

Kangaroo Poo Glue

- Year 4 – Science, Design Technologies
- Year 5 – Design Technologies
- Year 6 – Science, Design Technologies



(Science; Yr 4, ACSSU074)

Natural and processed materials have a range of physical properties that can influence their use

(Science; Yr 6, ACSHE100)

Scientific knowledge is used to solve problems and inform personal and community decisions

(Design Tech; Yr 3&4, ACTDEK010)

Recognise the role of people in design and technologies occupations and explore factors, including sustainability that impact on the design of products, services and environments to meet community needs

(Design Tech; Yr 3&4, ACTDEK011)

Investigate how forces and the properties of materials affect the behaviour of a product or system

(Design Tech; Yr 3&4, ACTDEK013)

Investigate the suitability of materials, systems, components, tools and equipment for a range of purposes

(Design Tech; Yr 3&4, ACTDEP014)

Critique needs or opportunities for designing and explore and test a variety of materials, components, tools and equipment and the techniques needed to produce designed solutions

(Design Tech; Yr 5&6, ACTDEK019)

Examine how people in design and technologies occupations address competing considerations, including sustainability in the design of products, services, and environments for current and future use

(Design Tech; Yr 5&6, ACTDEK023)

Investigate characteristics and properties of a range of materials, systems, components, tools and equipment and evaluate the impact of their use

Cross-curriculum priorities

Aboriginal and Torres Strait Islander histories and cultures;
Sustainability

Kangaroo Poo Glue

Tool technology from ancient knowledge

The One with the Poo includes an interesting aside about technology – old and new. Aunty Dale tells Billy, Maddy and Lucy how she makes glue out of kangaroo poo, resin and charcoal. Not only does this mean the Noongar people make the greatest possible use of animal products, they're also creating a flexible, strong, heat-bonded glue that is perfect for making tools.

Equipment:

An eraser that will bend

A piece of chalk or a thin twig that will snap when bent

Internet devices for student research

Duration:

45 – 60 minutes

Location:

The classroom

Notes:

Let's stick together

👁 Watch **The One with the Poo**, specifically the part where Aunty Dale explains how she makes kangaroo poo glue.



- Watch the segment twice if needed and ask students to explain the basic process to you.
- ◇ What are the ingredients, other than kangaroo poo? (Resin and charcoal, both ground to a powder.)
- ◇ What else is needed? (Heat!)
- ◇ What is this glue used for?
- A transcript of the segment is included for you included below and may be useful.

Stuck on you

- Show students the eraser and how it bends.
- Show them the chalk/twig and how it snaps.
- Aunty Dale describes some of the properties and/or characteristics of the glue.
- Which characteristic might be helpful in making an axe? Clue: we want to be able to use it for a long time without the head snapping off.
- Discuss the idea that flexible materials can be better than brittle materials for certain things. Define the words if needed.

Lexicon

Composite material

A material that is made of several different parts usually glass wood and/or plant fibres bound together by resin. Composites can be strong, light-weight and flexible.

Thermoplastic material

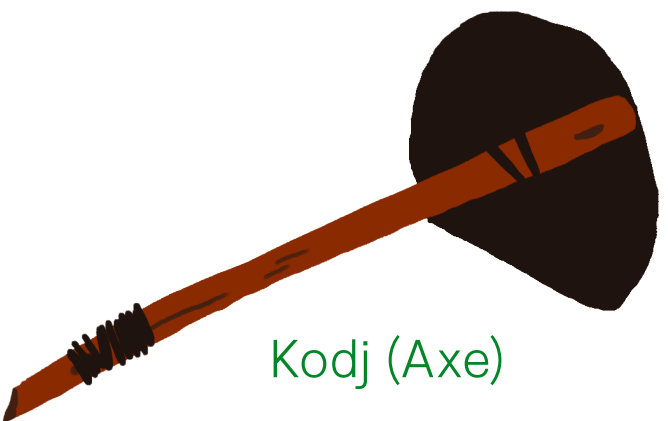
A material that becomes flexible when exposed to heat (i.e. 'thermo'). It can be formed and cooled to harden. It can be reheated and reformed more than once.

Taking it further

- Listen to Aunty Dale's comments about fibreglass.
- Divide the class into four groups:
 - ◇ Group 1 finds out the basic components of composite materials and explains them to the class.
 - ◇ Group 2 researches and tells the class ten things that are made from composite materials such as fibreglass. Why is the material good for these things?
 - ◇ Group 3 explores spear-making and axe-making technology in Australia. They show the class images of axes and spears, and possibly a knife like the one Aunty Dale mentioned.
 - ◇ Group 4 researches and tells the class about three new (or new to them) uses for glue.
- Resources (right) should provide some help.
- Allow time for research (more time for deeper projects could be assigned in later sessions.)
- Bring the class back together to discuss:
 - ◇ What did we discover?
 - ◇ What did it make us want to investigate further?
 - ◇ Was there anything we didn't understand?
- Explore the idea that ancient technology relies on an understanding of a material's properties, such as their most appropriate use and how they perform when heated and cooled.
- As a class, compare the kangaroo poo glue with modern composite fibre. What is the same, and what is different? Which is more sustainable? Make a comparison chart together and discuss questions the class would like to explore about valuable knowledge in ancient technology.



Taap (knife)



Kodj (Axe)

Resources:

- ◇ Australian Geographic – Aboriginal Inventions: 10 enduring innovations: <http://www.australiangeographic.com.au/topics/history-culture/2015/03/aboriginal-australian-inventions>
- ◇ Bushcraft Oz – a forum, chatting about using resin from grass trees to make glue: <http://bushcraftoz.com/forums/archive/index.php/t-3069.html>
- ◇ Composite material: https://en.wikipedia.org/wiki/Composite_material
- ◇ Construction material from coconut waste: <https://www.wur.nl/en/show/Construction-material-from-coconut-waste.htm>
- ◇ Crystal & Minerals – Teacher Guide – Earth Science Western Australia (PDF): www.earthsciencewa.com.au/mod/resource/view.php?id=1600
- ◇ Koori History – Grass Tree Resin (Xanthorrhoea): <http://koorihistory.com/grass-tree-resin/>
- ◇ New Scientist – Skyscrapers of the future will be held together with glue: <https://www.newscientist.com/article/2079877-skyscrapers-of-the-future-will-be-held-together-with-glue/>

Transcript

Dale	When I said we used all of the kangaroo, we used all of the kangaroo, even the poo.
Billy	What did that taste like?
Dale	We weren't eating that.
Lucy	Yeah, Billy.
Dale	We were making glue with it, kangaroo poo glue.
Lucy	Why don't they use it now?
Dale	I still do. I still make glue that way. I go to the grass trees. I get the resin from the grass trees. I grind it all up. Then I'll go to a fire and I'll get the charcoal from the fire, and I'll grind it all up. I'll get some kangaroo poo ... not too fresh, dry a few days, not too old, just right ... and crush it up in my hands. Kangaroos only eat grass and leaves.
Lucy	Okay.
Dale	Then I end up with some fibre that reflects what they eat. They only eat grass and leaves and things. Then I'll mix all of those three things together. I'll get my handle and warm it over the flame. I'll roll it in the powder. Some will stick because of the resin reacting to the heat, will get sticky. Then back over the flame, back through the powder until I get enough of the glue mix on my handle. Then I will coat it with the powder, nice and thickly, so that I can shape it without burning myself, because the glue makes it hot like toffee underneath it. I'll get my stone or stones and I'll slide it into that glue mix. Then I'll pull it over the cutting edges. Then I'll melt that last bit of powder and stand it in the sand and let it cool and harden. If I've just used a single stone, that's a kodj, an axe. If I've got lots of little cutting edges in it, that's a taap or knife.
Dale	Now the technology behind that glue is really interesting. Think about the ingredients that we've used. We've got some charcoal. We've got some resin. We've got some kangaroo poo. Think about modern-day fibreglass. It's resin with some fibre in to make it flexible and resilient. Think about modern-day plastics, resin with some carbon in to make it hard. The carbon is from the charcoal. We harden it. We make it flexible. We make an excellent glue to hold things together. We can strike things with our axe and the glue is not going to shatter, because it's now flexible and hard. Now everybody thinks that those two things, plastics and fibreglass, are 20th century inventions. We've been making glue this way, in the Swan Valley, in Western Australia, for at least 6,000 years.
Maddy	Wow.
Dale	We can prove that, because near where I live, there's a park called Walyunga and there's a scatter site there. A scatter site is called that because scattered around the area are all the left-over bits from making tools and weapons. If you are lucky enough, you can go through all the scatters and find a bit of chert. Fossilized chert was lost to the mainland when the sea levels rose more than 6,000 years ago. It's no longer on the mainland, hasn't been there for 6,000 years.
Maddy	That's very cool.
Alice	Billy?
Dale	He's speechless. He's never heard anything like it in his life, kangaroo poo glue.
Alice	How did you learn how to make kangaroo poo glue?
Dale	From my elders. It's information and knowledge which is passed down from one generation to the next. I've now passed it to you.