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

Key concept (age 11-14)
PMA1.3: Thermal conduction

Progression toolkit: Conductors and insulators

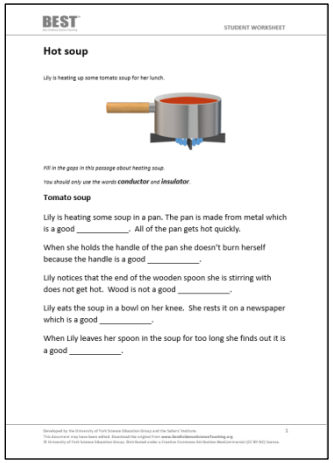
Learning focus	Heating makes the particles in a material move more quickly. Heating raises the temperature quickly throughout a good thermal conductor, and very slowly through a good thermal insulator.				
As students' conceptual understanding progresses they can:	CONCEPTUAL PROGRESSION →				
	Describe the speed at which the temperature increases along a thermal conductor compared to a thermal insulator.	Identify materials that are good thermal conductors or good thermal insulators.	Use the idea of vibrating particles to explain heating by thermal conduction.	Explain how insulators can be used to slow down heating and cooling.	Explain why it is common for thermal insulators to feel warm and thermal conductors cold. **B**
Diagnostic questions	Hot soup	Conductor survey		Ice melt	Warm feeling
Response activities		Hot rods	Hot vibrations		Cool rod

Key:

P Prior understanding from earlier stages of learning

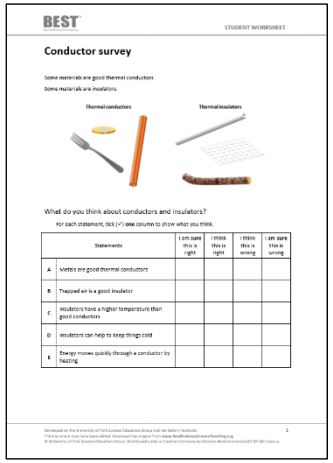
B Bridge to later stages of learning

Hot soup



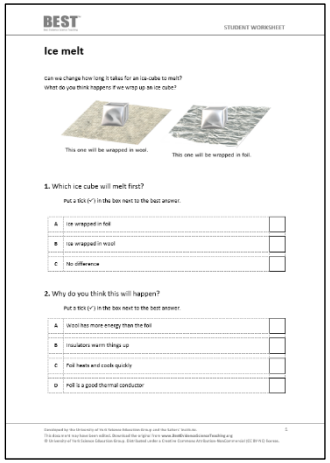
Focused cloze

Conductor survey



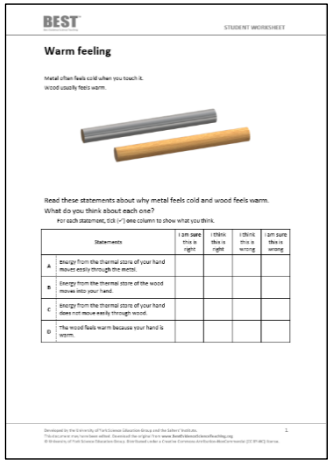
Confidence grid

Ice melt



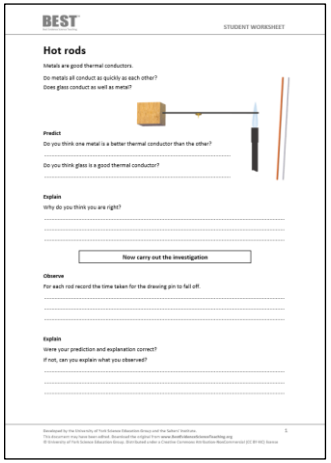
Two-tier multiple choice

Warm feeling



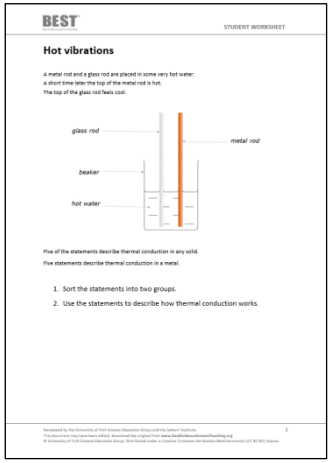
Confidence grid

Hot rods



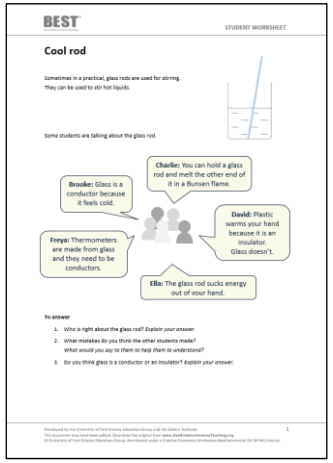
Predict, explain, observe, explain practical/demonstration

Hot vibrations



Sequencing

Cool rod



Talking heads