

STEM Learning Package

The impacts we hear

6

Sometimes reality is too
complex. Stories give it form.

Jean Luc Godard

Let's be aware of the impact
we have, in all ways, and not
just those ways we wish.

Donald T Iannone

Narrative imagining – story – is the fundamental instrument of thought. Rational capacities depend upon it. It is our chief means of looking into the future, or predicting, of planning, and of explaining.

Mark Turner

It's not what you look at that
matters; it's what you see.

Henry David Thoreau

If you change the way you look at things,
the things you look at change.

Wayne Dyer

Learning intention & student outcomes



Overview

- Students will study the effects of Big World Problems based on different human perspectives. They will examine big world problems affecting humanity and choose to investigate one of them in depth through the lens of three chosen perspectives.
- One of the perspectives must be investigated through the lens of Aboriginal and Torres Strait Islander Histories and Cultures. They may listen and analyse stories and music that convey Aboriginal and Torres Strait Islander perspectives on their selected issue.
- Another lens must be investigated through an international perspective and must incorporate a culturally diverse angle.
- Lastly, students study the human experience of their selected issue through their local and most familiar lens, through listening to stories and music from their community members. As a result of their investigations, students identify the similarities and differences between the three perspectives and analyse the cause of those variations.

Parallel experiences through stories

- Through drama and music, students produce a representation of the three perspectives with the aim of building connections between people and creating a more compassionate and conscious understanding of the issue affecting different people.
- ‘The Impacts We Hear’ will culminate in a production of three parallel experiences represented through storytelling, music and movement.
- Students will make a direct connection between the different impacts felt across different human angles. They will be able to communicate their learning they undertook through hearing (through English and History) the three chosen human perspectives.

ACARA Learning Areas

Year 10 Music

Achievement standards: Students use their understanding of music-making in different cultures, times and places to inform and shape their interpretations, performances and compositions.

- Plan and organise compositions with an understanding of style and convention, including drawing upon Australian music by Aboriginal and Torres Strait Islander artists.
- Analyse a range of music from contemporary and past times to explore differing viewpoints and enrich their music-making, starting with Australian music, including the music of Aboriginal and Torres Strait Islander Peoples, and consider music in international contexts.

ACARA Learning Areas

Year 10 History

Achievement standards: By the end of Year 10, students refer to key events, the actions of individuals and groups, and beliefs and values to explain patterns of change and continuity over time. They analyse the causes and effects of events and developments and explain their relative importance. They explain the context for people's actions in the past. Students explain the significance of events and developments from a range of perspectives. They explain different interpretations of the past and recognise the evidence used to support these interpretations.

- The significance of the following for the civil rights of Aboriginal and Torres Strait Islander Peoples: 1962 right to vote federally; 1967 Referendum; Reconciliation; Mabo decision; Bringing Them Home Report (the Stolen Generations), the Apology
- Describing accounts of the experiences of Aboriginal and Torres Strait Islander people who were forcibly removed from their families

ACARA Learning Areas

Year 10 English

Achievement standards: Productive modes – Students explain different viewpoints, attitudes and perspectives through the development of cohesive and logical arguments. They develop their own style by experimenting with language features, stylistic devices, text structures and images.

- Analysing the ways socio-cultural values, attitudes and beliefs are presented in texts by comparing the ways news is reported in commercial media and Aboriginal and Torres Strait Islander media

ACARA Learning Areas

Year 10 Drama

Achievement standards: Students use their experiences of drama practices from different cultures, places and times to evaluate drama from different viewpoints.

- Practise and refine the expressive capacity of voice and movement to communicate ideas and dramatic action in a range of forms, styles and performance spaces, including exploration of those developed by Aboriginal and Torres Strait Islander dramatists
- Analyse a range of drama from contemporary and past times to explore differing viewpoints and enrich their drama making, starting with drama from Australia and including drama of Aboriginal and Torres Strait Islander Peoples, and consider drama in international contexts

ACARA Learning Areas

Mathematics Year 10

Achievement standards: Statistics and probability; Data representation and interpretation – Students compare data sets by referring to the shapes of the various data displays. They describe bivariate data where the independent variable is time. Students describe statistical relationships between two continuous variables. They evaluate statistical reports.

- Evaluate statistical reports in the media and other places by linking claims to displays, statistics and representative data (ACMSP253)
- Use scatter plots to investigate and comment on relationships between two numerical variables (ACMSP251)

ACARA Learning Areas

Note: Ideally, this learning package would be delivered by a teaching team consisting of an educator from each learning area. However, the learning can be delivered in a collaborative unit of at least two of these areas.

Pedagogical/Androgogical/Heutagogical Options

Cross-disciplinary learning package for:

- Enquiry based learning
- Project/Problem-based learning
- STEM-focused learning design

Provides teachers with resources for delivering the learning intentions against cross-disciplinary ACARA achievement standards.

Teachers are encouraged to provide students with self-directed learning opportunities rather than opting to deliver in traditional teacher-guided modes.

General capabilities

- **Intercultural Understanding:** Investigate culture and cultural identity; explore and compare cultural knowledge, beliefs and practices; develop respect for cultural diversity; communicate across cultures; consider and develop multiple perspectives; empathise with others; reflect on intercultural experiences; challenge stereotypes and prejudices; mediate cultural differences
- **Personal and Social:** Appreciate diverse perspectives; contribute to civil society; understand relationships
- **Critical and Creative Thinking:** Inquiring – identifying, exploring and organising information and ideas
- **Literacy:** Compose spoken, written, visual and multimodal learning area texts; use language to interact with others; deliver presentations

Entrepreneurial skills & dispositions

- Multicultural understanding
- Global competence
- Social intelligence
- Listening with understanding and empathy
- Curiosity and inquisitiveness
- Perceptive awareness
- Communication
- Collaboration

Time duration

Day's challenge to full term's study

Mode

Face to face | Online in synchronous & asynchronous learning

- Can be delivered across a collaborative class shared between English, History, Music and Drama teachers

Multi-disciplinary connections

Drama/English/History/Maths/Music

Aspects of learning through this interdisciplinary STEM learning package provides students to develop the following skills, knowledge and dispositions:

- Consider and develop multiple perspectives
- Empathise with others
- Reflect on intercultural experiences
- Challenge stereotypes and prejudices
- Mediate cultural differences
- Appreciate diverse perspectives
- Contribute to civil society
- Understand relationships
- Identify, explore and organise information and ideas
- Compose spoken, written, visual and multimodal learning area texts
- Use language to interact with others
- Deliver presentations

Lesson implementation

Lesson aims:

- Familiarise students with the big world problems affecting humanity
- Understand the intended learning and learning objectives

Part 1: Introduction

- Introduce students to the ‘Global Issues’ or ‘Big World Problems’ (BWP) that affect humanity [Please see [Additional Resources on page 36](#)].
- Explain to students that they will be selecting an issue to examine in-depth individually, as a group, or within the class. Students will ultimately explore the evidence of the selected issue from three chosen perspectives.
- Students will need to connect with their local and international community to enquire about the effects of their chosen issue on each perspective:
 1. Aboriginal and Torres Strait Islander Histories and Cultures
 2. One chosen international perspective (ideally, choose a culture/country where you have access to contacts)
 3. Your own local community

Stories have to be told or they die, and
when they die, we can't remember
who we are or why we're here.

Sue Monk Kidd

A story has its purpose and its path. It must be told correctly for it to be understood.

Marcus Sedgwick

Any fool can know.
The point is to understand.

Albert Einstein

Part 2: Body & Content

- Students will select democratically as a class, in groups or individually (as per teacher discretion) the problem they would like to examine in more depth.
- Use the ETPG toolkit (p9) '5 Steps to guide any classroom to identify and design a simple reciprocally beneficial interaction with industry and community'. This tool will help students organise a connection between them and another contact from their three chosen perspectives.

Note: You may find local organisations that can help provide you with the right contacts that will help you gain the insights you need to understand each perspective. Search for relevant community centres, cultural associations, clubs and organisations.

- Design introduction emails/calls and interviews with relevant questions regarding the effects of their chosen 'big world problem' on that community.

- Organise a cultural immersion experience. The aim is to prepare students to listen and understand empathetically to stories (as primary data) that provide them with insights into the issue and how it is experienced by their chosen human perspective.
- Use the primary and secondary data that help students make parallel comparisons and capture the differences and similarities of each perspective.

Parallel experiences through stories:

- Students use their findings to create three parallel stories represented through music and drama.
- Through these stories, students aim to evoke empathy and build connections between people. Students' outcomes should be communicated to create a more compassionate and conscious understanding of the issue affecting different people.

Students manage the collaborative creation of their production, including event organisation and stage. This learning should be undertaken in groups, therefore, jobs need to be distributed and group dynamics established.

Prompt groups to:

- Identify group name, team members, why each member cares about the issue they selected. Perhaps they can also design a team logo, mascot or slogan, depending on time allowances. Clearly identify their three human perspectives and the issue of focus.
- Allocate roles (such as designer, writer, narrator, sound engineer etc). You may wish to use the last slide on 'jobs of the future' to engage students and help them understand the relevance of the work they are undertaking.
- Allocate jobs and responsibilities (such as designing or gathering props, rehearsal duties, voice practice, etc.) to each team member responsible for completing the tasks.
- Assign due dates for poems, lyrics, scripts etc. Coordinate progress reviews and rehearsals.
- Establish a cross-group feedback session with enough time to make improvements.
- Iterate their work based on feedback

Production inclusions (as per assessment criteria):

- Each group's production should be a maximum of 15 minutes and a minimum of 6 minutes, allowing 2-5 minutes for each perspective they will share
- Each production should display the information students gathered throughout their investigations about their three perspectives.
- Each group should communicate their stories through music, lyrics, and verbal communications (planned through script writing).
- Ideally, the three parallel stories should be delivered simultaneously and/or connected with each other through a blending feature

Example 1:

A group of students chose to study the environmental impacts (more specifically on plastic pollution) on the following three perspectives:

1. *The Bungandidj people, who are the traditional custodians of the Mount Gambier region of SA.* Students gained primary data by connecting and inviting a member to share their stories with the class. They gained insights into this community's perspective on the effects of plastic pollution on their community.
2. *Brazilians and plastic waste in the Amazon basin.* Students used their connection to a local Brazilian member of their community to gain further insights, but gained most information through Brazilian music and secondary sources such this [video](#).

3. *Their own school community.* Students asked their parents, teachers and close community network to share the changes and challenges they've experienced regarding plastic pollution and enquire with their local council regarding data on this issue. They also found secondary data.

Students then constructed a play with three background settings. Each setting had artefacts from each culture.

A student narrator dressed as 'industrialisation' slowly walked across each section. Only the section the narrator is crossing was active, the other two were frozen in time.

The active scenes displayed the story of each perspective.

As the narrator walk across, the background music and words also change.

Example 2:

Students could look at the impacts of land clearance on indigenous peoples of the world.

If students are looking at the sub-problem of land clearance through a cultural lens, place or mass, they might examine the data about hectares of land cleared in Australia since colonisation.

In comparison, they could also look into the hectares of land clearance in the Amazon.

Both of these perspectives have ample of online data students could access. Students can then use this data to embed it within the stories or even produce the story from the data found.

Some data visualisation resources to inspire your students:

<https://youtu.be/wvsE8jm1GzE>

<https://youtu.be/AdSZJzb-aX8>

<https://youtu.be/zb0C3HE7Qvw>

https://youtu.be/wxmG_jxJiw

Part 3: Story-fying their findings

Students capture and visualise the story within data. This storyfying of data allows students to analyse, abstract and synthesise and communicate the information they find.

There are many existing resources for helping students visualise data graphically and visually.

In a world where data is increasingly valued, understanding and extrapolating meaning from data is a highly valuable skill in the world of work.

Resources



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Additional resources

- ETPG toolkit
- Global food supply
- Economic growth and social inclusion
- Environment and natural resources
- The future of the global financial system
- Gender parity
- International trade and investment
- Infrastructure and development
- Top challenges for the future of humanity
- Limestone Coast Community Directory
- The Riddoch Arts and Cultural Centre
- Pangula Mannamurna Aboriginal Corporation
- City of Mount Gambier Council
- District Council of Grant

Jobs & industry



Associated jobs of the future

The skills, knowledge and experience of undertaking this learning experience can equip students for the following jobs of the future.

Teachers can use this engagement tool to help students understand the relevance of this learning to their future world of work.

Analogue experience guide

Analogue experience guides will help people unplug from digital life and reconnect with the natural world, without digital implants or augmented reality.

Food knowledge communicator

Food knowledge communicators will help people to change their relationship with food, making it healthier and more ethical.

Haptic technology designer

Haptic technology designers will create realistic touch control, touch sensing, and motion tracking to virtual and augmented reality.

Media remixer

Media remixers will combine a variety of media from across time to create blended one-of-a-kind products or experiences.

Multisensory experience designer

Multisensory experience designers will bring together virtual reality, haptic and biofeedback/biometric technologies to create fully immersive games and leisure activities, marketing campaigns, and education/training.

Swarm artist

Swarm artists will use drone swarms to create art, music, or performance-based cultural experiences.

Space tourism operator

Space tourism operators will lead real-life tours across the solar system.

Sportsperson of the future

Sportspeople of the future will engage in competitive sports, supported by the latest in technological advances.

Virtual and augmented reality experience creator

Virtual and augmented reality experience creators will design digital and virtual experiences for healthcare, marketing, or entertainment.

Virtual assistant personality designer

Virtual assistant personality designers will custom-program virtual assistants and tailor them to their client's needs.

Links with industry

Depending on the problem chosen, students can examine the effects and impacts of the problem on local businesses. By researching and enquiring about these repercussions on businesses, students can come across opportunities to innovate and collaborate with industry on real issues they face. The ability to ideate and use creative thinking to help solve a problem affecting the community is an essential skill valued by current and future industries. Liaising with local businesses provides students with an increased potential to generate solutions that matter.

Note: Use the ETPG tool '5 Steps to guide any classroom to identify and design a simple reciprocally beneficial interaction with industry and community' (Please see [Additional Resources on page 36](#)).

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