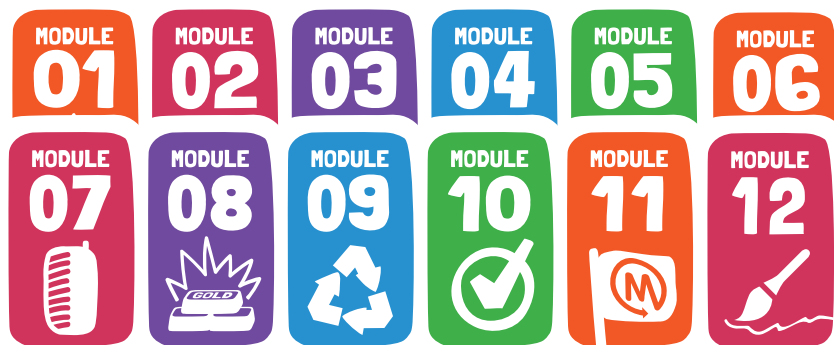


TEACHERS GUIDE



For more information and resources visit:
WWW.MOBILEMUSTER.COM.AU/SCHOOLS

The only not-for-profit government accredited mobile phone recycling program.

INTRODUCTION

Education plays a critical role in shaping young people's understanding of sustainability and their role in shaping a sustainable future for our planet. The Australian education system has identified sustainability as a cross curriculum priority. It is believed that this priority will encourage students to develop the knowledge, skills, values and world views which are required to live in a sustainable society.

MobileMuster has created the online [MusterKids Zone](#) to provide teachers and students with practical and engaging learning resources. Teachers can use the modules to deliver a unit of work on the sustainability of mobile phones. The modules have strong links with the new national curriculum and specific modules have been developed for Preschool, Primary and Secondary students.

It is hoped that the knowledge gained through the MobileMuster learning modules will increase student's knowledge, engagement, critical thinking and commitment to living in a sustainable society. Schools can participate in their own MobileMuster event which will demonstrate their commitment to individual and community action for sustainability.

ABOUT MOBILEMUSTER



Australian
Mobile Telecommunications
Association



PRODUCT STEWARDSHIP
Australian Government Accredited

MobileMuster is a voluntary product stewardship initiative of the Australian Mobile Telecommunications Association (AMTA). AMTA manages MobileMuster on behalf of its members who voluntarily fund the program. It accepts all types and brands of mobile phones, batteries, chargers and accessories for recycling free of charge. All mobiles and accessories collected are dismantled and separated, with more than 93% of the materials in the phone being recovered. All of the mobile phones and accessories are recycled, rather than refurbished for reuse.

MobileMuster is committed to engaging and educating Australia's youth. The MobileMuster learning modules gives teachers the opportunity to bring environmental and sustainability education programs to life for their students, teaching them about the environmental impact of mobile phones throughout the product life-cycle.

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HOW TO USE THIS GUIDE

The MobileMuster learning modules provide an engaging case study on the sustainability of mobile phones. The learning modules are cross-disciplinary and can be used by teachers to achieve national learning outcomes throughout the curriculum and cross-curriculum priority of sustainability.



These modules cover the life cycle of mobile phones and look at issues relating to the materials used in mobile phones, problems associated with re-use and systems for managing and recycling mobile phone waste. Modules can be taught separately or as a whole unit of work. Undertaking the MobileMuster event is not mandatory but will provide students with an opportunity to put into action the culmination of knowledge, skills, understanding and values developed throughout the previous modules.



The modules have been developed for use in preschool, primary and lower secondary school. They are designed to be flexible and teachers are encouraged to adapt the modules to suit their own classrooms and present the concepts according to their classroom abilities and personal learning style. The target year level has been indicated on each module as some modules are more suitable for older or younger students.

Each module includes a lesson objective, relevant Australian curriculum content descriptions, suggested resources, support material and extension activities. The modules are supported by MobileMuster Kid Zone which provides a suite of online resources including games, videos, fact sheets and printable worksheets for students and teachers. Kid Zone can be accessed via the MobileMuster website.

The modules cater for a range of student learning with a focus on interactive content which seeks to develop student Information and Communication Technology (ICT) capability. They encourage students to use ICT effectively as they access information, create ideas and solve problems in the classroom.

The MobileMuster Modules have a strong focus on collaborative learning. Most of the modules engage students in collaborative learning through facilitated discussions, information sharing amongst small groups of students, debating and organising a MobileMuster event. Collaborative learning is a good strategy to use when educating for sustainability. Collaborative learning strengthens ownership of an environmental problem and a commitment to action.

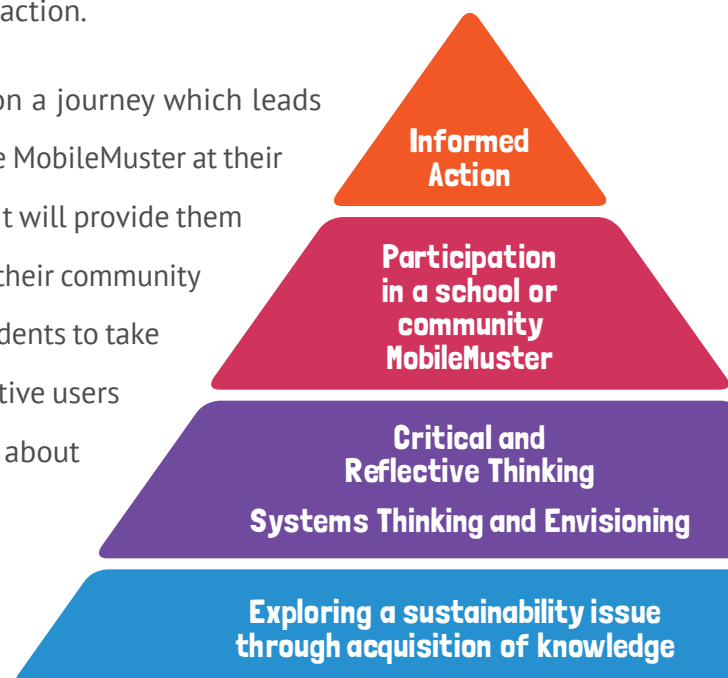
EDUCATION FOR SUSTAINABILITY

The MobileMuster modules have been developed with a strong focus on education for sustainability. This educational approach goes beyond just imparting knowledge about sustainability but builds on an individual's capacity for transformational change. In line with the Australian National Curriculum this approach is futures-oriented, with a focus on achieving environmental outcomes through informed action.

Each module has been designed to build upon the students understanding of a sustainability issue. Throughout the modules students will be required to develop a number of skills, including envisioning, systems thinking and critical thinking as they look at the sustainability of mobile phones throughout their lifecycle. Embedded in the Australian national curriculum is the principle that sustainability is not simply about the acquisition of knowledge or skills, but an approach which imparts motivation and commitment to take action.

These learning modules will take students on a journey which leads them to take action through participation in the MobileMuster at their school or through the MobileMuster program. It will provide them with the information and motivation to inform their community about MobileMuster. It will also encourage students to take their knowledge with them as they become active users of mobile phones and have to make decision about their use, reuse and recycling in the future.

The diagram to the right shows the application of the MobileMuster modules to education for sustainability principles.



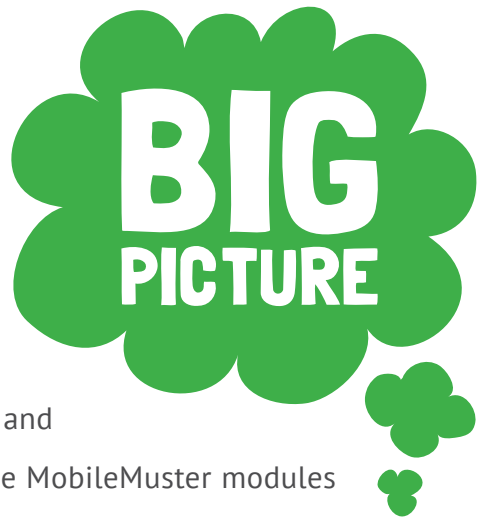


ENVISIONING

Envisioning a better future (or Futures Thinking) creates a link between where we are now and where we want to be in the future, so we can plan a series of steps to get us there. Futures' thinking is one of the key concepts of the sustainability priority in the national curriculum. The futures concept is aimed at building student capabilities for thinking and acting in ways that are needed to create a more sustainable future.

SYSTEMS THINKING

Systems thinking can help us to understand the big picture we are working within, and to create solutions that go beyond just addressing the isolated symptoms of a larger problem. The Australian National Curriculum has identified systems thinking as one of the key concepts for developing the knowledge, understanding and skills required in the area of sustainability. The MobileMuster modules take a systems approach to exploring the mobile phone life cycle. They encourage students to look at the interdependence and dynamic social, economic and environmental factors that influence mobile phone sustainability.



CRITICAL THINKING

Critical thinking and reflection challenges us to examine and question the underlying assumptions that affect the way we interpret the world. The Australian National Curriculum believes that developing reflective thinking processes amongst students will assist in the development of knowledge, understanding and skills which will lead to a more equitable, respectful and sustainable future. The MobileMuster modules encourage students to think critically about mobile phone design, re-use and recycling.



INFORMED ACTION

Informed action empowers individuals by directly involving them in the decision-making process. Engaging people in decision-making creates a greater sense of ownership, empowerment and commitment, both of which mean they are more likely to take action. The MobileMuster modules work towards students organising and participating in their own MobileMuster. It encourages students to take responsibility and encourage the wider community to take action.



LINKS TO THE AUSTRALIAN CURRICULUM

All modules align with the cross-curriculum priority of Sustainability.

Module	Title & Description	Learning Areas	General capabilities in the Australian Curriculum	Year level
	Picturing a Sustainable World Students develop early literacy and sustainability skills through reading.	English History	Literacy	K-2
	History of Mobile Phones Students critically explore the impact of mobile phones on society.	History English	Critical and creative thinking Ethical understanding	5-6
	Phone Maths Students record, graph and analyse data on mobile phone usage.	Maths Science	Numeracy Critical and creative thinking ITC competence	5-6
	How are phones made? Students investigate the resources used to make mobile phones.	Science	Critical and creative thinking Ethical understanding ITC competence	5-6
	What's In A Phone Students apply their understanding of what materials are in a mobile phone.	Maths Science	Numeracy	7-8
	Map Your Mobile Students map the location of resources that go into a mobile phone.	Geography	Intercultural understanding Ethical understanding	6

Module	Title & Description	Learning Areas	General capabilities in the Australian Curriculum	Year level
	The Mobile Reuse Debate Students examine the complex issue of mobile phone reuse and the exportation of phones to developing countries.	Geography English	Critical and creative thinking Ethical understanding Intercultural understanding	7-8
	From Waste to Resource Students explore mobile phones recycling statistics.	Maths Science	Numeracy Critical and creative thinking	5-6
	Recycling mobile phones Students identify the benefits of recycling mobile phones.	English Science	Critical and creative thinking ITC competence	3-4 9-10
	Product Stewardship Students research the concept of product stewardship.	Geography Science Design & Technology	Critical and creative thinking ITC competence	5-6 9-10
	How to run a MobileMuster Students develop, run and review a mobile muster recycling event. They put their sustainability knowledge into action.	English	Literacy Critical and creative thinking Personal and social competence	3-4 5-6 7-8 9-10
	Waste to art Students will explore the relationships between the arts and the environment.	English Visual Arts	Critical and creative thinking	9-10

The MobileMuster modules support learning outcomes in a variety of key learning areas and general capabilities within the Australian curriculum. The modules make particular reference to the cross curriculum priority of sustainability. Mobile phone recycling is an issue that provides a context to view and analyse sustainability using various organising ideas outlined in the national curriculum, including:

- Systems OI.3: Sustainable patterns of living rely on the interdependence of healthy social, economic and ecological systems.
- Worldview OI.5: World views are formed by experiences at personal, local, national and global levels, and are linked to individual and community actions for sustainability.
- Futures OI.6: The sustainability of ecological, social and economic systems is achieved through informed individual and community action that values local and global equity and fairness across generations into the future.

ENGLISH

The modules provide students with a range of texts and sources to shape their decision making in relation to mobile phone recycling. The activities will develop their abilities in listening, speaking, reading, viewing and writing. They will assist students to develop the skills necessary to communicate ideas and information related to sustainability and create texts that inform and persuade the community to take action.

MATHS

Throughout the modules, students engage in a range of activities including graphs, statistics and probability. The modules present opportunities for students to demonstrate their problem solving and reasoning skills which are essential for the exploration of sustainability issues and their solutions.

SCIENCE

The modules give students the opportunity to interpret, analyse and represent information using maps, statistical data, diagrams and graphs. Students will be able to explore cause and effect and develop observation and analytical skills to examine sustainability issues. Students are encouraged to explain observations; describe possible consequences of particular actions; and consider possible alternatives.

HISTORY

The modules will assist students to develop an historical perspective on the use of mobile phones and sustainability. They will provide them with a context to look at the changes of technology and the environment to inform their decision making process about sustainability.

GEOGRAPHY

The modules provide students with an explicit opportunity to investigate the sustainability of mobile phones as related to geographical issues. A number of the modules will ask students to investigate the sustainability of the mobile phone life cycle using their economic, social and environmental criteria.

Curriculum links to other subjects, such as The Arts and Technologies, will be updated when the relevant National Curriculum has been developed and published.

MODULE 1.

PICTURING A SUSTAINABLE WORLD



LESSON OBJECTIVE

Students will listen and respond to literature that explores the themes of recycling and sustainability. Students will examine literature and identify the sustainability issues that are raised in the texts including events and characters. They will also create texts and illustrations that envision a sustainable world in the future.

AUSTRALIAN CURRICULUM CONTENT DESCRIPTION

YEAR 1 HISTORY

- Distinguish between the past, present and future ([ACHHS032](#))
- Develop a narrative about the past ([ACHHS037](#))
- Identify and compare features of objects from the past and present ([ACHHS035](#))

YEAR 2 HISTORY

- Distinguish between the past, present and future ([ACHHS048](#))
- Develop a narrative about the past ([ACHHS053](#))
- Identify and compare features of objects from the past and present ([ACHHS051](#))

YEAR 1 ENGLISH

- Engage in conversations and discussions, using active listening behaviours, showing interest, and contributing ideas, information and questions ([ACELY1656](#))
- Make short presentations using some introduced text structures and language, for example opening statements ([ACELY1657](#))
- Engage in conversations and discussions, using active listening behaviours, showing interest, and contributing ideas, information and questions ([ACELY1656](#))

YEAR 2 ENGLISH

- Rehearse and deliver short presentations on familiar and new topics ([ACELY1667](#))
- Create events and characters using different media that develop key events and characters from literary texts ([ACELT1593](#))
- Listen for specific purposes and information, including instructions, and extend students' own and others' ideas in discussions ([ACELY1666](#))

LESSON OUTLINE

1. Picture books are a great introduction for young readers to the cross curriculum perspective – sustainability. Read one of the books and help students to interpret what is happening through the text and the illustrations by talking with them, and pointing out what to listen for in the text, and to find in the pictures. Discuss the environmental messages in the book, example focus questions are listed below.
 - a. Questions for Clancy and Millie the Very Fine House. What did the children make out of the cardboard boxes? Have you ever made something new out of old materials? Why do you think recycling is important for the environment?
 - b. Questions for The Lorax. What happened to the environment in the Lorax? What will happen if we use all of our water and trees to make things?
 - c. Questions for The Windy Farm. How does the wind affect everything on Windy Farm? What did the Mum discover about having a farm on a windy hill? Discuss the difference between renewable and non-renewable resources and the effect that they can have on our shared environment. Just like the mum in the story think of ways that the class can contribute to environmental sustainability in your school setting.
2. Introduce students to the concept of recycling (see glossary). Ask them if they recycle any things at home and school? Do they think we could recycle a mobile phone? Watch the MobileMuster Promise video and ask students to if they think it is important to recycle mobile phones and why?

3. Using a good collection of recycled materials including used boxes, cardboard, egg cartons of various shapes and sizes ask the children to create a mobile phone out of recycled products. They may want to draw the numbers onto the phone and create their own screen saver.
4. Ask students to think about what it would feel like if you were an old mobile phone and were being replaced:
 - a. Did your owner put you in a drawer or cupboard?
 - b. Would you feel sad and lonely?
 - c. Would it be fun to go on an adventure?
5. Imagine you were taken to a recycling centre where you were taken apart and made into new products (like the kettle and watering can in the MobileMuster Promise video).
6. Ask students to create their own stories and/or illustrations that come up with alternative solutions to the problem of old mobile phones. They need to create a vision for a future world. Students can create their own stories and illustrations focussing on the theme of envisioning a sustainable world.
7. Share your student work and upload the stories and illustrations to the [MusterKids Zone](https://www.mobilemuster.com.au/schools/musterkids-zone) on the MobileMuster website.

RESOURCES

1. One of the following books:
 - Clancy and Millie the Very Fine House
by Libby Gleeson and Freya Blackwood (Pre-schoolers – Year 2).
 - The Windy Farm by Doug MacLeod and Craig Smith. (Pre-schoolers – Year 2).
 - The Lorax by Dr. Seuss (Year K-2)
2. Interactive whiteboard (IWB)
3. Video: [MobileMuster Promise](#)
4. Recyclable household items (cardboard boxes, egg cartons, bottle tops etc)

5. SUPPORT MATERIAL

- Lesson ideas for Clancy and Millie the Very Fine House
http://www.thelittlebigbookclub.com.au/sites/thelittlebigbookclub.com.au/files/files/title_resource/clancy_and_millie_and_the_very_fine_house_learning_time.pdf
- Lesson ideas for the Lorax
http://www.seussville.com/Educators/lorax_classroom/educatorlorax_discuss.php
- Teacher's Notes for The Windy Farm
http://www.workingtitlepress.com.au/teachers_notes.html

MODULE 2. HISTORY OF MOBILE PHONES



LESSON OBJECTIVE

In this module students will appreciate how the rapid growth of technology has impacted on the development of mobile phones in a relatively short period of time. Students will understand why mobile phones have changed so rapidly and the repercussions of this on environmental sustainability.

AUSTRALIAN CURRICULUM CONTENT DESCRIPTION

YEAR 5 ENGLISH

- Plan, draft and publish imaginative, informative and persuasive print and multimodal texts, choosing text structures, language features, images and sound appropriate to purpose and audience ([ACELY1704](#))
- Reread and edit student's own and others' work using agreed criteria for text structures and language features ([ACELY1705](#))
- Use a range of software including word processing programs with fluency to construct, edit and publish written text, and select, edit and place visual, print and audio elements ([ACELY1707](#))

YEAR 6 ENGLISH

- Plan, draft and publish imaginative, informative and persuasive texts, choosing and experimenting with text structures, language features, images and digital resources appropriate to purpose and audience ([ACELY1714](#))
- Reread and edit students' own and others' work using agreed criteria and explaining editing choices ([ACELY1715](#))
- Use a range of software, including word processing programs, learning new functions as required to create texts ([ACELY1717](#))

YEAR 5 HISTORY

- Identify questions to inform an historical inquiry ([ACHHS100](#))
- Locate information related to inquiry questions in a range of sources ([ACHHS102](#))
- Identify points of view in the past and present ([ACHHS104](#))

YEAR 6 HISTORY

- Compare information from a range of sources ([ACHHS122](#))
- Locate information related to inquiry questions in a range of sources ([ACHHS121](#))
- Identify and locate a range of relevant sources ([ACHHS120](#))

LESSON OUTLINE

1. Do a quick quiz on the students personal and family use of mobile phones and what role they think mobile phones plays in society:
 - a. What is a mobile phone?
 - b. Do you own a mobile phone?
 - c. Do your parents own a mobile phone?
 - d. Do you have any old phones at home?
2. Ask your students to watch the following [old mobile phone advertisement](#) and discuss how old mobile phone compare with the ones we use today?
3. Students view the Slideshow: [History of Mobile Phones](#) on the IWB. Complete the Worksheet: [History of Mobile Phones](#) or play the Game: [History of Mobile Phones](#) on the IWB.
4. Design the next generation mobile phone. Students are divided into design teams to work together to design the next generation environmentally-friendly mobile phone. Within the design team students should be assigned research tasks and one team member could be thinking about how the design will be presented to the larger group.

5. They should be encouraged to be as imaginative as they can when covering the questions:
 - a. What functionalities will the phone display?
 - b. What kind of things will it be able to do?
 - c. What environmental features will the phone have?
 - d. What will the phone look like?
 - e. What applications would you like to have and describe how these would work?
6. When students have designed the phone (via computer model, poster, drawing, model) they present their design to the class. Consider inviting a judging panel which could include the school principal, head teacher, parent representative to provide feedback to each design group.
7. Students should be asked to document reflections, notes, ideas and sketches in a design journal.
8. Share your student work and upload the phone designs to the [MusterKids Zone](https://www.mobilemuster.com.au/schools/musterkidszone) section on the MobileMuster website.

RESOURCES

1. Interactive whiteboard (IWB)
2. Slideshow: [History of Mobile Phones](#)
3. Video: [Old Mobile Phone Advertisement](#)
4. Game: [History of Mobile Phones](#) or Worksheet: [History of Mobile Phones](#)

SUPPORT MATERIAL

- Audio File: [Evolution of the Mobile Phone](#)
- List of [mobile phone manufacturers](#)
- Read and watch a short video about [new mobile phone technology](#). This site is good to give ideas for the extension activity
- For more information about the history of mobile phones look here:
http://en.wikipedia.org/wiki/Mobile_phone
- Find out about iphones/smart phones here:
<http://en.wikipedia.org/wiki/Smartphone>

EXTENSION ACTIVITIES:

Research how mobile phone manufacturers are designing more environmentally-friendly phones. A list of mobile phones manufacturers is listed in the support material.

MODULE 3. PHONE MATHS



LESSON OBJECTIVE

In this module students will understand the environmental impact of rapid mobile phone usage in Australia. Students will also develop skills in graphing and manipulating data that relate to growth. At the same time students will develop skills in reporting their findings and presenting them in a visual form.

AUSTRALIAN CURRICULUM CONTENT DESCRIPTION

YEAR 5 MATHEMATICS

- Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies ([ACMSP119](#))

YEAR 6 MATHEMATICS

- Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables ([ACMSP147](#))

YEAR 5 SCIENCE

- Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate ([ACSYS090](#))
- Compare data with predictions and use as evidence in developing explanations ([ACSYS218](#))
- Communicate ideas, explanations and processes in a variety of ways, including multi-modal texts ([ACSYS093](#))

YEAR 6 SCIENCE

- Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate ([ACSYS107](#))
- Compare data with predictions and use as evidence in developing explanations ([ACSYS221](#))
- Communicate ideas, explanations and processes in a variety of ways, including multi-modal texts ([ACSYS110](#))

LESSON OUTLINE

1. Watch [The MobileMuster Promise](#) video and read the [Mobile Muster Fast Facts](#) and discuss:
 - a. When did the MobileMuster program start?
 - b. How often do people replace their mobile phones?
 - c. How many old phones are in Australian homes?
2. Inform students that today they are going to look at the growth in mobile phone recycling and graph the data.
3. Using the IWB or graph paper enter the MobileMuster Collection Results into excel.
4. Determine which type of graph is best used to display the dataset. Students may produce various types of graphs (to suit age group) – pictographs (using mobile phones), bar graphs, line graphs or composite bar or line graphs (showing the number of handsets against number of tonnes collected).
5. Students investigate the following questions about the data:
 - a. Compare the data for the two periods 2008-2009 and 2009-2010. Why might the number of phones be about the same in both periods, but the weight collected be more in 2008-2009? (Answer: changes in handset, battery and charger design – smaller)
 - b. What reasons might be given for the growth in collection since collection programs began in Australia? (Answer: more phones being used, therefore more phones being discarded, and increased awareness of recycling programs)
 - c. Using a projection from their graphs, what mobile phone collection data might we expect to see in the future?

6. Discuss the following questions or use them as a basis for student assessment.
 - a. How has each new development in a mobile phone always related to the model that came before it?
 - b. How were phone manufacturers able to reduce the weight of each new mobile phone that was developed?
 - c. What are some of the major technological advancements that influenced mobile phone development?
 - d. What have these advancements achieved?
7. Have a look at the MobileMuster Infographic [15 years of Mobile Phone Recycling In Australia](#). Discuss how the information has been put together. Using the graphs that you have designed in this module and the information you have learnt develop your own Infographic using graphs, images and key words.

RESOURCES

1. Interactive whiteboard (IWB)
2. Video: [The MobileMuster Promise](#)
3. Images: [15 years of Mobile Phone Recycling In Australia](#) Infographic
4. Fact Sheet: [MobileMuster Collection Results](#)
5. Fact Sheet: [MobileMuster Fast Facts](#)
6. Excel (via IWB/computer) or graph paper

SUPPORT MATERIAL

- Video: [New Mobile Phone Technology](#)



EXTENSION ACTIVITIES

Mobile Maths Facts: students create 'Fast Facts' cards to post in their classroom or around their school, based on other information from the MobileMuster 'Fast Facts' webpage. You can use the template in the Activities Booklet or online resources.

MODULE 4. HOW ARE PHONES MADE?



LESSON OBJECTIVE

In this module students will appreciate and understand the variety and quantity of resources that come together to manufacture a mobile phone. Students will be introduced to the idea that products have life cycles and will be encouraged to consider the impact of the product life cycle on the environment.

AUSTRALIAN CURRICULUM CONTENT DESCRIPTION

YEAR 5 SCIENCE

- Important contributions to the advancement of science have been made by people from a range of cultures ([ACSHE082](#))
- Scientific understandings, discoveries and inventions are used to solve problems that directly affect peoples' lives ([ACSHE083](#))
- Scientific knowledge is used to inform personal and community decisions ([ACSHE217](#))

YEAR 6 SCIENCE

- Electrical circuits provide a means of transferring and transforming electricity ([ACSSU097](#))
- Important contributions to the advancement of science have been made by people from a range of cultures ([ACSHE099](#))
- Scientific understandings, discoveries and inventions are used to solve problems that directly affect peoples' lives ([ACSHE100](#))
- Scientific knowledge is used to inform personal and community decisions ([ACSHE220](#))

LESSON OUTLINE

1. Read the Fact Sheet: [Mobile Phone Manufacturing](#) and watch the Mobile Phone Manufacturing videos. Discuss the different stages of the mobile phone life cycle.
2. Divide the students into five groups and assign each group with one stage of the product life cycle.
3. Ask each group to produce a presentation of their stage of the product life cycle.
4. As part of the presentation they need to investigate the social, environmental and economic benefits and costs at each stage of the product life cycle.
5. The work can be presented as an oral activity, flow diagram, poster, Prezi or Powerpoint presentation.
6. When all groups have produced their presentation, they can present it to the class as 'experts' on that stage of the mobile phone life cycle.
7. Share your student work and upload the presentations to the [MusterKids Zone](#) on the MobileMuster website.
8. Recap: using the information presented students can complete the Worksheet: [How Are Mobile Phones Made?](#) Either individually or as a class.

RESOURCES

1. Interactive whiteboard (IWB)
2. Facts Sheet: [Mobile Phone Manufacturing](#)
3. Video: Mobile Phone Manufacturing
 - a. [Part 1](#)
 - b. [Part 2](#)
 - c. [Part 3](#)
 - d. [Part 4](#)

SUPPORT MATERIAL

- [Pod cast– Life Cycle of a mobile phone](#) (New York Hall of Science).
- Video: [Product Life Cycles](#). Short animations on YouTube that get kids to look at the life cycle of products, where things come from and what happens when things get thrown away.
- [TED Talks](#): Sustainability by design.

EXTENSION ACTIVITIES

There are many household appliances that use environmental rating systems to measure the sustainability of products. Vodafone has developed a voluntary environmental rating scheme which looks at the environmental and ethical performance of many of the mobile phones they sell.

Visit the [Vodafone Eco Rating](#) site, view the [Video: Vodafone Eco Rating](#) and look at how you can calculate the mobile phone's impact on the environment. The rating system measures water usage, energy and raw materials, pollution, hazardous materials, carbon emissions, recyclability and ethical practices.

If you were an engineer working for a mobile phone manufacturer and wanted to create a new environmentally sustainable mobile phone, how would you design the phone? In your response consider the entire life cycle of a product – from materials acquisition, materials processing, manufacturing, packaging, transportation, use and disposal of the product.

MODULE 5. WHAT'S IN A PHONE?



LESSON OBJECTIVE

In this module students develop an understanding of the raw materials that make up a mobile phone. They will learn the difference between renewable and non-renewable resources, and look at the role of recycling these resources in mobile phones. Finally students are to enhance their research skills and present their findings graphically.

AUSTRALIAN CURRICULUM CONTENT DESCRIPTION

YEAR 7 MATHEMATICS

- Identify and investigate issues involving numerical data collected from primary and secondary sources ([ACMSP162](#))

YEAR 8 MATHEMATICS

- Investigate techniques for collecting data, including census, sampling and observation ([ACMSP284](#))

YEAR 7 SCIENCE

- Some of Earth's resources are renewable, but others are non-renewable ([ACSSU116](#))
- Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge ([ACSI124](#))

YEAR 8 SCIENCE

- Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge ([ACSI139](#))
- Construct and use a range of representations, including graphs, keys and models to represent and analyse patterns or relationships, including using digital technologies as appropriate ([ACSI144](#))
- Summarise data, from students' own investigations and secondary sources, and use scientific understanding to identify relationships and draw conclusions ([ACSI145](#))

LESSON OUTLINE

1. Ask students if they have ever wondered what's inside a mobile phone? If possible take apart an old and unused mobile phone to find out what is inside, use the MobileMuster display or view the image inside a mobile phone. Identify the mobile phone components that you find inside a mobile phone.
2. Students view the Video: Inside a Mobile Phone. This video identifies and classifies the various resources used and shows the amount of each material used in a typical mobile phone. Discussion questions:
 - What raw materials are mobile phones made from?
 - How are the raw material turned into a mobile phone?
 - What is a non-renewable resource? Discuss and then explain.
 - What are other examples of other non-renewable resources?
 - In your opinion, what role does recycling play in non-renewable resources?
3. Using information from the video, students independently reconstruct a visual representation of the resources used in the production of mobile phones. This can be done using the Worksheet: [What's in a Phone](#).
4. Each section should be correctly located on the worksheet, according to their type and amount (as in the video). Students may colour-code each type of resource to highlight the main types of resources (plastics, metals, other).
5. Log on to the MobileMuster [Resource Recovery Calculator](#). Use the calculator to work out what can be recovered from 1 tonne (1000kg) of mobile phone materials. Record and present the information in a table using the following categories:
 - a. What materials can be extracted?
 - b. What new things can be made?
 - c. What are the environmental benefits?

RESOURCES

1. Interactive whiteboard (IWB)
2. Image: Inside a Mobile Phone
3. Display: Inside a Mobile Phone
4. Video: What's in a Mobile Phone
5. Game: Resource Recovery Calculator
6. Worksheet: What's in a Phone?

SUPPORT MATERIAL

- Fact Sheet: [What's in a Phone?](#)
- [The Recycling Process](#) (MobileMuster website)
- [TES-AMM Website](#) (MobileMuster recycler)
- [Plastic Recycling](#) (Plasmar: plastic fence posts)

EXTENSION ACTIVITIES

Research how the materials from mobile phones are recycled and reused. As a starting point look at the [MobileMuster website](#) and support material which outlines the recycling process and links to the different recyclers, identify:

- Where are materials processed and recycled?
- What type of machines do they use to extract materials?
- What happens to the plastics?

On a Periodic Table, highlight the elements that can be found in a mobile phone. Write a brief explanation of each element.

MODULE 6. MAP YOUR MOBILE



LESSON OBJECTIVE

In this module students will appreciate that there are many different materials that come from all over the world to make mobile phones.

AUSTRALIAN CURRICULUM CONTENT DESCRIPTION

YEAR 6 GEOGRAPHY

- The effects that people's connections with, and proximity to, places throughout the world have on shaping their awareness and opinion of those places ([ACHGK036](#))
- Collect and record relevant geographical data and information, using ethical protocols, from primary and secondary sources, for example, people, maps, plans, photographs, satellite images, statistical sources and reports ([ACHGS041](#))
- Present findings and ideas in a range of communication forms, for example, written, oral, graphic, tabular, visual and maps, using geographical terminology and digital technologies as appropriate ([ACHGS045](#))
- Reflect on their learning to propose individual and collective action in response to a contemporary geographical challenge and describe the expected effects of their proposal on different groups of people ([ACHGS046](#))

LESSON OUTLINE

1. Students read the Fact Sheet: [Mobile Phone Resources from Around the World](#) and identify key points from within the text.

2. Using the IWB and Game: [Mobile Phone Resources Map](#) undertake the following activities:
 - a. Identify the countries mentioned in the Fact Sheet.
 - b. Ask students to connect (drag and drop) the raw materials to the country that supply those natural resources.
 - c. Ask students if they recognise any of the raw materials and click on each material to read through a brief description.
 - d. Discuss how the materials for making a mobile phone need to be transported around the world. What impact does this have on the environment?
3. Students write a letter from the perspective of a child their age, who lives in one of the countries discussed throughout the lesson. They should research the mining activity and focus on interpreting the following questions:
 - a. What effect does mining the raw material have on the environment of that country?
 - b. How does the mining of the raw material affect the people of that country?
 - c. What are the potential negative environmental impacts of mining?
 - d. What are the economic and social benefits of mining?
 - e. Why is it important to mine in a sustainable way? Older grade students should answer in terms of:
 - i. Economic sustainability - ensuring the operation makes enough money to be profitable and that the community benefits through employment, business opportunities and improvements to local infrastructure such as roads, housing and schools.

- ii. Environmental sustainability – ensuring that the air, energy, land, waste and water aspects of the operation are managed safely and that once mining is finished, the land can have future uses.
 - iii. Social sustainability – ensuring the health, safety and well-being of employees working on site and making sure members of the local community are informed and engaged in the process in an appropriate manner.
4. One of the ways to reduce the amount of raw material being mined is to recycle mobile phones. The materials extracted from the recycling process can be reused which reduces the demand for these materials. Discuss.
 5. Share your student work and upload the letters to the [MusterKids Zone](#) section on the MobileMuster website.

RESOURCES

1. Interactive whiteboard (IWB)
2. Fact Sheet: [Mobile Phone Resources from Around the World](#)
3. Game: [Mobile Phone Resources Map](#)

SUPPORT MATERIAL

- [Mining Lesson Plans and Fact Sheets](#) (Oresome Resources)
- [Envirosmart](#): includes lessons on why we mine and how we mine (Mineral Council of Australia)
- Video: [GSM Association Mobile Phone Lifecycle](#)
- GSM Association, [Mobile Phone Life Cycles: Use, Take-Back, Re-use and Recycle](#)



EXTENSION ACTIVITIES

Watch the Video: [Nokia: 10 Years of Eco Innovation](#) as an example of how manufacturers are becoming more innovative and sustainable. Student can investigate the concept of sustainability and critically look at the mobile phone manufacturing process to answer the following questions:

1. Is there a better way to make mobile phones?
2. And if so what might be the costs?
3. What might be the improvements?
4. How does the MobileMuster program improve the process?

MODULE 7. THE MOBILE REUSE DEBATE



LESSON OBJECTIVE

In this module students will examine the increasing volume of mobile phones being used and the exportation of obsolete mobile phones to developing countries. They will consider the social, economic and environmental impacts of this issue and gain an understanding of the impact of mobile phone use and disposal on different communities around the world.

AUSTRALIAN CURRICULUM CONTENT DESCRIPTION

YEAR 7 ENGLISH

- Plan, draft and publish imaginative, informative and persuasive texts, selecting aspects of subject matter and particular language, visual, and audio features to convey information and ideas ([ACELY1725](#))
- Edit for meaning by removing repetition, refining ideas, reordering sentences and adding or substituting words for impact ([ACELY1726](#))

YEAR 8 ENGLISH

- Create imaginative, informative and persuasive texts that raise issues, report events and advance opinions, using deliberate language and textual choices, and including digital elements as appropriate ([ACELY1736](#))
- Experiment with text structures and language features to refine and clarify ideas to improve the effectiveness of students' own texts ([ACELY1810](#))
- Use a range of software, including word processing programs, to create, edit and publish texts imaginatively ([ACELY1738](#))

YEAR 7 GEOGRAPHY

- Apply geographical concepts to draw conclusions based on the analysis of the data and information collected ([ACHGS052](#))
- Reflect on their learning to propose individual and collective action in response to a contemporary geographical challenge, taking account of environmental, economic and social considerations, and predict the expected outcomes of their proposal ([ACHGS054](#))

YEAR 8 GEOGRAPHY

- Develop geographically significant questions and plan an inquiry using appropriate geographical methodologies and concepts ([ACHGS055](#))
- Collect, select and record relevant geographical data and information, using ethical protocols, from appropriate primary and secondary sources ([ACHGS056](#))

LESSON OUTLINE

1. Watch [The Story of Electronics](#) video and/or [The Secret Life of Mobile Phones](#). These videos raise some important issues in relation to the life-cycle of electronics products and their impact on our society. It is advised that teacher's watch the video prior to student participation. Discuss the following issues raised in the videos:

The Story of Electronics

- What is Moore's Law?
- How often do we replace our old electronics products?
- How do we dispose of obsolete electronic devices?
- What happens when the electronics are exported overseas?
- What three solutions does the video raise?
 - Design /Innovation
 - Exports of toxic materials
 - Choose/Buy green products

The Secret Life of Mobile Phones

- How often do people replace their mobile phone?
 - What happens to disused phones?
 - Why are people not recycling their phones?
 - What happens to the phones when they are sent to be recycled?
 - What countries are old mobile phones being sent to?
 - What are the moral issues of sending mobile phones overseas?
 - What are some of the benefits of recycling?
 - What is a closed loop pattern of material use?
2. Introduce the term e-waste or electronic waste which refers to used electronics products including mobile phones. E-waste like mobile phones can be shipped to other countries for reuse or disassembly. Discuss how in some countries, people are earning a living by taking apart electronic devices, exposing themselves to toxic chemicals in the process, and degrading their environment as they do not have the environmental and safety regulations or standards that we have in Australia.
3. The Mobile Reuse Debate. A debate helps students to think through a complex issue and reconsider their opinions. There are two options for planning the debate:
- a. Students can debate the topic and present an affirmative or negative opinion towards the debate question - Are developing countries the toxic dumping ground for discarded mobile phones?
 - b. Students can represent different characters in the debate and use the debate cards to argue various positions. See the Worksheet: [Mobile Phone Debate Cards](#).

4. Divide the class into small groups and assign each group their debate position or character. Students will need to research the topic and consider a range of issues including:
 - a. lower environmental standards in developing countries,
 - b. international conventions and legal requirements of exporting,
 - c. occupational health and safety issues, and
 - d. the materials value of mobile phones.
5. Preparing for a debate. Students need to read through their research and work out the points they are going to make, provide examples and detailed explanations. They will also need to pre-empt counter arguments and prepare for rebuttal. They should be given plenty of time to practise speaking in smaller groups. Encourage students to give a reason for their opinions. Ensure students know there is no right or wrong answer.
6. Stage the debate. The teacher can act as the moderator or assign a student to the position of introducing the opposing teams of the debate and keeping time of each debate speaker. A student moderator should be able to speak clearly and keep everyone on task in a respectful manner. The moderator formally introduces the debate topic.
7. Debate rules will need to be outlined to ensure that students respect the opinions of others. Ideas for debate rules:
 - a. Be polite and courteous.
 - b. Listen attentively.
 - c. Be respectful and supportive of peers.
 - d. Avoid inappropriate noises.

- e. Speak only when recognized by the moderator.
 - f. Speak clearly, slowly, and loud enough to be heard by the audience.
 - g. Speak with passion and excitement.
8. Debate Reflection. It is important for students to express their reactions to the debate. Record your debate and upload it to the [MusterKids Zone](#) on the MobileMuster website.

RESOURCES

1. Interactive whiteboard (IWB)
2. [The Story of Electronics](#) (7:46)
3. [The Secret Life of Mobile Phones](#) (4:50)
4. Worksheet: [Mobile Phone Debate Cards](#)

SUPPORT MATERIAL

- Moore's Law http://en.wikipedia.org/wiki/Moore's_law
- The Basel Convention <http://www.basel.int/> provides details about the treaty attempting to limit the trade of hazardous waste, as well as ratification information.
- United Nations Environment Programme (UNEP) (2013) [Guidance document on the environmentally sound management of used and end-of-life mobile phones](#)
- For further information on how mobile phones are transforming lives in developing countries visit: <http://www.gsma.com/mobilefordevelopment/lifestories/>

EXTENSION ACTIVITIES

Research the Basel Convention, a United Nations treaty intended to limit the trade of hazardous waste. Prepare a presentation explaining how it limits trade, as well as which countries did or did not support this piece of legislation.

MODULE 8. FROM WASTE TO RESOURCE



LESSON OBJECTIVE

In this module students will appreciate the resources that can be recovered from mobile phones. Students will interpret data from the MobileMuster program and undertake purposeful investigations when interpreting and analysing the data.

AUSTRALIAN CURRICULUM CONTENT DESCRIPTION

YEAR 5 MATHEMATICS:

- Pose questions and collect categorical or numerical data by observation or survey ([ACMSP118](#))
- Construct displays, including column graphs, dot plots and tables, appropriate for data type, with and without the use of digital technologies ([ACMSP119](#))
- Describe and interpret different data sets in context ([ACMSP120](#))

YEAR 6 MATHEMATICS

- Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables ([ACMSP147](#))
- Interpret secondary data presented in digital media and elsewhere ([ACMSP148](#))

YEAR 5 SCIENCE:

- Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena ([ACSHE081](#))
- Scientific knowledge is used to inform personal and community decisions ([ACSHE217](#))
- Use equipment and materials safely, identifying potential risks ([AC SIS088](#))

YEAR 6 SCIENCE

- Electrical circuits provide a means of transferring and transforming electricity ([ACSSU097](#))
- Energy from a variety of sources can be used to generate electricity ([ACSSU219](#))
- Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena ([ACSHE098](#))
- Scientific knowledge is used to inform personal and community decisions ([ACSHE220](#))
- Use equipment and materials safely, identifying potential risks ([AC SIS105](#))



LESSON OUTLINE

1. Watch the [MobileMuster Recycling Program video](#) and ask the students to keep a record of what products are made out of old mobile phones.
2. Using the MobileMuster Resource Recovery Calculator complete the Worksheet: [Mobile Phone Recycling](#).
 - a. Divide the class into small groups and ask each group to choose a product that is made out of recycled mobile phones.
 - b. Using the Factsheet as a start students need to research their product, how it is made and what are the environmental benefits of the product.
3. Discuss these questions after activity:
 - a. Why is it important to recover resources from old mobile phones?
 - b. How can recycling mobile phones help the environment?
 - c. What would happen if mobile phones were not recycled? Where would the materials come from?

RESOURCES

1. Interactive whiteboard (IWB)
2. Fact Sheet: [End Products of Recycling Mobiles](#)
3. Video: [MobileMuster Recycling Program](#) (3:13 minutes)
4. Worksheet: [Mobile Phone Recycling](#)
5. Game: [Resource Recovery Calculator](#)

SUPPORT MATERIAL

- [Nokia: 10 Years of Eco Innovation](#)
- [GSM Association Mobile Phone Lifecycle](#)

EXTENSION ACTIVITIES

Using the MobileMuster [Resource Recovery Calculator](#) students can calculate the number of mobile phones that would need to be recycled to create some of the everyday items that they use at school or home. Create posters displaying the end products that can be recovered by recycling mobile phones around your classroom or school.

MODULE 9. RECYCLING MOBILE PHONES



LESSON OBJECTIVE

In this module students explore the concept of landfill and gain an understanding of the environmental benefits of mobile phone recycling. They will develop the understanding and skills necessary to act responsibly and create texts that inform and persuade others to take action for sustainable futures.

AUSTRALIAN CURRICULUM CONTENT DESCRIPTION

YEAR 3 ENGLISH

- Create imaginative texts based on characters, settings and events from students' own and other cultures using visual features, for example perspective, distance and angle ([ACELT1601](#))
- Create texts that adapt language features and patterns encountered in literary texts, for example characterisation, rhyme, rhythm, mood, music, sound effects and dialogue ([ACELT1791](#))

YEAR 4 ENGLISH

- Create literary texts by developing storylines, characters and settings ([ACELT1794](#))
- Create literary texts that explore students' own experiences and imagining ([ACELT1607](#))

YEAR 4 SCIENCE

- Science knowledge helps people to understand the effect of their actions ([ACSHE062](#))

YEAR 3 SCIENCE:

- Science knowledge helps people to understand the effect of their actions ([ACSHE051](#))

YEAR 9 ENGLISH

- Create imaginative texts based on characters, settings and events from students' own and other cultures using visual features, for example perspective, distance and angle ([ACELT1601](#))
- Create texts that adapt language features and patterns encountered in literary texts, for example characterisation, rhyme, rhythm, mood, music, sound effects and dialogue ([ACELT1791](#))

YEAR 10 ENGLISH

- Create literary texts by developing storylines, characters and settings ([ACELT1794](#))
- Create literary texts that explore students' own experiences and imagining ([ACELT1607](#))

YEAR 10 SCIENCE

- The values and needs of contemporary society can influence the focus of scientific research ([ACSH230](#))

YEAR 9 SCIENCE

- The values and needs of contemporary society can influence the focus of scientific research ([ACSH228](#))

LESSON OUTLINE

1. As a class, watch the [MobileMuster Recycling Program](#) video and [Why is it important to recycle phones?](#) presentation.
2. Play the Game: [Mobile Phone Recycling](#) Picture Sentence Match on the IWB.
3. As a class discuss the following questions:
 - a. How does recycling mobiles help the environment?
 - b. What are the benefits to recycling mobile phones?
 - c. What will happen if we don't recycle?
 - d. What happens to mobile phone batteries in the recycling process?
 - e. What happens to mobile phone circuit boards?
 - f. What are some products that are created by the recovered materials?
 - g. How much can turning old tech into new products reduce greenhouse gases by?
 - h. Where can you recycle your phone to help the environment?

4. Explain that there are many ways to tell stories - particularly short stories. A comic could be displayed on the IWB or hardcopy.
5. Explain the main features of cartoons including:
 - a. Reading format - boxes left to right in rows.
 - b. Difference between speech, thought and exclamation bubbles.
 - c. Importance of the story is shared through pictures.
 - d. Captions should be short and sharp.
6. Ask students to design their own cartoon that describes the environmental benefits of recycling mobile phones. They can use the [blank cartoon worksheet](#) or Toon Doo via the internet.
7. Teacher and students discuss potential storylines. The character in the cartoon may weigh up the pros and cons of recycling before deciding what to do with their old mobile. The cartoon should demonstrate the environmental, social and economic benefits of their decision.
8. When students have completed their cartoon they should share/discuss with another pair, once each team has seen two other working pairs the teacher should instigate a whole class share and reflection.
9. Share your student work and upload the cartoons to the [MusterKids Zone](#) on the MobileMuster website.

RESOURCES

1. Interactive whiteboard (IWB)
2. Fact Sheet: [Recycling Mobile Phones](#)
3. Presentation: [Why is it important to recycle phones?](#)
4. Video: [MobileMuster Recycling Program](#)
5. Worksheet: [Mobile Phone Cartoon](#) or computer access to Toon Doo and set up a free online account for comic creator: <http://www.toondoo.com/>
6. Game: [Mobile Phone Recycling](#) Picture Sentence Match
7. Computer access for extension activity

SUPPORT MATERIAL

Video: [Behind the News](#) Episode on Recycling (4.08 minutes)

Students could incorporate photos, graphic art, flashing text in their cartoons which will allow improve the ICT capability. The following links provide ideas and resources for creating cartoon.

- [Toon Doo](#)
- [How to Draw Comic Books](#)
- [Comicpile](#)
- [Flummery](#)

EXTENSION ACTIVITIES

Access Hero Creator and students can create their own mobile phone recycling hero <http://www.ugo.com/games/superhero-generator-heromachine-2-5>

MODULE 10.

PRODUCT STEWARDSHIP



LESSON OBJECTIVE

In this module students are encouraged to develop the value of personal contribution to the community and take an active part in making a difference to that community. Within the module the term product stewardship is introduced and the importance of looking after, nurturing and taking responsibility for the environment is explored. The module presents the essential knowledge required for learning about sustainability.

AUSTRALIAN CURRICULUM CONTENT DESCRIPTION

YEAR 5 GEOGRAPHY

- Reflect on their learning to propose individual and collective action in response to a contemporary geographical challenge and describe the expected effects of their proposal on different groups of people ([ACHGS039](#))

YEAR 6 GEOGRAPHY:

- Reflect on their learning to propose individual and collective action in response to a contemporary geographical challenge and describe the expected effects of their proposal on different groups of people ([ACHGS046](#))

YEAR 5 SCIENCE

- Scientific knowledge is used to inform personal and community decisions ([ACSHE217](#))

YEAR 6 SCIENCE

- Scientific knowledge is used to inform personal and community decisions ([ACSHE220](#))

YEAR 5 & 6 TECHNOLOGY AND DESIGN

- Investigate characteristics and properties of a range of materials, systems, components, tools and equipment and evaluate the impact of their use ([ACTDEK023](#))

YEAR 9 GEOGRAPHY

- The effects of the production and consumption of goods on places and environments throughout the world and including a country from North-East Asia ([ACHGK068](#))

YEAR 10 GEOGRAPHY

- The environmental worldviews of people and their implications for environmental management ([ACHGK071](#))

YEAR 9 & 10 DESIGN AND TECHNOLOGY

- Critically analyse factors, including social, ethical and sustainability considerations, that impact on designed solutions for global preferred futures and the complex design and production processes involved ([ACTDEK040](#))
- Explain how products, services and environments evolve with consideration of preferred futures and the impact of emerging technologies on design decisions ([ACTDEK041](#))

LESSON OUTLINE

1. Introduce the term product stewardship (see Fact Sheet: Product Stewardship) which simply means looking after something. Older students could look at the Product Stewardship Act (see Support Material) and research the legislation, regulation and voluntary arrangements.
2. Students participate in a teacher-guided discussion covering the following question:
 - a. How can we help care for the environment?
 - b. What do you think might happen to the world and in the world if people were more careful with their resources?
 - c. Why is product stewardship important?

3. Research and Reflection. Divide the students into small groups and assign each group a product stewardship program which they need to research. Some examples of product stewardship programs in Australia include:
 - a. Australian Packaging Covenant www.packagingcovenant.org.au
 - b. Batteryback <http://www.sustainability.vic.gov.au/www/html/3665-batteryback-faqs.asp?intSiteID=4>
 - c. Aldi Battery Recycling <http://aldi.com.au/au/html/service/23834.htm>
 - d. Container Deposit Scheme in South Australia <http://www.epa.sa.gov.au>
 - e. MobileMuster <http://www.mobilemuster.com.au>
 - f. DropZone <http://www.dropzone.org.au/>
 - g. drumMUSTER <http://www.drummuster.com.au>
 - h. FluoroCycle www.fluorocycle.org.au
 - i. TechCollect www.techcollect.com.au
 - j. Packaging Stewardship Forum www.afgc.org.au/psf.html
4. They will need to identify the following information:
 - a. What products are included in the program?
 - b. When did the program start?
 - c. Who pays/ funds the program?
 - d. What has the program achieved? For example, number of items recycled or diverted from landfill.
 - e. How does the program help the environment?

5. Go!Animate is an online video presentation tool that allows students to create simple video cartoons. Create a 'Go!Animate' video that shows a person caring for the environment by spreading the word about recycling mobile phones and participating in MobileMuster. The aim of the exercise is for students to demonstrate how being a good steward of resources helps the environment.
6. Students can present their animation to the class. Have a group sharing activity where the students view others' videos and ask questions about the message presented. Post your animations to the MobileMuster website.
7. Conduct a brainstorming session with students to answer the following question:
 - a. What can I do to make a difference and be a good steward of the products I have been given? Some possible answers:
 - i. I can recycle phones because it has positive consequences for the environment/people.
 - ii. I can hold a MobileMuster because it encourages others to become more aware of environmental issues.
 - iii. I can create materials to advertise the mobile muster to enhance awareness in my community.
 - b. Record the top 10 responses from the brainstorm to the IWB or classroom poster.
8. Share your student work and upload the presentations and animations to the [MusterKids Zone](http://www.mobilemuster.com.au/schools/musterkidszone) on the MobileMuster website.

RESOURCES

1. Interactive whiteboard (IWB)
2. Fact Sheet: [Product Stewardship](#)
3. [Go !Animate](#) : online video presentation tool

SUPPORT MATERIAL

- For more information about product stewardship visit:
http://en.wikipedia.org/wiki/Product_stewardship
- Product Stewardship Act 2011
<http://www.environment.gov.au/settlements/waste/product-stewardship/index.html>
- GoAnimate for Schools: includes lesson gallery, presentations, tutorials and FAQs. http://goanimate4schools.com/public_index

EXTENSION ACTIVITIES

Ask students to draw a picture of an environment which is special to them. It may be a park, river, beach or cave. What do they like about this special environment? Describe the sounds, smells and activities that they enjoy doing at the place. Why do they think it is important to look after this special place? Do they feel a responsibility to look after the place for future generations to enjoy?

MODULE 11.

HOW TO RUN A MOBILEMUSTER



LESSON OBJECTIVE

In this module students will be provided with the skills to take action in running a MobileMuster. They will develop the understanding and skills necessary to act responsibly and create an event that will inform and persuade others to take action for sustainable futures.

AUSTRALIAN CURRICULUM CONTENT DESCRIPTION

YEAR 4 ENGLISH

- Create literary texts by developing storylines, characters and settings ([ACELT1794](#))
- Plan, rehearse and deliver presentations incorporating learned content and taking into account the particular purposes and audiences ([ACELY1689](#))
- Create literary texts that explore students' own experiences and imagining ([ACELT1607](#))

YEAR 5 ENGLISH:

- Plan, rehearse and deliver presentations for defined audiences and purposes incorporating accurate and sequenced content and multimodal elements ([ACELY1700](#))
- Understand the use of vocabulary to express greater precision of meaning, and know that words can have different meanings in different contexts ([ACELA1512](#))

YEAR 6 ENGLISH:

- Plan, draft and publish imaginative, informative and persuasive texts, choosing and experimenting with text structures, language features, images and digital resources appropriate to purpose and audience ([ACELY1714](#))

YEAR 7 ENGLISH:

- Plan, rehearse and deliver presentations, selecting and sequencing appropriate content and multimodal elements to promote a point of view or enable a new way of seeing ([ACELY1720](#))
- Plan, draft and publish imaginative, informative and persuasive texts, selecting aspects of subject matter and particular language, visual, and audio features to convey information and ideas ([ACELY1725](#))

YEAR 8 ENGLISH

- Create imaginative, informative and persuasive texts that raise issues, report events and advance opinions, using deliberate language and textual choices, and including digital elements as appropriate ([ACELY1736](#))

YEAR 10 ENGLISH:

- Create sustained texts, including texts that combine specific digital or media content, for imaginative, informative, or persuasive purposes that reflect upon challenging and complex issues ([ACELY1756](#))
- Identify and explore the purposes and effects of different text structures and language features of spoken texts, and use this knowledge to create purposeful texts that inform, persuade and engage ([ACELY1750](#))
- Plan, rehearse and deliver presentations, selecting and sequencing appropriate content and multimodal elements to influence a course of action ([ACELY1751](#))

YEAR 9 ENGLISH

- Create imaginative, informative and persuasive texts that present a point of view and advance or illustrate arguments, including texts that integrate visual, print and/or audio features ([ACELY1746](#))
- Plan, rehearse and deliver presentations, selecting and sequencing appropriate content and multimodal elements for aesthetic and playful purposes ([ACELY1741](#))
- Use interaction skills to present and discuss an idea and to influence and engage an audience by selecting persuasive language, varying voice tone, pitch, and pace, and using elements such as music and sound effects ([ACELY1811](#))

LESSON OUTLINE

1. Introduce students to the concept of MobileMuster by visiting the website and watching the MobileMuster promise video.
2. To prepare for the muster, ensure that students undertake the following activities:
 - a. Where will the collection units be placed?
 - b. What is a visible and secure area for them to be displayed and stored for the duration of the muster?
 - c. How will students who return phones be recorded?

- d. What goals have been set on how many mobile phones could be collected?
3. Students could undertake a survey on how many old mobile phones they have in their home? Conduct this survey with other members of the school community.
 - a. Design and distribute a survey to your school community via the online survey website, www.surveymonkey.com
 - b. Promote the survey via the school newsletter and website.
 - c. Get a class representative to announce at each classroom that the survey needs to be completed before the muster.
 - d. Conducting a survey will give you an idea of how many phones to aim to collect.
4. Create a poster to advertise the MobileMuster event, this can be done individually, in groups or as a class. Use the MobileMuster website and access the Downloads: Make A Poster resources in the [MusterKids Zone](#). Share your poster on the MobileMuster website so that other school can see what your students have created.
5. Explore other ideas for promotion. Other ways that students can promote the mobile phone muster might include:
 - a. Writing articles for the school newsletter.
 - b. Sending an article to the local newspaper.
 - c. Announcing the event at the school assembly.
 - d. Sending an email to class parents so that it can be distributed around the school.
 - e. Setting up a display of old phones and information about MobileMuster during lunch time that students can visit.



6. Review the Muster. It's important to think about how effective or successful your school's muster was. Write a brief report for the school newsletter communicating the results of the MobileMuster.
 - a. Were the goals reached?
 - b. Was the promotion successful?
 - c. Did the event create awareness about recycling?
 - d. How could you improve the muster for next year?
7. Try to conclude the muster experience with some sort of celebration, thanking the students for their efforts. Share any records broken, or any rewards reached. Thank the students for making a difference. Encourage them to put these conservation/recycling practices into their everyday life.
8. Share your student work and upload the photos and stories of your MobileMuster to the [MusterKids Zone](#).

RESOURCES

Register for a Muster: Prior to running a muster the teacher will need to register with MobileMuster to receive collection units, tools to help promote your muster (e.g. template media releases, fact sheets, brochures, posters, stickers, screensaver, mouse mats) and to organize free pickups of the mobile phones collected. This can be done on the website www.mobilemuster.com.au or contact MobileMuster on 1300 730 070 during business hours.

MobileMuster Downloads: Make A Poster



SUPPORT MATERIAL

- MobileMuster website: www.mobilemuster.com.au

EXTENSION ACTIVITIES

Students are encouraged to share their knowledge about MobileMuster and speak with members of the community about recycling their mobile phones. Direct them to the MobileMuster website to locate the nearest drop-off location or request a pre-paid satchel.

MODULE 12. WASTE TO ART



Students will explore the relationships between the arts and the environment. Students will look at the relationship some artists play in raising public awareness about sustainability and environmental issues. They will also create an artwork made from recyclable materials including old mobile phones.

LESSON OBJECTIVE

Students will understand that art can portray an environmental message and apply the elements of design in order to communicate their environmental message on mobile phone recycling and persuading others to take action

AUSTRALIAN CURRICULUM CONTENT DESCRIPTION

YEARS 9 AND 10 VISUAL ARTS

- Manipulate materials, techniques, technologies and processes to develop and represent their own artistic intentions ([ACAVAM126](#))
- Plan and design artworks that represent artistic intention ([ACAVAM128](#))
- Analyse a range of visual artworks from contemporary and past times to explore differing viewpoints and enrich their visual art-making, starting with Australian artworks, including those of Aboriginal and Torres Strait Islander Peoples, and consider international artworks ([ACAVAR131](#))

YEAR 9 ENGLISH:

- Analyse how the construction and interpretation of texts, including [media texts](#), can be influenced by cultural perspectives and other texts ([ACELY1739](#))

YEAR 10 ENGLISH

- Analyse and evaluate how people, cultures, places, events, objects and concepts are represented in texts, including media texts, through language, structural and/or visual choices ([ACELY1749](#))

LESSON OUTLINE

1. Introduce the concept of environmental art by reviewing the Factsheet: Environmental Art and looking at the artwork created by Chris Jordan for MobileMuster. As a class discuss the questions at the bottom of the Factsheet.
2. Artist Case Study: Chris Jordan. View the artwork of environmental artist Chris Jordan. Students should begin by looking at his website and reviewing his collections [Chris Jordan Photographic images](#). Students should read the captions under each of his artworks and click on the images to zoom in/out on the website.
3. Complete Worksheet: The artwork of Chris Jordan and discuss how art can be a powerful tool for expressing ideas and how various forms of art can be used to spread environmental messages.
4. Create an artwork. Explain to students that they are going to create an artwork to encourage the public to recycle old mobile phones. Students can work on their artwork independently, but may work in groups or as a class in order to share ideas and resources.
5. Conceptualising the art work. Have a look at the [MusterKids Zone](#) and view the [MobileMuster Promise video](#) which details the importance of recycling old mobile phones and recovering materials. If students already have an idea for their artwork, go for it! If they need some help developing a concept undertake a brainstorming session.
6. Prior to construction students will need to choose what medium they will use when creating their artwork and what materials that will need to collect for their artwork.
7. During the construction stage the teacher will need to spend time observing and making suggestions about the student's art.

8. Create an artist's statement. Students will need to need to prepare an artist's statement in support of their work, explaining:
 - a. What inspired their artwork?
 - b. What elements of design are visible in their artwork?
 - c. How their choice of medium helped communicate their environmental message.
9. Ask the students to review their experience. Consider the following questions to guide the review:
 - a. What do you like most about the artwork?
 - b. What did you like most about creating the artwork?
 - c. How many different messages or themes can you find in the artwork?
What are they?
 - d. If you were to create the artwork again, what would you do differently?
 - e. Do you think that art is a good way to raise consciousness and empower communities to be more sustainable? Why or why not?
10. Display the student artwork in the school or local community to share the environmental message. Suggestions include:
 - a. Presenting it to the school principal at assembly and discuss the formation of the artwork;
 - b. Displaying the artwork at a special school event; and entering the artwork in a competition.

RESOURCES

1. Internet access
2. Factsheet: Environmental Art
3. Worksheet: [The artwork of Chris Jordan](#)
4. Images: [Chris Jordan Photographic images](#)
5. Materials for artworks (including old mobile phones)

SUPPORT MATERIAL

- TED Talk given by Chris Jordan, [Turning powerful stats into art](#)

EXTENSION ACTIVITIES

Ask students to find examples of other environmental artists. Students should review the artists and identify how they communicate their ideas.

REFERENCES

Australian Curriculum <http://www.australiancurriculum.edu.au/>

Australian Government Department of the Environment and Heritage, Australian Research Institute in Education for Sustainability and Macquarie University (2009) Education for sustainability: The role of education in engaging and equipping people for change.

Australian Government Department of the Environment, Water, Heritage and the Arts, (May 2010) Sustainability Curriculum Framework: A guide for curriculum developers and policy makers.

Groupe Speciale Mobile (GSM) Association report (2007) Mobile Phone Lifecycles: Use, Take-back, Reuse and Recycle.

GLOSSARY

Basel Convention: United Nation Environment Programme (UNEP) Convention of 22 March 1989 on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, which came into force in 1992.

Biodegradable: Capable of being decomposed by biological agents, especially bacteria: a *biodegradable* resource

Brominated: When something is combined with Bromine, it produces a heavy, volatile, corrosive, reddish-brown, non-metallic liquid element, having a highly irritating vapour.

Cadmium: a ductile metal which may be used in the production of new batteries.

Components: Parts or items removed from used mobile phones, which may include batteries, electronic components, circuit boards, keyboards, displays, housing or other parts or items.

Cradle to grave: the full life cycle of a product from raw materials (cradle) to the disposal phase (grave).

Dioxins: A toxic compound. The mobile phone recycling process is successful in preventing the reformation of dioxins from brominated fire retardants injected into plastics in an environmentally approved manner.

Environment: all the surroundings, both living and non-living.

Furans: a toxic compound. The mobile phone recycling process is successful in preventing the reformation of furans in an environmentally approved manner.

Hazardous waste: household garbage that is not usually accepted into mobile garbage bins by local councils.

Landfill: a site for the disposal of waste materials by burial in the ground.

Manufacturing: the act of making something (a product) from raw materials.

Non-renewable resources: resources (energy or materials) that will eventually run out if we use them faster than they can be replaced naturally.

Obsolete: as technologies continue to rapidly improve, these improvements can be significant enough to rapidly render predecessor technologies obsolete.



Product Stewardship: a concept of shared responsibility by all sectors involved in the manufacture, distribution, use and disposal of products.

Recycling: the recovery of used material for manufacture into new products.

Recyclable: materials that can be processed into new products to prevent waste.

Renewable Resources: resources (energy or materials) that don't run out when we use them.

Reuse: A process of using a used mobile phone, or a functional component from a used mobile phone, again, possibly after repair, refurbishment or upgrading.

Sustainable Development: development which meets the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainability: the ongoing capacity of Earth to maintain life.

Used mobile phone: a mobile phone which its owner does not intend to use any longer.



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Should you have any feedback on the content of the MobileMuster Teachers Guide please email your comments to mobilemuster@amta.org.au