

The Large Hadron Collider

1 Pre-reading

Do an Internet search for *What is the Large Hadron Collider?*
Then check (✓) the correct answer.

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

2 Vocabulary

Match the words a–i with the definitions 1–9.
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 large 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 behavior of the new particles that 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 that 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 tons the weight of the LHC
- 2 27 km _____
- 3 100 meters _____
- 4 26,659 meters _____
- 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.