

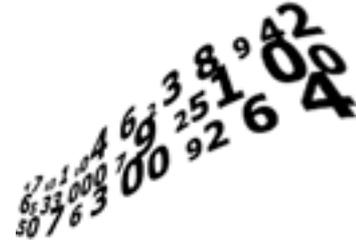


Pre-Reading Activities

A: Class Discussion

Discuss the following questions in small groups.

1. What is anthrax?
2. In which country was anthrax discovered in 2001?
3. What form was it found in? (e.g. liquid, powder, etc.)
4. Did anybody die?
5. Is there a cure for anthrax?



B: Listening

In the box are some words from today's article. Below is a list of definitions for these words. Use your dictionary to look up any words you are not familiar with. Then listen as your teacher reads out the definitions and fill in the gaps.

anthrax, antibiotics, symptoms, toxin, immune system, molecule, bacteria, antitoxin

1. _____ is a _____ which is _____ if not _____ immediately.
2. _____ are _____ organisms that can _____ disease.
3. If you have a _____, your _____ may include a _____ and a _____.
4. A _____ is a _____ produced by _____ microorganisms.
5. The simplest _____ compound is a _____ - consisting of _____ or _____.
6. _____ are used to destroy _____ - penicillin is an _____.
7. Your _____ is your body's _____ against disease and _____.
8. An _____ contains antibodies which can _____ or neutralize _____ produced by organisms.

Reading Activities

A: Scanning

Read the following questions and then find the answers in the first section of today's article.

1. Where did scientists get their computing power from?
2. What are they hoping to find a cure for?
3. Who were the possible cures given to?
4. How many molecules were tested?
5. For how many days were the tests run?
6. What computing platform was used?



Project Seeks Anthrax Cure

WASHINGTON Friday March 8 (Reuters) - Scientists using the power of more than a million home computers, all **linked** together and cranking along as one, have **come up with** thousands of possible **compounds** that could be developed as a cure for anthrax, officials said on Friday.

The British researchers who helped organize the project, which they said they completed with **unprecedented** speed, handed over two compact disks containing 300,000 **potential** drugs to US and British government officials.

Of these, they said 12,000 looked like good candidates for a cure for anthrax infection - not an antibiotic, but an antitoxin to counter the **lethal** effects of the bacteria.

"This has enabled us to have an enormous amount of power," Graham Richards, a chemistry professor at Britain's Oxford

University who helped organize the project, told a news conference.

"In only 24 days we could test 3.5 billion molecules," said Richards, adding that he believed this would be more than any pharmaceutical company could do on its own. Using traditional methods, he said, the project would have taken years.

"This is an historic first use of the Internet as a computing platform to solve a critical, real-world problem with a scope and a speed that simply could not be achieved using traditional computing methods," Ed Hubbard, Chief Executive Officer of United Devices, a Texas-based company that helped in the effort, told the news conference. (Continued/...)

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Glossary: **linked** - joined **come up with** - worked out, discovered **compounds** - chemical mixtures
unprecedented - never done before **potential** - possible **lethal** - fatal, deadly

B: What Do You Think?

Part One: Discuss the following question with your classmates.

What was the biggest advantage of linking one million computers together to test billions and billions of molecules?

Part Two: This is the headline from today's article but it is missing one word:

Worldwide _____ Project Seeks Anthrax Cure

See if this computer riddle helps you complete the headline. Fill the gap in the headline with the word you think is missing.

I am fun to make and entertaining to watch.

I am a toy you can play with.

Because I change and dim, I can protect from burning.

I can stop prying eyes from looking while you are away.

What am I???

C: Fast Reading

Read through the second section of the article quickly to check if your headline was correct. You have two minutes.

Section 2

(.../Continued.) Drug would block Anthrax toxin

Knowing the shape of this target, scientists can look for molecules that will fit into it, like a lock and key, and block it. But screening the billions of known compounds takes a huge amount of computing power.

The National Foundation for Cancer Research, a US group that funds cancer research, has had a project going since April in **collaboration** with Oxford, United Devices and Intel Corp. to screen potential treatments for **leukemia**.

Like the SETI@home project, which uses home computer downtime to process radio emissions in a search for **extraterrestrial** life, it uses computer time donated by personal computer users.

When a person downloads the screensaver, found at <http://www.chem.ox.ac.uk/anthrax/>, the first thing it does is dial the Austin server and ask what this particular personal computer can do. It gets its assignment and **crunches numbers** when the

computer is not in use.

The NFCR has 1.5 million computer users in 215 countries, including two in the Vatican. They will eventually screen 26 compounds for possible leukemia cures.

The companies, along with Microsoft, adapted the cancer software to work for anthrax. The anthrax project, started on Jan. 22, was finished by Feb. 14.

It usually takes, on average, 10 years to bring an experimental new drug to market, but Richards said he believed any product to emerge from this search could be used more quickly -- perhaps within two to four years.

"This would be somewhat different," Richards said. "This is more likely to initiate something you would provide to protect troops, or postal workers even, who are suspected of being attacked."

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Glossary: **collaboration** - working together **leukemia** - a cancer of the blood **extraterrestrial** - a being from outer space; not from earth
crunch numbers - to handle large amounts of data very quickly

D: Reading Carefully

Read through the second section of the article more slowly and complete the following sentences using words from the article.

1. Since _____, four companies have been working together to find a cure for _____.
2. People _____ time on their personal _____ when they are not being used.
3. A person's computer is given a job once a _____ has been downloaded.
4. A server in Austin then gives the computer _____ to crunch and examine.
5. _____ computer users have given time to the project.
6. Software used for _____ research was altered so they could find a cure for _____.
7. Drug companies normally expect the development and testing of new drug to take _____.
8. Scientists hope to have a cure for anthrax in _____ to _____ years.
9. It is anticipated that the antitoxin will be used to protect people like _____ or _____ who are more likely to be attacked by anthrax.

Post-Reading Activities

You may do one or more of these.

A: Language

Look at this sentence from today's article.

Knowing the shape of this target, scientists can look for molecules that will fit into it, like a lock and key, and block it.

Why do scientists know which molecules to look for? **Answer:** Because they know the shape of the target.

We can use the *present participle* or **ing** form of a verb in a clause to give information about reason, result or time.

Below are a number of sentences that relate to today's article. Rewrite each sentence or combine pairs of sentences using the word(s) in brackets. You may need to change the order of the clauses. The first two have been done for you as examples.

1. Knowing the shape of this target, scientists can look for molecules that will fit into it. **(because, know)**
Because scientists **know** the shape of the target, they can look for molecules to fit into it.
2. They used more than 1 million computers. Therefore, they were able to come up with results far more quickly. **(using)**
Using more than 1 million computers, they were able to come up with results far more quickly.
3. Having so many computers working together, they have enormous power. **(because, have)**

4. They tested 3.5 million molecules in 24 days because they had so much computing power. **(having)**

5. The development of a new drug will take less than 10 years because they were able to use so many computers. **(being able to)**

6. Dialing a number, my computer was given a job. **(when, dialed)**

7. Needing more computer power, the scientists asked for help. **(needed, so)**



B: Writing Questions

If you were going to consider helping cancer or anthrax research by donating your computer time, what questions would you need answered? Work with a partner to write a list of at least 6 questions you would like to have answered. Think about computer time, computer power, cost, how the screensaver idea works and other topics you would like to know the answers to.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

When you have finished, share your questions with another pair of learners, so you can get more ideas and also help with the accuracy of each other's questions. Are they grammatically correct? Can you answer any of the questions you have just been given?

C: Internet Research

Below are a number of Internet sites that could answer your questions from **Post-Reading Activity B**. Write down as many of the answers as you can find.

<http://www.researchforcure.com>

<http://www.intel.com/Cure/help.htm>

<http://www.intel.com/Cure/how.htm>

<http://setiathome.ssl.berkeley.edu/faq.html>

<http://setiathome.ssl.berkeley.edu/>



Teachers' Notes and Answer Key follow on next page.

TEACHERS' NOTES AND ANSWER KEY

Pre-Reading Activities

B: Listening - Notes

Read the text below to the students as many times as is needed. Read at a normal pace.

B: Listening - Answers

1. Anthrax is a disease which is lethal if not treated immediately.
2. Bacteria are very small organisms that can cause disease.
3. If you have a cold, your symptoms may include a headache and a runny nose.
4. A toxin is a poison produced by microorganisms
5. The simplest chemical compound is a molecule - consisting of two or more atoms.
6. Antibiotics are used to destroy infection - penicillin is an example.
7. Your immune system is your body's natural defense against disease and infection.
8. An antitoxin contains antibodies which can kill or neutralize poison produced by organisms.

B: Listening - Text to be Read Aloud to Students

1. **Anthrax** is a **disease** which is **lethal** if not **treated** immediately.
2. **Bacteria** are **very small** organisms that can **cause** disease.
3. If you have a **cold**, your **symptoms** may include a **headache** and a **runny nose**.
4. A **toxin** is a **poison** produced **by** microorganisms.
5. The simplest **chemical** compound is a **molecule** - consisting of **two** or **more atoms**.
6. **Antibiotics** are used to destroy **infection** - penicillin is an **example**.
7. Our **immune** system is your body's **natural defense** against disease and **infection**.
8. An **antitoxin** contains antibodies which can **kill** or neutralize **poison** produced by organisms.

Reading Activities

A: Scanning - Answers

1. more than a million home computers, 2. a cure for anthrax, 3. US and British government officials, 4. 3.5 billion, 5. 24 days, 6. the Internet

B: What Do You Think? - Notes

Part One: You may wish to have a classroom discussion about this question to make sure everyone understands that the real advantage of this project was the speed at which it was completed.

Part Two: Students may need to use their dictionaries to understand some of the words in the riddle. Try not to let students look at the article while trying to guess the answer. Do not give the students the answer at this point as they will try to find the answer in the article in the next activity.

B: What Do You Think? - Answers

Part One: It usually takes, on average, 10 years to develop and test new drugs before they can be marketed. Scientists need to screen billions of known compounds to find the right molecules. This process takes a huge amount of computing power. The recent anthrax project took much less time because of the sheer number of computers (more than a million home computers) that were working together.

Part Two: Headline: **Worldwide Screensaver Project Seeks Anthrax Cure**

C: Fast Reading - Notes

Only allow students 2 minutes to read the article. They need to find a single piece of information for which they have already been given clues, so they do not need to understand all the text.

D: Reading Carefully - Answers

1. Since **April**, four companies have been working together to find a cure for **leukemia**.
2. People **donate** time on their personal **computers** when they are not being used.
3. A person's computer is given a job once a **screensaver** has been downloaded.
4. A server in Austin then gives the computer **numbers** to crunch and examine.
5. **1.5 million** computer users have given time to the project.
6. Software used for **cancer** research was altered so they could find a cure for **anthrax**.
7. Drug companies normally expect the development and testing of new drug to take **10 years**.
8. Scientists hope to have a cure for anthrax in **2 to 4** years.
9. It is anticipated that the antitoxin will be used to protect people like **troops** or **postal workers** who are more likely to be attacked by anthrax.

Post-Reading Activities

A: Language - Notes

Focus students on the fact that they may need to change the order of the clauses in the new sentences and that the subject is the same in both clauses. Therefore, when using a participle in a clause with an adverbial meaning, the subject does not need to be repeated in the other clause in the sentence. You may like to photocopy the answers below onto an OHT to make marking and correction easier.

A: Language - Answers

1. Because scientists know the shape of the target, they can look for molecules to fit into it.
2. Using more than 1 million computers, they were able to come up with results far more quickly.
3. Because they have so many computers working together, they have enormous power.
4. Having so much computing power, they tested 3.5 million molecules in 24 days.
5. Being able to use so many computers, the development of a new drug will take less than 10 years.
6. When I dialed a number, my computer was given a job.
7. The scientists needed more computer power, so they asked for help.

C: Internet Research - Notes

If you can't take your class to a computer lab, you could print out many of the answers yourself and pin the sheets around the classroom. The first students to answer all their questions correctly could be given a prize.