Greenwood Canada

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Reading in Science 3

Lesson Reference Book

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1 Canadian AIDS vaccine development backed by Korean company.

Oct 18, 2006 Science and Technology News

An AIDS vaccine research and development being conducted by the University of Western Ontario that is heading for human clinical trials announced yesterday that a South Korean company will finance the expensive work.

Curocom Co. Ltd. of South Korea will pay the $15 million that will be needed to take the vaccine, developed by virologist Dr. Yong Kang of the university, through Phase 1 and 2 clinical trials, the university announced.

Kang said taking the vaccine through to licensure - if it proves effective in testing - could cost $50 million. He was hopeful but cautious about the vaccine's chances of success.

"We have to be careful, because we have only done the immune response studies on animals so far, and it looks good. But that doesn't mean we can repeat exactly the same kind of results in humans," he said from London, Ontario, Canada.

"I hope that this research will work for the treatment as well as the prevention of HIV infection.

"But ... we really have to wait until we finish up to the Phase 2 human trials before we can tell whether or not this is going to work or not."

HIV is the virus that causes full-blown AIDS. Currently there is no cure for AIDS.

Taking any experimental drugs to market for the general population in Canada and the U.S. is a very time-consuming and expensive process. It is not uncommon for a drug to take up to five years before the government would approve its use for the general public.

Difficult words and phrases:

vaccine - a substance made from germs, and given to a person to prevent him from catching a serious disease

research and development -
research - what scientists and engineers do to discover new things
development - what scientists and engineers do to make new things

Korean company -
Korea - a country in Asia (a map is shown online)
company - a group of people doing business together as a single unit

human clinical trials - doing tests with people in a doctor's office

finance - to give money to somebody to do some work

virologist - a special doctor dealing with the study of viruses and diseases

announced - to make known publicly or officially
A woman is making an announcement. (a woman shown online)
Two women are making an announcement about the winners of the music competition. (two women shown online)

licensure - the granting (giving) of licenses

effective - having an intended or expected effect,
having an intended or expected result,
useful

For example:
not effective, ineffective (shown a small hammer with a big nail)
effective (shown a normal hammer with a normal nail)

cautious - doing things in a careful way
(shown online a kid riding a bike with a helmet)
The boy is wearing a helmet just to be cautious in case of a bike accident.

immune response - your body's natural ability to fight diseases
(shown online red blood cell fighting bacteria)
When there are foreign objects inside your body,
your body's natural *immune* response is to send
out blood cells to fight and destroy these objects.

London, Ontario, Canada - (a map is shown online)

treatment -
1.) the manner of dealing with someone or something
e.g. The children received poor treatment at the refugee camp.

What are refugees?
People who have lost their homes due to wars, storms, etc.

2.) in medicine, a way or a method to help the patient
e.g. The cancer patient was given a new treatment that may
work better than any other old treatment.

prevention - to stop something from happening
e.g. Putting on sunscreen lotion is a good prevention against sun burn.

infection - invasion by germs into your body that may cause you to get sick

phase - different stages, different steps
e.g. Water can be in 3 different phases: ice, water liquid, water vapor.

virus - very very small things (smaller than germs) that can cause people
to get sick (e.g. the AIDS virus)

microscope (shown online a microscope with virus)

cure - a means of correcting and healing the body; making the body
not sick anymore
e.g. The two doctors cure the little boy of polio.

What is polio?
Polio is a disease that can cripple young children.

experimental drugs - medicines that are new and untested, and are being used on people as a test
experiment - a test for finding out the truth or facts
drugs - medicines

general population - the public, the citizens of a society

time-consuming - takes a long time
(an hourglass is shown online)
An hourglass has been used to measure time before clocks were invented.

government - the ruling organization of a nation
e.g. Government of Canada

approve - agree, saying 'yes', ok
e.g. #1. The father approves his daughter's marriage.
e.g. #2. The bank approves the loan of $10,000 to the business man.
e.g. #3. The man approves of the food.

sponsorship - to support something, or to support someone
e.g. #1. The beauty pageant has the sponsorship of the TV station and the tourism department of the government.
e.g. #2. The auto racing has the sponsorship of the hotels and the restaurants within the city.

Questions and Answers:

1. Which country is the sponsorship from?
   a. The United States
   b. Canada
   c. China
   d. South Korea

2. How many different stages are there within this sponsorship?
   a. one
   b. two

c. three
d. four

3. How has the vaccine been tested so far?
   a. The vaccine has not been tested so far.
   b. The vaccine has only been tested using computer programs.
   c. The vaccine has only been tested on animals.
   d. The vaccine has been tested on people.

4. According to the article, how long can it take for new medicine to be available for most people?
   a. one phase
   b. two phases
   c. two years
   d. four years
   e. five years

2 How well can you smell?

Dec 18, 2006 Science and Technology News

'Tis the season for the nose

If you had to give up one sense, what would it be? It is tough to pick any one. Isn't it? Solid arguments can be made for each sense, but we found that most people would prefer to keep sight, hearing and touch, and with taste and smell at the bottom of the list. Perhaps this has to do with us living in an increasingly visual and aural world -- take watching TV, for example.

We are well into the festive Christmas season, with its usual bombardment of our olfactory receptors -- apples, oranges, cinnamon, Christmas evergreens, baked turkey and stuffing, gingerbread, scented candles, rum, wine and eggnog. If there is a season for the nose, it is definitely now.

Most people's perception is that humans aren't very good smellers. For one thing, we no longer need to use our sense of smell to hunt or gather food. There is also the argument that since humans began to walk upright their noses moved farther from the ground and they began to lose their ability to follow a scent.

But a recent study at the University of California Berkeley finds that if humans keep their noses to the ground they can indeed follow a scent much like a dog (though not as effectively as a bloodhound, the sad-faced dog that can detect a scent four days old with a nose said to be a million times more sensitive than a human's).

The scientists of the neuroscience department at Berkeley used volunteering students to crawl on all fours -- wearing knee pads and gloves with ears plugged and eyes blindfolded -- to sniff out a 10-metre trail of lightly scented chocolate.

Why two nostrils?

The object of the experiment was to determine why mammals have two nostrils, and how it is related to the fact that most mammals have two eyes and two ears. The experiment showed that if both nostrils are used,

about 66 per cent of the students managed to follow the scented trail, but with one nostril taped shut only 36 per cent succeeded.

So, whatever conclusions you may want to draw from this experiment, the sense of smell is as nonetheless vital as any of the other senses. Case in point, last year when researchers at Amersham Hospital in Buckinghamshire, England, conducted an experiment to see whether dogs could sniff out cancers, they found some startling results.

Six dogs were used to find cancer in the urine samples of seven patients, of which only one had bladder cancer. The dogs were trained to lie down beside the dish containing the urine of the cancer patient. Some dogs were better at it than others, but the overall success rate was 41 per cent. If it was by chance alone, the rate would be about 14 per cent (one-seventh of the seven samples).

"The 41 per cent, as far as I'm concerned, was a remarkable result," said Dr. Carolyn Willis, a research dermatologist involved in the study. "And it was highly statistically significant."

The significance, she said, is that it showed the dogs weren't guessing. Even more amazing, some of the dogs kept lying down beside a dish of supposedly non-cancerous urine, which caused some of the researchers to suspect the experiment was a failure, only to discover that the urine came from a patient with kidney cancer who also had bladder cancer.

The dog-sniffing experiment wasn't the first to suggest cancers can be detected by smell, Willis said, citing Hippocrates who said in the sixth century that certain diseases have certain smells -- diabetes has a fruity smell, liver disease a musty smell. Meanwhile, tests continue in California with dogs on the scent of lung cancer, and in England with dogs trained to sniff out prostate cancer.

Dogs aren't the only keen sniffers. Scientists have found a male silkworm can smell a potential mate 11 kilometres away, but can't smell anything else, and an eel can detect a spoonful of artificial scent in a large lake.

Now there are bomb-sniffing bees being used in some airports around the world. The applications of smell for useful purposes just seem endless.

Evolution and the nose

Gordon M. Shepherd of the department of neurobiology at the Yale University school of medicine challenges the general belief that humans

have a poor sense of smell, even though some of this belief is based on scientific evidence. He has written a paper published by the International Society for Computational Biology titled *The Human Sense of Smell: Are We Better than We Think?*

He cites evolutionary changes that brought about the gradual ascendance of vision and reduction of smell, evidenced by the progressive diminution of the snout as the eyes moved to the middle of the face. Concurrently, as humans began to walk upright their noses moved away from the ground.

Shepherd compares mice to humans, observing that mice have some 1,300 olfactory receptor genes, whereas humans have only 350. The big "however" here is that humans have a much more highly developed brain, with a capacity for language, all of which enhances the human olfactory system, adding a keen sense of discrimination in the way humans smell. He says that in tests of odor detection, humans outperform sensitive measuring instruments such as the gas chromatograph.

These results indicate that humans are not poor smellers (a condition technically called *microsmats*), but rather are relatively good, perhaps even excellent smellers (*macrosmats*)," Shepherd says.

Difficult words and phrases:

participate - to take part in something, to join something
e.g. #1. The children are participating in answering questions.
e.g. #2. The women are participating in an aerobics class.

human smelling ability - how well can people use their nose

sniffing out explosives - using the nose to find explosives
(explosives are TNT, dynamite, bombs)
a bomb (shown online picture of a bomb)
dynamite (shown online picture of dynamite)
The dog is sniffing on the grass. (picture shown online)
The cat is sniffing on a flower. (picture shown online)

tough - difficult, hard, not easy, not soft
e.g. #1. George is a tough boxer. He wins all his fights.
e.g. #2. Big-horn sheep are tough animals.
e.g. #3. Nails are tough; they don't break easily.

solid arguments - good, useful arguments
(argument = a discussion of reasoning, disagreement)
e.g. #1. Sandra has solid arguments against spending more money.
e.g. #2. Bob gave two solid arguments to keep the hospital running.
e.g. #3. John presented solid arguments to his boss to try a new computer system.

sense - humans have five senses: sight, smell, hear, taste, touch

sight, hearing and touch - these are three of the five senses
(shown online pictures of eye, ear, hand)

taste and smell - these are two of the five senses
(shown online pictures of tongue, nose)

an increasingly visual and aural world -
a world where you need to use your eyes and ears more and more
visual - something that needs your eyes to see
aural - something that needs your ears to hear

festive Christmas season - a big Christian festival in the month of December

(shown online picture of Christmas) Christmas is on December 25th

(shown online as comparison)
Christian
Muslim
Buddhist

bombardment - to attack (e.g. to attack with bombs)
(shown online picture of bombs)

olfactory receptors - the small organs inside your nose for smelling
(shown online picture of an olfactory receptor)

apples, oranges, cinnamon – (pictures shown online)
apples oranges cinnamon sticks
cinnamon rolls Cinnamon smells good!
chocolate cream on apple cider
honey in apple cider
cinnamon sticks in apple cider
apple cider

Christmas evergreens - (pictures shown online)
evergreen leaves and branches
using evergreen leaves as decorations
Christmas present
Christmas present and decorations
An evergreen tree has leaves in winter.

baked turkey and stuffing - (pictures shown online)
stuffing in a bowl
turkey is a big bird

gingerbread - (pictures shown online)
gingerbread cookies
ginger

scented candles - candles with a good smell (picture shown online)

rum, wine and eggnog - (picture shown online)
eggnog with cinnamon sticks in stem glasses
Eggnog is made from cream or milk, egg yolks and sugar.

definitely - something that is for certain, for sure
e.g. 1.)
it must be good <=> it is definitely good
it is good, no question <=> it is definitely good

e.g. 2.) The cap is definitely too big for Mike!
(picture shown online)

perception - how people see things
how people believe in things
e.g. If you speak well, people will think you are very smart. This is the perception of most people.

hunt or gather food -
hunt - to find and kill an animal for food
gather food - to try to find food on the ground or on trees
(pictures shown online)

argument - a discussion of reasoning, disagreement
The co-workers are listening to the argument from the man.
The lawyer is giving his argument in front of the court.
The couple is having an argument.
The soccer player is having an argument with the referee.
(pictures shown online)

University of California Berkeley - University of California, in Berkeley

The United States of America (U.S.A.)
(pictures and a map shown online)

indeed - in fact, in reality, in truth, truly, certainly
e.g. 1.) Wow! The whale shark is indeed a big animal!
e.g. 2.) The panda bear is indeed very cute!
(picture shown online)

though - even if, however, nevertheless, although
e.g. Even though it is raining, she walks to work.
as though - as if
e.g. The baby sleeps next to the loud radio and singing as though the noise is not there.

bloodhound - (pictures shown online)
German Shepherd
poodle

neuroscience department - a department for the study of the brain

scientists at the department in the university
(shown picture of a "department")

volunteering students - students who don't get pay for doing the work

Volunteering students are cleaning up the park.
Volunteering students are farming.
(pictures shown online)

crawl – (shown online pictures of crawl)
The baby is crawling on the lawn.
The turtle is crawling towards the sea.
The beetle is crawling in the desert.
The ladybug is crawling on a leaf.

wearing knee pads and gloves - (pictures shown online)
Sally is wearing knee pads and gloves.
a pair of gloves
knee pads for playing volleyball

ears plugged and eyes blindfolded - (pictures shown online)
The boy has his ears plugged.
The woman has her eyes blindfolded.

trail of lightly scented chocolate - a path with a light smell of chocolate
trail - a path (pictures shown online)
a hiking trail in the forest
horseback riders on the trail
bicycle riders on the trail
lightly - something light, not heavy
scented - something with a special smell
chocolate - (picture shown online)

nostrils - the two openings on your nose for breathing
(picture shown online)

experiment - a test, to try something different or try something new
e.g. The two scientists are doing an experiment in their lab.
(picture shown online)

determine - to decide, to find out
e.g. 1.) The doctor determined that the cat is healthy.
e.g. 2.) The engineers determined that the new type of car is safe.

mammals - animals which produce milk for their young, e.g. human, tiger, dolphin, cow.
(pictures shown online)
cow and her calf
insects - (pictures shown online)
reptiles - (pictures shown online)

succeeded - to follow, to grow, to be successful
e.g. In spite of the rough sea, the ferry succeeded in crossing the channel.

What is a channel?
A narrow passage in the sea. (picture shown online)

whatever conclusions -
whatever - everything and anything that...
e.g. Whatever you want to eat, please don't eat too much.

conclusions - the end or final part, a result
e.g. After the police examined the place of the car crash, they drew the conclusion that the driver was driving too fast.

vital - important
e.g. 1.) The wheels are a vital part of a car. Without them, the car can't move.
side window rear window wheels
(pictures shown online of a car)
e.g. 2.) The human heart is a vital part of a person. Without it, a person will not live. (shown online diagram of a heart)
e.g. 3.) Wings are a vital part for a bird. Without wings, a bird cannot fly. (shown online picture of a bird in flight)

researchers - people who try to find out about things, search for facts or the truth
e.g. 1.) The team of researchers is made up of famous scientists and engineers from Canada.
e.g. 2.) The researcher is trying to find a cure for kidney cancer.

urine samples -
urine - liquid waste from your body
sample - a small part of something bigger

You give a urine sample in the washroom for your doctor.
(picture shown online)

patients - people who are sick and are treated by doctors

The patient is talking to the doctor in a hospital.
patient doctor (picture shown online)

bladder cancer -
bladder - the organ for carrying your urine
cancer - a body part that has gone very sick and growing very fast

bladder kidneys
A cancer patient in a hospital. cancer cell
(pictures shown online)

dish
a dish a pill a fork petri dishes (pictures shown online)

overall - including everything, total
e.g. The overall length of the Alberni Bridge is 600 metres.

remarkable result -
remarkable - very good, impressive
result - the end, the outcome

e.g. Wow! That is a remarkable ice castle!
e.g. The doctors are looking at the results after the tests.
(pictures shown online)

dermatologist - a doctor who studies skin diseases

statistically significant -
statistically - in math, the study of numbers, especially large numbers of things
significant - something important, something worth looking into

e.g. Statistically speaking, flying is safer than driving. (shown pictures)
e.g. According to statistics, only 1 person in 9 will live to be 100 years old. (shown picture)
e.g. The dog on the right is significantly bigger than the dog on the left. (shown picture)

guessing - to predict, assume the answer
e.g. I didn't know the answer to the question, so I just guessed the answer. (picture shown online)
e.g. Guess who? (picture shown online)

non-cancerous - not cancer-related, not a cancer

lung cancer, skin cancer (pictures shown online)

suspect - to believe in something bad or someone doing something bad

e.g. I do not know if the young man has been drinking but I suspect that he did because he got into a car accident.

failure - fail to do something, fail to have something done

e.g. His business was a big failure because he did not work hard enough.

kidney cancer -

kidney - the organ for filtering the liquid inside your body
cancer - a body part that has gone very sick and growing very fast

kidney cancer cells
(pictures shown online)

Hippocrates - "Father of Western Medicine" c460-c377 b.c., Greek doctor.
A famous medical rule of Hippocrates:
"Primum non nocere" (First, do no harm).

What is a Greek?
A Greek is a person who lives in Greece, Europe.

diabetes - a sickness where your body cannot digest sugar very well.

Diabetes can lead to blindness.
A diabetic patient injecting himself with medicine.
A diabetic patient testing his own blood.

What is a digestive system?
You digest food that you eat through your digestive system.

(pictures shown online)

fruity smell - smell like fruits

liver disease -
liver - the body organ for making blood
disease – sickness

lungs liver intestine
healthy liver diseased liver (liver with a disease)
blood cells in your body
(pictures shown online)

musty smell - smell like mold, as old buildings, long-closed rooms, or stale food

stale food - old food
mold colonies in a Petri dish mold on walls
an old, dusty, moldy house
(pictures shown online)

lung cancer -
lung - the organ for breathing lungs lung cancer
(pictures shown online)

cancer - a body part that has gone very sick and growing very fast

prostate cancer -
prostate - a male's body part for making semen during sex
(pictures shown online)

cancer - a body part that has gone very sick and growing very fast

keen sniffers -
keen - hard working
sniffers - people or animals who do a lot of smelling of things
Dogs are good sniffers. Dogs are keen sniffers.
The woman is sniffing on perfume. She is a sniffer.
The dog is sniffing on grass. It is a sniffer. In fact, it is a *keen sniffer*.
(pictures shown online)

silkworm -
silkworm spinning silk fabrics made of silk, a silk dress
(pictures shown online)

mate - a good friend, a husband or wife, a sex partner
the mate of a wife is her husband
the mate of a husband is his wife
frogs mating = frogs having sex
insects mating = insects having sex
(pictures shown online)

eel - a long fish that lives in the sea
Snowflake Moray Eel
Striped Moray Eel
(pictures shown online)

artificial scent -
artificial - man-made
scent - smell, fragrance
artificial fruits artificial pink flamingoes artificial eyelashes
woman smelling a fragrance
(pictures shown online)

bomb-sniffing bees - bees that can tell if there is a bomb somewhere
bomb - (shown picture of a bomb)
sniffing - smelling
bee flower - (shown picture of a bee)

applications - the use of something to solve a problem
e.g. The application of dogs to help find missing people.

evolution - how animals and humans slowly change from one shape to another over thousands or millions of years

neurobiology - the study of the brain and nervous system

human nervous system human brain
neurobiology scientists are called neurobiologists
(pictures shown online)

Yale University -

Founded in 1701, Yale is the third-oldest institution of higher education in the United States.

Yale University is located in the city of New Haven, state of Connecticut, U.S.A. (shown online picture and a map)

challenges - a call to fight or to a test

e.g. Space exploration offers a challenge to humans.

The International Space Station above Earth (picture shown online)

scientific evidence -

scientific - something to do with the study of the nature of things, how things work, how animals live, etc.

evidence - facts, things that can show if something is true or not science, scientists doing scientific work

police collecting evidence at a crime scene

(pictures shown online)

computational biology

computational - something to do with calculating, arithmetics, counting numbers

biology - the study of animals and plants, the study of living things

cites - to mention, to quote, to make reference to

e.g. the author of the book cites Alexander Graham Bell as the inventor of the telephone

Alexander Graham Bell The first telephone in the year 1876.

(pictures shown online)

gradual ascendance -
gradual - slow
ascendance - dominance, importance, command

e.g. The ascendance of Brazil as the top national soccer team is due to the importance Brazilians put on physical education in elementary schools.

Brazil's Ronaldo (right) taking on Germany's Thomas Linke and Jens Jeremies during the final match of the 2002 World Cup of football (soccer). Brazil defeated Germany to win the title (Brazil won the championship). The World Cup is held every four years and is the major world championship of the sport.

national flag of Brazil national flag of Germany

(pictures shown online)

progressive diminution of the snout -
progressive - step-by-step, one step at a time
diminution - getting smaller, shrinking
snout - the nose area of an animal (shown pictures)

concurrently - at the same time
e.g. David Letterman is serving concurrently as both the chairman and the CEO of the company.
chairman and CEO (CEO stands for 'Chief Executive Officer')
(picture shown online)

capacity for language -
capacity - the ability, whether something can be done or not
language - e.g. Chinese, English, French are all different languages
capacity for language - able to learn language
(pictures shown online)

enhances - to make better
e.g. a hearing aid enhances hearing for many people
hearing aid
(pictures shown online)

discrimination - to pick one thing over another, to tell the difference between one thing from another

e.g. Your eyes are very good at color discrimination; they can tell the difference between 3,000 different shades of green.
(pictures shown online)

odor detection -
odor - smell, especially bad smell
detection - to discover something
e.g. The soldiers walked very quietly in the dark to avoid detection by the enemy.
(pictures shown online)

gas chromatograph
- a scientific instrument using gas to tell what the gas is made of
gas bubbles liquid solid
(pictures shown online)

Questions and Answers:

1. According to the article, which senses would most people be least likely to give up?
   a. hearing, sight
   b. hearing, smell
   c. sight, smell
   d. smell, taste

2. 'Olfactory receptors' are located in our:
   a. eyes
   b. nose
   c. mouth
   d. throat

3. What is a bloodhound?
   a. bird
   b. reptile
   c. insect
   d. dog

4. Do volunteers get paid?
   a. yes
   b. no

5. What is blindfolding?
   a. (show picture of a person in bondage)
   b. (show picture of a person in blindfolding)
   c. (show picture of a blind person)

6. What is urine?
   a. solid waste from your body
   b. liquid waste from your body
   c. gas from your body

7. What is a bladder?
   a. the organ inside your body for storing liquid waste
   b. the organ inside your body for storing solid waste
   c. a bag for carrying money
   d. a bag for carrying grocery when shopping

8. What is a dish?
   a. (show picture of a bowl)
   b. (show picture of a fork)
   c. (show picture of a dish)

9. What does a dermatologist do?
   a. A scientist studying cancer.
   b. An engineer designing software programs.
   c. A doctor specializes in skin diseases.

10. Which is the sixth century?
   a. The years between 500-599 A.D.
   b. The years between 600-699 A.D.
   c. The years between 700-799 A.D.

11. What does 'diminution' mean?
   a. increasing
   b. decreasing

3 Japanese scientists found giant squid

Dec 22, 2006 Science and Technology News

For the first time in scientific history, scientists have filmed a live giant squid and calculated that the elusive creatures may be more plentiful than previously believed.

Tsunemi Kubodera, team leader and researcher from the Japan's National Science Museum, said Friday that they videotaped the giant squid at the surface as they captured it off the Ogasawara Islands south of Tokyo, earlier this month.

"We believe this is the first time anyone has successfully filmed a giant squid that was alive," said Kubodera. "Now that we know where to find them, we think we can be more successful at studying them in the future."

The squid was caught using a smaller type of squid as bait, and pulled into a research vessel "after putting up quite a fight," Kubodera said. The squid, which measured about seven metres long (about 21 feet long), died while it was being caught.

"It took two people to pull it in, and they lost it once, which might have caused the injuries that killed it," he said.

He said the squid, a female, was not fully grown and was relatively small, by giant squid standards.

"The longest one on record is 18 metres (about 54 feet)," he said.

Kubodera and his team found the squid on Dec. 4 off the remote island of Chichijima, which is about 960 kilometres southeast of Tokyo. They had been conducting expeditions in the area for about three years before they succeeded in making their first contact two years ago.

Last year, the team succeeded in taking a series of still photos of one of the animals in its natural habitat — also believed to have been a first.

Giant squid, formally called *Architeuthis*, are the world's largest invertebrates.

Because they live in the depths of the ocean, they have long been wrapped in mystery and embellished in the folklore of sea monsters, appearing in ancient Greek myths or attacking the submarine in Jules Verne's *20,000 Leagues Under the Sea*.

Until the successes of Kubodera and his team, most scientific study of the creatures had to rely on partial specimens that had washed ashore dead or dying, or had been found in the digestive systems of whales or very large sharks.

Kubodera said whales led his team to the squid. "Giant squid are a major source of food for sperm whales," he said, so they are found in an area where whales feed.

He also said that, judging by the number of whales that feed on them, there may be many more giant squid than previously thought.

"Sperm whales need from 500 to 1,000 kilograms of food every day," he said. "There are believed to be 200,000 or so of them, and that would suggest there are quite a few squid for them to be feeding on. I don't think they are in danger of extinction at all."

Having filmed the squid, Kubodera said his next goal is to further study the creatures' habits in their natural surroundings — at a depth of around 650 metres (about 2000 feet).

But he said he is not planning to try to capture one live.

Many scientists now believe it is better to study animals in their natural habitats. For one thing, it allows scientists to study the interactions between different species of animals, and not just a single type of animal in isolation. With the advent of digital pictures and videos, it is quite easy nowadays to capture the images of animals in the wild, and distribute this information to scientists across the world. This is much better than each scientist going out there and capturing their own specimens.

Difficult words and phrases:

Japanese scientists -

Japanese - people of Japan (shown online a map of Japan)
scientists - people who study the nature of things, how things work, how animals live, etc.

A scientist wearing protective eyewear looking at a liquid.

(pictures shown online)

giant squid -

giant - big
squid - (picture shown online)
Fried Calamari (deep fried squid) fork knife (picture shown online)

scientific history -

scientific - something to do with the study of the nature of things, how things work, how animals live, etc.
history - the past, things that happed in the past

This scientist is doing some scientific work in his lab.
Timeline of History

(pictures shown online)

filmed - some happenings that were taken by film, a moving picture

cameraman film
The cameraman is *filming* a movie.

(pictures shown online)

calculated - in arithmetic, if you want to find the answer you would need to *calculate* and get the answer

What is arithmetic?
Addition, subtraction, multiplication, division are called arithmetic.

elusive creatures -

elusive - something hidden, not easily seen
creatures - animals

more plentiful - more in numbers, a lot, plenty more

There is not a lot of food in the winter. But food is more plentiful in the spring. (pictures shown online)

previously believed -
previous - before
previously believed - something that was believed to be true before now

It was previously believed that stars were little holes in the sky!

National Science Museum -
national - something related to a nation as a whole (e.g. the national football team, the national flag)
science - the study of the nature of things, how things work, how animals live, etc.
museum - a place where important and valuable things from the past are kept

e.g. The national football team of Denmark
e.g. The national flag of Canada
e.g. The national flag of U.S.A.
e.g. a museum of natural history
e.g. a museum of man
e.g. a museum of war
(pictures shown online)

videotaped - some happenings that were taken by video

Sarah is videotaping. video camera

John videotaped his wife and daughter on a boat during their vacation last month.

(pictures shown online)

captured - if an animal is taken into a fishing net or a box, it is said to have been *captured*

The captured lions were put into a cage.
The captured insect was put into a jar.

(pictures shown online)

Tokyo - the capital of Japan
Imperial Palace, Tokyo, Japan (picture shown online)

bait - e.g. a bit of food used for fishing

fishing hook worm worm used as bait
(shown online picture of a fishing rod with a bait)

research vessel
research - what scientists and engineers do to discover new things
vessel – ship
(picture shown online)

fight -
Two bulls are fighting. Two boxers are fighting
Two seals are fighting. A couple is having a fight.
(pictures shown online)

measured - to *measure* something is to find out how long, how tall, how fast or how big something is

The woman is measuring her waist.
The chef is measuring how much sugar to use for baking her cake.
(pictures shown online)

caused the injuries -
cause - to make something happen
injury - a cut or a wound
knee injury - the man skinned his knee
arm injury - the woman broke her arm
Skateboarding caused his knee injury.
Skiing caused her arm injury.
(pictures shown online)

standards - something that is used for others to measure by
e.g. Length is often measured in metres,
weight is often measured in grams.
Metres and grams are the *standards* of measurements for length and weight.
Metre is the standard for measuring length.
Gram is the standard for measuring weight.

on record - to keep a record, to write something down so that you won't forget it

e.g. Wendy is putting all the information on record.

conducting expeditions -
conducting - to direct or to make something happen
expedition - a trip, a journey, an adventure, going away from home to look for something

e.g. The conductor is conducting an orchestra.
conductor orchestra
e.g. The team is on an expedition across the mountain.

(pictures shown online)

first contact - first time seeing something or meeting someone, first touch

In 1492, Columbus was the first European to have the first contact with American Indians.

Columbus from Spain, Europe American Indians

(pictures shown online)

still photos - photographs, pictures that don't move, unlike a movie

still photo a still photo
(pictures shown online)

natural habitat - places where animals live in the wild
natural - something to do with nature, something that happens normally, without people making changes
habitat - living spaces

The ocean is the natural habitat for sharks.
The arctic is the natural habitat for polar bears.
(pictures shown online)

largest invertebrates -

largest - biggest
invertebrates - animals without a backbone

jellyfish is one kind of invertebrate
crabs are also a kind of invertebrate
...so are insects
(pictures shown online)

wrapped in mystery -

wrap – (picture shown online)
mystery - secret, something hidden, something not well-understood, questions

Gifts wrapped in Japanese traditional *Furoshiki*.
Do you believe in flying saucers? It is still a mystery.
(pictures shown online)

embellished in the folklore

embellish - to make more beautiful, to beautify, to decorate
folklore - the beliefs, stories of a group of people or population

embellished embroidery in silk thread on linen, 19th century
colourful, embellished bead necklace
woman working on her embroidery
French-Canadian folklore includes tales of the "flying canoe"
(pictures shown online)

monsters - ugly creatures that usually are believed to hurt people

Frankenstein is a popular monster in the movies.
Little kids dressing up as monsters.
(pictures shown online)

ancient Greek myths -

ancient - hundreds or thousands of years ago, the old days
Greek - something to do with the country Greece
myths - stories that people tell as a true story but actually may not be the truth

The ancient Parthenon in Athens, Greece is a famous Greek landmark.

It is a myth that computers will do everything and people will have nothing to do. In fact, computers give people more opportunities to do things.

myth real life

(pictures shown online)

submarine - a vessel that can go under the sea
A submarine can be used to explore under the sea. (shown picture)

creatures - animals

partial specimens -
partial - only a part of something, not complete
specimen - a sample of something, one item from many

e.g. A butterfly *specimen* is one butterfly taken from many butterflies in the garden.
An apple *specimen* is one apple taken from many apples in the barrel.

a plant specimen specimens of various metals
specimen of a human fetus (2 months old)
(pictures shown online)

digestive - to turn food into body energy
e.g. The stomach is part of the *digestive* system.
The intestine is another part of the *digestive* system.
(pictures shown online)

whales - big mammals living in the sea
(a whale is not a fish)

What are mammals?
Mammals feed milk to their babies.

e.g. humans, cows, whales, elephants

(pictures shown online)

sharks - big fish living in the sea

The whale shark is a shark, not a whale. It is the biggest kind of shark.
The sand tiger shark is one of the fiercest sharks in the ocean.
(pictures shown online)

extinction - a group of animals of the same kind that no longer live -- they are all dead

e.g. dinosaurs went into *extinction* millions of years ago
(picture shown online)

depth - how deep something is
e.g. The depth of the ocean can be as deep as 3 kilometres.
(picture shown online)

interactions - back and forth responses, taking turns in talking, talking to someone would be a form of *interaction*

The interaction between teacher and student helps the student in doing her homework.
(picture shown online)

different species - a species - a group of animals that have the same certain kind of characteristics

e.g. Most *species* of squids are small, but some *species* of squids are very big.

Most *species* of monkeys live in Africa, but there are some *species* that live in Asia.

A species of monkey from Asia
A species of monkey from Africa

(pictures shown online)

in isolation - separated, divided where different groups cannot talk to each other

e.g. The four prisoners were divided into four rooms; they cannot talk to each other for more than a week. They were in total *isolation*.
(picture shown online)

advent - coming into view, arrival

e.g. The *advent* of the car helps people travel long distance easily.

The *advent* of computer learning allows teachers to have more time to help students.

(pictures shown online)

digital pictures and videos -
digital - using the numbers 0, 1 for storing information
pictures - photographs
videos - moving pictures

analog clock digital clock analog thermometer digital thermometer

e.g. The girl is holding a small picture in her hand.
e.g. The man is taking a video near the sea.

(pictures shown online)

images - the shapes of things captured in a picture

e.g. The spaceship captured many *images* of Mars closeup when it passed by the planet.

The artist painted the *image* of some trees on his paper.

images of Mars spaceship

(pictures shown online)

distribute - to take something and put it into different location

e.g. The paper boy *distributes* the newspapers to all the houses in the neighbourhood.
(picture shown online)

specimens - an individual, item, or part representative of a group or a category
- samples, examples

e.g. *specimens* of spiders, beetles and other types of insects
specimen of a fetus pig (a pig before it was born)
(pictures shown online)

Questions and Answers:

1. What is the opposite of a 'live giant squid' ?
   a. A squid that is alive.
   b. A dead giant squid.
   c. A small squid.
   d. A shark.

2. Had scientists caught giant squid before?
   a. Yes, but they were all dead or were dying.
   b. Yes, they had caught many live ones as well as dead ones before.
   c. No, scientists had never seen anything like it before.
   d. No, they had never caught such a big one, only small ones.

3. What was the bait used to catch this giant squid?
   a. A fish.
   b. A worm.
   c. A squid.
   d. A piece of bread.

4. What eventually killed this squid?
   a. The squid was pulled out of the water and it was too dry from lack of sea water.
   b. The squid was killed by the scientists so that they can put it in the freezer to preserve it for later studies.
   c. The squid struggled and injured itself during the catch.
   d. The squid cannot come to shallow water since it is a deep sea animal.

5. Was this squid a big one or a small one by giant squid standard?
   a. It was relatively speaking a small one.
   b. It was a giant even among giant squid.

6. Where was the squid found?
   a. Near the coast of Canada.
   b. Near the coast of Japan.
   c. Near the coast of China.

7. How many years had the scientists been trying before catching this squid?
   a. 2 years.
   b. 3 years.
   c. 4 years.
   d. 5 years.

8. What are invertebrates?
   a. Animals without a body.
   b. Animals without a voice box.
   c. Animals with many tentacles.
   d. Animals without a backbone.

9. How did the Japanese scientists find the squid?
   a. The scientists found many dead squids washed up onto beaches before.
   b. The scientists followed whales to see where they find food.
   c. The scientists used a fishing rod to catch the squid.

10. What was the main reason Kubodera was not planning to capture a live squid?
   a. Because squids don't live very long in captivity.
   b. Because many scientists now believe it is better to study animals in their natural environment.
   c. Because he didn't have enough money.
   d. Because giant squids are too big to handle.

4 Scientists found lakes on Saturn's moon Titan

Jan 4, 2007 Science and Technology News

Space probe found large bodies of liquid on the surface of planet Saturn's moon, Titan, the National Aeronautics and Space Administration (NASA) of the United States said today.

The Cassini spacecraft, with deep-space probe launched in 1997 by NASA, has discovered yet another similarity between Earth and Saturn's moon Titan, revealing images of what appear to be lakes on its surface.

The radar images show dark, smooth patches that appear to be lakes, based on their shape and low radar reflectivity.

The images, published in the current issue of the journal *Nature*, are the best evidence yet of lakes of liquid on the moon's surface since they were first predicted more than 20 years ago.

Researchers speculate the liquid is methane, which is one of the few molecules to exist as a liquid in the extreme cold of the moon, where temperatures rarely rise above –179°C.

The dense haze of Titan's mostly nitrogen atmosphere had prevented earlier attempts to view the surface of the moon. Cassini's probe made its northern-most radar pass to date last July to retrieve the images.

Regular telescopes cannot see through the haze, and radar is the only way to pierce through. Titan has an atmosphere 10 times denser than Earth's.

The spacecraft took an image of a narrow strip about 250 kilometres wide and more than 1,000 kilometres long that contained more than 75 lakes.

Titan's dense atmosphere and presence of carbon-based material have fascinated scientists who see it as a time vault of what Earth may have looked like billions of years ago, before life formed and introduced oxygen into the atmosphere. Carbon is the fundamental element as the building block of life as we know it.

Scientists has speculated Titan might also contain vast oceans, but a 2004 Cassini flyby found no evidence of large bodies of liquid.

The Cassini-Huygens mission is a co-operative project of NASA, the European Space Agency and the Italian Space Agency.

For many years, scientists have theorized that if small organisms such as bacteria were introduced onto a planet or a moon, like Titan, with the subsequent release of oxygen gas, the heavy atmosphere would gradually change into something similar to what we now have on earth and people could colonize such new worlds.

Titan is the biggest moon of Saturn and the second largest moon in our Solar System (after Jupiter's Ganymede). It is larger than the planets Mercury and Pluto. Titan has a thick, mostly nitrogen atmosphere (with some methane) and an atmospheric pressure of 1.6 bars (60 percent greater than the Earth's). This atmosphere, with its heavy clouds, obscures the moon's surface. It may rain liquid methane. The surface temperature is about -178°C.

Methane can be used as a fuel. Some scientists and engineers are hoping perhaps, one day, humans can somehow bottle up methane from Titan and ship it back to Earth for use. Do you think it is possible?

Difficult words and phrases:

telescope - a long instrument for looking at things far away

e.g. The grandfather is showing his grandson some of the planets using a *telescope*.

(pictures shown online)

nitrogen - a gas that makes up about 80% of the air that we breathe
in chemistry, the symbol for nitrogen is N

our air is 78% nitrogen
20% oxygen
0.03% carbon dioxide
liquid nitrogen is at -195.79 °C

(pictures shown online)

atmosphere - all the air that surrounds us is called the atmosphere

The Earth's atmosphere is a layer of gases surrounding our planet Earth.

our atmosphere is 78% nitrogen
20% oxygen
1% water vapor
0.03% carbon dioxide

our planet Earth

(pictures shown online)

radar - an instrument for detecting objects far away

Police uses a radar gun to check if people are driving too fast or not.
A radar dish for looking at the weather
(pictures shown online)

methane - a gas that can be used as a fuel for burning
in chemistry, the symbol is CH4

Cows emit (give out) a massive amount of *methane* through *belching* (passing gas through the mouth) and flatulence (passing gas through the anus, commonly known as *farting*).

The large amount of *methane* produced by cows are now the subject of much scientific research. Some scientists are hoping to capture *methane* for fuel to produce electricity.

(pictures shown online)

space probe -
space – (picture shown)
probe - an instrument that is used to go to dangerous places to find and explore new things

a space probe going to a planet for exploration
(picture shown online)

liquid – (pictures shown online comparing between gas, liquid, solid)

surface - (pictures shown online comparing between aboveground, surface and underground)

aboveground underground
above the sea sea surface below the sea
There are a lot of fish below the surface of the sea.
(pictures shown online)

planet Saturn -
Earth Venus Mars Mercury Pluto Jupiter
Saturn Uranus Neptune
Sun
You can compare the sizes of all the planets with the sun below.
(pictures shown online)

Titan - 1.) a moon of Saturn
2.) (usually lowercase) a person or thing of enormous size, strength, power, influence, etc.: e.g. a *titan* of industry.
In Greek mythology, the Titans were a race of powerful gods.

Titan is the biggest moon of Saturn.
Can you see the sun and planet Saturn in the sky?
(pictures shown online)

National Aeronautics and Space Administration (NASA)
- the space agency of the United States of America (USA)
(pictures shown online)

United States - United States of America (USA) (map shown online)

Statue of Liberty, New York City
- The statue was a gift from the French government for the 100th birthday of America's Independence.
Mount Rushmore
- with Presidents Washington, Jefferson, T. Roosevelt, Lincoln
The White House
- the office and home of the current president of the United States
(pictures shown online)

Cassini spacecraft - the spacecraft used for exploring planet Saturn

spacecraft - a machine that goes into space to find and explore new things

e.g. Apollo 11 going to the moon in 1969
e.g. Space Shuttle circling around the earth
e.g. The International Space Station above the earth
(pictures shown online)

launched - to start, something that was started

e.g. The spacecraft was *launched* yesterday to go to the moon.
e.g. The Titanic was *launched* in 1912. It sank the very same year.
(pictures shown online)

discovered - found out about something

e.g. Christopher Columbus *discovered* America in 1492.

Christopher Columbus

Christopher Columbus sailing across the ocean looking for a new way to go to China and India...
In doing so, Christopher Columbus discovered the New World which is now called America.

(pictures shown online)

similarity - one thing that looks like another

e.g. One *similarity* between a dog and a horse is that they both have four legs.
The *similarity* between a car and a plane is that they both are made of steel.
steel rods

(pictures shown online)

Earth - the planet that we live on

Our planet Earth as seen from space
Earth shown for size comparison
(pictures shown online)

revealing - showing, exposing something so that everybody can see

e.g. The beautiful woman was wearing a *revealing* dress and all the men were looking at her.

(picture shown online)

dark, smooth patches

dark - the opposite of bright (shown picture comparing the two)

smooth - the opposite of rough (shown picture comparing the two)

patches - small pieces, small parts or small sections of something

e.g. patches of sunlight on the lake

e.g. patches of sunlight on the ground

(pictures shown online)

reflectivity - the measurement of how reflective a substance is

substances = things

The woman is wearing a pair of reflective sunglasses.
In other words, the *reflectivity* of her sunglasses is high.

The *reflectivity* of water is very high, as can be seen here where the house's image and canoes' image are *reflected* from the calm water.

The shiny panels are *reflecting* most of the light from their surface. They have a very high *reflectivity*.

(pictures shown online)

published - a book that is printed and distributed to many readers is said to have been *published*

e.g. The famous author *published* a second book this year after the first book last year.

e.g. Sun Zi's *The Art of War* was *published* in China in the year 512 BC.

painting of a Chinese warrior Sun Zi

(pictures shown online)

journal - a magazine or a newspaper used to keep a record of something

e.g. A scientific *journal* is a record for keeping new happenings in science.
A medical *journal* is a record for keeping new happenings of what doctors have done.

medical journal books
(picture shown online)

evidence - facts, things that can show if something is true or not

e.g. There is *evidence* that Mars has water on its surface.

Do you think there was water on Mars once?
Do you think there is water on Mars now?

planet Mars North Pole of planet Mars
(pictures shown online)

predicted - to predict something is to guess at something unknown after some studying

e.g. The weatherman *predicts* tomorrow will be sunny.
e.g. In 1555, Nostradamus correctly *predicted* the invention of the nuclear bomb in 1945.

Nostradamus nuclear bomb

(pictures shown online)

researchers - people who try to find out about things, search for facts or the truth
e.g. The team of researchers is made up of famous scientists and engineers from Canada.

speculate - to guess at something, usually without much ground, much basis or much studying

e.g. Many people *speculate* that the stock market will go up next month.
(pictures shown online)

molecules - very small substances that are made up of atoms

e.g. a water molecule
- it has two hydrogen atoms
one oxygen atom

an oxygen atom two hydrogen atoms

student building a molecule model
(pictures shown online)

exist - something that is present, that is here

e.g. Scientists have already found that dinosaurs *existed* millions of years ago, but dinosaurs do not *exist* today. They are non-*existing* today.

Dinosaurs lived millions of years ago,
but they are extinct now. They are all dead.
(picture shown online)

extreme - very, the most

e.g. Breaking a bone is *extremely* painful.
The sailors were in *extreme* danger when their ship hit a rock.
(pictures shown online)

temperatures - a measurement of how hot or cold it is

e.g. The *temperature* last night was -10°C, so it was very cold.
The *temperature* this afternoon is going to be 40°C, so it will be very hot.
(pictures shown online)

rarely - not often

e.g. It *rarely* rains in the desert; it is always very dry.

a desert
(picture shown online)

dense haze -
dense - something that is packed very close together
haze - fog, mist, a thick atmosphere

dense not dense (compared using two pictures online)

fog water mist

(pictures shown online)

prevented - to stop something from happening beforehand
e.g. Using a seatbelt can *prevent* yourself from injury in case of a car accident.
(picture shown online)

earlier attempts -
early - not late
e.g. If you want to see the sun rise, you have to get up *early*.
e.g. 7 am is *earlier* than 9 am.

attempt - to try doing something
e.g. Many people *attempted* to find the treasure under the sea, but no one has successfully found it yet.

(pictures shown online)

retrieve - to take out, to get something out
e.g. The office worker is *retrieving* files from the drawer.
files drawer
e.g. The woman is *retrieving* her luggage from the carousel at the airport.
luggage carousel

(pictures shown online)

pierce through - using a pointed weapon to poke through something
e.g. 1.) The mosquito *pierces through* the skin easily.
e.g. 2.) The girls had their ears *pierced*.
(picture shown online)

narrow strip -
narrow - the opposite of wide
narrow street wide street

strip - a long piece of wood, metal or some other material
strips of metal a strip of film
woman working with a strip of wood
(pictures shown online)

kilometres - a measurement of length
1 kilometre = 1,000 metres
1 kilometre = 0.6 mile

contained -
This box contains chocolates. These books contain information.
This box contains apples.
e.g. This box *contained* oranges yesterday,
but today it contains apples.
(pictures shown online)

carbon-based material - things made of carbon
carbon - a common substance on earth
in chemistry, the symbol is C

Carbon is needed as building blocks of living things.
Our body is mainly made from carbon.
Coal is mainly made of carbon.
(pictures shown online)

fascinated - to fascinate is to attract, to hold motionless, to have much interest
e.g. The little baby is *fascinated* by the big, shiny toys.

time vault - also known as the time capsule, a box containing things from the present that is locked and not to be opened until many years into the future

e.g. The town of Smallville is inviting its citizens to put in items of significance into a *time vault* on Apr 22, 2008 and not to be opened for 100 years till Apr 22, 2108.

significance - something important, something worth remembering, something worth noticing

oxygen gas - a gas that makes up about 20% of the air that we breathe
(*oxygen* is a gas that we need, without *oxygen* we will die)
in chemistry, the symbol for oxygen is O
(pictures shown online)

fundamental element - basic substance
e.g. Carbon (C), oxygen (O), hydrogen (H), nitrogen (N) are all *fundamental elements*; they are the building blocks of stars, planets and living things in our universe.

building block - a small part that is used to make a larger part
The boy is playing with *building blocks*.
(picture shown online)

vast - big, wide open
Canada is a *vast* country.

flyby - flying around something, or flying near something
e.g. Every morning, the red biplane does a *flyby* near the little village at the waterfront.

European Space Agency - (ESA) the space agency that is made up of countries in Europe

ESA includes Germany, Denmark, France, Ireland, Italy, the United Kingdom (U.K.), etc.

ESA engineers building the Huygens Titan probe
ESA rocket ready to be launched

(pictures shown online)

Italian Space Agency - the space agency of Italy

Italian Space Agency's Ground Station

Where is Italy?
Italy is a country in Europe.

(pictures shown online)

theorized - to form a theory about something

theory - a story that scientists formed to explain why somethings happen the way they do

e.g. 1 The *theory* of gravity explains why an apple would fall onto the ground when it is ripe instead of fly up in the air.

e.g. 2 The *theory* of friction explains why a car can turn a corner without sliding off the road.
Scientists *theorize* that because ice and snow have less friction, therefore cars can easily slide off the road.

e.g. 3 Charles Darwin *theorized* that man evolved from monkey over hundreds of thousands of years.

(pictures shown online)

organisms - living things

an organism is a form of life made up of many parts
e.g. A man is an organism,
a cow is an organism,
a tree is an organism,
a mushroom is an organism,
a worm is an organism, and
a fish is an organism.
(pictures shown online)

bacteria - very small living things that cannot be seen by the eye unless you use a microscope

note: a single bacterium is about 1,000 times bigger than a virus

bacteria in a petri dish
(pictures shown online)

subsequent - after, following, occurring or coming late
e.g. *Subsequent* to her elementary school, the girl went to high school.
Five years ago, Sarah was in elementary school.
Now Sarah is in high school.

release - to let out, to free, to set free, to be freed from something
e.g. The prisoner was *released* from prison early because of his good behaviour.

colonize - one group of people taking control of a new land

e.g. Europeans started to *colonize* North America a few hundred years ago.
Europeans landed in large numbers in North America in Nov 1620.

parachute - a device for allowing people to jump from great height without any injury

The man opened his *parachute* so that he can land safely.
(picture shown online)

Solar System - Our sun, our planet (Earth) and other planets such as Mars, Saturn, etc. is our *solar system*.

There are many other *solar systems*.
Our galaxy, the Milky Way.
The red dot is where our solar system is. (picture shown online)

Scientists estimate that there are 100 billion solar systems in our galaxy, the Milky Way. That's 100,000,000,000 solar systems!

There are many galaxies in the whole universe.
It is estimated that there are as many as 200 billion galaxies in the universe.

Jupiter
Jupiter is a big, gaseous planet in our solar system.

gaseous - something made of gas, no liquid, no solid
Jupiter is the fifth planet from our Sun.
Jupiter and its moons
(picture shown online)

pressure - the application of force by one body on another that it is touching

woman taking blood pressure blood pressure equipment
pressure cooker for cooking
(pictures shown online)

obscures - block from view, covered from view, cannot see something because it is blocked from view

The man is hiding his face. His hands *obscure* his face.
The sun is *obscured* by the clouds.
(pictures shown online)

fuel - any substance that can be used for burning to get power
e.g. coal is a *fuel* for trains in the old days
gasoline is a *fuel* for cars nowadays

Questions and Answers:

1. What did scientists find on Titan this time with the Cassini spacecraft?
   a. An atmosphere.
   b. Lakes.
   c. Living creatures.
   d. Water.

2. Did the finding of lakes surprise scientists?
   a. Yes, scientists originally thought Titan would be dry.
   b. No, scientists had previously calculated that there could be liquid on Titan.
   c. Scientists did not have any expectation beforehand, so they were not surprised.

3. With the thick atmosphere on Titan, how did the scientists find the lakes?
   a. The scientists used a high-powered telescope and put it on the space probe.
   b. The scientists had observed the lakes many years ago by using an earth's telescope.
   c. The scientists used radar on the space probe.

4. Why has Titan been so interesting to scientists?
   a. Because it is the largest moon of the planet Saturn.
   b. Because there is the possibility of finding life on Titan.
   c. Because it gives scientists a chance to test their radar equipment.
   d. Because they may find vast oceans on Titan.

5. How can Titan be changed so that people can live on Titan someday?
   a. Small organisms such as germs can be introduced so that oxygen would be available in the atmosphere.
   b. Large buildings can be built, just like on the moon someday, and people can live in it.
   c. If the lakes can be changed from methane to water, then people can have drinking water.
   d. If solar panels can be built to capture more sunlight, the temperature on Titan can be raised so that it would be warmer.

6. From the article, how long would you guess it took to fly the spacecraft to Saturn?
   a. 2 years.
   b. 5 years.
   c. 10 years.
   d. 20 years.

Teacher's Notes

The Greenwood reading materials are designed to give students a taste of the many internationally accepted literature, current news in science and arts, as well as other interesting topics.

These lessons are suitable for teachers using a "blended" learning approach where regular classroom teaching is supported by outside-of-classroom e-learning. The accompanying web assignments allow students to do homework that teachers can monitor.

READING IN SCIENCE 3 is based on the needs of most students of English as a Second Language (ESL) at an upper intermediate level. Science and technologies are essential in many aspects in everyday living. By studying the many science and technology-related words in these lessons, it is hoped that they will give students a deeper understanding and thus retention of these words. Students are expected to have fundamental components such as phonics, grammar and basic sentence writing done in previous levels.

There are many creative and exciting ways to incorporate *READING IN SCIENCE 3* into a blended classroom/e-learning teaching. The Greenwood development team hopes that you find these lessons a valuable addition to your teaching resource materials. If you have any questions or suggestions, we would be happy to hear from you.

Greenwood Canada
Tel: (604) 231-8197
web: www.Greenwood.ca
email: support@Greenwood.ca