Student name: Student number:

Designer Stuff: Cross-links and Plasticisers

pgs. 149, 151

Activity 1: *Listen to the presentation and fill in the missing information below.*

Fill in the blanks:

Scientists have made many materials that make our lives **easier**. **Cling Film** is a useful product that is sometimes made with **plasticisers**. It can also be made from

Kevlar is a polymer that is strong and **lightweight**. It is hard to break, so it has a **high** melting point. The very **long** molecules are linked together in **sheets**. The molecules form **hydrogen** bonds, which are very **strong**.

The inventor of **Velcro** copied **seed pods** that attached to his sock. He found a way to make hooks go into loops, he made the material with **nylon**.

Activity 2*: Answer the following questions by using the presentation and the textbook.*

1. How can scientists change the properties of polymers? How can scientists make polymers stronger? (2 marks)

Scientists can change the number of molecules in a polymer. They can make a polymer stronger by adding cross-links.

2. Name **one benefit** (good thing) and **one risk** (bad thing) of using cling film. (2 marks)

One benefit is that is protects food from growing bacteria/ makes food last longer. One risk is that it is bad for the environment/ the plasticisers could make people sick.

3. What makes Kevlar a better material than metal for soldier`s armour? List 2 reasons. (2 marks)

Kevlar is 5 times stronger than steel and it is more lightweight.

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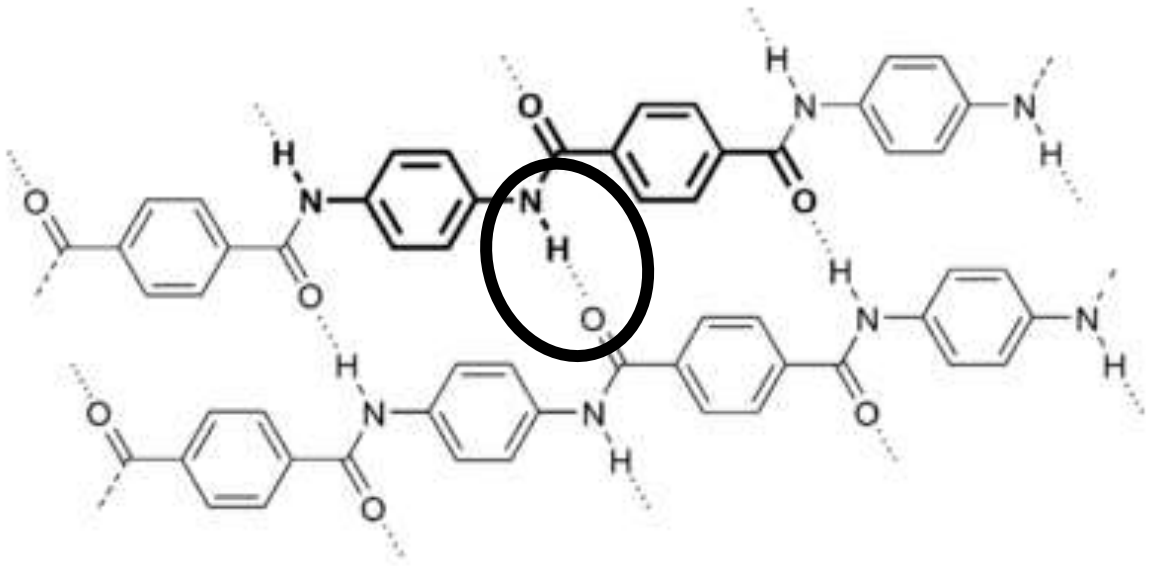
4. A) What type of bond helps Kevlar to be so strong? (1 mark)

Hydrogen Bond

B) Using your answer from 3A), put a ring around those bonds in the picture below. (2 marks)



5. Name two materials that may have been used before Velcro was invented. (2 marks)

People could have used buttons/ strings/ zippers.