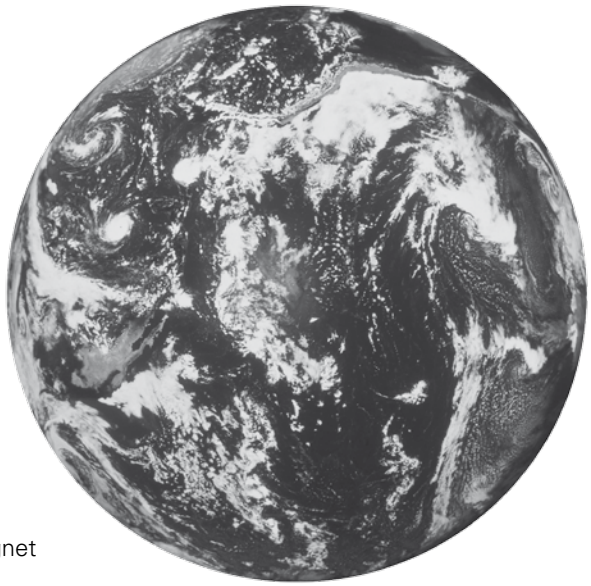
CLIL Science Webquest

The Large Hadron Collider



1 Pre-reading

Do an Internet search for *What is the Large Hadron Collider?* Then tick the correct answer.

a a giant telescope ☐
b a nuclear power station ☐
c a particle physics laboratory ☐

2 Vocabulary

Match the words with the definitions. Then go to the Macmillan Online Dictionary www.macmillandictionary.com and check your answers by typing the words into the search box.

a Big Bang **b** beam **c** collide **d** intersect **e** magnet
f mass **g** matter **h** quark **i** subatomic particle

1 line of light or other form of energy *beams*

2 tiny part of matter that forms part of an atom or is smaller than an atom .....

3 very small unit of matter that the particles of an atom consist of .....

4 the amount of matter that something contains .....

5 an explosion that some scientists believe happened 15 billion years ago and started the universe .....

6 crash into each other .....

7 piece of metal that can make iron or steel objects come to it so that they seem to stick to it .....

8 to join or cross each other .....

9 the physical substance that everything in the world is made of .....

3 Vocabulary

Complete the text with words and expressions from Exercise 2. Check your answers on the internet. You can use these websites to help you:

www.lhc.ac.uk/About+the+LHC/11795.aspx

www.bbc.co.uk/news/science-environment-11711228

www.swissinfo.ch/eng/science_technology/Understanding_the_Big_Bang_Machine_.html?cid=30414356

news.nationalgeographic.com/news/2010/03/100330-large-hadron-collider-lhc-record-higgs-boson/

How it works

The Large Hadron Collider (LHC) is a very big machine that makes hadrons. It works like this: (**1**) *Subatomic particles*, made up of tiny (**2**) ......, accelerate in two (**3**) ..... of light, which rotate in opposite directions. When the particles reach their maximum speed (almost the speed of light), they are made to (**4**) ..... with each other with the help of (**5**) ...... This occurs at four points where the two rings of the LHC (**6**) ...... Scientists record and measure the results of these collisions and try to identify and track the behaviour of the new particles which they produce.

What it can be used for

The purpose of the LHC is to develop our understanding of physics. The LHC will be able to simulate the conditions just after the (**7**) ....., when our universe was created, improving our understanding of the origins of the universe and the basic structure of (**8**) ..... and its (**9**) .....

4 Reading

Read about the Large Hadron Collider online and find the information which corresponds to the following numbers. You can use these websites to help you:

www.telegraph.co.uk/science/large-hadron-collider/3351344/Large-Hadron-Collider-facts.html

public.web.cern.ch/public/en/lhc/Facts-en.html

www.symmetrymagazine.org/cms/?pid=1000364

www.time.com/time/photogallery/0,29307,1810749_1718527,00.html

1 38,000 tonnes *the weight of the LHC*
2 27 km .....
3 100 metres .....
4 26,659 metres .....
5 9300 .....
6 10,080 tonnes .....
7 11,245 .....
8 600 million .....
9 10–13 atm .....
10 100,000 .....
11 -271.3°C .....
12 15 million gigabytes .....

5 Project

The 'Big Questions' scientists hope the LHC will answer include:

1 How did our universe become the way it is?
2 What kind of universe do we live in?
3 What happened in the Big Bang?
4 Why do particles have mass?
5 What is our universe made of?

Choose one of these questions and research it online, using the suggested websites. Prepare a presentation and discuss:

- why you think the question is important.
- what information science has already provided.
- what scientists hope to discover in the future.