



## Horrible Science Downloadable Experiments – 6 HORRIBLE HYDROGEN

Brainy boffin Henry Cavendish (1731-1810) (that's him on the right) was really rich and really weird. He spent his days hiding from people and doing science experiments. He discovered hydrogen gas and found out that you can explode it with oxygen gas to make water. Today we know that water is made up of molecules (groups of atoms) with one oxygen atom and two hydrogen atoms. Here's how to make some hydrogen of your own.



### WHAT YOU NEED:



- Metal pencil sharpener (one of these things!)
- Jar or glass with 4 cm of water
- Elastic band
- Teaspoon
- Salt
- Polythene bag

### WHAT YOU DO:

1. Stir a teaspoon of salt into the water and keep stirring until all the salt has been dissolved.
2. Place the pencil sharpener in the salty water.
3. Squeeze the air from the bag and place it over the mouth of the container. Secure the bag tightly with the elastic band.
4. Watch carefully.

### WHAT HAPPENS:

Within seconds, loads of tiny bubbles are fizzing from the pencil sharpener blade. The bag may fill out slightly with the gas. The rest of the sharpener but not the blade will darken and small white lumps will appear on it.

### THIS IS BECAUSE:

Hang on to your brain cells – this is getting COMPLICATED! The bubbles are hydrogen gas made by splitting water molecules with electricity. The pencil sharpener contains two metals – usually a steel blade and a magnesium or zinc case.

1. Electrons flow from the steel to the magnesium.
2. They rip hydrogen atoms away from water molecules. These hydrogen atoms make the gas bubbles you saw.
3. The remaining bits of the water molecules consist of one oxygen and one hydrogen atom. Scientists call this substance hydroxide. The hydroxide molecules end up on the magnesium. They darken the metal.
4. Some of the hydroxide molecules join with magnesium atoms to make magnesium hydroxide. That's the white stuff.

### Bet you never knew!

Magnesium hydroxide is also found in indigestion tablets. You might find this fact hard to stomach.

