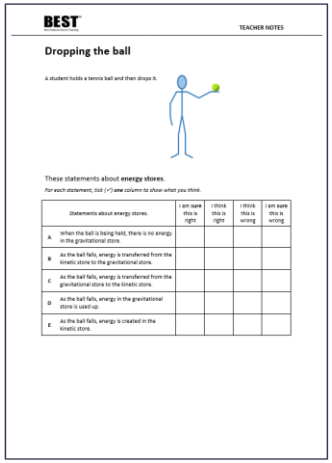
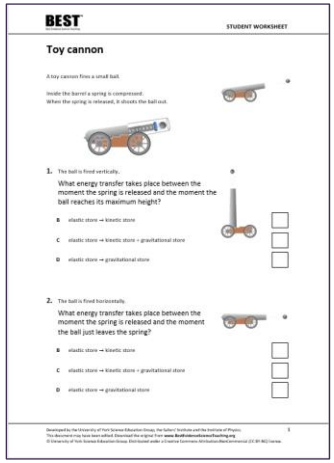
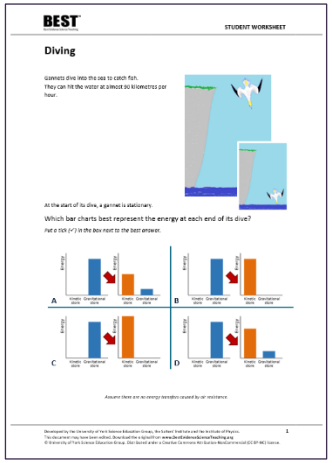
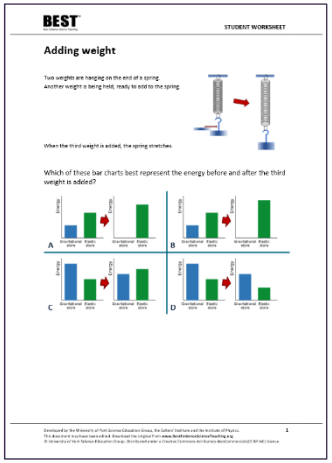
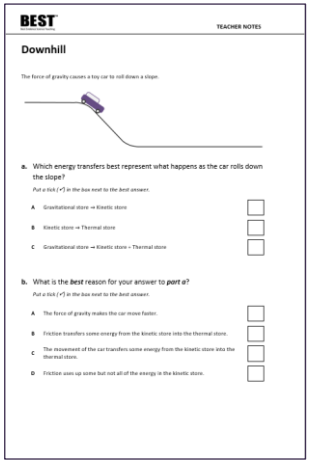
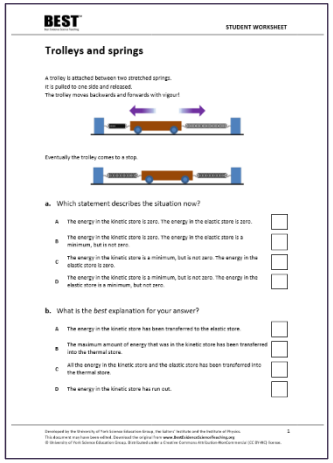
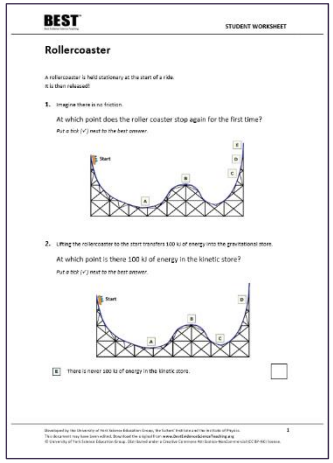
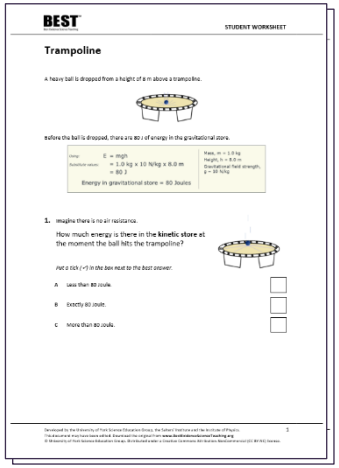
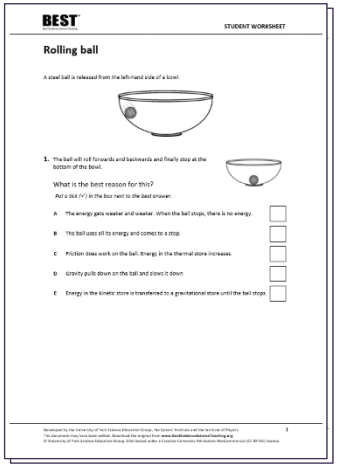
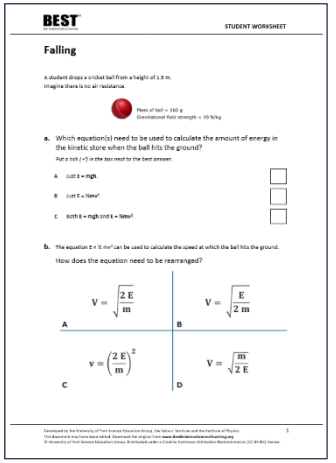
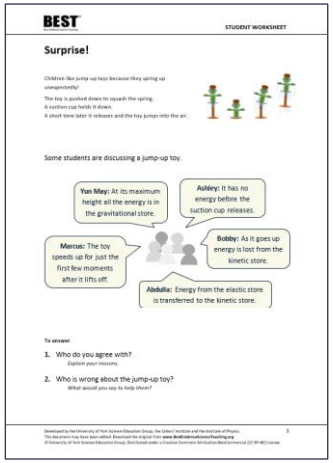
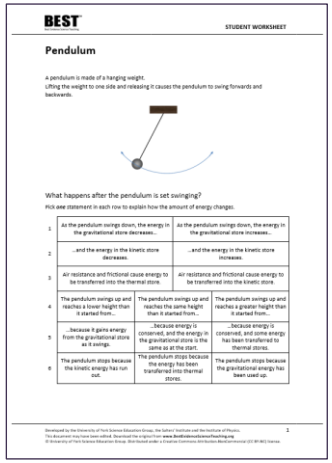
Progression toolkit: Energy transfer, conservation and dissipation

<table>
<tr><td>Learning focus</td><td colspan="5">Energy is conserved, so that the total amount of energy in all stores before a transfer is the same as after the transfer, plus any work done on the system. Some energy is always transferred to thermal stores, and this energy is generally less useful.</td></tr>
<tr><td>As students' conceptual understanding progresses they can:</td><td colspan="5">CONCEPTUAL PROGRESSION</td></tr>
<tr><td></td><td>Describe how energy can be transferred from one store to another.</td><td>Describe how the amount of energy in each store changes as energy is transferred.</td><td>Explain why, in any transfer, some energy is transferred to a thermal store.</td><td>Use the principle of conservation of energy and energy calculations to determine the amount of energy in different stores.</td><td>Calculate missing variables using the principle of conservation of energy and energy calculations.
B</td></tr>
<tr><td rowspan="3">Diagnostic questions</td><td rowspan="2">Dropping the ball</td><td rowspan="2">Diving</td><td>Downhill</td><td>Rollercoaster</td><td rowspan="3">Falling</td></tr>
<tr><td>Trolleys and springs</td><td>Trampoline</td></tr>
<tr><td>Toy cannon</td><td>Adding weight</td><td colspan="2">Rolling ball</td></tr>
<tr><td>Response activities</td><td colspan="2">Surprise!</td><td colspan="2">Pendulum</td><td></td></tr>
</table>

Key:

B Bridge to later stages of learning

Dropping the ball	Toy cannon	Diving	Adding weight	Downhill
				
Confidence grid	Simple multiple choice	Simple multiple choice	Simple multiple choice	Two-tier multiple choice
Trolleys and springs	**Rollercoaster**	**Trampoline**	**Rolling ball**	**Falling**
				
Two-tier multiple choice	Simple multiple choice	Simple multiple choice	Two-tier multiple choice	Simple multiple choice

Surprise!	Pendulum
	
Talking heads	Explanation story