



Geothermal energy 1: Heat beneath your feet

Components

	NAME	DESCRIPTION	AUDIENCE
	<i>Heat beneath your feet</i> teachers guide	This guide shows how to engage students' interest in latent and specific heat by examining how geothermal energy is used in Western Australia.	teachers
	<i>Heat beneath your feet</i> video	The video shows how geothermal energy is used in Perth to heat swimming pools. Ideas of how geothermal energy could be used in the future are also raised.	students

Purpose

To **Engage** students' interest in specific heat and latent heat by examining uses of geothermal energy in Perth, surveying community awareness of geothermal energy and looking at how it can be developed for future use.

Outcomes

Students:

- identify geothermal hot water as a viable alternative source of energy for Western Australia;
- formulate opinions about the viability of using geothermal energy in Western Australia;
- identify areas of energy use where geothermal energy may be substituted in the future; and
- appreciate that geothermal energy is a relevant, abundant, alternative source of energy, present in large quantities in the Perth Basin.

Activity summary

ACTIVITY	POSSIBLE STRATEGY
Show the video, <i>Heat beneath your feet</i> .	whole class
Students discuss focus questions.	in groups, individually or teacher-led discussion

Using the video

Play the video, *Heat beneath your feet*. The following questions may be used to encourage discussion in relation to the intended outcomes:

- Do you think people in Perth are well informed about the use of geothermal energy?
- How does geothermal energy compare with energy produced by fossil fuels, when carbon emissions are considered?
- In what situations can geothermal energy be used, in addition to heating swimming pools?
- Would you consider geothermal energy to be a sustainable source of energy?
- Do you think the claim that geothermal energy can be used to air-condition an entire university campus is reasonable?
- Water is used to transfer heat in many situations, not just in Perth, where a vast supply of hot water exists. Why do you think this is?

- The Perth sedimentary basin is up to 10 km deep. Why do you think bores to access hot water only need to go down 1 km?
- How is hot water able to move through rock?

Technical requirements

The video, *Heat beneath your feet*, is provided in two formats: on a standard DVD-video disk and as a QuickTime movie. QuickTime version 7 or later is required to view the movie. This is a free download from www.apple.com/quicktime.

The teacher guide requires Adobe Reader (version 5 or later), which is a free download from www.adobe.com.

Associated SPICE resources

Geothermal energy 1: Heat beneath your feet may be used in conjunction with related SPICE resources to investigate specific heat and latent heat.

DESCRIPTION	LEARNING PURPOSE
<p><i>Geothermal energy (overview)</i></p> <p>This learning pathway shows how a number of SPICE resources can be combined to assist with teaching the topics of specific heat and latent heat.</p>	
<p><i>Geothermal energy 1: Heat beneath your feet</i></p> <p>A video engages student interest in recent developments and future possibilities for the use of geothermal energy.</p>	Engage
<p><i>Geothermal energy 2: Specific heat capacity</i></p> <p>Students investigate the specific heat capacity of water in laboratory and problem-solving activities.</p>	Explore
<p><i>Geothermal energy 3: Heating a pool</i></p> <p>Students' understanding of specific heat is developed through data analysis in the context of heating swimming pools using geothermal energy.</p>	Explain
<p><i>Geothermal energy 4: Sustainable energy sources</i></p> <p>Students reinforce and deepen their understanding of specific heat and geothermal energy through problem-solving activities.</p>	Elaborate
<p><i>Geothermal energy 5: Latent heat</i></p> <p>Students investigate latent heat through practical and problem-solving activities.</p>	Explore
<p><i>Geothermal energy 6: Using geothermal energy</i></p> <p>Students use an interactive learning object to develop an understanding of how latent heat is used in a number of devices.</p>	Explain
<p><i>Geothermal energy 7: The geothermal alternative</i></p> <p>Students use concepts developed throughout this sequence to analyse two case studies that involve use of geothermal energy.</p>	Elaborate

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Video credits

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