Science

Animals Including Humans

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Meet Quizby!

Can you spot me in the Lesson Presentation?

The questions that appear will help you to think about the key learning throughout the lesson.

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Growing Up

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Aim

- To compare the stages of the human life cycle.

Success Criteria

- I can name and order the stages of the human life cycle.
- I can explore how humans grow and develop through each stage.
- I can ask and answer a question to compare different human life stages.

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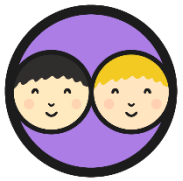
Remember It



We have been learning about the life cycles of different animals.

Can you remember the stages of a frog's life cycle?

- Work with your partner.
- Write numbers 1-4 on your whiteboard.
- Can you write the correct label next to each number?

PLAY GAME

Growing Up

Today we are going to be learning more about the **human** life cycle.

We can recap what we have learnt so far about the human life cycle in this section of the **eBook**.

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Growing Up

This is the **life cycle** of one person named Ajani.

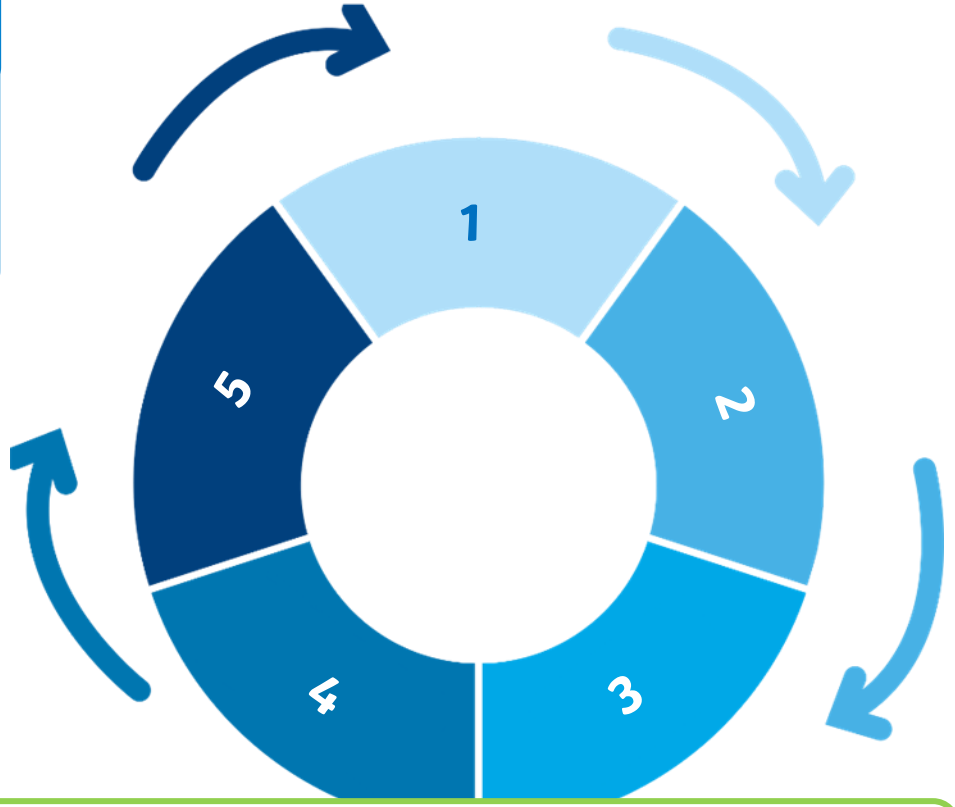
Let's look at Ajani's **life stages**.

With a partner, can you work out where each stage should go in this **life cycle**?

Teenager

Baby

Child



X Can you name and order the stages of the human life cycle?

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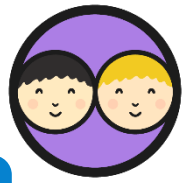
Growing Up

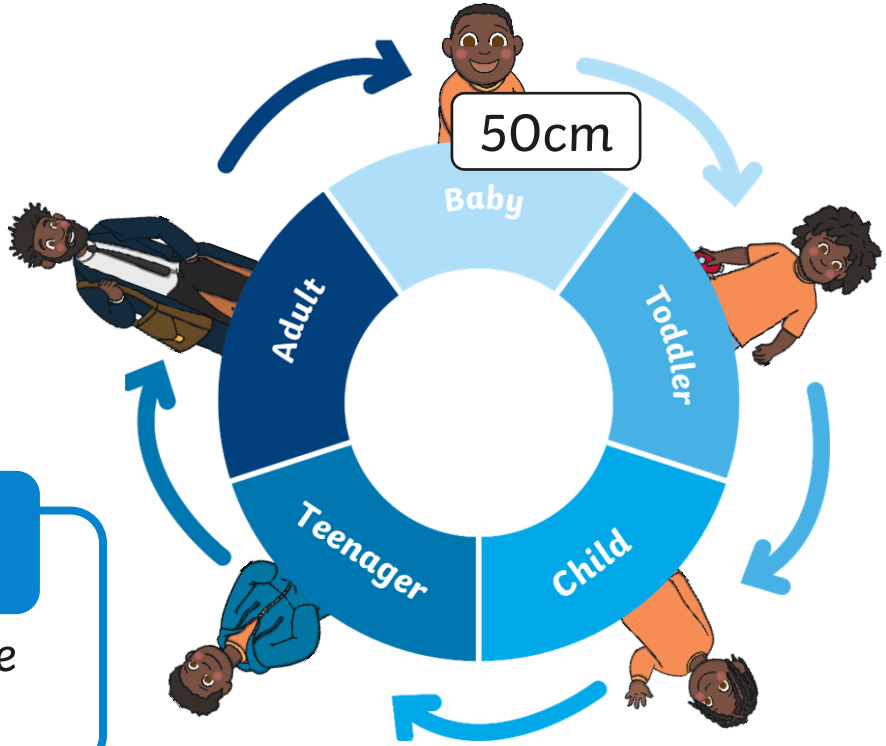


These are the heights, measured at each of Ajani's **life stages**.

When he was a baby he was **50cm** tall.
Can you match the rest of the heights to the correct **life stage**?

150cm | 160cm | 90cm | 100cm

- Can you work out how much Ajani grew from being a baby to a toddler? 40cm
- What about from a teenager to an adult? 10cm



How did you know where to put each measurement?

Humans grow taller as they get older, so the measurements of their height increase.

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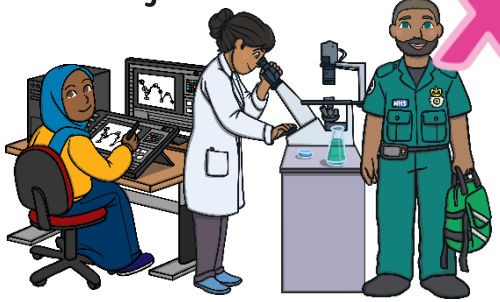
What Can We Do as We Grow?

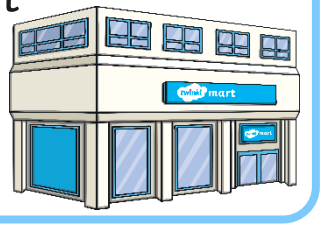
Whole Class

Which of these things are most **children** able to do?
Which of these things are **children** not able or expected to do?
Click each one to find out.

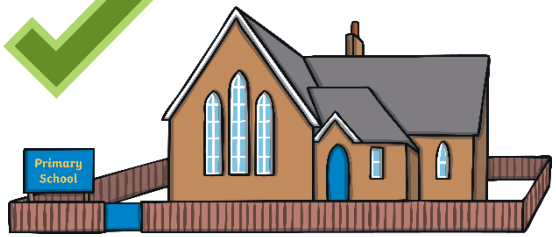
have a job



do the weekly food shopping alone at the supermarket



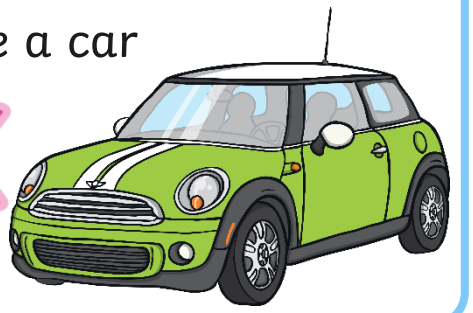
go to school



play with friends

communicate, e.g. by talking or signing

learn to drive a car



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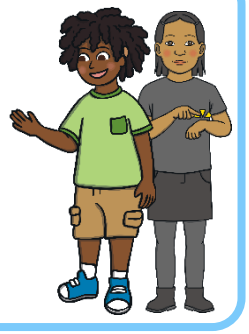
What Can We Do as We Grow?

Whole Class

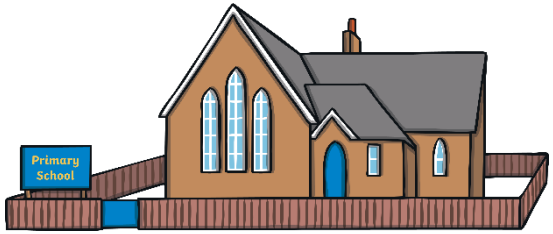
Things most children are able to do:

play with friends

communicate, e.g. by talking or signing



go to school



Can we think of any more things that some children in this class may have learnt to do?

- Do you know anybody younger than you, such as a little brother, sister, cousin or friend?
- Can they do everything that you can do?

Babies and toddlers can't do as many things as lots of older children can because they haven't grown big enough or learnt how to do as many things yet.

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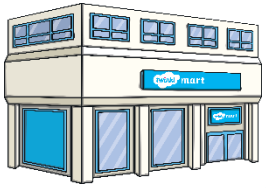
What Can We Do as We Grow?

Whole Class

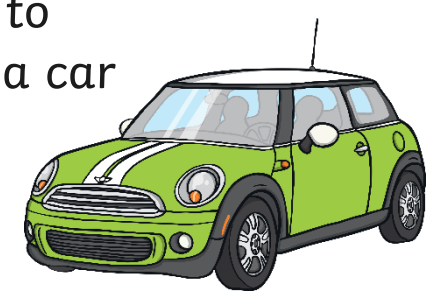
Things children should not be expected to do:

have a job

do the weekly food shopping alone at the supermarket



learn to drive a car



Do you know anybody that **can** do some of these things?
Are they older or younger than you?

As we develop and get older, we usually get bigger and stronger. We may also be more independent as we have lots of time to practise and get better at things.

Remember - people are all different and not everybody does the same things at the same time.

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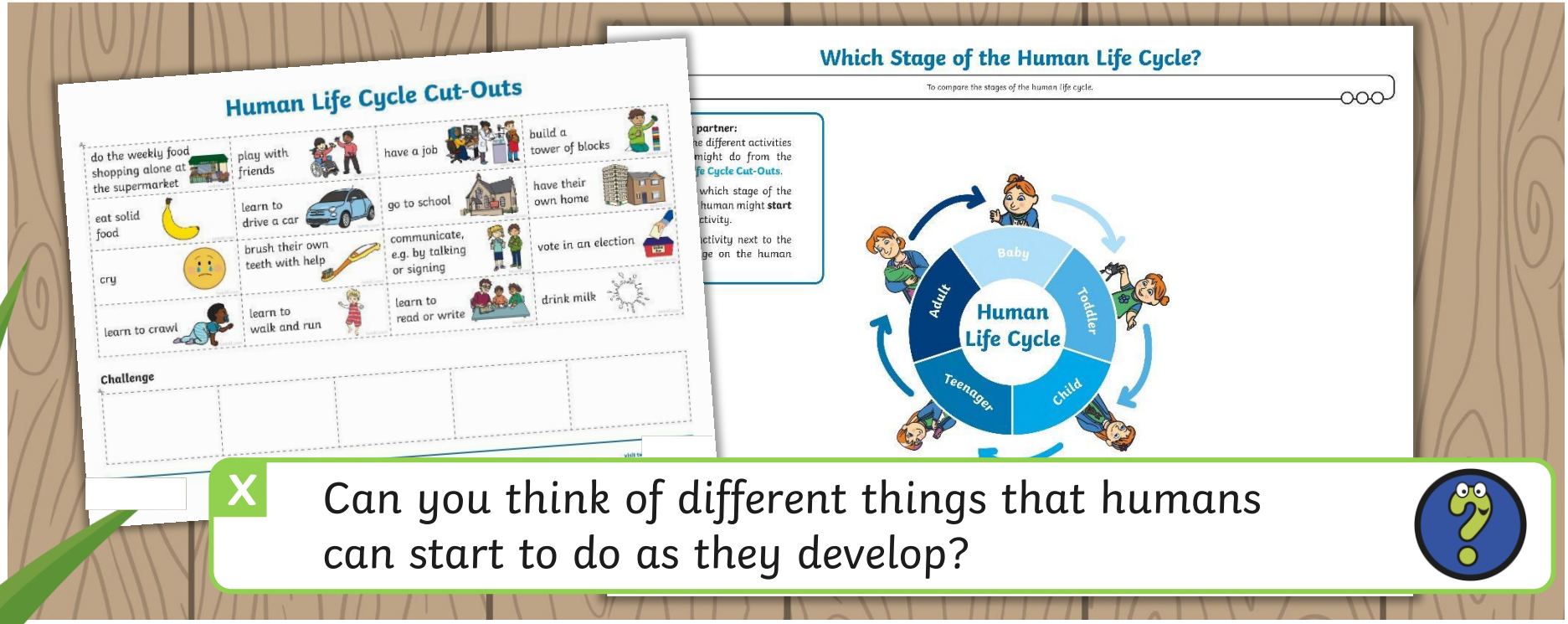
Which Stage of the Life Cycle?

- With a partner, read through all the activities.
- Decide when people might **start** to do each activity.
- Stick each label around the correct stage on the life cycle.



X Can you think of different things that humans can start to do as they develop?

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Comparing Life Stages

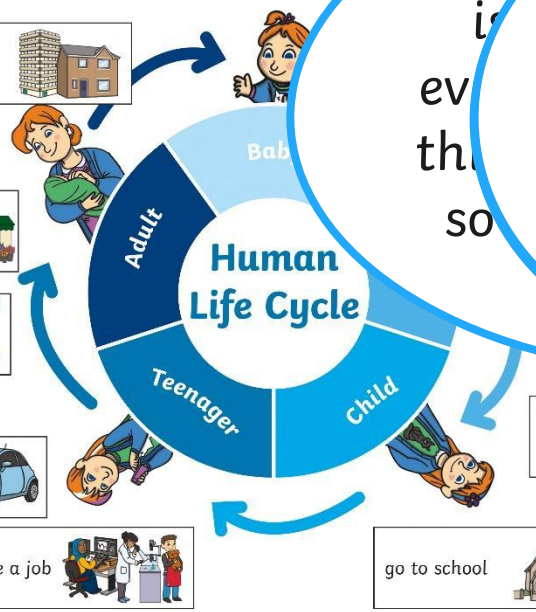
Whole Class

Which Stage of the Human Life Cycle? **Example Answer**

To compare the stages of the human life cycle.

With your partner:

- Cut out the different activities humans might do from the **Human Life Cycle Cut-Outs**.
- Decide at which stage of the life cycle a human might **start** to do the activity.
- Stick the activity next to the correct stage on the human life cycle.



cry

have their own home

do the weekly food shopping alone at the supermarket

vote in an election

learn to drive a car

have a job

brush their own teeth with help

play with friends

go to school

Are there any other activities we could add to our life cycle?

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Comparing Life Stages

Whole Class

Can we build a **question** about the human life cycle?

What might a _____ **do** that a _____ **can't do**?

baby

toddler

child

teenager

adult

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Comparing Life Stages

Does this question make sense? Why or why not?

Question:

What might a child **do** that a teenager **can't do**?

Teenagers can often do more things than they could when they were a child, because they are older.

When we write our questions, it's best to start with the **older** life stage first.

What might a teenager **do** that a child **can't do**?

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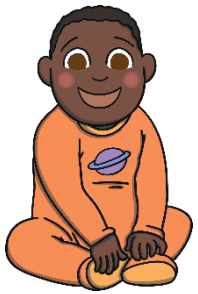
Comparing Life Stages

Work with a partner to write a question together on your whiteboard.

What might a _____ **do** that a _____ **can't do**?



baby

toddler

child

teenager

adult

X Can you ask and answer a question to compare different human life stages?

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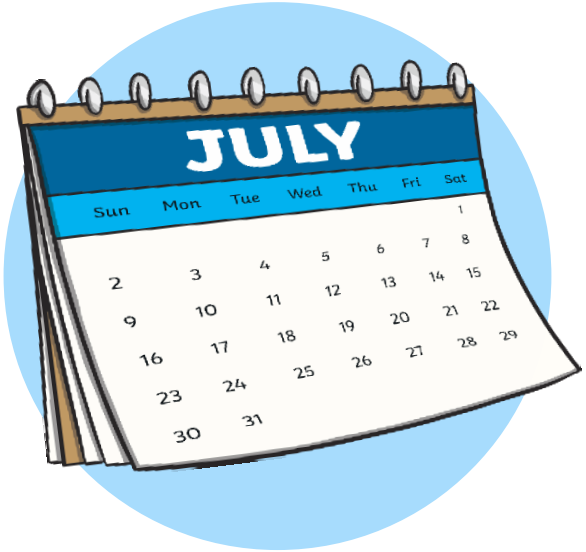
Asking Questions About Growth

Whole Class

What else could we find out about the human life cycle?



For example:

'How much does a child's foot grow from year 1 to year 6?'

Let's think of some more questions we could ask together.

How could we find out the answers to these questions?

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Aim

- To compare the stages of the human life cycle.

Success Criteria

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Animals Including Humans Scientific Knowledge

Introduction

As part of the new framework, OFSTED inspectors will evaluate the extent to which "Teachers have a good knowledge of the subject(s) and courses they teach". This guidance has been provided to help you develop a broader knowledge of the concepts in this area of science and not just of the content taught in year 2. This will help you to anticipate and answer questions the children may pose. Alongside this, we have also provided some examples of the possible misconceptions you may find the children have.

Lesson	Scientific Knowledge	Possible Child Misconceptions
Lesson 1 Animal Offspring	Animals that are viviparous give birth to live young. This is very common in mammals but also in other groups. Oviparous animals produce eggs that develop and hatch outside of the body. Examples include birds. Ovoviviparous animals produce eggs that hatch within the body. Examples include some fish and certain reptiles. **Patterns within groups:** **Birds** All birds lay eggs. **Amphibians** Most amphibians lay eggs but there are a few that do not in this group. For example, many caecilians (a wormlike and limbless amphibian) give birth to live young. **Mammals** All mammals give birth to live young with the exception of monotremes (which includes the duck-billed platypus and echidnas) who lay eggs. **Fish** Most fish lay eggs but some do give birth to live young. For example, different species of shark can be oviparous, ovoviviparous or viviparous. The hammerhead example given in this lesson is viviparous. **Reptiles** Most reptiles lay eggs but some, such as some lizards and snakes, give birth to live young.	Animals quite often either do not seem to fit into their group or do not follow the patterns generally seen in their group. For example, dolphins and whales seem like fish but are actually mammals. Throughout the lessons and **eBook** these irregularities are addressed (look out for the 'Be Careful!' slides in some **Lesson Presentations** throughout the unit). Children should be encouraged to spot patterns within the different animal groups but should also be aware that biology doesn't always follow these patterns and there are often exceptions. In this lesson, children sort animals into those offspring that do look like their adult when they are born and those that do not. Children may have the misconception that because an animal's young is a different colour or size, they do look different to their adult. However, when looking closely they should see that they do look similar to the adult. The aim of this activity is to identify the young that look drastically different to their adults (such as tadpoles) and to form the basis for understanding processes such as metamorphosis.

Lesson 2 Life Cycles	This lesson examines how animal offspring grow into adults through the use of life cycle diagrams. Metamorphosis describes the process in which there are major changes in the form or structure between the young and adult forms of an animal. Metamorphosis is commonly found in the insect and amphibian groups but is also seen in some fish. Common examples of animals that undergo metamorphosis include frogs and butterflies. We tend to call the pupa of a butterfly a 'chrysalis'. See below (lesson 3) for further information about the human life cycle.	Children may assume that there is a sudden leap between each of the stages given in a life cycle diagram and nothing in between. Using the example of our own human life cycle is a good way to show how there are still changes in between each stage given. Children can access the lesson content without using the term 'metamorphosis' (although this is used in the content and may be appropriate depending on your class) but should instead identify that some animals (such as frogs) have big changes across their life cycles. The term 'cocoon' is often misused but may be one children have heard. It tends to be used when talking about the life cycle of moths. A cocoon is a silky protective covering that forms around the pupa of certain insects such as moths.

Lesson 3 Growing Up	The stages in the human life cycle used in this lesson match those suggested in the non-statutory notes and guidance of the science national curriculum: baby, toddler, child, teenager and adult. Pupils return to the human life cycle in year 5 where they will describe more stages and learn about adolescence and puberty. Human growth can be separated into the following stages (some content here would not be appropriate for year 2 but is provided for your scientific knowledge): • **Fertilisation:** The male and female sex cells fuse together. • **Prenatal:** The cells develop and grow into a foetus inside the mother's uterus. After around nine months, the baby is born. • **Infancy:** Rapid growth and development. Children may learn to walk and talk. • **Childhood:** Children learn new skills and become more independent. • **Adolescence:** The body starts to change over a few years. The changes occur to enable reproduction during adulthood. • **Early adulthood:** The human body is at its peak of fitness and strength. • **Middle adulthood:** Ability to reproduce decreases. There may be hair loss or hair may turn grey. • **Late adulthood:** Leading a healthy lifestyle can help to slow down the decline in fitness and health which occurs during this stage.	This lesson focuses on different activities that humans can do at different stages in their life cycles. As people are all different and may do these activities at different times or not do them at all (including things like walking and talking), this lesson has been worded carefully to acknowledge this. This can also be addressed through further discussions with children. For example, some may think that everyone goes to university after school and it is important to discuss the fact that although many people do, there are also lots of other career paths and life choices that can be made at this stage. Children may bring up elements of puberty in discussions (perhaps voice changes or changes in skin). However, puberty isn't referenced in the science curriculum until year 5 and the lesson does not cover this topic. Any comments regarding puberty from children should be handled in line with your school's policies on this topic.
Lesson 4 Survival	All animals need oxygen (although the term 'oxygen' is used in this unit, it is not essential for covering the curriculum aims). Animals use this oxygen in their cells for a process called respiration (specifically aerobic respiration). Respiration is a chemical reaction that provides energy for an organism. In aerobic respiration, energy is released from glucose (which comes from food) by reacting with oxygen. Note that breathing and respiration are not the same thing. Breathing is generally described as the process of getting air in and out of the lungs. However, different animals have different ways of breathing that may not involve lungs. Fish have gills to remove oxygen from the water. The amphibian group can use multiple different ways of breathing including gills, lungs and breathing through their skin.	Water, food and air are essential for us to stay alive but through discussion children should also be made aware of other things that we do need beyond these three absolute essentials (for example, education, appropriate shelter and exercise). A misconception about fish not needing air and water is addressed in the **Lesson Presentation**.

Lesson 5 Exercise	Information in this lesson is matched to NHS guidance on physical activity. The NHS recommends that children and young people aged 5-18 should aim to do an average of at least 60 minutes of moderate intensity physical activity a day across the week. Please see the NHS website for more detailed guidance on exercise requirements for children and young people aged 5-18 years, including the different types it should include. See the **Awesome Offspring to Healthy Adults eBook** for detail on what happens to our bodies when we exercise.	Children may think that exercise (or physical activity) only involves team sports (like football) or organised activities (like PE lessons) but actually the NHS also recommends everyday activities such as walking to school and skipping with a rope.
Lesson 6 Healthy Living	Information in this lesson matches the government and NHS Eatwell Guide guidance. Please see the NHS and government Eatwell Guide webpages for more detailed information on this. Nutrients are substances that living things need to stay alive and healthy. Children learn more about specific nutrients in our year 3 'Animals Including Humans' unit. Briefly, each group does the following: • **Carbohydrates:** provide energy • **Protein:** helps growth and repair • **Fibre:** helps us digest the food that we have eaten • **Fats:** provide energy • **Vitamins and minerals:** keep us healthy (for example: help us grow, keep our bones strong, boost the immune system) • **Water:** moves nutrients around our bodies and helps us to get rid of waste.	Food can be a sensitive issue and the lessons and eBook are worded carefully to reflect this. Adapt discussions as needed for your specific class and see the Eatwell Guide information for more detail on the current government/NHS guidance.

Animals Including Humans: Growing Up

Aim

Notice that animals, including humans, have offspring which grow into adults.

Asking simple questions. Using their observations and ideas to suggest answers to questions.

To compare the stages of the human life cycle.

It is estimated that this lesson will take approximately one hour. 60 mins Approx.

Success Criteria

I can name and order the stages of the human life cycle.

I can explore how humans grow and develop through each stage.

I can ask and answer a question to compare different human life stages.

Standard School Equipment

Pencils, scissors, glue sticks, whiteboards and pens

Preparation

Which Stage of the Human Life Cycle? Activity Sheet - per pair

Human Life Cycle Cut-Outs - per pair

Reasoning Cards: Growing Up - as required

Key Vocabulary

Grow, **develop**, **life cycle**, life stages, human, baby, toddler, child, **adult**, independent.

Prior Learning: In the previous lesson, children will have learnt that all animals change as they grow into adults and will be familiar with the life cycles of a sheep, a frog, a human, a duck and a butterfly.

Learning Sequence

	Remember It: Using the **Lesson Presentation**, recap the life cycle of a frog from the previous lesson.	5 mins
	Growing Up: Read pages 21-22 of the **eBook** to recap the human life cycle. Using the **Lesson Presentation**, children work with a partner to order Ajani's life cycle. Then, look at Ajani's heights and ask the children to match the correct heights to each stage of the life cycle to show how he has grown. As a challenge, children could work out how much Ajani has grown by finding the height difference between stages. Can children name and order the stages of the human life cycle and explore how humans grow as they develop?	10 mins
Whole Class	**What Can We Do as We Grow?** Look together at the activities on the **Lesson Presentation**. Ask the children and encourage them to discuss: Can you do any of these activities? Children to select which of the suggested things they should be able to do. Next, ask if any children have younger or older brothers or sisters, can they do the same things? Then ask and discuss: Why do you think you can only do some of these things as you get older? (discuss how as we get older, we get bigger and often stronger, we have time to practise things and get better at them and we can also be more independent).	10 mins
	Which Stage of the Human Life Cycle? Explain to children that they will be sorting activities into the different stages that a human might start to do the activity, using the **Which Stage of the Human Life Cycle? Activity Sheet** and **Human Life Cycle Cut-Outs**. Children may decide to sort them into distinct stages, sort them so that some may overlap stages or sort them sequentially around the life cycle thinking about how humans develop. Can children understand that humans can start to do different things as they develop through each stage? Children work in mixed-ability pairs to cut out the activities, discuss at which stage of the life cycle people may start to do the activity and then stick them around the correct stage. ★ Adult support, if required. ★★ ★★★ As a challenge children can add one of their own labels to each stage of the life cycle.	20 mins

	**Comparing Life Stages:** Using the **Lesson Presentation**, discuss and review answers to the previous activity. An example answer is given but children's answers may vary. Use this to discuss why they have put things in different places, using their prior knowledge and observations to support their decision. Show children how they can build a question to ask and answer about the human life cycle, using the frame 'What might a _____ do that a _____ can't do?' and filling in words like baby, toddler, etc. Ensure that children know that the older stage needs to come first, as humans learn to do more as they get older. In pairs, children can write a question together using a whiteboard and pen, leaving space underneath for the answer. Swap with another pair, who can then work together to answer the question. **Can children ask and answer a question to compare different human life stages?**	
	**Asking Questions About Growth:** Using the **Lesson Presentation**, ask the children: What else could we find out about the human life cycle? Using pictures as prompts, generate more questions about human growth that they could find out the answers to. For example: How much do our feet grow from year 1 to year 6? How would they find out the answers to these questions? **Can children ask and answer a question about human growth?**	

Exploreit

Investigateit: Children could plan, with support, their own investigation about human growth, perhaps using one of their questions generated in the last section of the lesson. This could become a second lesson or a home learning task.

Observeit: Gather photos, either of teachers as babies or children as babies (or both) *[ensure you follow your school's photograph policy]* and make comparisons, discussing how humans may change as they grow, including how hair and eye colour can change.

Reasonit

Children discuss **Reasoning Cards: Growing Up**. They determine whether they think a given idea about how humans might change as they grow older is correct and say how they would prove it.

Assessment

Science Knowledge	
Working Towards the Expected Level With support, children can identify some ways that humans grow and develop through each life cycle stage.	Children:
Working At the Expected Level Children can identify several ways that humans grow and develop through each life cycle stage.	Children:
Working At Greater Depth Children can independently identify multiple ways that humans grow and develop through each life cycle stage.	Children:
Working Scientifically	
Working Towards the Expected Level With support, children can ask simple scientific questions and start to use scientific language to answer them.	Children:
Working At the Expected Level Children can ask simple scientific questions and use scientific language to answer them.	Children:
Working At Greater Depth Children can confidently ask simple scientific questions and use a wide range of scientific language to answer them.	Children:

Aim: To compare the stages of the human life cycle.				**Date:**					
				Delivered By:			**Support:**		
Success Criteria	**Me**	**Friend**	**Teacher**	**T**	**PPA**	**S**	**I**	**AL**	**GP**
I can name and order the stages of the human life cycle.				**Notes/Evidence**					
I can explore how humans grow and develop through each stage.									
I can ask and answer a question to compare different human life stages.									

Next Steps

- _____
- _____

T	Teacher	**I**	Independent
PPA	Planning, Preparation and Assessment	**AL**	Adult Led
S	Supply	**GP**	Guided Practice

Aim: To compare the stages of the human life cycle.				**Date:**					
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I can ask and answer a question to compare different human life stages.									

Next Steps

- _____
- _____

T	Teacher	**I**	Independent

PPA	Planning, Preparation and Assessment	**AL**	Adult Led
S	Supply	**GP**	Guided Practice

Animals Including Humans | Growing Up

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Animals Including Humans | Growing Up

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