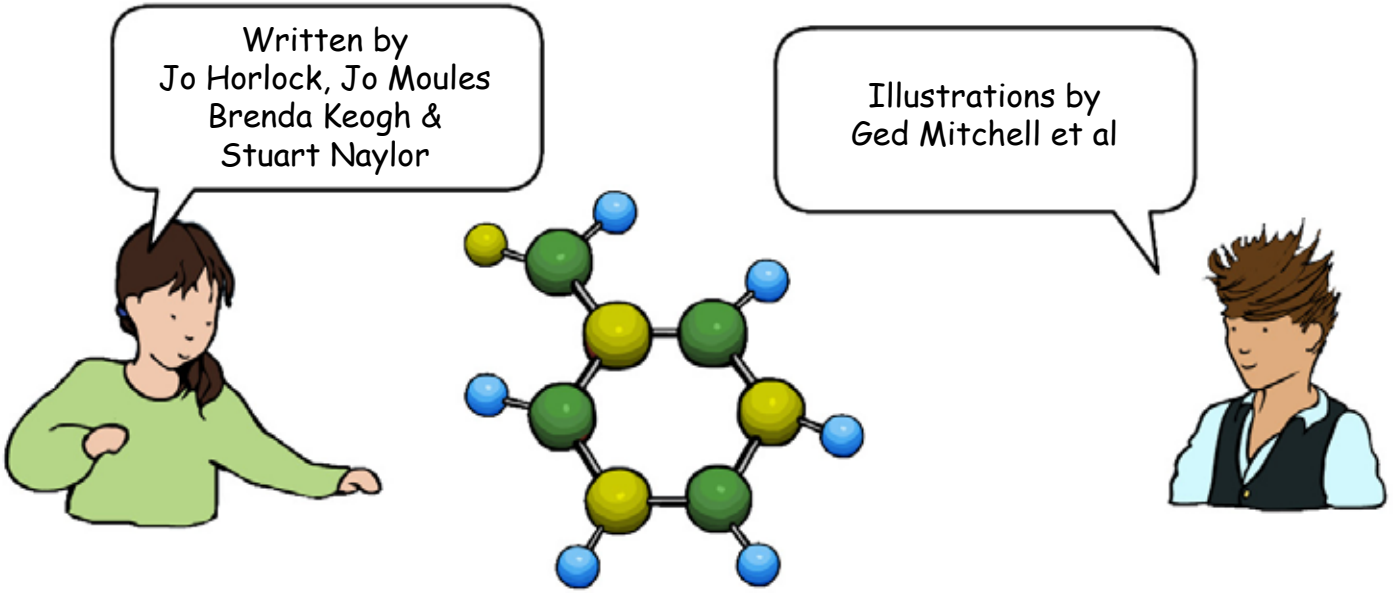
Science Concept Cartoons®

Set 2 - Sample Set 1



Produced by Millgate House Education

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Science Concept Cartoons® Set 2 - Sample Set

Concept Cartoons® are cartoon-style drawings that put forward a range of viewpoints about a particular situation. They are designed to intrigue, provoke discussion and stimulate thinking. Concept Cartoons make concepts problematic and provide a stimulus for developing ideas further.

Each Concept Cartoon can be used to stimulate a free standing discussion and enquiry. Alternatively, the Concept Cartoons can be linked together to form a larger topic or to create a project related to science.

Some Concept Cartoons may look as if they are too easy for some learners, but their deceptive simplicity can stimulate discussion about more challenging concepts and can often reveal some basic misunderstandings. Learners can create their own Concept Cartoons as a way of assessing and reviewing their current understanding.

Concept Cartoons do not always have a single right answer.

Each Concept Cartoon has support material, including ideas for follow up and some possible answers.

* Concept Cartoons are normally used to promote a group discussion.
* Ask learners to discuss why each character in the Concept Cartoon might hold their particular idea. Do they have any other ideas that might go in the blank speech bubble?
* Avoid being judgemental when learners are sharing their ideas. The uncertainty created by Concept Cartoons is productive.
* Provide an opportunity for learners to explore, challenge or consolidate the ideas raised through the Concept Cartoon(s).
* Provide time for learners to share their ideas.
* Have they changed their minds and why?

To learn more about Concept Cartoons and how they are used, visit:
www.millgatehouse.co.uk **Twitter: @MillgateHouseEd**

When printing out the Concept Cartoons please select the landscape setting on your printer options

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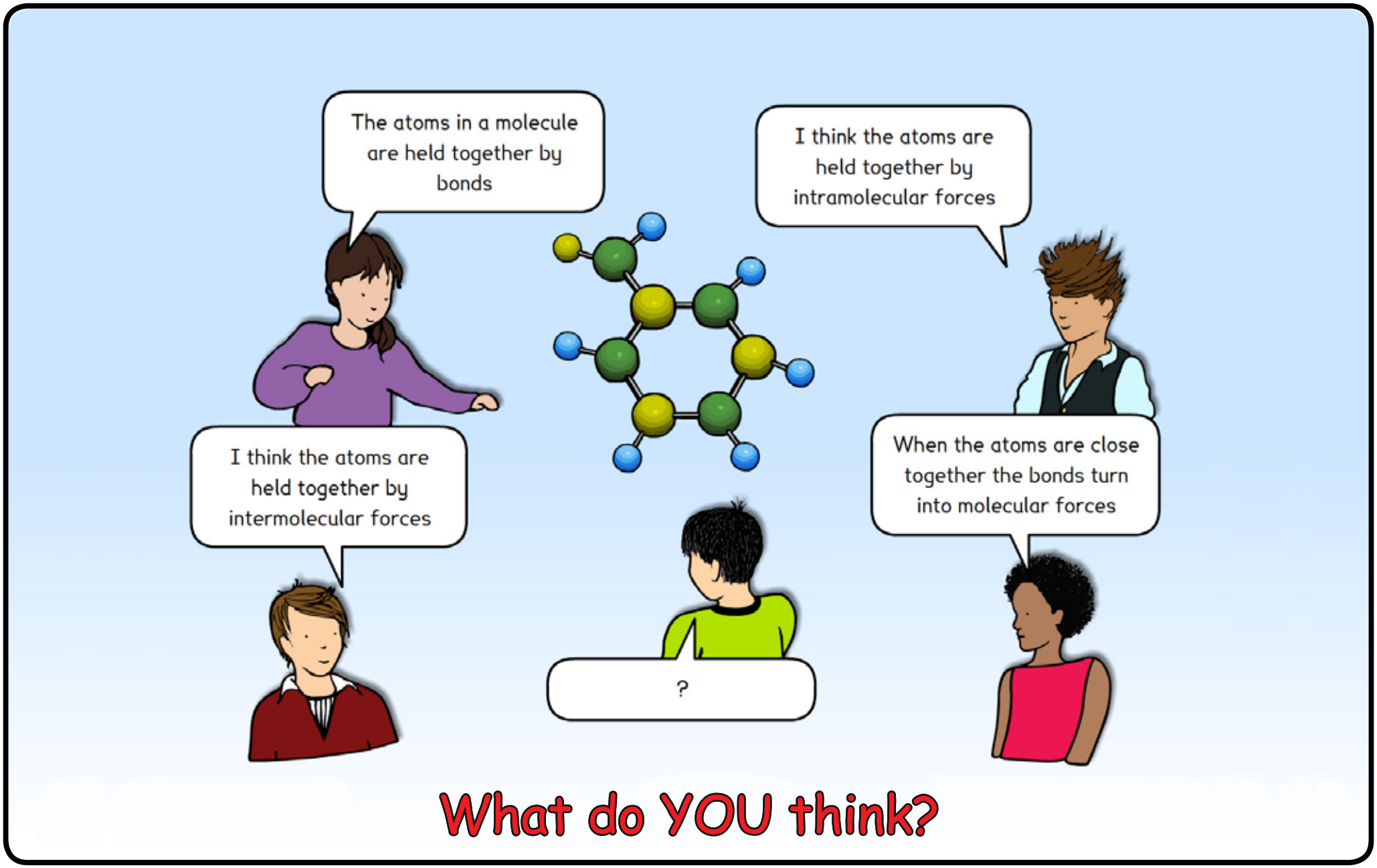
4.12 What holds atoms together?



Follow up

Make some models of different chemical molecules. Use a chemical model kit or modelling clay and matchsticks. Talk about what holds atoms together in your model, and how you think this compares with what holds atoms together in real molecules. Find out what the prefixes intra- and inter- mean, and discuss what this has to do with models of molecules.

Ideas

When molecules are formed in reactions, some or all of the bonds between the atoms in the reactants are broken, and new bonds are formed between atoms as the products are made. Bonds are made when electrons are exchanged or shared by atoms. This changes the forces that are acting, and creates new bonds that hold the atoms together in the newly-formed molecules. The bonds between atoms in a single molecule are called intramolecular forces, and they can be very strong forces. The prefix intra- means within, so intramolecular forces are forces within the molecule. There are also forces between molecules. The prefix inter- means between, so these are called intermolecular forces. They are weaker than intramolecular forces. They hold molecules close to other molecules, as we see when molecules are arranged in a regular pattern to form crystals like sodium chloride. Use the internet to make a table of the different types of bonds that can form between atoms and molecules.