



## Assessment task

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The Interconnections unit of the K–10 Geography syllabus gives teachers and students an exciting opportunity to explore the connections that link our lives to people living all around the globe. The products we buy and use, and the actions we undertake, link us with people in some of the most distant parts of the world through trade. What's more, new communication technologies allow us to interact with people with increasingly less fictional effects from distance.

In my school context, we wanted to find an assessment task that would enable a range of conversations about these links and allow students to explore the commodity chains associated with a range of consumer items in Australia. As a group of teachers, we were familiar with the environmental and ethical issues of resources like coltan, palm oil, cotton, cocoa and lithium, so we wanted an assessment task that would allow students to demonstrate that they could make the connections between the items they buy, and the positive and negative impacts felt around the globe.

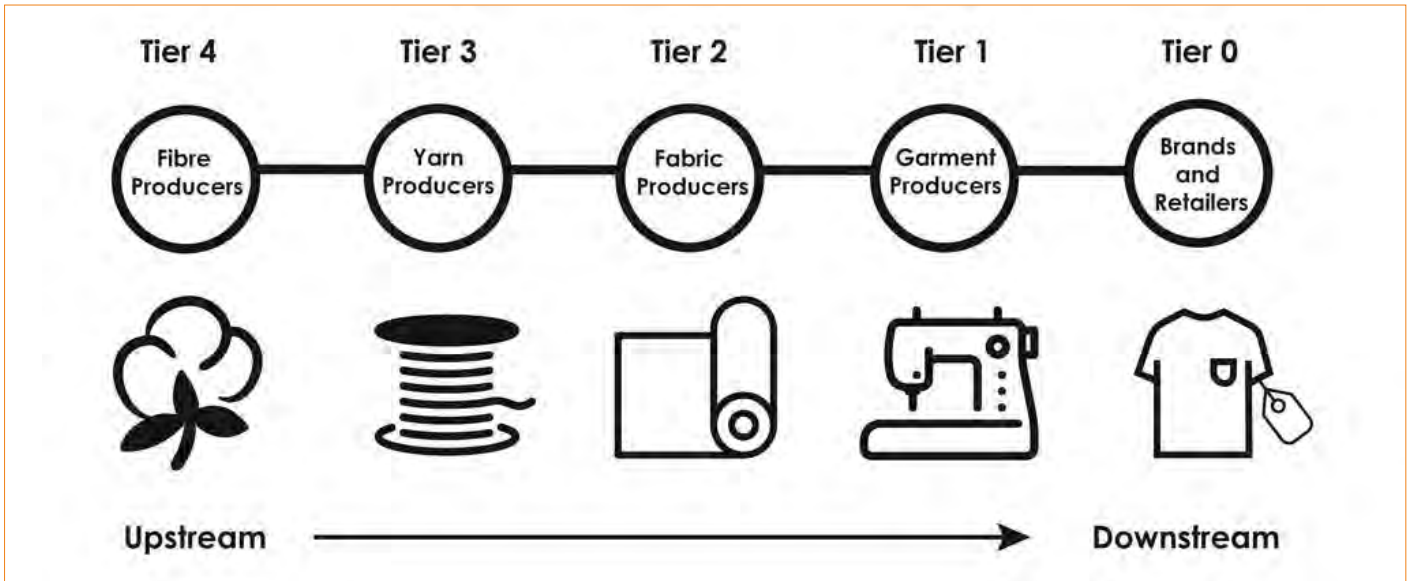
The assessment uses student research to produce a scaffolded report. The report format combines both visual mapping exercise with literacy skills to create a strongly geographical style of communication being assessed. As students are allowed to bring two photos in to support their response there are also some photo

skills being demonstrated in this task. However, the critical literacy resulting from students developing their understanding the perspectives and connections between people and places is really the main aim of this task.



Garment manufacturing, Pakistan. Source: [https://commons.wikimedia.org/wiki/File:USAID%27s\\_Firms\\_Project\\_\(10587583886\).jpg](https://commons.wikimedia.org/wiki/File:USAID%27s_Firms_Project_(10587583886).jpg)

# INTERCONNECTIONS



GTA NSW & ACT has also produced a new poster resource “Minerals in a Smartphone” which would act as a valuable research source and a model for the finished product expected of students. This assessment gives teachers an opportunity to extend classroom discussions from the impacts of commodities into areas like raw material certification or models of circular or ethical consumption. Moreover, as so much of Australia’s trade occurs with Asia, the task can easily be adapted to meet the Asia and Australia’s Engagement with Asia topic.

**1 BORAX: BORON**  
An alloy of boron, neodymium and iron is used to make the strong permanent magnets used in the speakers, headphones and in the vibration unit of a smartphone. Turkey and USA are the largest producers of boron.

**2 PALLADIUM (native)**  
Palladium is used in smartphone electrical circuits and contacts. Palladium can be found in its elemental form or alloyed with other platinum group metals (e.g. platinum and iridium) or with iron. Palladium is largely obtained as a by-product of copper and nickel mining. Russia and South Africa currently produce most of the world's palladium.

**3 WOLFRAMITE: TUNGSTEN**  
The stability and high melting temperature of tungsten means that it can be used in smartphones for electrical connections and to absorb and redistribute excessive heat. Wolframite and scheelite are rare minerals used for tungsten. Wolframite is considered to be a conflict mineral due to unethical mining practices in the Democratic Republic of Congo. The top producers of tungsten are China (over 80% of world production), Vietnam and Russia.

**4 GRAPHITE: CARBON**  
Graphite conducts electricity and is heat resistant. It is used as a negative electrode in smartphone rechargeable batteries. Graphite is a naturally occurring allotrope of carbon which can be found in metamorphic rocks, igneous rocks and in meteorites. China produces almost all of the world's graphite, with smaller quantities coming from India.

**QUARTZ: SILICON 5**  
The processor in a smartphone, the brain that can respond to instructions, is made from thin layers of silicon. A mixture of silica with alumina is used to manufacture smartphone glass screens. Potassium also helps to strengthen the screen. Silicon is largely sourced from quartzite or quartz sand. China is by far the world's largest producer of silicon, followed by Russia and Norway.

**14 BERYL: BERYLLIUM**  
Beryllium is used to make battery contacts and electrical connectors in smartphones. Beryllium is extracted from ores with the current leading producers being USA, China and Mozambique.

**13 SPHALERITE: ZINC**  
Zinc is used in smartphone circuit boards and when alloyed with aluminium can increase the strength of smartphone cases. Almost 95% of all zinc we use comes from sphalerite ore that contains trace amounts of indium and gallium important for making screens, touch sensitive. Most of the world's sphalerite comes from China, Peru and Australia.

**12 CHALCOPYRITE: COPPER**  
Copper's high electrical and heat conductivity make it ideal for use in the electrical wiring of a smartphone. Chalcopyrite is the most important ore mineral for copper, but copper can also be found in other minerals as well as in its elemental form. Chile, Peru and China are currently the largest producers of copper.

**MONAZITE: RARE EARTH ELEMENTS 6**  
The mineral monazite is extremely important as a source of rare earth elements (REE). REEs are used in small amounts in smartphone electrical circuitry, vibration units, speakers, glass polishing and to make the vivid colours in smartphone displays. Currently more than 90% of the world's REEs come from China.

**7 CASSITERITE: TIN**  
Tin is used in smartphones for soldering different metal components together. Tin is also used with indium to make indium tin oxide, a thin, transparent and electrically conductive material used to make touchscreens. The most important source of tin is from the ore mineral cassiterite. The current leading producers of tin are China, Indonesia and Myanmar.

**8 GOLD (native) 8**  
Tiny amounts of gold are used in smartphone circuit boards as gold is a very stable element and a conductor of electricity. Gold is usually found in its elemental form in alluvial placer deposits or associated with hydrothermal veins. The current leading producers of gold are China, Australia and the USA.

**11 TANTALITE: TANTALUM**  
Tantalum is used to manufacture the anodes in smartphone capacitors, the components that store electrical charge. The current leading producers of tantalum are the Democratic Republic of Congo, Rwanda and Brazil. The mining of tantalum has caused extensive social and environmental problems in the Democratic Republic of Congo and is recognised as a conflict mineral.

**10 SPODUMENE: LITHIUM**  
Lithium is used in lithium-ion batteries, the rechargeable batteries found in smartphones and most other electronic devices. Lithium can be extracted from lithium chloride salts found in brine pools. Most of the world's lithium brines come from Chile and Argentina. The minerals spodumene, petalite and lepidolite are also commercially viable sources. Australia is the current leading producer of spodumene.

**9 BAUXITE: ALUMINIUM**  
Aluminium is one of the most abundant elements found in a smartphone. It's in the outer case, battery case, circuit board, glass screen and even in the camera lens as a synthetic sapphire glass almost as hard as diamond. Almost all aluminium we use comes from bauxite ore. Currently Australia, China and Brazil are the leading producers of bauxite.

**MINERALS IN A SMARTPHONE**

Did you know that your smartphone is a mine of precious metals and rare elements? In fact, the average smartphone uses 75 out of the 81 stable (non-radioactive) elements in the periodic table, 62 of which are metals. All elements in a smartphone, both rare and abundant, come from minerals, usually from metal ores, which must be located, extracted, processed and refined. A small, but growing, proportion of smartphone metals come from metal recycling. With an ever increasing demand for smartphones and concerns over supply security as well as environmental and social issues, innovative technologies are required to source and extract minerals and to use them more efficiently.

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Mineral Resources Data website (www.earth.gov.au) © 2014 Mineral Resources  
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Minerals in a Smartphone poster available from <https://www.gtansw.org.au/order-resources/>

## Interconnections – Stage 4 Geography

### Assessment Task HSIE Department

Date of issue:	n/a
Weight:	30%
Course:	Geography
Task number:	2

Due date:	n/a
Nature of task:	In-class Writing Task
Topic:	Interconnections (Stage 4 Geography)
Year group:	Year 8

#### Outcomes Assessed:

- GE-1 locates and describes the diverse features and characteristics of a range of places and environments.
- GE4-3 explains how interactions and connections between people, places and environments result in change.
- GE4-4 examines perspectives of people and organisations on a range of geographical issues.
- GE4-7 acquires and processes geographical information by selecting and using geographical tools for inquiry.
- GE4-8 communicates geographical information using a variety of strategies.

#### Assessment Location

- Students will complete the assessment in their regular classroom.
- Specific learning needs adjustments: Student will be supplied with a scaffolded version where appropriate.

#### Academic honesty and extensions on due dates

Students are reminded that all work submitted for assessment must be original and one's own work, except where acknowledgement is made to the original author (using the APA referencing method) or where collaboration with another student is a mandated requirement of the task. Students must submit any Hand-In assessment through Turn-it-in in order to validate the authenticity and integrity of the student's material.

The school's assessment policy requires all extensions on the due date be coordinated by the Director of Curriculum. Students applying for leave will be required to complete the task on the due date or, if this is not possible, before the due date unless there are exceptional circumstances.

The school applies a standard penalty for late submission of assessments of 10% of the total per day.

## Interconnections – Stage 4 Geography

### Context and description of assessment activity

Geographies of interconnection demonstrate how people and their product choices and/or actions, are connected to places throughout the world in a variety of ways. Interconnections help to change people, places and their environments on a global scale.

In this assessment task, students will select and research the impacts resulting from the life cycle of ONE PRODUCT and produce a visual report. Students may select from the products listed in the boxes below. Students should investigate the impacts on people, places and environments resulting from the supply chain of the selected product. Students may present information from the products raw materials, through to its production, consumption and its disposal.

Phone (iPhone)	Cars (Tesla)	Snacks (Tim Tam)	Clothing (Levi Jeans)
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### In-Class Visual Report

In a 45-minute period, students will write an introduction about their product and annotate a world map with detailed descriptions about the impacts of a product on people, places and environments. The annotations that students make can also refer to two relevant 10cm x 10 cm photographs that students may bring into the assessment.

Students will be provided with an A3 scaffold for this visual report.

Students will be required to locate their annotations on a political world map using an appropriate legend. Students should describe two impacts on each of the topics of people, places or environments. It would be ideal if these descriptions cover the entire life cycle of a product from raw material production through to disposal.

### Performance criteria for assessing learning

Students will be marked on the quality of geographic detail and the clarity of their communication of geographic ideas.

### Feedback

Verbal feedback may be given to students to aid their research prior to the task submission.

An annotated marking criteria and annotations on the task will be presented with the task when it is returned.

**This assessment task has been included in the Appendix.**

## Interconnections – Stage 4 Geography

	<b>A Grade</b> Extensive knowledge and very high competence	<b>B Grade</b> Thorough knowledge and high competence	<b>C Grade</b> Sound knowledge and adequate competence	<b>D Grade</b> Basic knowledge and Limited competence	<b>E Grade</b> Elementary knowledge and very limited competence
GE-1 locates and describes the diverse features and characteristics of a range of places and environments.					
GE4-3 explains how interactions and connections between people, places and environments result in change.					
GE4-4 examines perspectives of people and organisations on a range of geographical issues.					
GE4-7 acquires and processes geographical information by selecting and using geographical tools for inquiry.					
GE4-8 communicates geographical information using a variety of strategies.					

# INTERCONNECTIONS

## Interconnections – Stage 4 Geography

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**Place**

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**Environment**

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**Figure A.**



**Figure B.**

**People**

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**Place**

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**Environment**

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