Hinchingbrooke School Science Department

KS3 Homework Task

Particles and Materials HW2 – Dreamliner plane

Date set:

Date Due in:

On the following page is information related to the task. You may need to do additional research to achieve the maximum level possible.

- Answer all questions, if you use PowerPoint please print off and stick in your book
- Fill in your details below

Name:	Form:
Teacher:	Science Set:

Feedback from teacher:
Student comment:

Dreamliner plane

In July 2007, the American aircraft manufacturer, Boeing, unveiled the first all-new plane they have built since 1995. It is the Boeing 787 Dreamliner, and the company says that they already have orders to build more than 600 of the planes. They are hoping to deliver the first of these to their customers by the summer of 2009, even though the first test flights will probably not take place until late 2008.

The Dreamliner plane (www.boeing.com)

The Dreamliner plane is being called the most environmen about 50% of the plane's structure, including the fuselage and wings, is made from carbon-fibre composite materials instead of metal. The carbon-fibre composite materials are made from fine strands of carbon held together by epoxy resins. As well as being stronger than aluminium, the carbon-fibre is also lighter, so the Dreamliner plane uses less fuel than older planes to fly the same distance, and it produces 20% less carbon dioxide gas than older planes.

Materials used to make the Dreamliner plane	
Carbon-fibre composite	50%
Aluminium	20%
Titanium	15%
Steel	10%
Other materials	5%

A Boeing spokesperson says that another advantage of the carbon-fibre composite is that it does not corrode as easily as metals, so the passenger area of the plane can be kept more humid than in most planes. This means passengers are less likely to suffer from jet lag after long journeys.

QUESTIONS

1 How much of the structure of the Dreamliner plane is made from carbon-fibre composites?

2 List the metals used in the Dreamliner plane, and give their chemical symbols. What percentage of the plane do these metals together make up?

3 Describe in your own words what a 'carbon-fibre composite material' is.

4 From information in the article, give **three** ways in which the properties of carbon-fibre are different from those of aluminium.

5 Describe **two** advantages that Boeing says the Dreamliner plane has, compared to older planes.

6 Discuss what you think 'environmentally friendly' means. Do you think the Dreamliner plane is more 'environmentally friendly' than older planes, or not?