The Skeleton Project – understanding musculoskeletal injuries

Background

The musculoskeletal system includes our bones, muscles, ligaments and tendons, as well as soft tissues that connect these together.

‘Musculoskeletal injuries’ is a term used to broadly describe a range of conditions including back pain, muscle sprains and strains, soft tissue injuries, fractures and dislocations, abdominal hernias, carpal tunnel syndrome and tendonitis.

The Skeleton Project is an initiative of WorkSafe Victoria. It aims to raise awareness of musculoskeletal injuries by showing the experiences of three CEOs who go undercover to experience the reality of workplace safety in their companies.

Overview of the unit

In this unit, students will investigate musculoskeletal injuries using WorkSafe’s musculoskeletal injuries website. They will also look at how technology is used to prevent workplace injuries and develop their own device for making a task safer.

There are two activities in this unit. In Activity 1: Common musculoskeletal injuries, students investigate the common musculoskeletal injuries and how to prevent them. Activity 2: Using technology to improve safety looks at how technology is used to improve safety in workplaces and students have the opportunity to develop a device that will make completing a task safer.

Purpose of the unit

- To improve students’ knowledge of musculoskeletal injuries
- To develop their awareness of how technology is used to improve workplace safety
- To encourage students to think creatively to solve problems.
Resource requirements

**Activity sheets**
- Activity sheet 1: Common musculoskeletal injuries
- Activity sheet 2: The Skeleton Project
- Activity sheet 3: Technology and safety
- Activity sheet 4: Design a device to improve safety

**Other material or resources**
- WorkSafe Awards website [www.awardsoffice.com/worksafe100/](http://www.awardsoffice.com/worksafe100/)

**Facilities and equipment**
- Access to the internet

Assessment & curriculum alignment

The activities in this unit are designed to **support** student learning but may also be used for assessment purposes. The activities support the learning outcomes listed in the table below but **may not cover all the elements**. If the activities are to be used as assessment tasks, teachers should **check the relevant curriculum document**, e.g. the VCAL Curriculum Planning Guides, to ensure all the elements are covered and the activity is consistent with the unit purpose statement.

While documentation from undertaking the activities in this unit can be collected to build a portfolio of evidence to be used for the assessment of relevant learning outcomes, students will need to demonstrate competence of a learning outcome on more than one occasion and, wherever possible, in different contexts, to ensure the assessment is consistent, fair and equitable.

<table>
<thead>
<tr>
<th>VCAL Foundation</th>
<th>VCAL Intermediate</th>
<th>VCAL Senior</th>
<th>VELS</th>
<th>Primary e-phase</th>
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| Activity 1: Common musculoskeletal injuries | Activities could be adapted for Foundation level but students would need additional support. | R&W - LO 6,7 WRS1 - LO 1,2,3,4 | R & W - LO 6,7 WRS1 - LO 1,3 | English  
  - Reading  
  - Writing  
  - Health knowledge and promotion | Engage Explore |
| | | | | | |
| Activity 2: Using technology to improve safety | | R&W - LO 3,6,7 WRS1 - LO 1,2,3,4 | R & W - LO 3, 6, 7 Numeracy - LO 1 WRS1 - LO 1,3,7 | Mathematics  
  - Space English  
  - Reading  
  - Writing  
  - Speaking & listening Design, | Explore Explain Evaluate |
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Activity 1: Common musculoskeletal injuries

In this activity, students will investigate the common musculoskeletal injuries in the industries covered in the Skeleton Project (retail, health and aged care, and manufacturing) and how to prevent them.

What to do

Show students the three Worksafe ads about musculoskeletal injuries (shoe shop, construction site and office) at www.worksafe.vic.gov.au/worksafe/msi_10/

Discuss the different musculoskeletal injuries that the workers sustained.

Discuss with students what the musculoskeletal system is and ask students to think of different musculoskeletal injuries (e.g. back pain, muscle sprains and strains, soft tissue injuries, fractures and dislocations, abdominal hernias, carpal tunnel syndrome and tendonitis). Students may need to undertake formal or informal research to find out what some of these are.

Explain to students that they will be doing an activity around the Skeleton Project (www.worksafeform.com/promo/skeleton/) where three CEOs agreed to go undercover to better understand workplace safety in their businesses.

Ask students to form small groups and choose an industry covered in the Skeleton Project (retail, health and aged care, or manufacturing). Get students to research common injuries and how they can be prevented for different occupations in the industry they chose. For each of the common injuries, ask students to think of a task where the injury might occur and consider what might increase the risk when performing the tasks e.g. awkward postures, applying force, repetition, reaching above shoulders. Students can record the information in the table provided in Activity sheet 1: Common musculoskeletal injuries.

Ask students to share what they have found out with the class. Encourage students to think back to the situations shown in the Worksafe ads and discuss common situations where the injuries they have researched might occur.

Provide students with Activity sheet 2: The Skeleton Project. With their groups, ask students to watch the Skeleton Project video in the industry they have chosen and identify the safety issues highlighted in the video and the strategies that were used to improve safety. Discuss what factors would increase the risk of an injury occurring. Students may like to watch all three videos but only ask them to identify the safety issues in one of them.

Discuss the issues that students have identified.

Student roles and responsibilities in relation to the activity

Work collaboratively

Undertake research and record information

Contribute to class discussions

Listen to the views of others

Level of teacher support

Facilitate discussion

Provide support with internet research

Provide support appropriate to the level of VCAL the students are working at
Assessment

This is a learning activity. This activity could be used to support the learning outcomes as indicated in the table on page 2.

If the activity is to be used as an assessment task, teachers should check the relevant curriculum document, e.g. the VCAL Curriculum Planning Guides, to ensure all the elements are covered and the activity is consistent with the unit purpose statement.

Students working at a Senior level would be expected to work more autonomously on the activities.
Activity 2: using technology to improve safety

In this activity, students will look at how technology is used to improve safety in the workplaces shown in the Skeleton Project. Students will then develop their own device that will make completing a task safer.

What to do

Ask students to think of machines/devices/objects that have been developed to improve safety in the workplace. E.g. trolley for moving boxes, scaffolding for building sites, ergonomic keyboards for office work.

Working in groups, ask students watch episode 3 of the Skeleton Project and one other episode and identify the technology that is used (or that is recommended) to improve safety. Students can record the information on Activity sheet 3: Technology and safety.

Encourage students to think of how using the technology may introduce new hazards.

Explain to students that they will be designing a device that will make a task safer to complete.

Ask students to form small groups and research some ideas that people in different industries have come up with to improve safety. These can be accessed by clicking on the Award Winning Ideas buttons in each of the industries on the musculoskeletal injury website. Students can also access more award winning ideas at the WorkSafe Awards website www.awardsoffice.com/worksafe100/

Using Activity sheet 4: Design a device to improve safety, have students brainstorm tasks where safety is a concern where a device might help to make the task safer. If possible, this should be in a work context but school, community and home contexts can also be used.

Activity sheet 4 provides questions to assist students to develop their ideas.

Students should:

- consider how the device will make the task safer and what injuries might be prevented
- draw a diagram showing the parts of the device and explain how the device will work
- consider the materials that could be used to construct the device
- consider any hazards that would be introduced by using the device and how risks could be minimised.

Assist students in evaluating their design, looking at how they would source materials and construct the device.

Have students present their design to the class.

If the resources are available, have students construct a prototype of their design.

Student roles and responsibilities in relation to the activity

Work collaboratively
Watch a video and record information
Develop a design for a device to improve safety
**Level of teacher support**

- Facilitate discussion in small groups
- Provide support with developing ideas
- Assist students with evaluating their design
- Provide support appropriate to the level of VCAL the students are working at

**Assessment**

This is a learning activity. This activity could be used to support the learning outcomes as indicated in the table on page 2.

If the activity is to be used as an assessment task, teachers should check the relevant curriculum document, e.g. the VCAL Curriculum Planning Guides, to ensure all the elements are covered and the activity is consistent with the unit purpose statement.

Students working at a Senior level would be expected to work more autonomously on the activities.
Use the information on Worksafe’s musculoskeletal injury website (www.worksafe.vic.gov.au/worksafe/msi_10/) to complete the tables below.

Industry chosen by group: ____________________________________________

<table>
<thead>
<tr>
<th>Occupation:</th>
<th>Common injury</th>
<th>Task that may cause injury</th>
<th>What would increase the risk of injury e.g. repeating the task often, awkward posture, reaching above shoulders</th>
<th>How can injuries be prevented?</th>
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The Skeleton Project

Watch one of the CEOs go undercover to investigate how safety can be improved in their business - [www.worksafeform.com/promo/skeleton/](http://www.worksafeform.com/promo/skeleton/).

Record the safety issues that they uncovered and what the strategies they used to improve safety.

CEO: ________________________________

Business: ____________________________

Industry: _____________________________

<table>
<thead>
<tr>
<th>Safety issue</th>
<th>Possible injury that could occur</th>
<th>What factors could increase the risk of injury?</th>
<th>Strategy for improving safety</th>
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Watch episode 3 of the Skeleton Project - [www.worksafeform.com/promo/skeleton](http://www.worksafeform.com/promo/skeleton)

Look at the technology that is used to help workers complete tasks safely and fill in the table below.

After you have finished, watch one other episode and complete the extra boxes in the table.

<table>
<thead>
<tr>
<th>Task</th>
<th>Possible injury that could occur</th>
<th>Machine/device used</th>
<th>How device helps reduce risk of injury</th>
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**Design a device to improve safety**

Brainstorm some tasks that you (or friends or family) carry out where safety is a concern. E.g. Lifting, pushing or pulling objects, using dangerous equipment, climbing or having an awkward posture.

<table>
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<tr>
<th>Task</th>
<th>Injuries that could occur</th>
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Think of an idea for a device that could help make one of these tasks safer to carry out. If you are stuck for ideas browse the Award Winning Ideas on Worksafe’s Musculoskeletal injuries website - [www.worksafe.vic.gov.au/worksafe/msi_10/](http://www.worksafe.vic.gov.au/worksafe/msi_10/) or go to the WorkSafe Awards website [www.awardsoffice.com/worksafe100/](http://www.awardsoffice.com/worksafe100/).

You could also look at the safety section of The New Inventors website - [www.abc.net.au/tv/newinventors/inc/categories/InventionsByCat_SAFETY.htm](http://www.abc.net.au/tv/newinventors/inc/categories/InventionsByCat_SAFETY.htm)

Our idea: ________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________
Now that you have your idea, you will need to design your device. Answer the questions below to develop your design.

How will the device allow people to do the task in a safer way?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

What injuries might be prevented?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Draw a diagram showing the different parts of the device?
Describe how the device works.
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

What materials could be used to make the device?
____________________________________________________________________________________
____________________________________________________________________________________
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Would using the device introduce any new hazards? If so, are there any changes you could make to your device to reduce the risk of injury?
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