

Physics > Big idea PMA: Matter > Topic PMA1: Heating and cooling

Key concept (age 11-14)

PMA1.4: Thermal store of energy

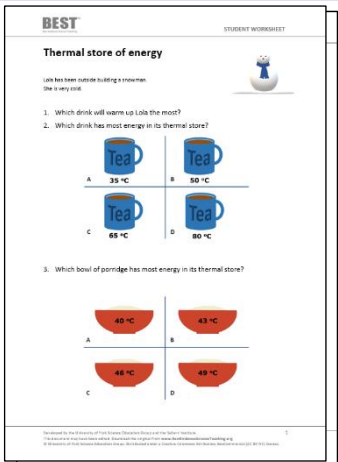
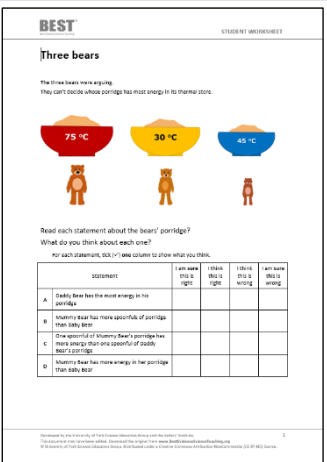
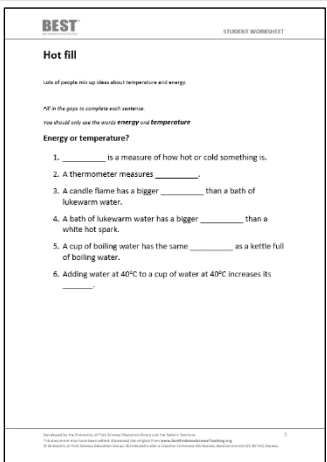
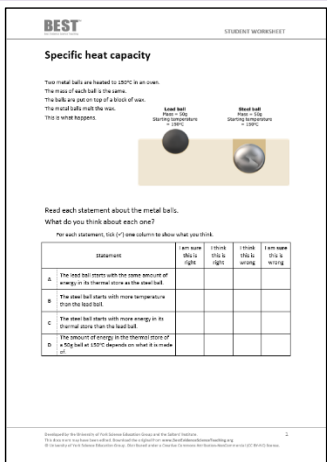
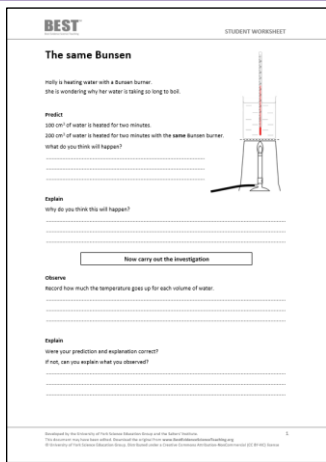
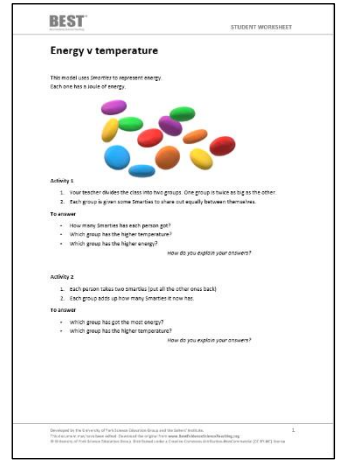
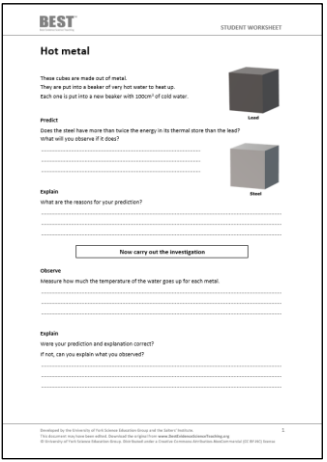
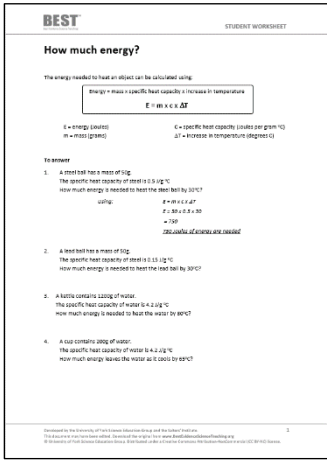
Progression toolkit: Thermal store of energy

Learning focus	Each different material will have more energy in its thermal store if either its temperature or mass is increased.				
As students' conceptual understanding progresses they can:	<div>CONCEPTUAL PROGRESSION</div> <div> <div>Identify which of two objects or substances has the most energy in its thermal store when the only difference between them is temperature.</div> <div>Identify which of two objects or substances has the most energy in its thermal store when the only difference between them is their mass.</div> <div>Explain the difference between energy (in a thermal store) and temperature.</div> <div>Describe how the specific heat capacity of a material affects the amount of energy in its thermal store.</div> <div>Use the equation $E = mc\Delta T$ to calculate the energy needed to increase the temperature of a material.</div> </div>				
Diagnostic questions	Thermal store of energy		Three bears	Specific heat capacity	
			Hot fill		
Response activities		The same Bunsen	Energy vs temperature	Hot metal	How much energy?

Key:

P Prior understanding from earlier stages of learning

B Bridge to later stages of learning

Thermal store of energy	Three bears	Hot fill	Specific heat capacity	The same Bunsen
 <p>Thermal store of energy</p> <p>Let's have been inside building a house.</p> <p>1. Which drink will warm up a lid the most?</p> <p>2. Which drink has most energy in its thermal store?</p> <p>3. Which bowl of porridge has most energy in its thermal store?</p>	 <p>Three bears</p> <p>Read each statement about the bears' porridge? What do you think about each one?</p> <p>For each statement, tick (✓) or cross (✗) to show what you think.</p>	 <p>Hot fill</p> <p>Let's imagine you're a cup of tea.</p> <p>Read each statement about the metal balls.</p>	 <p>Specific heat capacity</p> <p>Read each statement about the metal balls.</p> <p>What do you think about each one?</p>	 <p>The same Bunsen</p> <p>Read each statement about the metal balls.</p> <p>What do you think about each one?</p>
Simple multiple choice	Confidence grid	Focused cloze	Confidence grid	Predict, explain, observe, explain practical/demonstration
 <p>Energy v temperature</p> <p>Read each statement about the energy.</p> <p>1. How many marbles has each person got?</p> <p>2. Which group has the higher temperature?</p>	 <p>Hot metal</p> <p>Read each statement about the metal.</p> <p>1. How many marbles has each person got?</p> <p>2. Which group has the higher temperature?</p>	 <p>How much energy?</p> <p>Read each statement about the energy.</p> <p>1. How many marbles has each person got?</p> <p>2. Which group has the higher temperature?</p>		
Challenge to thinking - modelling	Predict, explain, observe, explain practical/demonstration	Application and practice calculations		