Reduction and oxidation

MAGS	Hi, Mags and Cal here.
CAL	This episode, I'm off to the uni lab to look at how gaining or losing oxygen can make big changes to metals.
MAGS	On your bike, then.
CAL	Metals are pretty useful. Loads of things are made of metal – my bike for example. Most metals come from ores, which are rocks containing metal. To get to the metal, we need to separate it from the ore using a chemical reaction. Let's look at how removing or gaining oxygen affects metals with reduction and oxidation reactions. Reduction is the loss of oxygen from a reactant. The oxygen escapes – a bit like the air escaping from my tyres. I knew I should have fixed that slow puncture. Oxidation is the gain of oxygen by a substance. Her tyres are gaining oxygen in the air she's pumping in.
MAGS	You're always leaving your bike in the rain. I told you, it makes it rust.
CAL	I can explain the rust.
MAGS	Yeah, you don't look after your bike.
CAL	No, I can explain it in terms of oxygen. Rusting is an oxidation reaction – the iron reacts with water and oxygen and gains the oxygen. You can recognise oxidation – the gain of oxygen – by looking at the formula. See, the iron has gained oxygen – it's been oxidised. Metals like iron and steel rust over time when they're exposed to oxygen – the air, and water – like this lovely rain. The hydrated iron(III) oxide is the orange-brown rust we saw on my chain – you can also see it here on my bike lock.

So, that was oxidation. Reduction on the other hand is the loss of oxygen.

Take copper oxide. It is reduced to form copper when it reacts with hydrogen.

You can recognise that this is a reduction reaction because the oxygen is gone from the copper – that's because hydrogen has made off with it and become water. So, now we've got copper and water.

MAGS Nice. Just one thing, Cal - if that's your bike lock, what's stopping someone from making off with your bike?