**Absence work**

**14 April 2020**

**Composites**

**Read the information below to gain an understanding of composites.**

Composites are materials used in construction, engineering and technology. Most composites are made of two materials – a material called the reinforcement bound together by a matrix material. Fibreglass consists of fibres of glass (the reinforcement) embedded in a matrix made of plastic polymer. It has a very low density, but is very strong. It is used to make skis, boats and surfboards. Concrete is made from aggregate (a mixture of sand and gravel) embedded in cement. It is strong and rigid. Concrete is used as a building material. Carbon fibres are made from long chains of carbon atoms or carbon nanotubes which are bound together with a polymer matrix. Carbon fibre composites are very strong and light. They are used in aerospace designs and sports car manufacturing.

**Copy the key knowledge table into your exercise books.**

**Key knowledge- Do your look, cover, write check by learning the answers to the questions below.**

|  |  |
| --- | --- |
| Describe what composites are made of. | Two materials: the ‘reinforcement’ and the ‘matrix’. |
| Describe the materials in fibreglass. | Fibres of glass (the reinforcement) embedded in a matrix made of plastic polymer. |
| State the properties of fibreglass. | Very low density but is very strong and so, is used for skis and boats. |
| Describe the materials in concrete. | Aggregate (a mixture of sand and gravel), embedded in cement. |
| State the properties of concrete. | Strong and rigid and is used as a building material |
| Describe the materials in carbon fibre. | Long chains of carbon atoms (or carbon nanotubes), bound together with a polymer matrix. |
| State the properties of carbon fibre. | Very strong and light and are used in aerospace designs and sports car manufacturing. |

**Complete each of the following sentences in your exercise books**

**Recall Quiz:**

1. *The two materials which make up a composite are called the \_\_\_ and the \_\_\_.*
2. *Fibreglass is made from… and…*
3. *\_\_\_\_ is produced by embedding aggregate in cement.*
4. *The properties of fibreglass are… As a result, it is often used to make…*
5. *Carbon fibre composites are used in…*

**Application Task - I do**

Suggest a material you would use to build a sports car with. Justify your answer.

I would use carbon fibre to build a sports car because it is a strong and light material, allowing the car to reach higher top speeds.

**Application Task - We do**

**Copy and complete the question in your exercise book.**

Suggest a material you would use to build the foundations of a large building. Justify your answer.  I would use \_\_\_\_\_\_\_\_\_ to build the foundations of a large building because…

**Application Task - You do**

**Copy and complete the question in your exercise book.**

Suggest a material you would use to build the hull of a boat. Justify your answer.

 I would use \_\_\_\_\_\_\_\_\_\_ to build the hull of a boat because…

**Independent Task**

**Write your answers in complete sentences in your exercise book.**

Below is a table of materials describing various properties of each material. Suggest which material would be best suited for the following:

1. Fruit bowl
2. Skis
3. A protective barrier for spectators at an ice hockey game.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Material** | **Brittleness** | **Water resistance** | **Transparency** | **Rigidity** | **Weight** |
| Clay ceramic | Brittle | No | Opaque | Hard | Heavy |
| fibreglass | Shatter resistant | Yes | Opaque | Hard | Light |
| Poly(methyl methacrylate) | Shatter resistant | Yes | Transparent | Hard | Light |
| Concrete | Tough | Yes | Opaque | Hard | Very heavy |