C5 Energy Changes Part 1 For Year 10

**Exothermic and endothermic reactions:**

1. Energy is conserved in chemical reactions. Energy cannot be created or destroyed.
2. The amount of energy in the universe at the end of a chemical reaction is the same as before the reaction takes place
3. Energy is either transferred to the surroundings or taken in from the surroundings.
4. Exothermic reactions transfer energy to the surroundings so the temperature of the surroundings increases e.g. combustion, oxidation and neutralisation
5. Endothermic reactions take in energy from the surroundings so the temperature of the surroundings decreases e.g. thermal decomposition
6. During a chemical reaction, bonds in the reactants are broken and new bonds are made in the products

**Reaction profile diagrams:**

1. Chemical reactions can only occur when reacting particles collide with sufficient energy
2. The minimum amount of energy that particles need to react is called the activation energy
3. Reaction profiles show the relative energies of reactants and products, the activation energy and the overall change of a reaction
4. In exothermic reactions the reactants are higher than the products (energy is released)
5. In endothermic reactions the reactants are lower than the products (energy is absorbed)

**Bond breaking and forming (HT):**

1. Energy is absorbed to break bonds, therefore bond-breaking is an endothermic process
2. Energy is released when new bonds form, therefore, bond-making is an exothermic process
3. In an endothermic reaction, the energy needed to break existing bonds is greater than the energy released from forming new bonds
4. In an exothermic reaction, the energy released from forming new bonds is greater than the energy needed to break existing bonds

**Task 1: Watch Free Science lessons (if you can) and do a mind map of the information**

**GCSE Chemistry (9-1) Exothermic and Endothermic Reactions**

**GCSE Science Chemistry (9-1) Bond Energy Calculations**

**GCSE Science Chemistry (9-1) Bond Energy Calculations 2**

**GCSE Science Chemistry (9-1) Required Practical 4: Temperature Changes**

**Task 2: Test yourself! Answer these quick fire questions.**

1. Define exothermic.

2. Define endothermic.

3. Draw the reaction profile for an endothermic reaction.

4. Draw the reaction profile for an exothermic reaction.

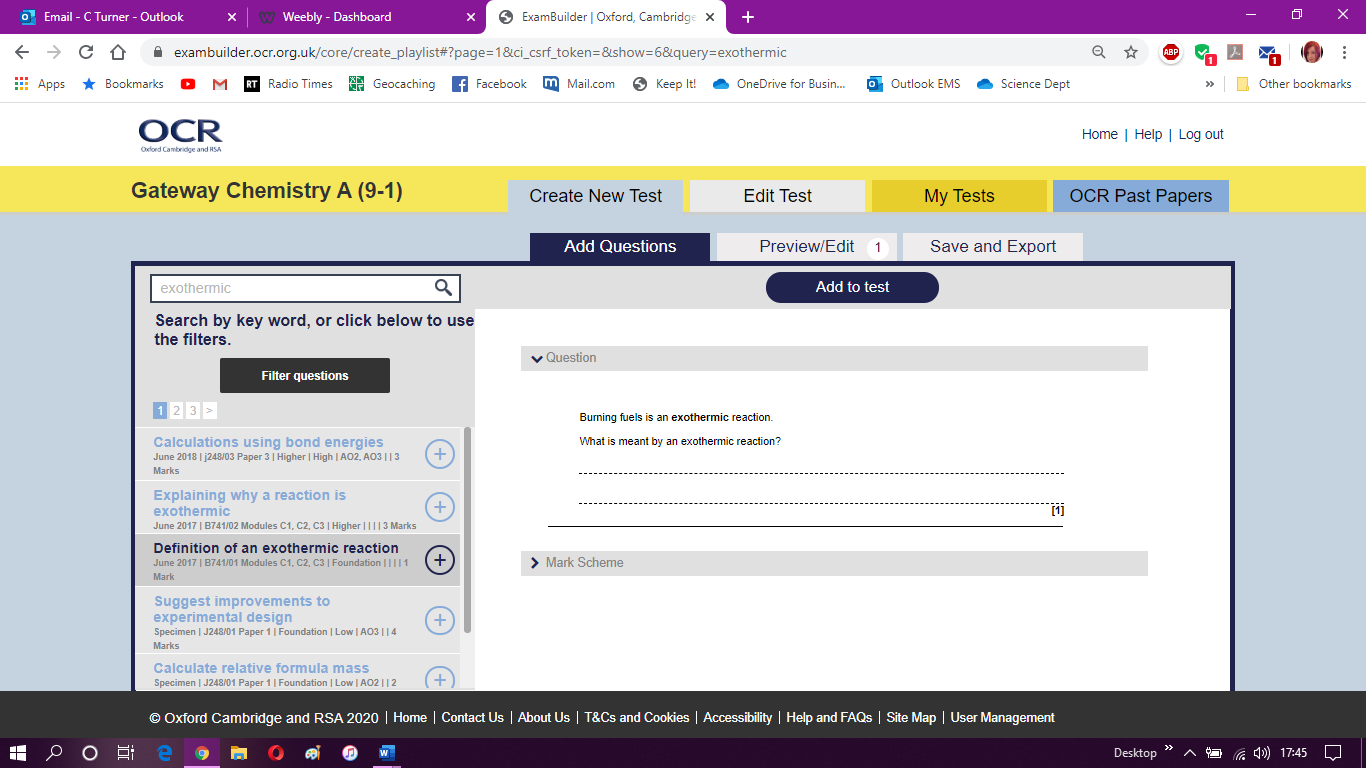
5. If energy is needed what is happening to the bonds?

6. If energy is released what is happening to the bonds?

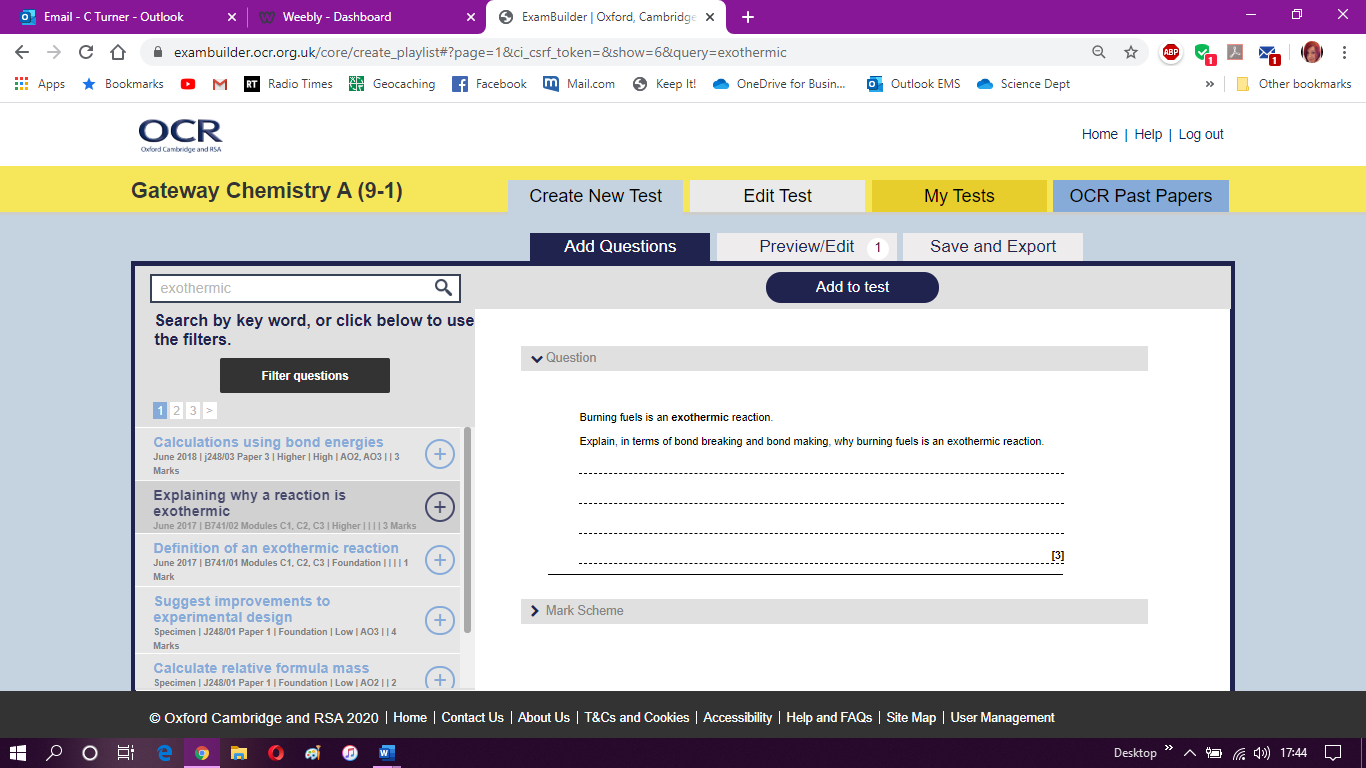
7. How do you calculate the energy change in a reaction?

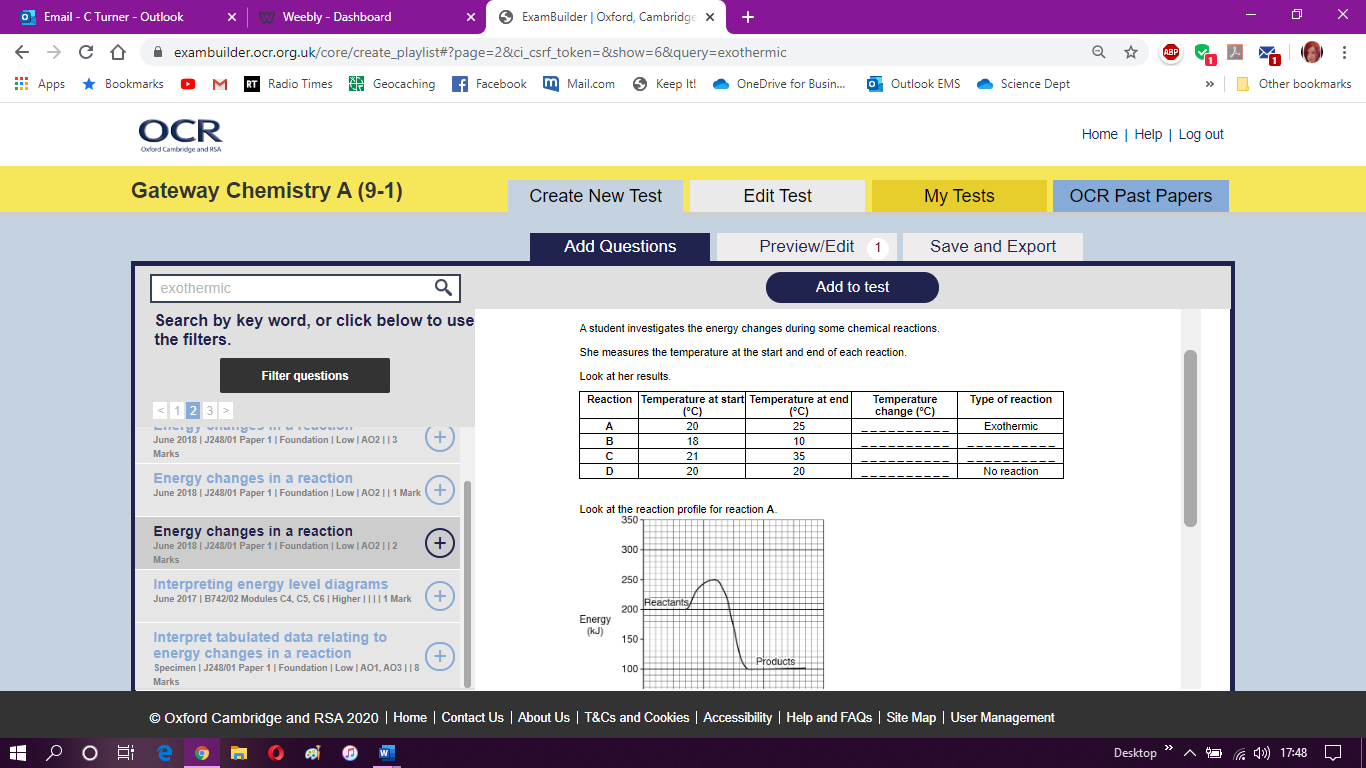
**Task 3: Complete these shorter answer questions.**

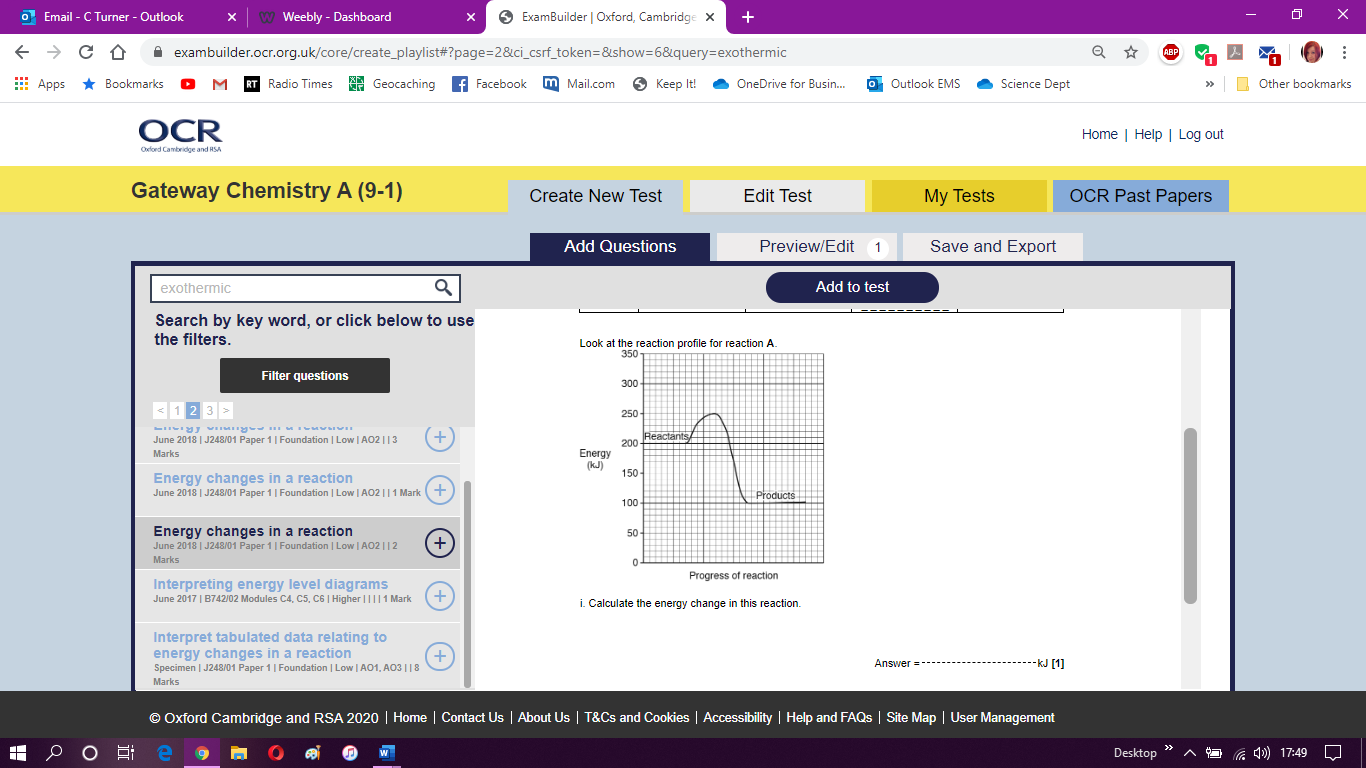
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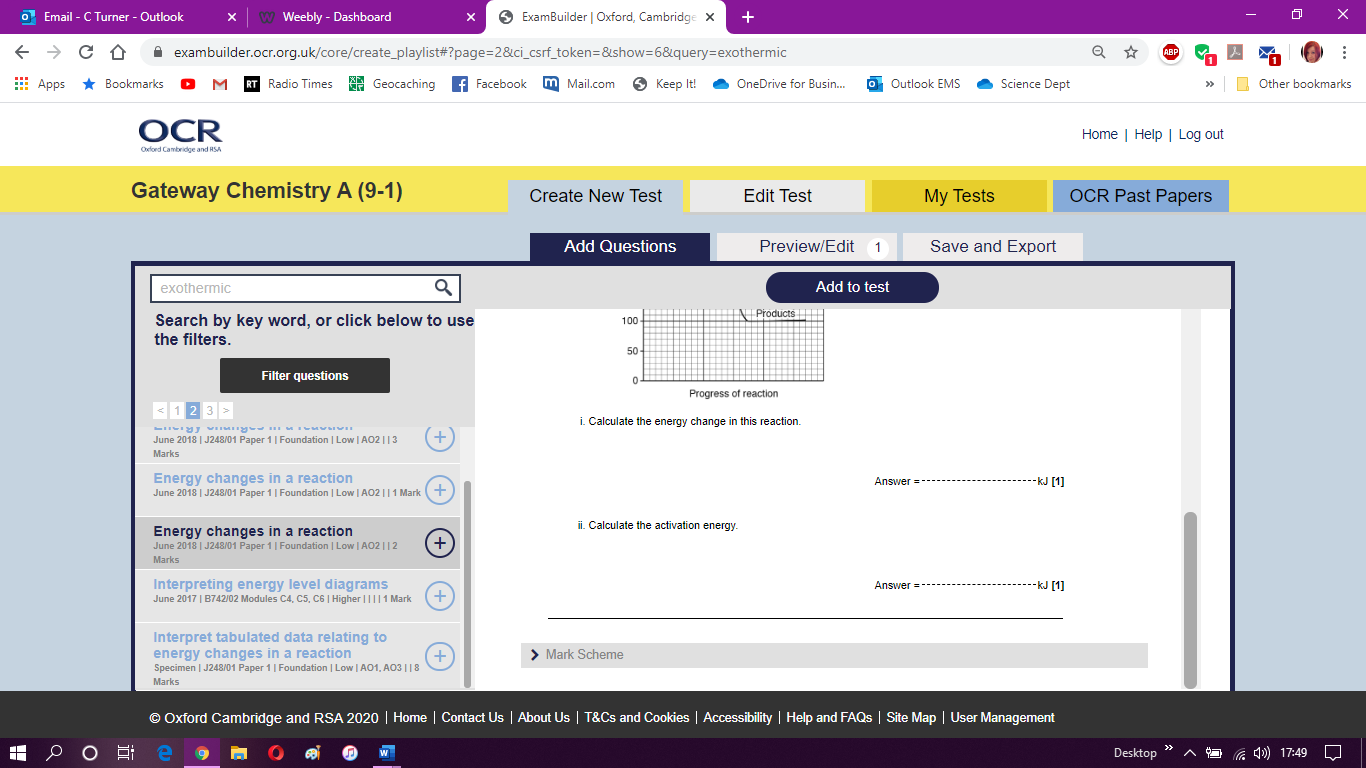


**Higher version**

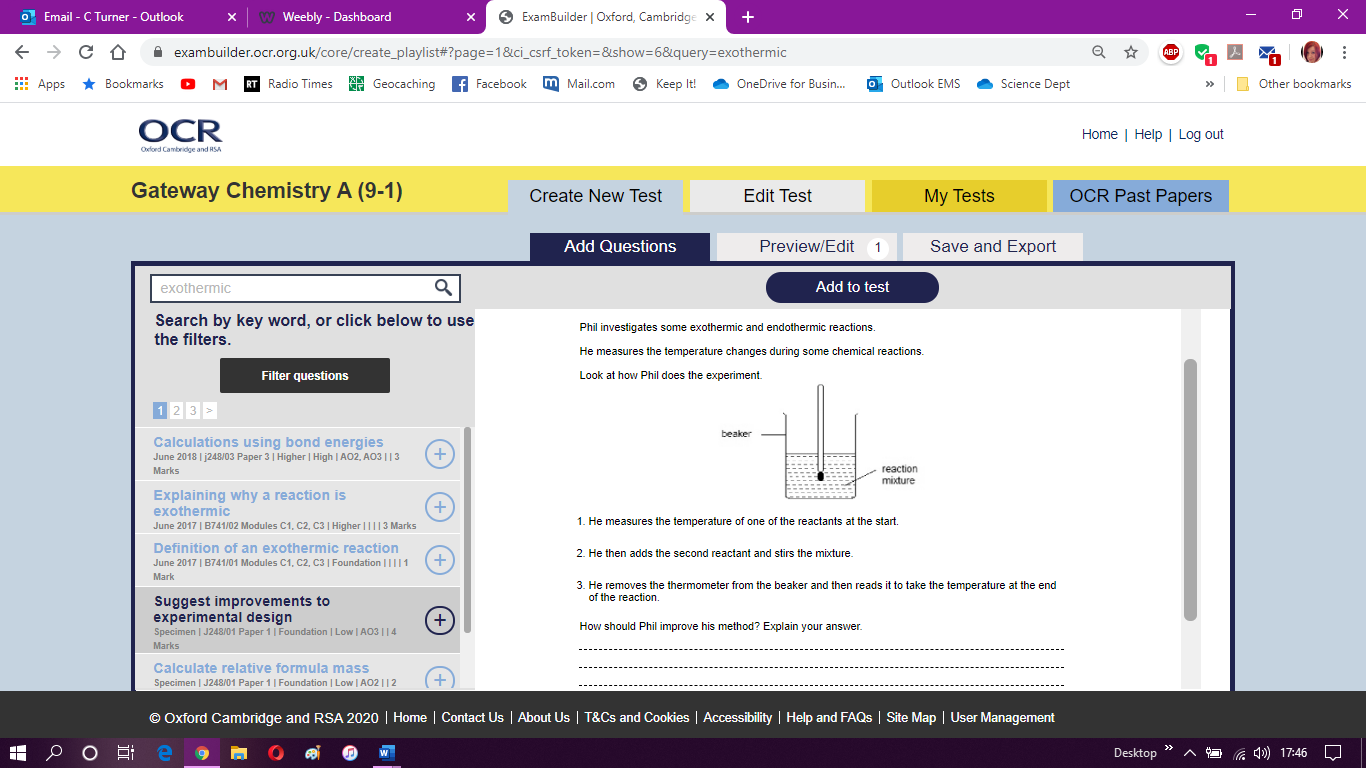








**Task 4: Complete these longer answer questions.**



**Task 5: Complete this bond enthalpy calculation.**

