

**teachers guide**

**Geothermal energy 5:**

**Latent heat**

# Components

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|  | NAME | DESCRIPTION | AUDIENCE |
|  | *Latent heat*  teachers guide | This guide describes some activities for teaching the concept of latent heat. | teachers |
|  | *Investigating latent heat*  procedure sheet | Students perform an experiment to investigate the latent heat of water and its relevance to energy transfer. | students |
|  | *Latent heat problems*  worksheet | Students solve problems about latent heat. | students |

Purpose

To introduce students to the concept of latent heat, including both qualitative and quantitative treatment.

# Activity summary

Outcomes

Students:

* perform an experiment that helps them explore the concept of latent heat;
* analyse second hand data to establish the value for the latent heat of vaporisation of water;
* apply the concept of latent heat to everyday contexts; and
* use the relationship Q = m L in calculations.

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| ACTIVITY | POSSIBLE STRATEGY |
| Students perform the experiment, *Investigating latent heat*. | small group practical activity |
| Students answer questions posed in post-lab analysis and discussion. | teacher-led discussion |
| Students complete the worksheet, *Latent heat problems*. | individually or in pairs |

# Teacher notes

It is difficult to conduct a student experiment in school laboratories that produces a reliable result for the value of the latent heat of vaporisation of water, without resorting to use of complicated apparatus. For this reason second hand data are provided to support a simplified investigation. Students may analyse the provided graph and calculate a value.

# Technical requirements

The guide, procedure sheet and worksheet require Adobe Reader (version 5 or later), which is a free download from adobe.com. The procedure sheet and worksheet are also provided in Microsoft Word format.



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# Associated SPICE resources

*Geothermal energy 5: Latent heat* may be used in conjunction with related SPICE resources to investigate specific heat and latent heat.

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

# Acknowledgements

Designed and developed by the Centre for Learning Technology, The University of Western Australia.

Production team: Leanne Bartoll, Alwyn Evans, Bob Fitzpatrick, Dan Hutton, Emma Pointon, Gary Thomas and Michael Wheatley, with thanks to

Pauline Charman, Jenny Gull, Wendy Sanderson and Charmaine White.

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