Bitesize GCSE Science – Physics

Motion

British Cycling coach Charlie Evans on how physics can help to give cyclists an edge

An understanding of physics benefits cyclists, coaches and teams to be able to make informed equipment choices, to refine and develop new pieces of equipment - whether that is to improve the aero dynamics, reduce the weight to improve the climb performance, and also looking at components such as tyres and getting the optimum grip and the optimum rolling resistance.

Riders need to climb hills so power to weight ratio is important and they need to overcome aero dynamic drag and understanding these enables coaches, riders and scientists to make changes to a rider's equipment and their setup to improve their racing performance.

Riders train to be fit to win races, so if you've got two riders with very equal fitness the one who has an understanding of physics could be the faster bike rider. This is because they know to improve their riding position so they can be more aero dynamic on the bike, they know what equipment to select. If there are any hills in their event they can reduce the weight so they can maximise the power that they are putting into the pedals and improve their climbing speed.

Elite riders where they have a lot of money and they can afford to hire wind tunnels will take their equipment, their wheels, their frames, their different clothing to the wind tunnel and they will try different combinations of equipment, different riding positions to find which minimises that drag so that they can maximise their speed.

A significant factor with cycling is the aero dynamic drag and to double your speed you need eight times as much power so minimising the drag makes a significant difference to cyclists.