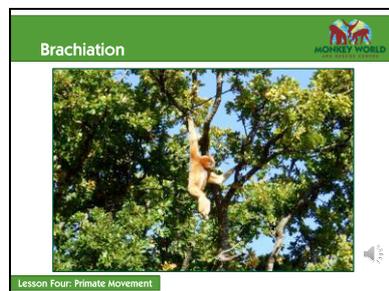
When quadrupedal primates walk, the diagonal pair of limbs move together. So, they move their left arm and their right leg together, then their right arm and left leg together.

As we have already learned, primates are adapted for either a mostly arboreal or terrestrial lifestyle. Therefore, when discussing primate movement we might refer to a tree-dwelling primate such as a capuchin monkey as an **arboreal quadruped**, and a ground-dwelling stump-tailed macaque as a **terrestrial quadruped**. Remember, they are each adapted for their lifestyles – for example, capuchins

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have long tails to help them balance on branches, but stump-tailed macaques only have a tiny reduced tail as balancing on the ground isn't an issue!

Slide 6

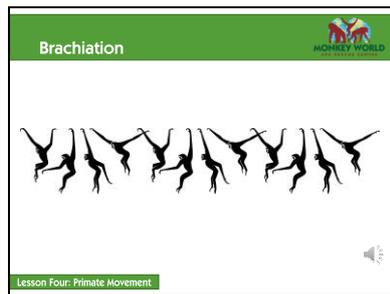


Some large primates, like spider monkeys, gibbons and orang-utans, move by hanging underneath branches and using their arms to swing between each support. This is called **brachiation**. Brachiation is mostly an adaptation seen in apes and humans; our skeletons are adapted with the ability to reach for supports in many different directions. *Try it now! How far can you stretch your arms? How many different directions can you move them in?*

Gibbons are the only “true” brachiators, and they are adapted for an almost entirely arboreal lifestyle; their shoulder joints are more flexible than any other primates, and have ball & socket joints in their wrists. This is Peanut, a golden-cheeked gibbon rescued from the illegal pet trade in the UK. She lives in a forested enclosure at Monkey World, and can often be seen brachiating through the trees with her mate Pung-yo.

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Slide 7



This diagram shows the movement pattern **brachiation**. You can see how a gibbon swings their arms in an underarm motion to reach the next support. By moving their arms in an underarm motion, they spread their weight as they swing from different branches. Remember, gibbons have long, hook-like fingers that are adapted for wrapping tightly around branches, and their thumb is shorter to aid them in swinging forwards.

Slide 8



When brachiating, gibbons can reach speeds of up to 20mph, building enough momentum that they accomplish leaps of over 10m! Can you remember which arboreal adaptation will help them to accurately judge distance? **Binocular vision**. This photo is of one of the golden-cheeked gibbons rescued and rehabilitated by our charity, EAST (the Endangered Asian Species Trust). The charity rescues young gibbons from the black market trade (as well as pygmy loris and black-shanked doucs) and rehabilitates them for wild release. We will learn more about EAST towards the end of our course, but check out their website to learn more about their work: www.go-east.org

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Slide 9



You might be wondering where great apes like chimpanzees and orangutans fit into these movement patterns, as they mostly walk on all fours when on the ground (exhibiting quadrupedalism), but their strong arms are longer than their legs, and they use them to brachiate through the trees. As youngsters they make great use of brachiation, as they are regularly seen using their arms to move through the trees – the photograph on the left shows chimpanzee Thelma practicing her daredevil antics, as she brachiates across the ceiling of her playroom! As they get older and larger, they tend to spend more time on the ground as fewer branches can support their weight; luckily for the adult apes at Monkey World, there are plenty of cargo nets and ropes that they can make use of!

The great apes are classified as **modified brachiators**. They use a combination of brachiation and quadrupedalism, but are physically adapted more for brachiating.

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Slide 10



The great apes are not very well suited for quadrupedalism. One of the basic adaptations for quadrupedalism is limbs of equal length, but the great apes' arms are longer than their legs. They also cannot walk upright (bipedally) for more than a few steps at a time. To solve the problem and allow for easier terrestrial movement, chimpanzees walk bearing weight on their knuckles (knuckle walking), and orang-utans on bunched fists (fist walking).

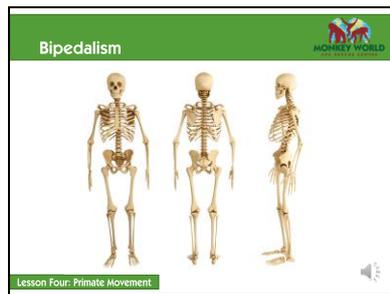
Slide 11



Bipedalism means to walk upright on two feet, and humans are the only fully bipedal primate. It is not clear exactly why bipedalism evolved in our early ancestors, but it frees the hands and has given humans the ability to use their hands more than any other primate. Bipedalism allows humans to use and manipulate objects with great precision, whilst stationary and whilst moving.

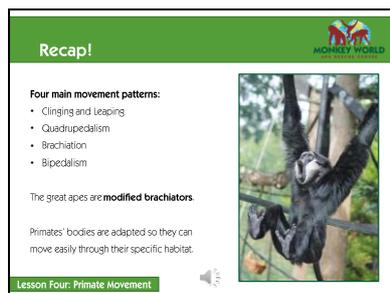
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Slide 12



Unlike with other primates, our arms are not particularly important for our movement pattern – it is our legs and spine that enable us to balance our bodies on two feet. Our spine has two curves which helps us to balance our torso over our legs; our spine is also shorter with bigger vertebrae, which bears the weight of our upper half. Our toes are shorter than in the great apes and we do not have an opposable big toe. Our pelvis also faces forwards, allowing for much stronger hip muscles that stabilise the trunk of the body.

Slide 13



Let's recap what we've learned today:

There are four main movement patterns seen in primates:

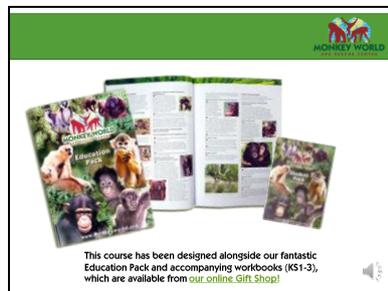
- Vertical clinging and leaping – seen only in prosimians, where they leap between tree trunks using frog-like legs
- Quadrupedalism – walking on all fours, either in the trees or on the ground
- Brachiation – the motion of swinging underneath branches by the hands
- Bipedalism – walking upright on two feet, like a human

The great apes are classified as modified brachiators, as their large size calls for them to live on the ground as well as in the trees.

Primates' bodies are adapted to move in a way that is practical in their habitats.

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Slide 14



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!