

Introduction:

This learning journey is designed to assist the teaching of science within the context of sport. Learners will have the opportunity to explore the position of organs in the body, e.g. heart, skeleton, skin, lungs. They could then be encouraged to discover the main functions of some organs. Learners could then research current advice on how best to keep their body healthy, e.g. balanced diet, exercise, sun protection.

Building on this knowledge of the body, learners could then investigate the physical effects exercise has on the body. Both before and after PE, learners could investigate and record physical changes caused by sport, e.g. increased heart rate, increased temperature, and change in colouring of the face, sweating, and muscle tiredness. Learners could then find out some reasons for these effects of exercise on the body, e.g. pulse rate increases because the heart pumps faster to pump more oxygen to the working muscles. Using the knowledge and understanding of the body and how exercise can affect it, learners could then investigate the benefits of exercise, e.g. fun, gives you more energy, improves mood, builds muscle, strengthens bones, and helps maintain a healthy weight. Learners could find out about clubs and activities on offer in their local area and advertise these in the school and investigate the sporting activities that their schoolmates take part in.

Finally, learners are given the opportunity to explore the science behind performance. They are encouraged to investigate whether or not practise can lead to improvement in performance. There is also an opportunity to investigate sporting equipment and materials and any science behind the design. e.g. friction, air resistance, ability to float, type of material. Finally, learners could be introduced to microbes that exist on our skin, and make links to the need for washing themselves and sports kits after training to help prevent germs spreading and causing infection.

This learning journey contains the following learning experiences:

- The Body and Keeping it Healthy
- Effects and Benefits of Exercise on the Body
- Performance, Equipment and Microbes

Prior learning:

Children could have discussed the success of British athletes during the London 2012 Olympic Games, and should be made aware that Scotland will be hosting the Commonwealth Games in 2014.

See Experiences and Outcomes relating to health and wellbeing to make learners aware of their growing bodies, and have learned the name of some body parts and how they work.

Interdisciplinary opportunities:

In each of the learning experiences outlined, there are opportunities for planning for interdisciplinary learning, including Responsibilities of All, in ways which promote the development and application of what has been taught and learned in new and different ways.

Learners could work in groups to prepare a teaching aid/PowerPoint presentation detailing all they have learned on this Learning Journey about the body, how to keep the body healthy, effects and benefits of exercise and ways to improve performance. This could be presented at a school assembly / Parent's Evening, highlighting the many benefits of exercise and hopefully inspiring their peers to lead more active, healthier lives.

Capabilities:

Successful Learners: use literacy and communication skills; think creatively and independently; make reasoned evaluations.

Confident Individuals: achieve success in different areas of activity; pursue a healthy and active lifestyle.

Responsible Citizens: develop knowledge and understanding of the world and Scotland's place in it; make informed choices and decisions.

Effective Contributors: work in partnership and in teams; create and develop.

Relevant Experiences and Outcomes:

Sciences:

- Through play children could have explored different materials and selected them for different purposes according to their properties. **SCN 0- 15a**
- By investigating forces on toys and other objects, I can predict the effect on the shape or motion of objects. **SCN 1- 07a**
- By researching, I can describe the position and function of the skeleton and major organs of the human body and discuss what I need to do to keep them healthy. **SCN 1-12a**
- I know the symptoms of some common diseases caused by germs. I can explain how they are spread and discuss how some methods of preventing and treating disease benefit society. **SCN 1-13a**
- Through exploring properties and sources of materials, I can choose appropriate materials to solve practical challenges **SCN 1 – 14a**

Health and wellbeing:

- Within and beyond my place of learning I am enjoying daily opportunities to participate in physical activity and sport, making use of available indoor and outdoor space. **HWB 1-25a**
- I am aware of the role physical activity plays in keeping me healthy and I know that I also need to sleep and rest, to look after my body. **HWB1-27a**
- I understand that my body needs energy to function and that this comes from the food I eat. I am exploring how physical activity contributes to my health and wellbeing. **HWB1-28a**

Numeracy:

- I have used a range of ways to collect information and can sort it in a logical, organized and imaginative way, using my own and others' criteria. **MNU1-20b**

Literacy:

- As I listen and watch online clips, videos and games about the body, I can identify and discuss key words and main ideas. **LIT 1-04a**

Technologies:

- I can access and retrieve and use information from electronic sources (science and food websites) to support and extend my learning. **TCH 1-03a**

Learning experience A: The Body and Keeping it Healthy

Introduction

These activities are designed to introduce learners to some of the main organs of the body, *e.g. heart, skeleton, muscles, skin, lungs*.

They are designed to help learners develop an understanding of the **position** of the main organs in the body.

Learners can discover the **function** of many of the bodies' organs.

Finally, learners have the opportunity to explore current advice on **keeping the body healthy**.

Stimulus:

3D model of a torso

Interactive whiteboard games and posters showing organs of the body.

Sun protection creams and clothing

Key learning

Learners can:

- name and identify the **position** of organs within the body.
- explain the **main functions** of some of the organs in the body, *e.g. heart, lungs, skeleton, muscles, skin*.
- Understand that a balanced diet and sun protection are some of the ways to keep our bodies healthy.

Possible learning opportunities / tasks

- Use a 3D model, large posters or other resources to identify the position of organs in the body.
- Draw around a partner's torso. Draw in the main organs and label.
- Make notes on the structure and function of skin
- Research why calcium and Vitamin D are important for bone strength. Find out foods rich in this nutrient. Sort snacks in to healthy /unhealthy groups.
- Investigate growth by taking measurements from themselves and someone younger.
- Find out the range of sun protection products available at the local chemist / shops. Prepare a quiz on sun safety for another class.
- Invite/write to/interview guest speakers – doctor, nurse, paramedic or STEM Ambassador.

Useful resources

<http://kidshealth.org/kid/htbw/skin.html>

<http://www.sciencekids.co.nz/sciencefacts/humanbody/skin.html>

<http://www.bbc.co.uk/learningzone/clips/the-human-heart-and-its-function/2270.html>

<http://www.primaryresources.co.uk/science/science2b.htm>

<http://www.la84foundation.org/6oic/OlympicCurriculum/math9.pdf>

<http://www.foodafactoflife.org.uk>

Possible evidence

Learners can:

- Correctly name and label organs on a diagram of the torso.
- In groups, design and present a poster showing facts they have discovered about the function of some organs of the body.
- State some rules for keeping safe in the sun
- Explain orally / visually what makes up a balanced diet.
- Design plates showing balanced meals to be displayed in Dinner Hall.

Reflecting on learning

How many bones are in the human skeleton? What are the main roles of the skeleton, muscles, skin and heart? How can we protect skin from sunlight?

Taking it further

Learners could research the position and function of other organs, *e.g.*, brain, eyes, and ears.

They could consider the needs of each organ to remain healthy, *e.g.* lungs need clean air, skin needs to be kept clean and protected from the sun, the skeleton needs a balanced diet to keep it strong.

Find out about diseases caused by a lack of nutrients, *e.g.* scurvy, anaemia

Explore further different types of muscles, *e.g.* voluntary, involuntary, how they work, what they do?

They could look at muscle pairings and predict what muscle groups are used in different sports?

Learning experience B: Effects and Benefits of Exercise on the Body

Introduction

These activities allow learners to investigate the physical effects of exercise on the body. By carrying out practical investigations during PE, learners have the opportunity to observe and record changes that occur when they exercise. Through research, learners could explore reasons why these changes occur and use this knowledge to interpret and explain their findings. Learners could also explore the benefits of exercise.

Stimulus

Clips from YouTube, showing athletes competing at 2012 Olympic Games and 2010 Commonwealth Games.

Key learning

Learners can:

- explain why exercise causes changes in pulse rate, temperature, breathlessness and muscle tiredness.
- record the physical effects of exercise on the body, e.g. increases pulse rate, raises temperature, causes sweating, breathlessness, muscle tiredness
- recognise and explain the effect practice can have on reaction time

Possible learning opportunities / tasks

- Investigate how exercise changes pulse rate by recording pulse rate before, during and after activity. Record results in a table or on a line graph.
- In pairs, during PE, learners could investigate visible changes to their skin before and after circuit training. Record observations on a tick chart.
- Investigate muscle endurance by recording the amount of repetitions they can manage on a first, second and third attempt. (Amount of repetitions should decrease as muscles become more tired) Record results in a bar graph.
- Carry out different exercises to investigate which cause the most and least breathlessness. Record findings.
- Find out reasons why exercise causes changes to heart rate, temperature, etc. Use this knowledge to interpret and explain results from investigations.
- Explore the benefits of exercise on muscles, the heart and on general wellbeing.

Useful resources

<http://www.childrensuniversity.manchester.ac.uk/interactives/science/exercise/types/>
<http://www.bbc.co.uk/learningzone/clips/the-benefits-of-being-active/10844.html>
<http://www.sciencekids.co.nz/gamesactivities/keephealthy.html>

Possible evidence

- Record results from investigations using graphs, charts or tick sheets.
- Design a poster showing the effects and benefits of exercise on the body.
- Explain some reasons for the effect of exercise on the body.

Reflecting on learning

- Why do you become hot and breathless during exercise?
- Which exercise is more effective at raising heartbeat?
- What type of exercise makes muscles tired?
- What are the most effective ways to present data – graphs, bar charts etc.?

Taking it further

Learners could be introduced to metabolism, and how it is affected by exercise. They could use this knowledge to further investigate the role of sport and metabolism in maintaining a healthy weight.

Learning experience C: Performance, Equipment and Microbes

Introduction

These activities allow learners to investigate factors that may affect performance, e.g. whether or not practice can lead to improvements in performance.

Learners could then research a piece of sporting equipment that has been designed to improve performance, with the help of scientific knowledge of materials and forces.

Finally, learners could be introduced to microbes and the need for good hygiene.

Stimulus

Sports magazines advertising new and improved sports equipment.

Key learning

Learners can:

- know that practice can lead to improvement in performance
- be able to explain how performance can be improved through the use of a piece of sporting equipment that has been developed with the help of scientific knowledge
- that microbes are small organisms which cannot be seen by the human eye
- know that microbes can be “good” and help fight infection or “bad” and spread disease
- be aware that washing themselves and their sports kits after exercise helps cut down the risk of infection.

Possible learning opportunities / tasks

- Test your reaction time in this [online activity](#).
- Measure length of legs of classmates then record distance each person can jump. Does leg length affect performance?
- Investigate [Air Resistance](#)
- Research a piece of sporting equipment – find out about any science used to help develop it.
- Research current advice on good hygiene after sports.
- Investigate microbe transfer when shaking hands, using Glo Germ Gel and Fluorescent Lamp or Glitter Gel.

Useful resources

UV light hand washing kit

http://www.getinthezone.org.uk/media/24098/wellcometrust_primary_sa_lesson_plan.pdf

Learn about microbes

<http://www.bbc.co.uk/learningzone/clips/microbes-and-the-human-body/207.html>

Investigate how reaction times

<http://www.sserc.org.uk> (Bulletin 59)

Possible evidence

Learners can:

- Record and explain results from the reaction time investigation.
- Present information about a piece of sporting equipment that has been developed to improve performance.
- Explain that you should always wash yourself and your kit after exercising to help the spread of germs.

Reflecting on learning

What are the best foods to give you energy before exercising? Did your reaction time improve with practise? Why does washing help keep you healthy and free from infection?

Taking it further

Learners could research food / drink products that are claimed to improve performance. Assess their fitness and record any improvement over the year by recording results at intervals over a term/year.

Learners could find out about different types of microbes, e.g. *bacteria*, *viruses* and *fungi*.