



Hinchingsbrooke School Science Department

KS3 Homework Task

Energy HW5 - Arctic monitoring expedition

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:

Arctic monitoring expedition



An arctic landscape (iStockphoto)

In February 2009, explorer Pen Hadow and two colleagues went on a 2000 km trek across the Arctic to the geographic North Pole, dragging behind them a sledge with radar and other monitoring equipment. The expedition was to provide valuable data to tell scientists just how the Arctic ice is being affected by climate change.

Until this expedition, scientists used satellite and submarine data to measure how the ice is changing, but there were vast areas where they could not tell how thick the ice was, and so could not estimate how long it

would be before it melted, if current trends continued. The ground penetrating radar equipment that Pen Hadow and his colleagues dragged behind them sent pulses of radar down through the ice and used the reflections to measure the ice thickness. Usually this type of equipment weighs about 100 kg, but engineers had to design equipment that was light enough for the team to tow. The resulting 'Sprite' radar weighs only 4 kg. Prior to the expedition, tests conducted in Canada to compare the results of the Sprite radar with drilled ice cores showed that the Sprite radar is very accurate indeed. So the expedition was able to measure the thickness of the ice every few centimetres on the way to the North Pole.

A computer on the sledge collects data from the radar, bio-monitoring equipment, cameras and video, and transmits it to whichever of a series of 66 communications satellites is within range. The communications satellites then re-transmit the data on to a base-camp in the UK.

QUESTIONS

- 1 Until this expedition, how did scientists find out how the Arctic ice is changing?
- 2 What new information has this expedition enabled scientists to measure, and what has this enabled them to predict more accurately?
- 3 Describe in your own words how ground penetrating radar works.
- 4 Which types of electromagnetic radiation were used during this expedition, and where?
- 5 Suggest some reasons why it was important to test the equipment in Canada before the expedition began.

Challenge

You can find out more information about this expedition, the people, the science and the technology involved, from the website www.vancoarcticsurvey.com. Choose **one** aspect of the expedition that particularly interests you and find out more about it. Be prepared to share what you find out with another group or with your whole class.