Physics > Big idea PFM: Forces and motion > Topic PFM4: Measuring and calculating motion

Key concept (age 14-16)
PFM4.1: Velocity

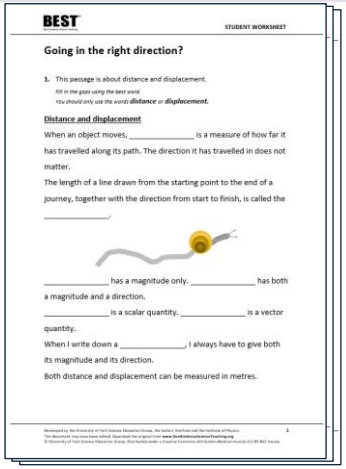
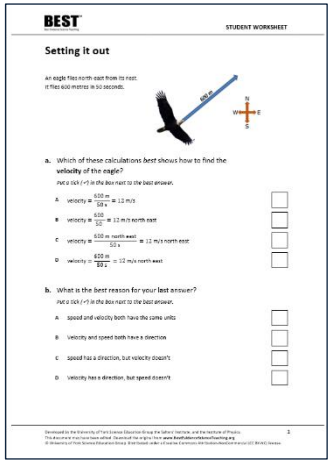
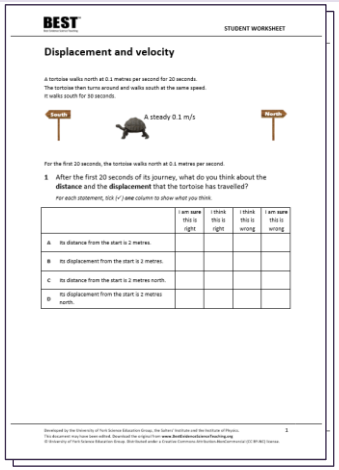
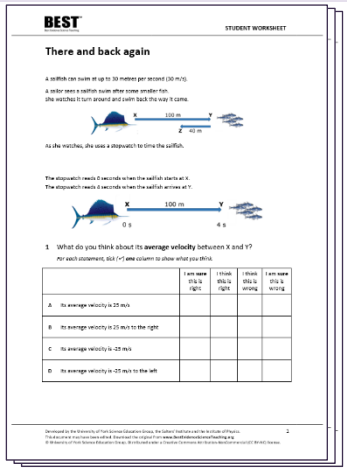
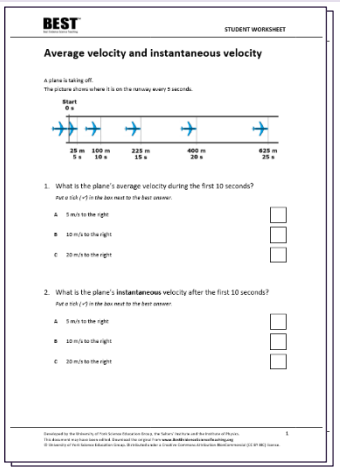
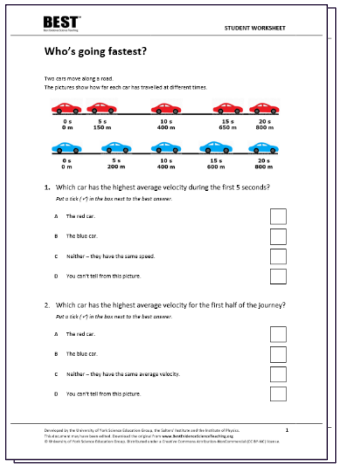
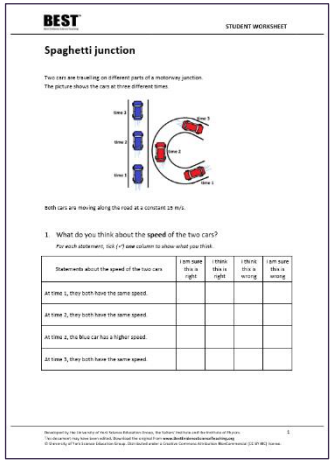
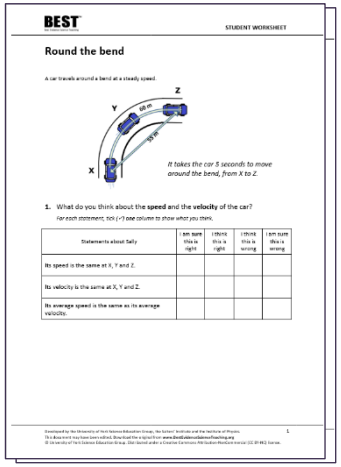
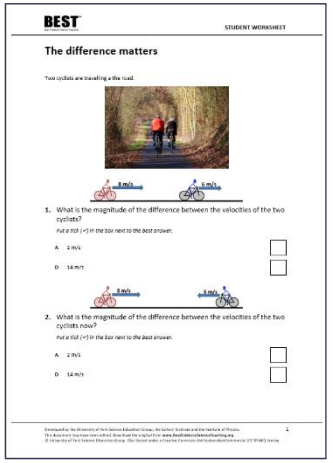
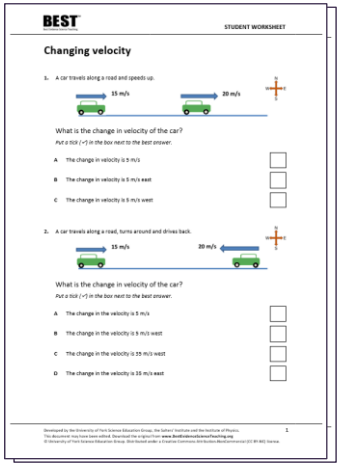
Progression toolkit: Velocity

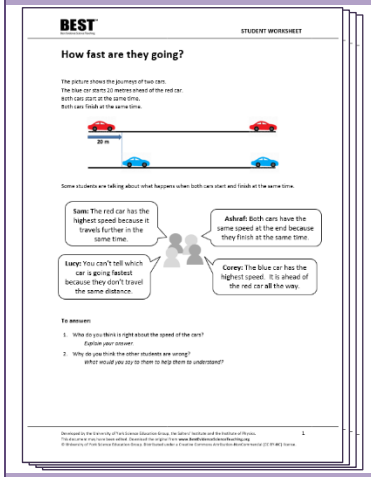
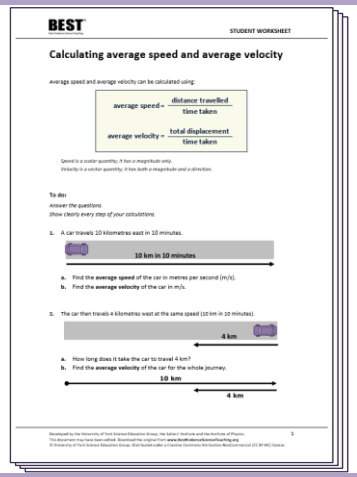
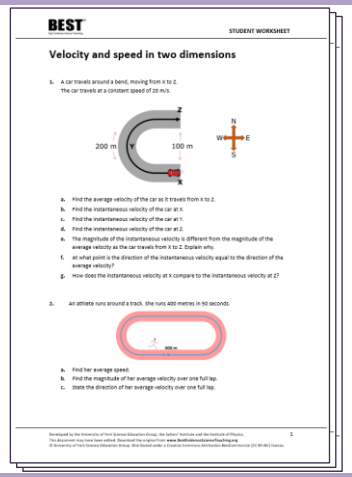
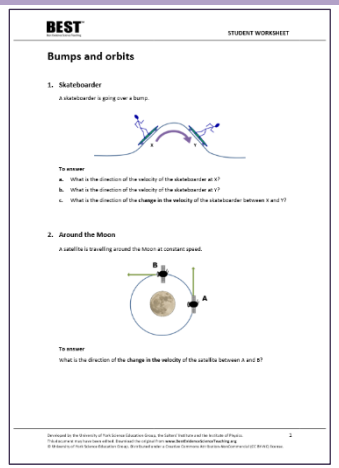
Learning focus	Velocity and displacement are vector quantities. Velocity measures by how much displacement changes in a given time interval.				
As students' conceptual understanding progresses they can:	CONCEPTUAL PROGRESSION Explain the difference between distance and displacement, and between speed and velocity. **P**	Calculate displacement and velocity for one-dimensional motion.	Calculate average velocity and instantaneous velocity for one-dimensional motion.	Identify the difference between speed, instantaneous velocity and average velocity for two-dimensional motion.	Calculate differences in velocity for 1-dimensional and 2-dimensional motion. **B**
Diagnostic questions	Going in the right direction	Displacement and velocity	Average velocity and instantaneous velocity	Spaghetti junction	The difference matters
	Setting it out	There and back again	Who's going fastest?	Round the bend	Changing velocity
Response activities	How fast are they going?	Calculating average speed and average velocity		Velocity and speed in two dimensions	Bumps and orbits

Key:

P Prior understanding from earlier stages of learning

B Bridge to later stages of learning

Going in the right direction?	Setting it out	Displacement and velocity	There and back again	Average velocity and instantaneous velocity
				
Focused CLOZE	Two tier multiple choice	Confidence grid	Simple multiple choice	Simple multiple choice
Who's going fastest?	**Spaghetti junction**	**Round the bend**	**The difference matters**	**Changing velocity**
				
Simple multiple choice	Confidence grid	Confidence grid and simple multiple choice	Simple multiple choice	Simple multiple choice

How fast are they going?	Calculating av. speed & av. velocity	Velocity and speed in 2-D	Bumps and orbits
			
Response, talking heads	Application and practice - calculations	Application and practice - calculations	Application and practice