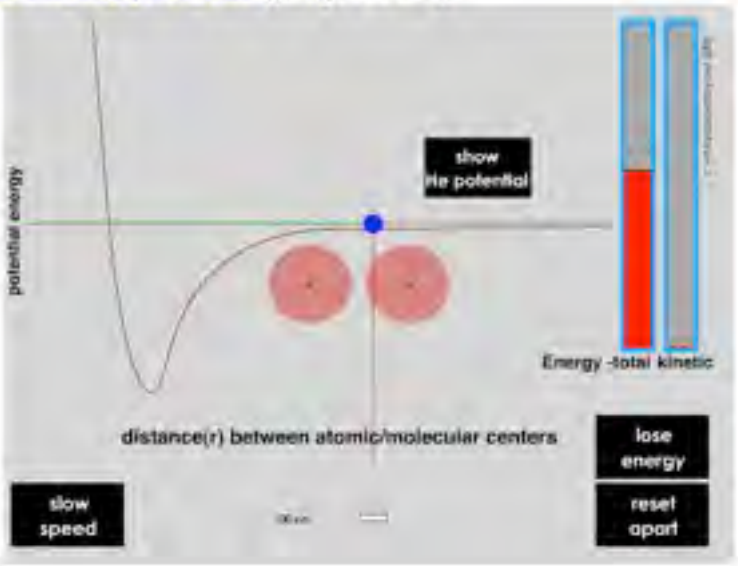
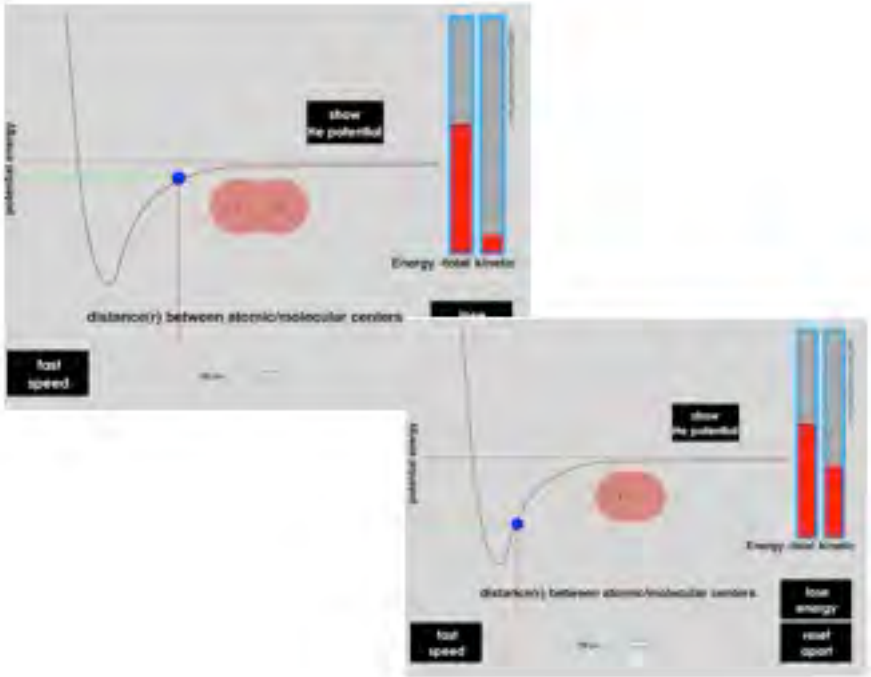
Bonds and Intermolecular interactions

Formation of covalent bonds

- When two H atoms approach – they are attracted much more strongly than two He atoms. – they form a covalent bond.
- (we will worry about why in chapter 3)

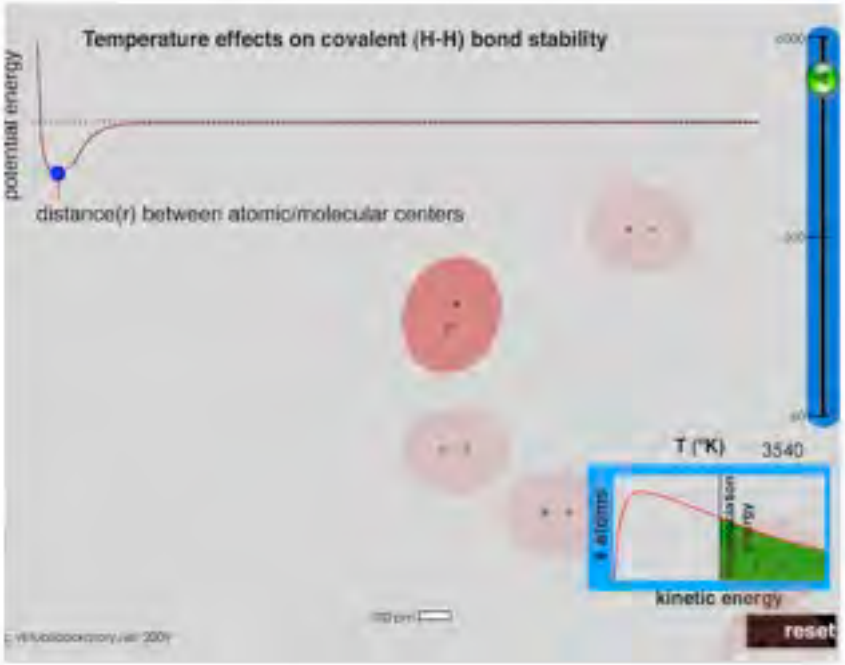
What happens when two hydrogen atoms approach (pages 6-9)





The two H atoms have formed a NEW chemical species – a hydrogen molecule (H_2). It has different chemical and physical properties than H atoms

What happens when you heat H_2 up?

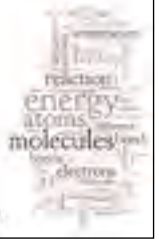


A range of interactions between atoms

- van der Waals (London Dispersion Forces) – can be between atoms or molecules – (intermolecular)
- Bonds – more permanent – stronger harder to break.

Helium boils at around 4K, hydrogen boils at around 20K, but the hydrogen molecules do not form hydrogen atoms until the temperature reaches over 6000K (as shown on page 8). Draw a picture of what hydrogen looks like at 30K and above 6000K.

What is all that extra energy used for?



Why do you think it takes a temperature of 6000K to break the interaction between two hydrogen atoms – but only 4K to break the interaction between two helium atoms?