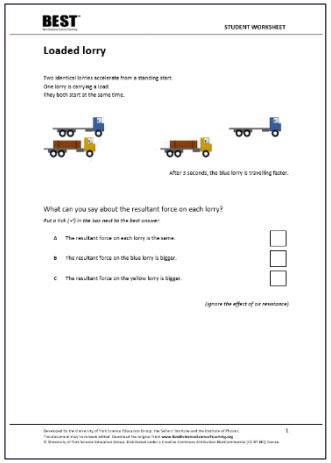
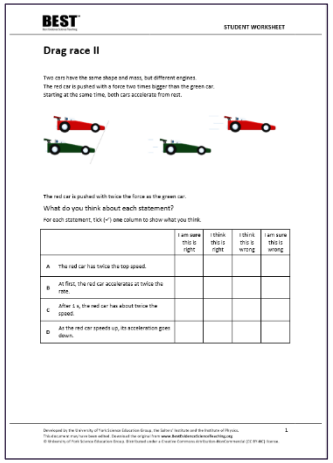
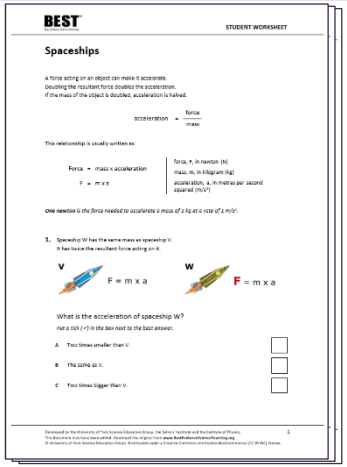
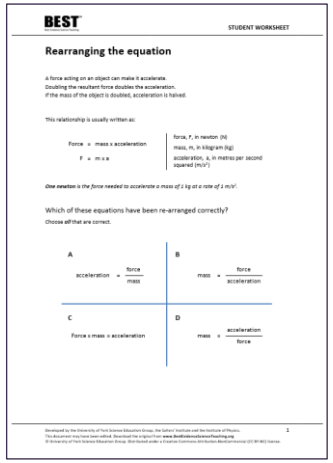
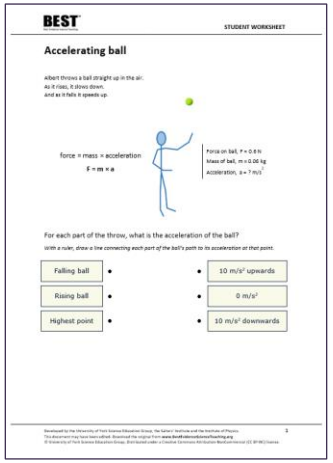
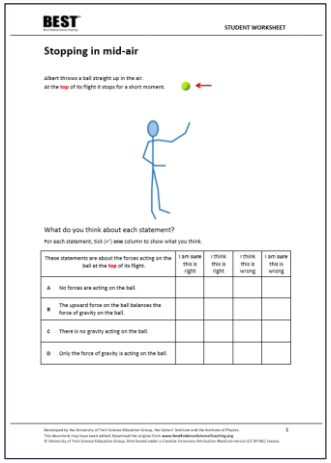
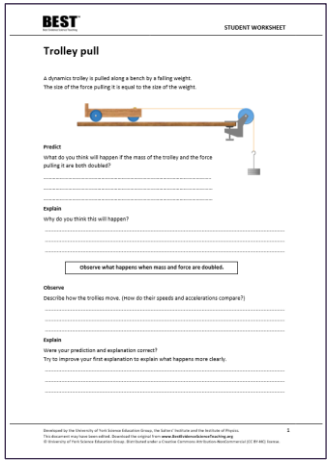
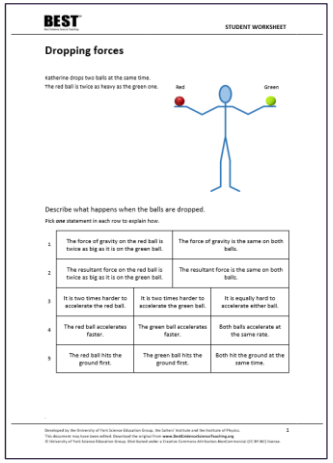
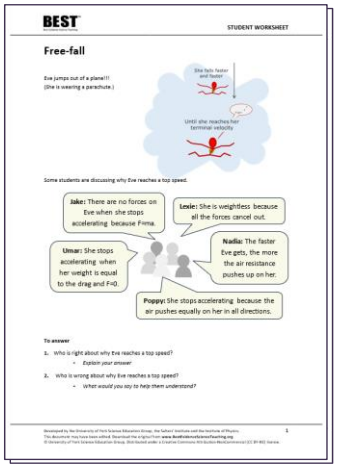
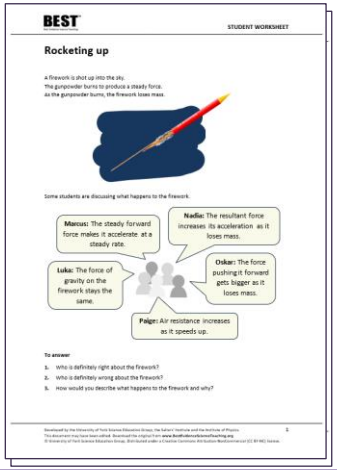
Progression toolkit: Force, mass and acceleration

	The acceleration of an object is proportional to the resultant force acting on it and inversely proportional to its mass. An object accelerates in the direction of the resultant force acting on it.				
As students' conceptual understanding progresses they can:	CONCEPTUAL PROGRESSION →				
	Describe the effect of a resultant force on objects of different mass. **P**	Describe the relationship between the resultant force on an object and its acceleration.	Explain the equation F = m x a and use it to make calculations.	Use the equation F = m x a to determine and explain the motion of falling objects.	Apply an understanding of F = m x a for a changing mass. **B**
Diagnostic questions	Loaded lorry	Drag race II	Spaceships	Accelerating ball	
			Rearranging the equation	Stopping in mid-air	
Response activities	Trolley pull			Free-fall	Rocketing up!
	Dropping forces				

Key:

P Prior understanding from earlier stages of learning

B Bridge to later stages of learning

Loaded lorry	Drag race II	Spaceships	Rearranging equations	Accelerating ball
				
Simple multiple choice	Confidence grid	Simple multiple choice	Simple multiple choice	Linking ideas
Stopping in mid-air	**Trolley pull**	**Dropping forces**	**Free-fall**	**Rocketing up**
				
Confidence grid	Predict, explain; observe, explain (PEOE)	Explanation story	Talking heads	Talking heads