

OP awareness lesson plans

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Stage 4: Lesson 1

Unit: Osteoporosis Unit, Lesson 1

Syllabus Outcomes:

A student:

- Examines and evaluates strategies to manage current and future challenges PD4-1
- Investigates health practices, behaviours and resources to promote health, safety, wellbeing and physically active communities PD4-7

Syllabus Content:

Students:

- Examine factors that influence health and wellbeing
 - describe health and its dynamic nature
- Plan and use health practices, behaviours and resources to enhance the health, safety, wellbeing and physical activity participation of their communities
 - research and plan a variety of nutritional and physical activity options to promote the health of young people in the wider community
 - identify and plan preventive health practices and behaviours that assist in protection against disease
 - design and implement health promotion activities, using ICT tools as appropriate, targeting preventive health practices relevant to young people
- Explore the relationship between various health, safety and physical activity issues affecting young people and assess the impact it has on the health, safety and wellbeing of the community
 - evaluate the interrelationship between nutrition, mental health and physical activity and explain how this has an impact on the health and wellbeing of the community

Lesson Intentions:

By the end of the lesson students should be able to:

- Describe what bones are and why they're important.
- Identify different parts of bones and explain their function.
- Analyse the different impacts on bone health and how this impacts individuals.

Learning Activities

Resources

Introduction

As a class, discuss why they think Osteoporosis Awareness may be important in a high school setting. Brainstorm what it may be, then read the 'Why Osteoporosis Awareness' blurb, as well as watching the introductory video together.

Introduce 'Mrs Cooper' and explain that the online program will be supplementing the Osteoporosis Workbook throughout the lessons.

Activity One (core)

Guide students through the first two activities online with Mrs Cooper. Combining this with their own research, have them answer the first two questions:

- What are bones?
 - Bones have many critical functions in our body. Bones in our body are living tissue. They have their own blood vessels and are made of living cells, which help them to grow and to repair themselves.
- Why are bones important to us?
 - **Support**
 - **Movement**
 - **Protection.** Your skeleton helps protect your internal organs and fragile body tissues. The brain, eyes, heart, lungs and spinal cord are all protected by your skeleton. Your cranium (skull) protects your brain and eyes, the ribs protect your heart and lungs and your vertebrae (spine, backbones) protect your spinal cord.
 - Provide an environment for marrow where your blood cell **production** takes place
 - **Storage** of minerals (such as calcium)
 - Endocrine **regulation**: collection of glands that produce hormones that control growth and development, metabolism, etc.

If available, use skeletons as prompts in Lesson 1. Otherwise, images of skeletons and bones are sufficient.

Suggested websites for Activity One:

<https://www.osteoporosis.foundation/health-professionals/about-osteoporosis/bone-biology>.

<https://tinyurl.com/boneimportance>:

<https://www.healthline.com/health/bone-health/bone-function#types-of-bone>

<https://sciencing.com/five-main-functions-skeletal-system-5084078.html>

Suggested Youtube video for Activity Two:

<https://www.youtube.com/watch?v=6PQ5Rv6ONfY>

Activity Two (core)

Have students view the video '[Types of Bones](#)', complete 'Different Types of Bones' and 'Bone Functions' with Mrs Cooper. Then complete the types of bones and their function in the table:

- The different shapes and sizes of bones are dictated by their individual function.
 - Long bones act as levers (as in the arms and legs),
 - Flat bones shield and protect (as in the sternum),
 - Short bones span spaces and give added flexibility (as in the small bones in the wrist and ankle).
 - Irregular bones, vary in shape and protect organs or are attached to tendons (knee cap)
- Points of interest:
 - Bones are continually being broken down and rebuilt. In fact, a human's entire skeleton is replaced about every 10 years.
 - We are born with about 270 soft bones. During childhood and adolescence, the cartilage grows and is slowly replaced by hard bone. Some of these bones later fuse together, so that the adult skeleton has 206 bones.

Activity Three (core)

Complete the 'Parts of a Long Bone' video and the dropbox diagram with Mrs Cooper. Once finished, review different parts of a bone and their function:

What are the parts of a bone?	What is the function of each bone part?
The Shaft (Diaphysis)	The main part of the bone
The epiphysis	Forms the joint at either end of the bone
Osteoclasts	Bone absorbing cells. The cells that break down old bone tissue.
Osteocytes	The cells that maintain bone tissue by controlling the

**** Playback speed is recommended to be 0.75 to slow it down a bit!**

	mineral and calcium content
Osteoblasts	Bone building cells. The cells that build bone tissue
Bone marrow	Produces blood cells
Collagen	Provides support and elasticity
Periosteum	Involved in bone growth and repair

Activity Four (extension)

In pairs, have students create an 'all about bones' song, using the YouTube clip as a guide:

https://www.youtube.com/watch?time_continue=33&v=UYSOe06j4ps&feature=emb_logo

- Song needs to include:
 - A definition of what bones are
 - Why bones are important to humans
 - The different parts of a bone and the function of them.
- The song can be recorded on Flipgrid, or students can write their lyrics and present them using Canva or another publishing resource.

Quiz

Remember to complete the Quiz with Mrs Cooper at the end of the lesson!

Suggested Youtube video for Activity Four:

https://www.youtube.com/watch?time_continue=33&v=UYSOe06j4ps&feature=emb_logo

<https://mskhealthresearch.com/osteoporosis-lesson-1>

Reflection

Stage 4: Lesson 2

Unit: Osteoporosis Unit, Lesson 2	
Syllabus Outcomes: A student: <ul style="list-style-type: none">• Examines and evaluates strategies to manage current and future challenges PD4-1• Recognises how contextual factors influence attitudes and behaviours and proposes strategies to enhance health, safety, wellbeing and participation in physical activity PD4-6• Investigates health practices, behaviours and resources to promote health, safety, wellbeing and physically active communities PD4-7	
Syllabus Content: Students: <ul style="list-style-type: none">• Plan and implement inclusive strategies to promote health and wellbeing and to connect with their communities<ul style="list-style-type: none">○ refine interpersonal skills through undertaking a range of roles when participating and planning physical activities• Develop health literacy skills and promote health information that is aimed at assisting young people to address health issues<ul style="list-style-type: none">○ promote and apply credible health messages and information to positively influence the decisions of their peers and the wider community	
Unit Intentions: By the end of the lesson students should be able to: <ul style="list-style-type: none">• Describe what Osteoporosis is and what can help build healthy bones to prevent it.• Identify the cause and effect of Osteoporosis on bones.• Compose an advertisement informing the viewer about Osteoporosis.	
Learning Activities	Resources

Introduction (if applicable)

Using labelled Lego blocks, Jenga, cups, cans or other stackable equipment, explain the building blocks of healthy bones.

- Have each Lego block/Jenga block/cup or can labelled with calcium, sunshine and weights/resistance machines, explaining that our bones require these factors for growth, development and maintenance:
 - **Adequate calcium intake**, to build and maintain bone strength and flexibility.
 - **Sufficient Vitamin D** through exposure of the skin to sunlight, small amounts of dietary sources and supplementation. Vitamin D is important for bone health because it helps absorb calcium. It also plays a role in:
 - Supporting growth and maintenance of the skeleton
 - Regulating calcium levels in the blood
 - **Regular weight-bearing and resistance exercise** to assist in maintaining or improving bone density.
- Discuss what may happen to the support pyramid without the contribution from each of the building blocks.
 - Introduce the concept of greater holes beginning to form in the building blocks if there aren't contributions from each.
 - This will allow an easier visualisation/description in relation to Osteoporosis/Normal Bone comparison for Activity Two onwards.

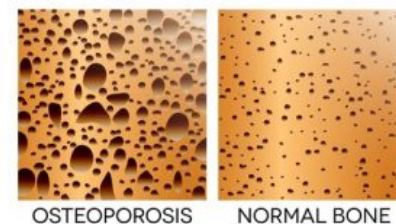
Activity One (core)

Complete 'Building Blocks to Healthy Bones' with Mrs Cooper. Once completed, rank the components in Activity One from most to least important (Exercise, Calcium, Vitamin D)

Activity Two (core)

- Complete Mrs Cooper's 'What About Unhealthy Bones' and then in small groups, brainstorm '*Ways to keep our bones healthy*'.
 - Extend the mindmap to '*what might happen if our bones aren't kept healthy?*'
 - This can be recorded in tools such as **Mindmeister or Coggle** or on the class whiteboard if the space in the workbook isn't suitable.

Labelled lego blocks, Jenga, cups, cans or other stackable equipment, if not a pyramid image is sufficient.



- Have students record the most important points from their mindmap in the workbook.
 - *Ways to keep our bones healthy:* adequate **calcium** intake, sufficient **vitamin D** and keep active through regular weight-bearing and muscle strengthening **exercise**.
 - *What might happen if our bones aren't kept healthy?:* bones become brittle, increased risk if fall, decreased density, decreased blood cells, increased risk of fractures

Activity Three (core)

- Introduce the concept of Osteoporosis as a class, showing the 3D animated video.
- Complete Mrs Cooper's 'Osteoporosis Face Sheet' in groups of 2, and then using the provided websites, research and answer the following:
 - What is the cause of osteoporosis?
 - What parts of a bone are affected by osteoporosis?
 - What are the effects of osteoporosis?
 - How can osteoporosis be prevented?

Activity Four (extension)

- In pairs, have students create an advertisement for different age groups (10 - 13 years, 13 - 15 years, 15 - 17 years, 17 - 19 years, 19 - 29 years) within society, aiming to educate them about Osteoporosis.
 - Include the four questions of Activity Three, as well as specific information and tips for the age group allocated and appropriate images. Encourage students to think about what is important in relation to their age group and what peer pressures may impact their decisions (for example, patterns in young women dropping out of sports, poor relationships with food, exams, study, stress, less organised sport in schools, financial burden, less parental support)
 - Present these in **Adobe Sparke, Microsoft Publisher or Canva**.

Mrs Cooper's Quiz

- Have students complete the five questions of Mrs Cooper's quiz to complete the lesson.

Animated 3D Virtual video for Activity Three:

Suggested websites for Activity Three:

<https://www.iofbonehealth.org/osteoporosis>

<https://healthybonesaustralia.org.au>

Suggested presentation methods for Activity Four:

Free online option

<https://www.canva.com/>

If school has Adobe Sparke:

<https://express.adobe.com/>

<https://mskhealthresearch.com/osteoporosis-lesson-2>

Reflection

Stage 4: Lesson 3

Unit: Osteoporosis Unit, Lesson 3

Syllabus Outcomes:

- Investigates health practices, behaviours and resources to promote health, safety, wellbeing and physically active communities PD4-7
- Plans for and participates in activities that encourage health and a lifetime of physical activity PD4-8

Syllabus Content:

Students:

- Investigate the benefits of a balanced lifestyle and explore strategies that contribute to community health, wellbeing and participation in a lifetime of physical activity
 - describe the components of a balanced lifestyle and use ICT tools as appropriate to promote the contribution of regular physical activity to health and wellbeing
 - discuss the physical, social, emotional and spiritual benefits of being active in outdoor and natural environments to community health and wellbeing
 - compare their current physical activity levels with Australia's Physical Activity and Sedentary Behaviour Guidelines and suggest strategies for increasing opportunities for physical activity for themselves and others
- Plan and use health practices, behaviours and resources to enhance the health, safety, wellbeing and physical activity participation of their communities
 - research and plan a variety of nutritional and physical activity options to promote the health of young people in the wider community
 - identify and plan preventive health practices and behaviours that assist in protection against disease
 - design and implement health promotion activities, using ICT tools as appropriate, targeting preventive health practices relevant to young people
- Create and monitor fitness plans and participate in physical activities that develop health-related and skill-related fitness components
 - propose realistic strategies for maintaining and monitoring fitness, health and wellbeing
 - develop and evaluate a fitness plan for themselves, a peer or community group

Lesson Intentions:

By the end of the lesson students should be able to:

- Define physical health and identify characteristics of someone who has good physical health.
- Outline required physical activity guidelines for children.
- Create an infographic to represent exercise choices inline with guidelines.

Learning Activities	Resources
<p><u>Activity One (core)</u></p> <ul style="list-style-type: none"> ● Students are to construct a definition of physical health by exploring a range of community and accepted definitions. ● Discuss the WHO definition of health as provided by Mrs Cooper: “Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” and discuss why WHO may have arrived at this definition. <ul style="list-style-type: none"> ○ From this discussion, Think, Pair, Share – and have students develop their own personal definition of health. <ul style="list-style-type: none"> ■ Share paired definitions with the class. <p><u>Activity Two (core)</u></p> <ul style="list-style-type: none"> ● Complete Mrs Cooper’s ‘Good Health vs Poor Health’ table and then using Padlet or the class whiteboard to record answers, have students identify the characteristics of someone who shows good physical health to someone who does not and how this is achieved. <ul style="list-style-type: none"> ○ For example <ul style="list-style-type: none"> ■ Good physical health: exercises often, eats a well balanced diet, sleeps well, limited to no smoking and alcohol consumption, lack of sickness, lack of injuries <ul style="list-style-type: none"> ● Achieved by: accessibility to resources for exercise - community sport, gyms, money to purchase nutritious food, education for the dangers ■ Poor physical health: doesn’t exercise often, doesn’t have a balanced diet, poor sleep, often sick, often injured ● Have students record the most common responses in their workbooks. <p><u>Activity Three (core)</u></p> <ul style="list-style-type: none"> ● Have students complete Mrs Cooper’s ‘Physically Healthy Day’, and identify what a physically healthy students day would look like. Websites can be used as a reference point also. Have students record the examples in the table provided. 	<p>Website for Activity One: https://www.who.int/about/who-we-are/constitution</p> <p>Suggested website for Activity Two: https://padlet.com/</p> <p>Suggested websites for Activity Three https://www.health.gov.au/health-topics/exercise-and-physical-activity</p>

- Once the table is filled in, complete the 'Sedentary Activities' slide with Mrs Cooper.

Health Dimension	Guideline
<i>Physical activity</i>	Accumulating 60 minutes or more of moderate to vigorous physical activity per day involving mainly aerobic activities. Activities that are vigorous, as well as those that strengthen muscle and bone should be incorporated at least 3 days per week. Several hours of a variety of light physical activities should also be incorporated.
<i>Screentime</i>	Limiting sedentary recreational screen time to no more than 2 hours per day.
<i>Sedentary activities</i>	Breaking up long periods of sitting as often as possible.
<i>Sleep</i>	An uninterrupted 9 to 11 hours of sleep per night for those aged 5–13 years and 8 to 10 hours per night for those aged 14–17 years and consistent bed and wake-up times.

Activity Four (core)

- Using the recommended physical activity guidelines completed in Activity Four, as well as Mrs Cooper's 'Activity Ideas', students identify what types of physical activities could be completed to meet the guidelines, what kind of physical responses the body would have to each of the activities and how they could incorporate these guidelines into their week.

Guideline	Possible activities to meet guideline	Physical responses of the body

[https://www1.health.gov.au/internet/main/publishing.nsf/Content/F01F92328EDA DA5BCA257BF0001E720D/\\$File/brochure%20PA%20Guidelines_A5_Families.PDF](https://www1.health.gov.au/internet/main/publishing.nsf/Content/F01F92328EDA DA5BCA257BF0001E720D/$File/brochure%20PA%20Guidelines_A5_Families.PDF)

60min moderate to vigorous activity, involving mainly aerobic.	Running, cycling, zumba	Improve cardiovascular endurance.
Activities that strengthen muscles and bones 3 days/week.	Weights sessions, pilates.	Improved bone strength, stability and muscular endurance.

Activity Five (extension)

- Students will use their knowledge of recommended physical activity guidelines and [information](#) about the importance of exercise for reducing Osteoporosis to create an infographic, showing five activities and exercises best suited for building healthy bones for kids.



Quiz

Remember to complete the online quiz with Mrs Cooper at the end of the lesson!

Website recommendation for Activity Five:

<https://healthybonesaustralia.org.au/your-bone-health/exercise-bone-health/>

Further information:

<https://www.aihw.gov.au/reports/physical-activity/physical-activity-across-the-life-stages/contents/summary>

<https://www.sportaus.gov.au/findyour30>

<https://www1.health.gov.au/internet/main/publishing.nsf/Content/health-pubhlth-stateg-phys-act-guidelines#:~:text=Be%20active%20on%20most%2C%20preferably,and%20vigorous%20activities%2C%20each%20week.>

<https://mskhealthresearch.com/osteoporosis-lesson-3>

Reflection

Stage 4: Lesson 4

Unit: Osteoporosis Unit, Lesson 4

Syllabus Outcomes:

- Examines and evaluates strategies to manage current and future challenges PD4-1
- Investigates health practices, behaviours and resources to promote health, safety, wellbeing and physically active communities PD4-7

Syllabus Content:

Students:

- Plan and use health practices, behaviours and resources to enhance the health, safety, wellbeing and physical activity participation of their communities
 - research and plan a variety of nutritional and physical activity options to promote the health of young people in the wider community
 - identify and plan preventive health practices and behaviours that assist in protection against disease
- Examine influences on peoples' behaviours, decisions and actions
 - review the dietary patterns of young people in relation to the Australian Government dietary guidelines and advice for young people and discuss how contextual factors influence food choices and eating habits
- Explore the relationship between various health, safety and physical activity issues affecting young people and assess the impact it has on the health, safety and wellbeing of the community
 - evaluate the interrelationship between nutrition, mental health and physical activity and explain how this has an impact on the health and wellbeing of the community

Unit Intentions:

By the end of the lesson students should be able to:

- Identify what components need to supplement physical activity to achieve physical health.
- Describe how a child's diet impacts their healthy bones and outline dietary requirements.
- Create an advertisement to inform of the importance of diet in building healthy bones.

Learning Activities

Resources

Activity One (core)

- As a class, discuss what else is needed to supplement a child's health, in addition to the health dimensions as outlined in their table in Lesson Three (physical activity, sedentary time, sleep, screentime), to ensure their bones are healthy. Using Mrs Cooper's 'Cool Fact', as a starting point, research what community or school programs exist in Australia to encourage and support these choices.
 - *Examples*
 - *Diet:*
 - *Healthy Harold:*
<https://www.lifeeducation.org.au/about-us/healthy-harold>
 - *2&5:* https://healthywa.wa.gov.au/Articles/F_I/Go-for-2-and-5
 - *Crunch and Sip:* <https://www.crunchandsip.com.au/>
 - *Vitamin D:*
 - *PDHPE classes outside*

Activity Two (core)

- Using the resource below as well as Mrs Cooper's 'Australian Dietary Guidelines', have students identify the five Australian dietary guidelines and record responses in the table:
<https://www.eatforhealth.gov.au/guidelines/about-australian-dietary-guidelines>
 - **Guideline 1:** To achieve and maintain a healthy weight, be physically active and choose amounts of nutritious food and drinks to meet your energy needs
 - **Guideline 2:** Enjoy a wide variety of nutritious foods from these five groups every day:
 - **Guideline 3:** Limit intake of foods containing saturated fat, added salt, added sugars and alcohol
 - **Guideline 4:** Encourage, support and promote breastfeeding
 - **Guideline 5:** Care for your food; prepare and store it safely

Activity Three (core)

- Using the website below, as well as Mrs Cooper's 'Calcium and Bones' slide, have students research how a person's calcium intake impacts their healthy bones and what food groups are most important for growing healthy bones, recording their answers in the table.
<https://healthybonesaustralia.org.au/your-bone-health/calcium/>

Activity Four (core)

- Have students draw what breakfast and dinner plates should look like for kids and create an example lunchbox, justifying the inclusions in relation to foods for building healthy bones, using the [Australian Guide to Healthy Eating diagram](#) for assistance. Mrs's Cooper's 'Making Healthy Choices' will also be handy.
 - Healthy Eating Recommendations:*
 - Plenty of vegetables, including different types and colours, and legumes/beans
 - Fruit
 - Grain (cereal) foods, mostly wholegrain and/or high cereal fibre varieties, such as breads, cereals, rice, pasta, noodles, polenta, couscous, oats, quinoa and barley
 - Lean meats and poultry, fish, eggs, tofu, nuts and seeds, and legumes/beans
 - Milk, yoghurt, cheese and/or their alternatives, mostly reduced fat (reduced fat milks are not suitable for children under the age of 2 years)
 - And drink plenty of water.

Activity Five (extension)

- In groups of three, have students create a new diet focussed community initiative and develop a radio advertisement or brochure to advertise it, expressing the importance of diet in building healthy bones and its link to prevention of Osteoporosis across the lifespan of a person.
 - Include:
 - A slogan for the community initiative
 - What types of foods are required to build healthy bones



- How much of each food is required to build healthy bones
- Why each food is linked to building healthy bones
- For the brochure, students can use:
 - Canva: <https://www.canva.com/>
 - Adobe Sparke: <https://spark.adobe.com/>
 - Or any other accessible publishing resources.
- For the radio advertisements, students can use an online voice recorder:
 - <https://online-voice-recorder.com/>

Mrs Cooper's Quiz

- Remember to have students complete the quiz with Mrs Cooper at the end of the lesson!

<https://mskhealthresearch.com/osteoporosis-lesson-4>

Reflection