



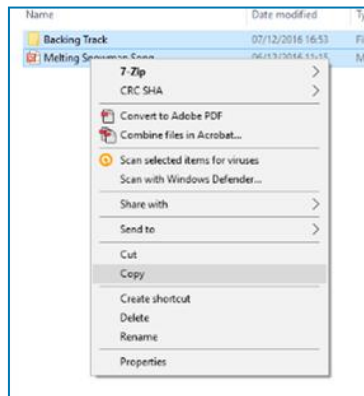
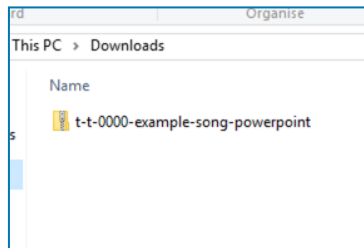
Science

Animals Including Humans

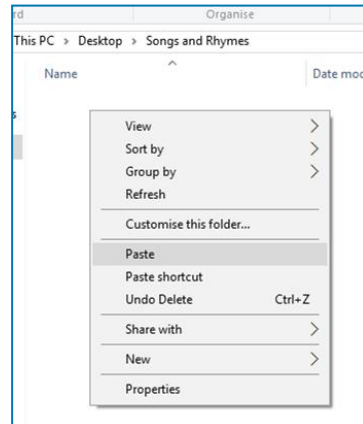


Guidance for Video/Audio in PowerPoints

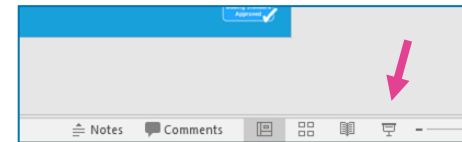
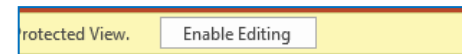
1. Open the folder and copy all the files.



2. Paste the copied files into a new folder.



3. Open the PowerPoint file, enable editing and enter presentation mode (start the slide show).



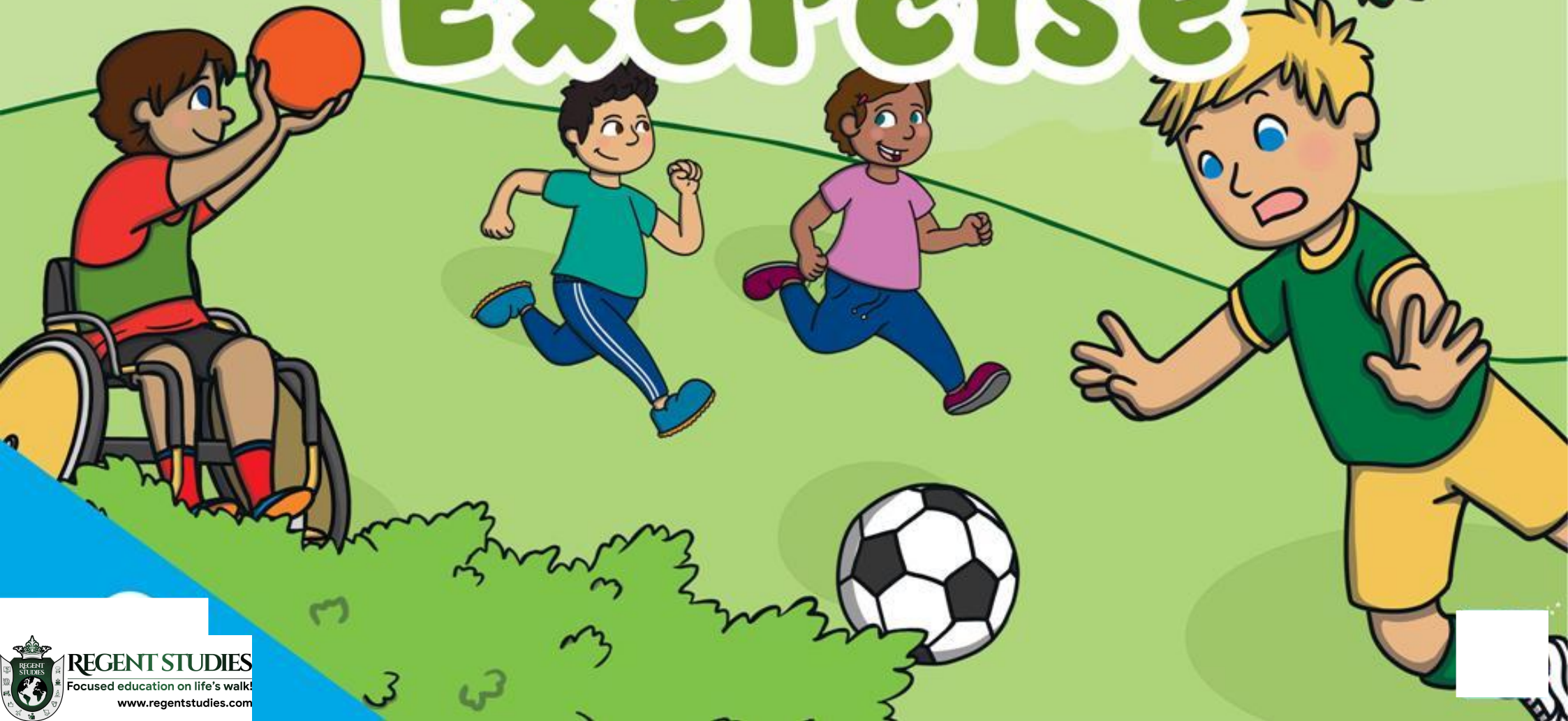
Meet Quizby!

Can you spot me in the
Lesson Presentation?

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



Exercise



Aim

- To test the effects of exercise on the human body.

Success Criteria

- I can ask questions about exercise.
- I can say what I think (predict) will happen to my heart rate during exercise.
- I can perform a test about exercise and talk about what I find out.





Remember It

Let's split into two teams to play Three in a Row!

- Take it in turns to answer a question.
- Click on each square to check if your answer is correct -
one correct answer = one point.
- If your team gets three in a row, you will score an additional five points!
- Keep trying to score points until all the questions have been answered.

**PLAY
GAME**



Growing Up and Staying Healthy



Let's find some information about staying healthy from the **Knowledge Organiser**. Click the magnifying glass to zoom in.

Animals Including Humans
Year 2

| Key Vocabulary | |
|------------------|--|
| diet | The food and water that an animal needs. |
| exercise | A physical activity to keep your body fit. |
| germs | Tiny living things that can cause disease. |
| hygiene | How we keep ourselves and the world around us clean so we can stay healthy and stop germs spreading. |
| nutrition | Food needed to live. |

To stay alive, all animals have three basic needs for survival:

air

water

food

Eatwell Guide

Eat less often in small amounts

oil and spreads
Choose unsaturated oils and use in small amounts.

6-8 a day

Water, lower fat milk and sugar-free drinks.

Being active and **exercising** keeps our bodies and minds healthy.

To stop germs from spreading, it is important to be **hygienic**.

To look at all the planning resources linked to the Animals Including Humans unit, [click here](#).

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Growing Up and Staying Healthy



Look again at this key learning from the **Knowledge Organiser**.

To grow into a healthy adult, we should try to eat the right types of food in the right amounts and **exercise**.

What could we try to find out about exercise?

Let's think of questions we could ask.

Who?

What?

When?

Where?

Why?

How?

Do?

If?



Growing Up and Staying Healthy



Example Questions

Why should we try to exercise?

How much exercise should I try to do?

Why is it important for us to try to exercise?

How much exercise do we need?

Can you ask a question about exercise? Can you make a class list of questions to answer?

Let's see if we can find the answers to any of our questions in the **eBook!**



Growing Up and Staying Healthy



Think about what we have read.

**How can exercise help us to stay healthy?
Can we now answer the questions on our list?**

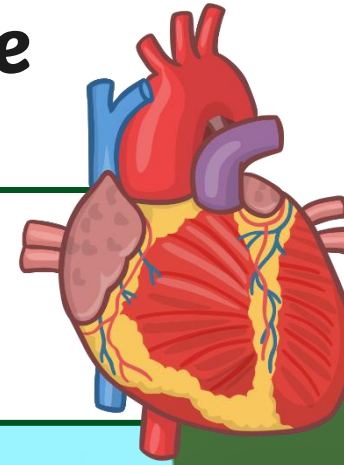


Investigating Exercise



Today, we will be asking the question:

Which activity will make my heart rate faster?



If we are not moving very much, our heart rate is slow.
When we exercise, our heart rate speeds up.

How do you know if your heart rate is fast?

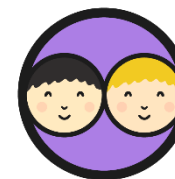
Can you think of any activities that speed up your heart rate?

We are going to decide which kinds of activities we think will speed up our heart rate!

X

Prompts

- ▶ you feel out of breath
- ▶ you feel warmer
- ▶ you feel sweaty
- ▶ you feel tired
- ▶ your heart is beating faster in your chest
- ▶ you have a faster pulse



Investigating Exercise

If you did each of these exercises for **30 seconds**, which do you think would make your heart rate faster and which wouldn't?

- ▶ With a partner, cut out the activities and read each one.
- ▶ Do you think it would make your heart rate faster or not?
- ▶ Stick each one into the correct place in the table.

Investigating Exercise

To test the effects of exercise on the human body.

With a partner, cut out the activities and read each one. Do you think it would make your heart rate faster or not if you did it for 30 seconds? Stick each activity onto the correct place in the table.

| Would make my heart rate faster | Would not make my heart rate faster |
|---------------------------------|-------------------------------------|
| | |

Investigating Exercise

lunges 

tap your shoulders 

wiggle your fingers 

Here is how long 30 seconds is:

START
TIMER

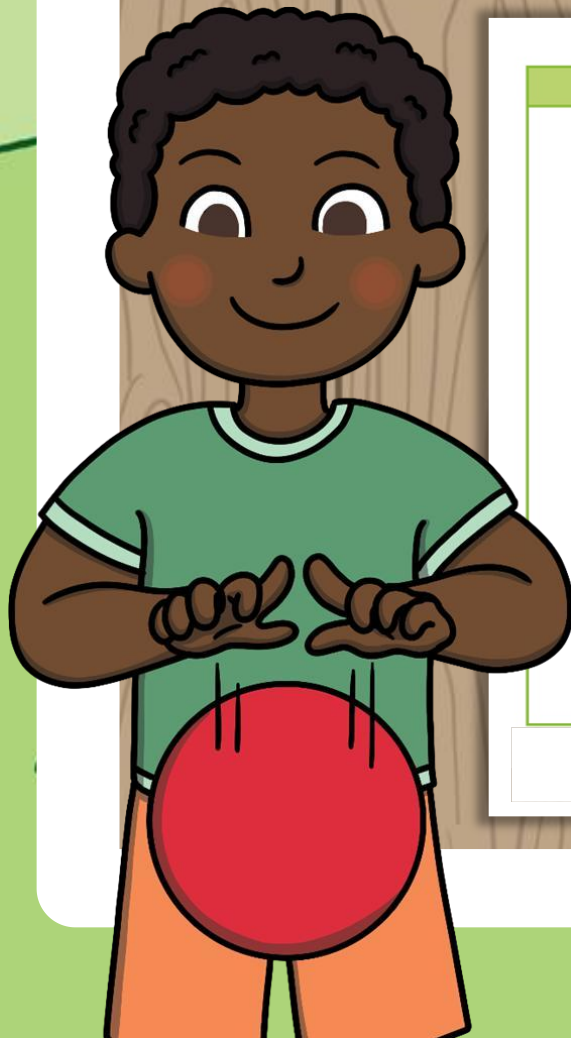
End





What Do You Think Will Happen? (Making Predictions)

Where did you decide to sort each activity? **Why?**

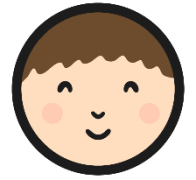


Investigating Exercise

| Would make my heart rate faster | Would not make my heart rate faster |
|---------------------------------|-------------------------------------|
| | |



What Do You Think Will Happen? (Making Predictions)



Choose one of your **'would'** make my heart rate faster and one of your **'would not'** make my heart rate faster

X



Can you say what you think will happen to your heart rate during exercise?

Can you explain **why** you think that these activities would or wouldn't make your heart rate faster? Let's use this word bank to help us:

What Do You Think Will Happen (Making Predictions)

To test the effects of exercise on the human body.

Can you explain why you think your chosen activities would make your heart rate faster?

You can use the word bank at the bottom of the page to help.

I think _____ would make my heart rate faster because _____

I think _____ would not make my heart rate faster because _____

Word Bank

| | | | | |
|------------|--------|------|--------|-----------------------|
| heart rate | fast | body | tired | movement |
| easier | harder | slow | less | warmer |
| arms | legs | more | energy | breathe faster/slower |

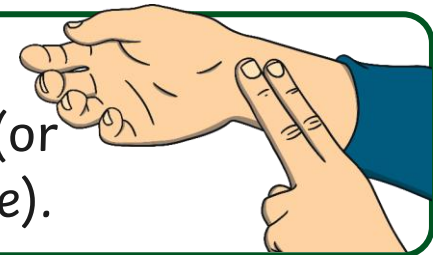




Making Observations (What Do You Notice?)

One way to see if our heart rate is faster is to check our pulses.

Place your first two fingers on the inside of your wrist (or you could try the side of your neck under your jaw bone).



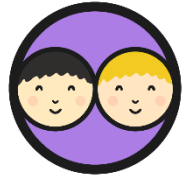
Touch carefully and make sure you don't press too hard. If you can't feel the pulse straight away, try moving your fingers slightly or try the other wrist instead.

While we aren't moving very much, our pulse will be fairly slow. Some activities will make it speed up!

Let's see if there is a difference once we have done our activities.



Making Observations (What Do You Notice?)



After choosing your two activities to compare from your table, decide which activity you and your partner will both complete first.

When everyone is ready, we will start the 30 second timer for you to complete the activity! Stop when the timer finishes.

START
TIMER

End



Discuss with your partner while you rest for 2 minutes - Is it what you thought would happen? (Was your prediction correct?)

After your rest, repeat with your second activity.





Discussing the Answers

Let's share what we have found out.



Did the activities make your heart rate faster, or not?

Why or why not?

Were there things you found tricky?

Did you find out the same things as your friends?

Why might it be different for different people?





Discussing the Answers

It's important to choose **varied** (lots of different) types of activities that use several different parts of our bodies to help us to stay active and healthy.



What is your favourite type of **exercise**?



How could we try to get more **exercise** each day?



Aim



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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 | <p>Animals that are viviparous give birth to live young. This is very common in mammals but also in other groups.</p> <p>Oviparous animals produce eggs that develop and hatch outside of the body. Examples include birds.</p> <p>Ovoviviparous animals produce eggs that hatch within the body. Examples include some fish and certain reptiles.</p> <p>Patterns within groups:</p> <p>Birds All birds lay eggs.</p> <p>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.</p> <p>Mammals All mammals give birth to live young with the exception of monotremes (which includes the duck-billed platypus and echidnas) who lay eggs.</p> <p>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.</p> <p>Reptiles Most reptiles lay eggs but some, such as some lizards and snakes, give birth to live young.</p> | <p>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.</p> <p>Throughout the lessons and eBook these irregularities are addressed (look out for the ‘Be Careful!’ slides in some Lesson Presentations throughout the unit).</p> <p>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.</p> <p>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.</p> |

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: Exercise

| | | | |
|---|--|---|---|
| Aim Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. Perform simple tests. To test the effects of exercise on the human body. | | Lesson Duration It is estimated that this lesson will take one and a half hours. |  |
| Success Criteria I can ask questions about exercise. I can say what I think (predict) will happen to my heart rate during exercise. I can perform a test about exercise and talk about what I find out. | | | |
| Standard School Equipment Scissors, glue sticks, writing equipment, flipchart paper, stopwatch/timer if completing 'Making Observations (What Do You Notice?)' out of the classroom. | | Preparation Investigating Exercise Activity Sheet – cut up cards, sheet per pair Prediction Activity Sheet – *, as required, ** and ***, per child Reasoning Cards: Exercise – as required <i>For the 'Making Observations (What Do You Notice?)' part of this lesson, ensure that you have a larger space available that can be used for PE lessons.</i> Optional resource for 'Teachit': Lucy the Gym Instructor's Letter . | |
| Key Vocabulary Exercise , healthy, activity, active, heart rate, pulse, muscle, blood, measure, run, jump, skip, hop, minute, seconds, what do you think will happen? (prediction), observations. | | | |

Prior Learning: In the previous lesson, children will have learnt that all animals have three basic needs to survive: air, water and food.

Learning Sequence

| | | | | | |
|---|---|---|--|---|---|
|  | Remember It: Split the children into two teams and play the basic needs Three In a Row game on the Lesson Presentation . |  | | | |
|  | Growing Up and Staying Healthy: Review the relevant section of this topic's Knowledge Organiser using the Lesson Presentation , discussing key vocabulary. Generate questions about exercise that children would like to find the answer to (you will find some examples on the Lesson Presentation if you need). Record these ideas together on your board or flipchart paper to refer to later when looking at the eBook . How could we find out the answers? Can children ask a question about exercise? Read pages 37-42 of the eBook together and discuss the ways in which exercise can help us to be healthy. |  | | | |
|  | Investigating Exercise: Explain that the children will be trying to find the answer to this question: 'Which activity will make my heart rate faster?' Ask children, 'How do you know if your heart rate is faster?', e.g. feel out of breath, feel warmer, sweating, feel tired, might feel a faster pulse in neck/wrist or heart beating in chest. Discuss what activities speed up their heart rate. Use the Lesson Presentation to introduce the investigation. Look at the bank of activities together and explain that children will be working in pairs making a prediction to sort the activities into 'Would make my heart rate faster' or 'Would not make my heart rate faster' using the Investigation Exercise Activity Sheet . (Children could be paired as similar ability or mixed-ability to enable different levels of support and potentially enable the teacher to support a lower ability group.) |  | | | |
|  | What Do You Think Will Happen (Making Predictions)? Following the sorting activity, briefly discuss children's ideas as a class. Then, explain that children will be choosing one activity from each column to explain their predictions in more detail using the Prediction Activity Sheet . Explain that a prediction is saying what we think will happen. Can children make a simple prediction about exercise and heart rate? |  | | | |
|  | Children to discuss why they think their chosen activities would make their heart rate faster? Ideas could be recorded by a supporting adult using the two star Prediction Activity Sheet . |  | Children complete the Prediction Activity Sheet to explain why they think their chosen activities would make their heart rate faster? |  | Children complete the Prediction Activity Sheet to write their own sentences explaining why they think their chosen activities would make their heart rate faster? |

| | | |
|---|--|---|
|  | <p>Making Observations (What Do You Notice?): Read the information about how to try and find your pulse on the Lesson Presentation and see if children are able to find their pulse. Remind children of the other ways you can tell if your heart rate has increased (incase they are unable to find their pulse). Model, or get the children to join in, carrying out one of the exercises (for 30 seconds), then try and find their pulse again.</p> <p>Use the timer on the Lesson Presentation to time 30 seconds while everyone in the class carries out one of the two activities they have chosen. Once the 30 seconds is up, ask children to try and find their pulse or to think about the other ways they might know if their pulse has increased. Discuss if their predictions were correct and why they need to rest for 2 minutes (to ensure their heart rate returns to normal so they can see if there is a difference). Then repeat with the second activity.</p> <p>Can children perform simple tests to find the answer to the question?</p> |  |
|  | <p>Discussing the Answers: Children share their findings. Did the activities make your heart rate faster, or not? Why or why not? What kind of activities should we do to help our bodies to stay healthy? (Highlight the importance of varied, fun activities for staying active and healthy).</p> <p>Can children perform a test about exercise and talk about the results?</p> |  |

Explore it

Exercise it: In a PE lesson, challenge the children to come up with an exercise sequence for their friends to copy. For example, the rules could be that there must be three separate movements but only one can include a stretch etc.

Teach it: Children make a poster to explain the positive effects of exercise on the body and offer some ideas of the sort of exercises they could do, using the **Lucy the Gym Instructor's Letter**.

Reason it

Children discuss **Reasoning Cards: Exercise**. Children discuss how they would find out whether the given idea about exercise is correct.

Assessment

| | |
|---|-----------|
| Scientific Knowledge | |
| <p>Working Towards the Expected Level</p> <p>Children can notice what happens when we do exercise and, with support, talk about the importance of exercise for the human body.</p> | Children: |
| <p>Working At the Expected Level</p> <p>Children can describe the effects of exercise and begin to explain the importance of exercise for the human body.</p> | Children: |
| <p>Working At Greater Depth</p> <p>Children can confidently describe the effects of exercise and explain the importance of exercise for the human body.</p> | Children: |
| Working Scientifically | |
| <p>Working Towards the Expected Level</p> <p>With support, children can carry out simple practical tests and use their observations and ideas to suggest answers to questions.</p> | Children: |
| <p>Working At the Expected Level</p> <p>Children can carry out simple practical tests and use their observations and ideas to suggest answers to questions.</p> | Children: |
| <p>Working At Greater Depth</p> <p>Children can carry out simple practical tests and explain the reasons for results. They can use their observations and ideas to suggest more complex answers to questions.</p> | Children: |

| Aim: To test the effects of exercise on the human body. | | | | Date: | | | | | |
|--|----|--------|---------|----------------|-----|---|----------|----|----|
| | | | | Delivered By: | | | Support: | | |
| Success Criteria | Me | Friend | Teacher | T | PPA | S | I | AL | GP |
| I can ask questions about exercise. | | | | Notes/Evidence | | | | | |
| I can say what I think (predict) will happen to my heart rate during exercise. | | | | | | | | | |
| I can perform a test about exercise and talk about what I find out. | | | | | | | | | |
| | | | | | | | | | |
| Next Steps | | | | | | | | | |
| <ul style="list-style-type: none"> _____ _____ | | | | | | | | | |

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

| Aim: To test the effects of exercise on the human body. | | | | Date: | | | | | |
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Animals Including Humans | Exercise

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Animals Including Humans | Exercise

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| To test the effects of exercise on the human body. | | |
| I can ask questions about exercise. | | |
| I can say what I think (predict) will happen to my heart rate during exercise. | | |
| I can perform a test about exercise and talk about what I find out. | | |