

Student name:

Student number:

Designer Stuff: Cross-links and Plasticisers

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ENGLISH	JAPANESE
Cling Film	食品用包装ラップ
Flexible	柔軟な
Controversial	異論の多い
Kevlar	ケブラー（防弾服等に使われる合成繊維）
Accident	偶然
Synthetic	合成の
Properties	特性
Light-weight	軽量の
Sheets	板状のもの
Steel	鋼
Linked	連動した
Bulletproof	防弾の
Vest	ベスト、チョッキ
Surface	表面
Velcro	マジックテープ
Hook	フック、留め金
Loop	輪
Seedpod	種子の殻
Thread	糸
Weave	織る
Produce	を生み出す

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 polythene.

Kevlar is a polymer that is strong and light-weight. 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.

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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)

They can change the length of the molecules. They can make polymers longer to make them stronger.

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

One benefit is that it keeps food fresher for longer and keeps it safe from bacteria. A risk of using cling film is that the plasticisers can move through the plastic and into our food which can make us sick.

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

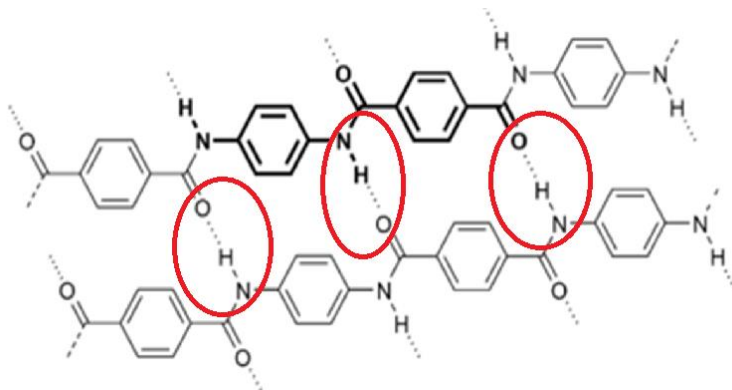
Kevlar is a better material for soldier's armour than metal because it is light-weight so it is not too heavy to wear. Also, Kevlar is 5 times stronger than steel, so it can protect the soldier from many things.

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)

Buttons and zippers could be used before Velcro was invented.