



How does lead affect our health?

S2 - Module 1

Modular delivery

The LeadSmart modules are designed to allow flexibility for teachers and schools to tailor the delivery of the program in a way that best suits their needs. Each set of modules are designed in a way that they can be delivered in sequential order, as individual lessons, or in an arrangement of the school's choosing.

Module overview

In this module students will understand that lead can enter our bodies and build up over time, increasing our blood lead levels and making us sick. They will investigate groups who are most at risk of lead harm and identify strategies that can be put into place in order to protect them.

During this module students will have the opportunity to engage in an inquiry activity to investigate one identified at-risk group, using the LeadSmart website as a source of information.

Program adjustments

As with all of the LeadSmart Education modules, we encourage you to differentiate the following activities by making any necessary modifications in order to cater for diverse student learning needs.

Resources

- Health hub space in your school
- Interactive Whiteboard (IWB)
- LeadSmart website - (leadsmart.nsw.gov.au)
- Effects of lead webpage - (leadsmart.nsw.gov.au/effects-of-lead/)
- Start smart webpage - (leadsmart.nsw.gov.au/pregnancy/)
- Tradespeople webpage - (leadsmart.nsw.gov.au/tradespeople/)
- Renovating webpage - (leadsmart.nsw.gov.au/renovating/)
- LeadSmart - Living with lead in Broken Hill brochure - (leadsmart.nsw.gov.au/wp-content/uploads/2016/09/LeadSmart-Brochure-GeneralAwareness.pdf)
- Startsmart – Pregnancy and babies brochure - (leadsmart.nsw.gov.au/wp-content/uploads/2016/09/LeadSmart-Brochure-Pregnancy.pdf)
- BuildSmart - Renovating and maintenance brochure - (leadsmart.nsw.gov.au/wp-content/uploads/2016/09/LeadSmart-Brochure-Renovating.pdf)
- Work smart - Tradespeople and mining industry workers Who is most at risk of lead harm? - Activity sheet
- Supplementary IWB resources

Assessment

There are a number of informal assessment opportunities throughout this module including:

- Brainstorm to assess prior knowledge and experiences
- Class discussion
- Student questioning
- Student workbooks
- Observation

Learning intentions

Students will understand:

- Lead can enter our bodies and build up over time affecting our health
- Unborn babies, infants and young children under 5 years of age are most at risk
- There are many strategies that could be used to help reduce the risk of lead harm, including a blood test for children under 5 years of age

Curriculum links

Stage 2

PDHPE

- **COS2.1** Uses a variety of ways to communicate with and within groups
- **IRS2.11** Describes how relationships with a range of people enhance wellbeing
- **PHS2.12** Discusses the factors influencing personal health choices
- **SLS2.13** Discusses how safe practices promote personal wellbeing

English

- **EN2-10C** Thinks imaginatively, creatively and interpretively about information, ideas and texts when responding to and composing texts
- **EN2-1A** Communicates in a range of informal and formal contexts by adopting a range of roles in group, classroom, school and community contexts

Cross curriculum priorities

- Sustainability

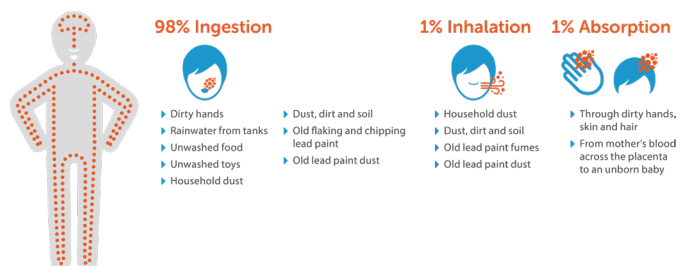
General capabilities

- Critical and creative thinking
- Ethical understanding
- Literacy

Introduction activity: What do we already know?

10 minutes

1. Reinforce that lead occurs naturally in the ground throughout Broken Hill, that's why it has been mined here for over 130 years. It gets into the air as dust from past and present mining activities. Because of the dry climate and wind found in Broken Hill, lead dust has been spreading in and around places found in Broken Hill.
2. Reinforce that lead is also found in old paint which was widely used in and around our homes until the 1970s, so it's a good idea to assume that most homes and buildings in Broken Hill will contain lead dust and lead paint. This means lead can be disturbed and spread around when we build and renovate around Broken Hill.
3. Display the image on the right on the IWB. Explain that lead does not belong in the human body, and when it gets into our bodies, it builds up over time and makes us sick.
4. Discuss the three main exposure pathways (ingestion – in our mouths, inhalation – when we breathe, and absorption – through our skin). Explain that ingestion (through our mouths via hand-to-mouth activities) is the main way that lead gets into our bodies in Broken Hill. Inhalation (when we breathe) is less likely as the lead particles are usually too big – lead particles must be very fine or fumes to get into our body this way. Absorption (through our skin) is most likely for people who work with lead. Encourage students to share the actions that they already do to help protect themselves from lead harm.



1. Explain that there are people who are more at risk from lead harm than others and there are jobs that people can do where they are at risk of being exposed to high levels of lead.
2. Display each of the groups on the IWB, do not reveal them at this stage. Ask students to think about who these groups of people might be.
3. Reveal each group when identified by students and introduce any remaining groups that weren't identified.
4. Discuss each group in more detail as they are revealed, including why students think they might be at a higher risk than other people.

Unborn babies, infants and young children (0-5 years)



Tradespeople and mining industry workers



Renovating and home maintenance



Teacher background information:

- **Unborn babies, infants and young children** – Unborn babies get their lead levels from their mothers which can be serious if not well managed. Young children spend much of their lives exploring their world by crawling and putting things in their mouths, which makes them more likely to ingest (swallow) lead if their surroundings are contaminated. Young children's bodies and brains are still developing at a rapid rate which means they can absorb a higher amount of lead.
- **Tradespeople and mining industry workers** – People who work in the mining industry reduce their risk of exposure to lead by following guidelines on the safe handling of lead provided by their employers. But many other workers such as electricians, plumbers, tilers and builders are also at risk of causing harm – to themselves and their families – by disturbing lead dust in ceilings, behind walls and between and under floorboards.
- **Renovating and home maintenance** – Lead dust builds up over many years in places that are unused and hard to access, like roof spaces, behind walls, as well as between and under floorboards. Working in these areas can spread lead dust around and expose everyone nearby to lead.

5. Explain that it is a good idea to learn and understand more about lead harm so that we can put strategies in place to reduce the risk.

6. Display the image below on the IWB.



'Getting lead tested' ad.

7. Ask students to describe what they can see in the image.
- Who is in the image?
 - Where do you think they are?
 - What do you think they are doing?
8. Explain to students that they might remember visiting a similar place like this when they were younger. The child is about to get his blood tested to measure how much lead is in his body. All children in Broken Hill aged 0-5 years get their blood lead levels tested regularly at a health centre to see if their lead levels are elevated / too high so action can be taken to try and reduce or remove the risks of lead exposure and protect children from lead harm.
9. Provide students with opportunity to share their own experiences of getting their blood tested at a health centre. Teachers should be aware that this may be a sensitive subject for some students as it may bring up emotional memories of a past experience.
- Teacher note:** Testing was previously undertaken intravenously - taking blood with a needle from a vein. It is now a simple finger prick test that is quick and painless.
10. Explain to students that they are going to complete a research activity using the materials from the LeadSmart website. Each group will select one of the at-risk groups to investigate and design a lead health brochure about them.
11. Show students the LeadSmart website on the IWB and the paper materials available to the students. Discuss the information students are required to research, focussing on three main questions students must address:
- **Who is most at risk of lead harm?** – identify your chosen at-risk groups in this section. You may decide to draw an illustration or write a description.
 - **How are they exposed to lead?** – Think about the environments they spend time in and how they move around. Think about the surfaces they may come into contact with.
 - **How can they prevent lead harm?** – Think about the strategies that can be put into place to reduce the risk of lead harm of your identified group, this may include washing toys and equipment or providing a safe environment such as a sandpit (covered when not in use) to play in.
12. Display the LeadSmart website on the IWB. Demonstrate to students how to navigate to the different areas. Prompt students to take note of the information found on the Effects of lead and the Being LeadSmart – Pregnancy, Renovating and Maintenance, and Tradespeople and Renovating - pages. Point out that some of the information found may apply to all at-risk groups. Alternatively these brochures can be supplied as a hard copy to students.
13. Break students up into small groups of 2-3. Ask each group to identify their chosen at-risk group they wish to investigate or allocate them one of the at risks groups to ensure an even spread of investigation.
14. Provide students with the necessary resources to use for their research and allow adequate time to complete their Lead Health brochures.

Reflection activity: What did we discover?

10 minutes

1. Revise with students what they learned about the impact that high levels of lead can have on our health (lead does not belong in our bodies and can make us sick), and reasons why some groups are more at risk than others.
2. Invite students to present their brochures to the class.
3. After each presentation provide students with an opportunity to reflect on and discuss new learnings.
4. Ask students for some ideas on how they can reduce lead exposure. Prompt with asking how it might get into our bodies? Main way is through our mouth off of our hands, so regular handwashing is key! Discuss other examples from teacher background information sheet.
5. Congratulate students on completing their investigations and provide feedback.