



Sample assessment task

Year level	9
Learning area	Science
Subject	Physical Sciences
Title of task	Camping scenario and heat

Task details

Description of task	Within the context of a camping scenario, students are asked to apply their understanding of the principles of heat transfer to various situations.
Type of assessment	Test
Suggested time	One lesson

Content description

Content from the Western Australian Curriculum	Science understanding Energy transfer through different mediums can be explained using wave and particle models
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Task preparation

Prior learning	Students have learnt about the three methods of heat transfer: conduction, convection and radiation, and can apply the particle model to explain conduction. They have discussed practical examples of different methods of heat transfer.
Assessment differentiation	Teachers should differentiate their teaching and assessment to meet the specific learning needs of their students, based on their level of readiness to learn and their need to be challenged. Where appropriate, teachers may either scaffold or extend the scope of the assessment tasks.

Assessment task

Assessment conditions	Under test conditions
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Instructions to students

Student name _____

Use your science understanding to fully answer the following questions.

1. Ben and Jack are sitting around a camp fire, watching the smoke from the fire rise up into the sky. Ben says, "I wonder why the smoke goes up like that." Jack explains it to Ben using scientific principles. Outline Jack's explanation below. (4 marks)

2. It's a cold night at the campsite and Jos and Nicole are wearing several layers of clothing to keep themselves warm. Explain how their clothing keeps them warm. (3 marks)

3. Ben and Nicole have been walking around gathering wood for the fire and they are feeling warm. When they stop walking around, they cool down. Describe how heat is lost to the cold air from their bodies and name the processes involved.

(4 marks)

4. Tim decides to cook some sausages for dinner over the campfire. He uses a metal frypan with a metal handle. Tim finds that once the sausages are cooked, the handle of the frying pan is hot, even though the handle was not near the flames.

Draw a diagram showing how the heat moves along the handle to his hand. Show the particles in the metal handle and describe what is happening.

(4 marks)

Name this method of heat transfer. _____

5. Tim wraps a cloth around the hot handle of the frypan so that he can pick it up without burning his hand. Explain why. (2 marks)

6. The outside of the frypan is black from being used over the campfire. How would this effect the transfer of heat from the fire to the frying pan? Explain using your science understanding. (3 marks)

Sample marking key

Description	Marks
Question 1	
Comprehensively explains why smoke rises	1–4
Subtotal	4
Answer could include, but is not limited to:	
• Air above the fire heats up and expands	[1]
• Particles move apart	[1]
• Warm air is lighter than cool air	[1]
• It rises, taking smoke with it	[1]
Description	Marks
Question 2	
Layers of clothes trap air between them Air is an insulator Body heat warms the trapped air	1–3
Subtotal	3
Description	Marks
Question 3	
Their bodies are warmer than the air So heat radiates from their bodies Warm air near their bodies rises and is replaced by cool air This is convection	1–4
Subtotal	4
Description	Marks
Question 4	
Diagram shows particles vibrating in place Particles vibrate faster near the heat source Heat is passed along through vibration of particles	1–3
Conduction	1
Subtotal	4
Description	Marks
Question 5	
Cloth is an insulator Heat is prevented from being conducted from metal to the hand	1–2
Subtotal	2
Description	Marks
Question 6	
Black dull surfaces absorb radiated heat better than shiny silver surfaces The food would cook more quickly in the blackened pan	1–2 1
Subtotal	3
Total	20