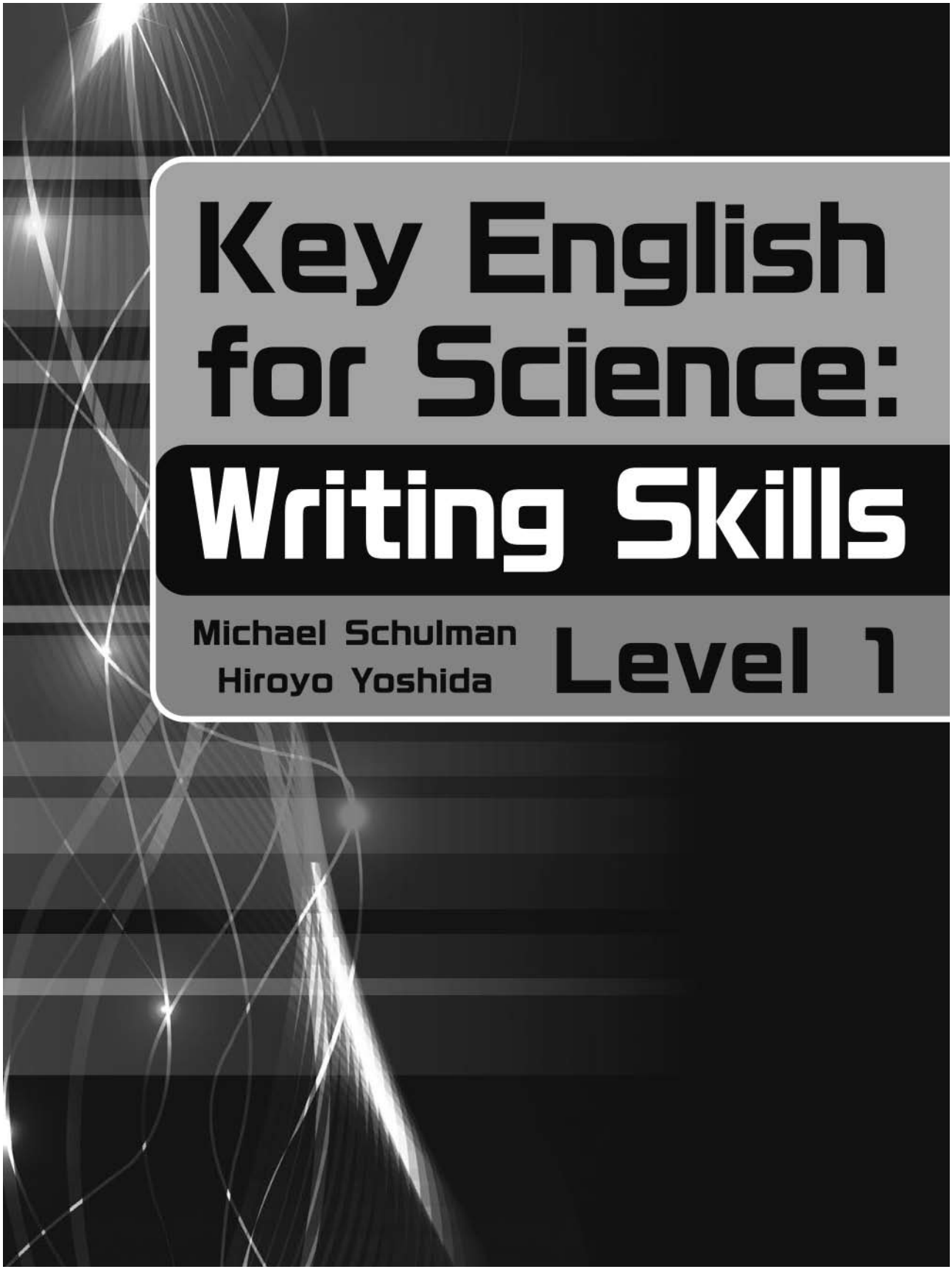
Teacher's Manual



Unit 1　Where is the audio-visual corner?

Part 1

Comprehension Questions

1. He wants to borrow a copy of Time magazine and a DVD.

2. She says that he can't take out DVDs from the library.

3. He checks out the magazine.

Dictation

Professor Coleman wants to (borrow) a copy of Time magazine and a DVD. The librarian tells him that it is not permitted to (take) (DVDs) (out) (from) the library and they must be viewed (inside) (the) (library). So, the professor only (checks) (out) the magazine.

Part 2

Comprehension Questions

1. He says he'll do it during the lunch break.

2. They can get access by using databases on the website.

3. It needs to be returned by next Friday.

Dictation

Professor Coleman would like to take out a copy of Time magazine and a DVD, but the librarian tells him that people are only (allowed) to view DVDs inside the library. The professor needs to check the DVD, so he tells the librarian that he will do it during the lunch (break). The professor also confirms that his students are able to use the databases of Chemical Abstracts (on) (the) (website). Finally, he checks out the magazine, and the librarian tells him to return it (by) (Friday).

Part 3

Comprehension Questions

1. She tells him that the professor can use the self-checkout machine next time.

2. It's near the stairs in the back.

Dictation

Professor Coleman would like to take out a copy of Time magazine and a DVD, but the librarian tells him that people are only allowed to view DVDs inside the library. The professor needs to check the DVD, so he tells the librarian that he will do it during the lunch break. The professor also confirms that his students are able to use the databases of Chemical Abstracts on the website. Finally, he checks out the magazine, and the librarian tells him to return it by Friday. The librarian tells the professor that he needs to check out the book (with) (his) (ID) (card) because of the security systems (at) (the) (main) (entrance), and next time he can use (the) (self-checkout) (machine) near the stairs in the back.

Exercise (A)

1. Plans for the new building are on hold (until the end of October).
2. The change will take place at the (beginning of the year).
3. I came back two days (after he left New York).
4. The program has aired continuously (since April 5, 2009, on the QBS Television Network).
5. I'll have finished the task (before you come home).
6. (When you left to get the newspaper), he went to bed.
7. (In the center of the park) is a large play structure for kids including a slide and jungle gym.
8. (Not until the eighteenth century) did scientists decide that air, earth and fire were not really elements at all.

Exercise (B)

a) He will call you the day (after tomorrow).
b) She called on her friends in her hometown (two days ago).
c) They must be seated quietly while the performance is (in progress).
d) She started for Canada (a few weeks) after she graduated.
e) We are (under) the sun.
f) The sun is (in the center of) the solar system.

Exercise (D)

Answers will vary.

Exercise (E)

Answers will vary. Sample:

A playing field lies just in front of the main entrance of the campus. If one continues down the main pathway, he or she will see the parking facility on the right, and the Health Services Building on the left. The Research Center and Administrative Building are in front of the Health Services Building, while the Student Life Center lies in front of the parking facility. The Physical Activities Complex is to the right of this building, and in front of it stands the library. The Sciences Lab Building and Engineering Lecture Hall wrap a bit more than halfway around the library.

Unit 2　Amazing inventions

Part 1

Comprehension Questions

1. He thinks that there are truly amazing inventions all around them.

2. They talk about Thomas Edison.

3. The last invention mentioned during their talk is the kinetoscope.

Dictation

David tells Ayano that he has never thought about it before, but there are truly amazing (inventions) all around them. For example, (Thomas) (Edison) developed a lot of incredible devices. Finally, they talk about the (kinetoscope), which was one of the most important inventions he introduced.

Part 2

Comprehension Questions

1. He thinks people may have been shocked when they heard recorded sound for the first time.

2. He thinks that recorded sound is incredible.

3. They discuss the first high quality electric light bulb, electric power generation and distribution, and the phonograph.

Dictation

David tells Ayano about his thoughts. He says that they are surrounded by amazing inventions. He's thinking about Thomas Edison, and his most amazing invention. David imagines how people must have been shocked when (they) (heard) (recorded) (sound) for the first time, and he (feels) (that) (it's) (incredible), too. Edison was involved with a lot of important inventions, (including) (the) (first) (high) (quality) (electric) (light) (bulb), electric power generation and distribution, and the (phonograph). Finally, they talk about the kinetoscope, which Edison also introduced.

Part 3

Comprehension Questions

1. It was one of the first machines which could record motion pictures.

2. Ayano shares her opinion that Edison is the father of modern entertainment.

Dictation

David shares his thoughts with Ayano. He talks about how amazing inventions are all around them. In particular, he's thinking about Thomas Edison. David feels that people must have been really shocked when they first heard recorded sound, and he also feels that it's incredible. Edison created many inventions, including the first high quality electric light bulb, electric power generation and distribution, and the phonograph. Finally, they discuss the kinetoscope, which was also introduced by Edison. It was one of the first machines which could record (motion) (pictures). Ayano shares her opinion that Edison is (the) (father) (of) (modern) (entertainment).

Exercise (A)

1. I (agree) that science and technology have become important parts of our lives.
2. Half of the population (thinks) human actions have nothing to do with climate change.
3. Some people (believe) in God, while others do not.
4. There are many ways to choose a computer password that is hard for hackers to (guess).
5. We (hope) to cultivate professionals with a broad perspective on the local environment.
6. (Imagine) that there are no countries.
7. He was able to (infer) the topic of the book by looking at its cover.
8. When Isaac Newton discovered the law of gravity, he (realized) its monumental importance.
9. (Suppose) we plan to roll two dice and we're interested in the sum of the two numbers appearing on the top faces.

Exercise (B)

1. We're sorry, but (there) appears to be a problem loading the email.
2. The browser (doesn't) seem to be working right.
3. Charlie gets a small ugly tree because he feels (sorry) for it. His friends decide that maybe they can make the tree look (beautiful) for Christmas.
4. Good sandwiches always smell (good).
5. The melody sounds (familiar) to me. I think I've heard it before, but I'm not sure.
6. Dinosaurs became (extinct).

Exercise (D)

Answers will vary.

Exercise (E)

Answers will vary. Sample:

I greatly admire Paul McCartney. First, I think he is a very charismatic man. When he smiles at his fans, they seem very happy. In addition, he often says very charming things in interviews. Second, he's extremely intelligent. His music is brilliant, and it has had a huge influence on music as we know it today. He is very gifted at coming up with gorgeous melodies. Finally, he's very hardworking. Although he is most famous for his work with the Beatles, since that time he has been working continuously. The songs he wrote as a member of Wings, while not as well known, are some of the best songs in the history of rock music. For these reasons, I feel that McCartney is an admirable man, and I'm proud to call myself his fan.

Unit 3　The sun is white

Part 1

Comprehension Questions

1. It's a color picture of the sun.

2. He doesn't believe that the sun is white.

3. Sunspots looks black because they are a bit cooler than the areas around them.

Dictation

Akane shows Hirofumi a picture. It's surprising because Hirofumi thinks it's a (black) (and) (white) picture, but actually it's a color picture of (the) (sun). The sun is white. (A) (few) (sunspots) can clearly be seen in the photo because they are a bit (cooler) (in) (temperature) than the areas around them.

Part 2

Comprehension Questions

1. We can't look at it because it's dangerous and hurts our eyes.

2. Akane uses a Herschel wedge with an installed filter.

3. They are caused by magnetic activity on the sun.

Dictation

Akane shows Hirofumi a photograph. Hirofumi is surprised because he thinks it's a black and white picture, but actually it's a color picture of the sun. The photo reveals the sun is white. In fact, when it's (overhead), it appears white, but we can't look at it directly because it's (dangerous) and it hurts (our) (eyes). Akane takes the photo using a Herschel wedge with an installed filter, so the sun is easier and safer (to) (view). They can clearly see a few sunspots in the photo. Sunspots are caused by (magnetic) (activity) on the sun, and they are a bit cooler in temperature than the areas around them.

Part 3

Comprehension Questions

1. The sun appears that way because of dust and other materials in our atmosphere.

2. They look dark because the areas around them are even brighter.

Dictation

Hirofumi is shown a picture. It's a color picture of the sun. The sun is white, which surprises Hirofumi. It appears white when it's overhead, but it's too dangerous to look at it directly. When the sun is on the horizon, it appears orange, red and yellow because of the (dust) in our atmosphere. Akane takes the photo safely by using a Herschel wedge and a filter. They can clearly see a few sunspots in the photo because they are caused by magnetic activity on the sun, and they are (a) (bit) (cooler) in temperature than the areas around them. In fact, sunspots are brighter than the full moon, but they look dark because (the) (areas) (around) (them) are even brighter.

Exercise (A)

1. In engineering and other physical sciences, an experiment is a (primary) component of the (scientific) method.
2. Scientists perform research toward a more (comprehensive) understanding of nature, including (physical), mathematical and social realms.
3. Most airplanes are flown by a pilot on board the aircraft, but some are designed to be (remotely) or computer-controlled.
4. Algebra is the study of operations and their application to (solving) equations.
5. The Tiger Swallowtail butterfly is a strong flier with (distinctive) yellow and black (striped) markings on its wings and body.

Exercise (B)

1. The students will participate in a scientific experiment (that shows how cacti retain water) in order for them to survive in hot, dry parts of the world.
2. A scientist is a person (who studies one or more of) the natural sciences.
3. Stability and control are much more complex for an airplane (which can move freely) in three dimensions, than for cars or boats which only move in two.
4. International mathematics courses contain a body of knowledge (which students are required to learn and apply), ranging from algebra concepts, statistics, and geometry, to trigonometry and differential calculus.
5. The biggest living creature (that scientists know of right now) may be the blue whale.

Exercise (D)

Answers will vary.

Exercise (E)

Answers will vary. Sample:

I really like my phone. First, it's quite small, so it fits into my pocket easily. This is a big advantage when I have a lot of things to carry and I don't have any free space in my backpack. Second, it's made of steel and glass. Although that makes it kind of heavy, I really enjoy how solid it feels in my hand. Finally, it has advanced video chat capability. This appeals to me because I can see my friends and family as I talk to them. It also allows me to talk to other students about schoolwork and show them what I'm working on as we speak. Unfortunately, this phone is getting a little old, so I hope my next one is as versatile and innovative.

Unit 4 Online Social Networking

Part 1

Comprehension Questions

1. They are staring at their cell phones.

2. They discuss addiction to the internet.

3. He explains that computers were developed in the 1950s, the first operational packet-switching network was developed in the 1960s and 1970s, and the World Wide Web was created in the early 1990s.

Dictation

Students in a school cafeteria are staring at their cell phones. It seems that they are using the internet. Perhaps they are using a (social) (networking) (service). David and Rumi say that this kind of technology is transforming people into (internet) (addicts). Rumi asks David about the time when people started to use the internet. He explains that computers were developed in the 1950s, the first operational packet-switching network was developed in the 1960s and 1970s, and the (World) (Wide) (Web) was created in the early 1990s.

Part 2

Comprehension Questions

1. He thinks it is amazing and helpful, but could lead to addiction.

2. He thinks it's helpful because it enables him to communicate with his friends and family, and it helps him because he's so far from home.

3. He doesn't think it's healthy for people to stop talking to other people.

Dictation

Students in a school cafeteria are apparently using the internet, perhaps while browsing an online social networking service. David and Rumi say that this kind of technology is making people into internet addicts. David thinks it's amazing that he can communicate with his friends and family in the United States so easily with email and (instant) (messaging). He also thinks that this technology really helps him a lot because he’s so (far) (away) from home. However, he thinks that (face-to-face) (communication) (and) (time) (away) (from) (the) (internet) are also both important. He (doesn’t) (think) (it’s) (healthy) for people to stop talking to other people. Finally, Rumi asks David about the point when people started to use the internet. He explains that computers were developed in the 1950s, the first operational packet-switching network was developed in the 1960s and 1970s, and the World Wide Web was created in the early 1990s.

Part 3

Comprehension Questions

1. It was created in the early 1990s.

2. He thinks it's understandable because the advent of the World Wide Web played an important role in making internet use more widespread in the general population.

Dictation

Students in a school cafeteria appear to be using the internet. Perhaps they are checking an online social networking service. David and Rumi discuss the idea that that this kind of technology is making people into internet addicts. David is happy that he can communicate with his friends and family in the United States so easily with email and instant messaging, even though it's addictive. While Rumi doesn't need to (communicate) (with) (her) (friends) (and) (family) (online) (very) (often) because she sees them almost every day, David thinks that the technology is very helpful to him because he's (such) (a) (long) (distance) (from) (home). However, he thinks face-to-face communication and time away from the internet are also important because he thinks it's unhealthy for people to stop talking to other people. Finally, in reply to Rumi's question, David talks about the history of the internet. He discusses the (development) (of) (computers) in the 1950s, the first operational packet-switching network in the 1960s and 1970s, and the creation of the World Wide Web in the early 1990s. Rumi's father started to use online social networking services in the mid-1990s. David isn't surprised by this because the advent of the World Wide Web played an important role in making internet use more widespread in the (general) (population).

Exercise (A)

1. The group member discussed (whether) or not they should focus on biological research.
2. Your report is a useful record of (what) you observed in the laboratory.
3. This document describes (how) the plans meet the needs of the community.
4. (What) happened in the spacecraft was a tragedy.
5. My father remembers (when) his first computer was brought home.
6. (Whoever) works the hardest has the best chance to succeed.
7. Some scientific evidence proves (that) the planet is getting warmer.
8. Scientists have estimated (how) many stars there are in the universe today.

Exercise (B)

1. (The) moon rotates about its axis in approximately the same amount of time it takes to orbit the Earth.
2. He is looking forward to becoming (a) chemist in the near future.
3. The psychiatrist likes cats, but in fact, she keeps (a) dog.
4. All of the books (are) related to biomedical engineering.
5. The master key to the laboratories (is) kept in the locker at the guard station.
6. (Is) there anything I can do for you?
7. Nobody passed the exam, did (they)?
8. Students have to submit a lab report every three (weeks).

9. I saw my math professor near the station yesterday. Today, I saw (the) same professor near the station again.
10. Behind the machine (were) the scissors which I had been looking very hard for, but couldn't find.

Exercise (D)

Answers will vary.

Exercise (E)

Answers will vary. Sample:

The first time I used a computer, I was a really young kid. However, I remember it very clearly. My father brought it home one day and put it on a table. Then, he turned it on. He proceeded to load a program. I was amazed to see text and pictures on the screen. Next, we tried a few different programs, including games. I was most interested in the games, and I was upset when my father told me that I can't play them all the time. However, I understood and calmed down pretty quickly. Finally, my father turned off the computer, and I thought about it for the rest of the night.

Unit 5　Robotic Cleaner

Part 1

Comprehension Questions

1. She asks him if the automated robotic vacuum cleaner can really replace a traditional one.

2. He says that when it comes to an obstacle, it changes direction.

3. He bought it because he learned that it was created by an advanced technology company, rather than a typical consumer electronics maker.

Dictation

Akane asks David if the automated (robotic) (vacuum) (cleaner) can really replace a traditional one. David says that it cleans the room (perfectly). He says that when it comes to an obstacle, it changes direction. When he learned that the robot was created by an (advanced) (technology) (company), he became interested, and then he bought it in America.

Part 2

Comprehension Questions

1. She says that it also creates robots which are used to gather data at the nuclear disaster site in Fukushima.

2. He says that their other robots took an active role after a large and damaging oil spill.

3. He says it's because it's powered by a rechargeable battery.

Dictation

Akane asks David if the automated robotic vacuum cleaner really replaces a traditional one. David says that it cleans the room perfectly, and when it approaches an obstacle, it changes direction. After he learned that the robot was created by an advanced technology company, he bought one. Rumi says that the company also creates robots which are used to gather data at the (nuclear)(disaster)(site) in Fukushima. David replies that their other robots took an active role after a large and damaging (oil)(spill). David says that the robotic cleaner returns to its docking station after finishing its cleaning cycle because it’s powered by a (rechargeable)(battery).

Part 3

Comprehension Questions

1. He says it benefits people for whom cleaning is a difficult task, such as the elderly and people who are sick.

2. He says it's because they're expensive.

Dictation

Akane asks David if the automated robotic vacuum cleaner can actually replace a traditional one. David says that it cleans the room very well, and it changes direction when it approaches an obstacle. When he found out that the robot was developed by an advanced technology company, be bought one. Rumi shares that the company also makes the robots which gather data at the nuclear disaster site in Fukushima. David adds that their other robots took an active role after a particularly large and damaging oil spill. He says that the robotic cleaner is powered by a rechargeable battery and thus returns to its docking station after finishing the cleaning cycle. This kind of robot can be useful for people for whom cleaning is a difficult task, such as (the)(elderly)(and)(the)(disabled). However, they are expensive and thus some people (cannot)(afford) them.

Exercise (A)

1. Donating blood is a good way to save a life because patients often require (blood) or platelets to help treat a fatal disease.
2. Economics (is) one of the social sciences such as sociology, psychology and anthropology.
3. Radiation, matter, gravitation, electric charge, and magnetism are all invisible physical (phenomena).
4. The police usually (have,) a search warrant before (c they) enter and search a citizen's home.
5. (Light) travels in straight lines, and transmits energy from one place to another.
6. (Tomatoes) and lycopene have been the subject of scientific research in relation to their effect on people with certain health conditions like cancer.
7. Although (few) people think that smoking is healthy, some people think that smoking is a relaxing tool. Surprisingly, (quite a few) people never try to quit smoking.
8. (Most of the children) in the summer camp are interested in nature.
9. Electronic data exchange via e-mail or the Web is more eco-friendly than using millions of (sheets of paper).
10. (Half) of employees in the company are contract workers.

Exercise (B)

1. The soccer team (takes) great pride in their players.
2. Scholars are expected to (do) research and give lectures.
3. If people (have) a fever lasting a week or longer, it may be caused by the flu.
4. The bank (made) a profit in the second quarter last year.
5. Many individuals (took) advantage of the online service to submit their annual tax returns.

6. Information and communication technology has (made) a lot of progress in the last few years.
7. Heat illness occurs when the weather is very hot or very humid and children are (doing) exercise or playing sports.
8. (Taking) medicine can be dangerous if you don’t recognize an adverse reaction.

Exercise (D)

Answers will vary.

Exercise (E)

Answers will vary. Sample:

My ideal robot would have three main jobs. First, I would like it to clean my house. I hate cleaning, and it would be a big advantage to me if I didn't have to do it any more. Second, it would cook all of my meals. After school, I don't have much time to cook because I have to do my homework. If the robot prepared the food, I'd have more time to do other things. Finally, my robot would hide when it wasn't needed. Although many people seem to want to develop personal relationships with robots, I know that robots are only machines and incapable of emotions. Therefore, I have no interest in communicating or playing with one. If a robot similar to my ideal robot is sold in the future, I'll probably buy one.

Unit 6　Water Survey

Part 1

Comprehension Questions

1. Students are conducting an experiment to analyze water pollution.

2. They analyze water temperature, coliform bacteria, dissolved oxygen biochemical oxygen demand, nitrate, phosphate, pH, and suspended solids.

3. David took part in a similar experiment in his country.

Dictation

Students (conduct) (an) (experiment) to analyze water pollution. Asako and David plot a diagram, and (analyze) (each) (item) accordingly. They analyze water temperature, coliform bacteria, dissolved oxygen, biochemical oxygen demand, nitrate, phosphate, pH and suspended solids, in that order. David took part in a similar experiment in his country, (a) (water) (quality) (study) of the Hudson River in New York.

Part 2

Comprehension Questions

1. The result concerning the coliform bacteria is disturbing.

2. PCB contamination is a major problem.

3. Japan had a similar situation concerning PCB contamination.

Dictation

Students carry out an experiment to analyze water pollution. Asako and David plot a diagram, and start by analyzing the water temperature. They proceed to analyze the coliform bacteria, dissolved oxygen, biochemical oxygen demand, nitrate, phosphate, pH, and suspended solids. The rate of (coliform) (bacteria) (is) (positive) and rather high even though there's no indication of the cause, which is disturbing. David helped to carry out a similar experiment in his country, a water quality study of New York's Hudson River. There is some (PCB) (contamination) in the river, which is a major problem. In 1977, PCBs were banned in the US. Japan had (a) (similar) (situation) and also banned their use in the 1970s.

Part 3

Comprehension Questions

1. The government, researchers, advocates, and students have been working together.
2. The results differ depending on various factors.

Dictation

Students perform an experiment to analyze water pollution. Asako and David plot and analyze each of the following items, in order: water temperature, coliform bacteria, dissolved oxygen, biochemical oxygen demand, nitrate, phosphate, pH, and suspended solids. The rate of coliform bacteria is positive and rather high although there is no indication of the cause, which is disturbing. David participated in a similar water quality study of the Hudson River in New York. The river was contaminated by PCBs. This was considered to be a major problem, and PCBs were banned in the US in 1977. Japan banned their use in the 1970s due to a similar situation. According to David, (the) (government), (researchers), (advocates), (and) (students) have been working together on a cleanup campaign for the river, which has been effective so far. However, it seems that the results vary (depending) (on) (factors) including location and season.

Exercise (A)

1. There are many things you can do to (help) protect the environment.
2. Unfortunately, if you (fail) to attend the mid-term or final exam, no other arrangements will be made.
3. The software corporation (allows) users to take advantage of the latest software updates until the next version is released.
4. The government (hopes) to support projects that can offer rehabilitation services for the community.
5. In Australia, you may (happen) to see a large herd of kangaroos.
6. To keep the computer network in good working order, professionals recommend that we (consider) having regular server updates.
7. Because of its nature, water molecules at the surface (resist) separating.
8. We (heard) someone next door crying through the night.
9. A strong wind blew in, and the door (closed) behind me.
10. Currency exchange rates fluctuate and (change) every day.

Exercise (B)

1. Architect Antoni Gaudí (designed) Sagrada Família, a large and famous Roman Catholic church in Barcelona.
2. It is amazing that the Mona Lisa (was painted) by the Italian artist Leonardo da Vinci more than 500 years ago.
3. The unsuspecting citizens (were never told) the truth of the disastrous accident.
4. I'm always hesitant about having my photo (taken) or asking someone to take a picture of me.
5. There (was reported) to be light snow and fog at the time when the plane accident happened.

Exercise (D)

Answers will vary.

Exercise (E)

Answers will vary. Sample:

The most interesting experiment I have ever done was in the fifth grade. First, our teacher poured some water into a glass. Then, she put a bunch of salt into the glass. She stirred it a lot so it mixed well with the water. Next, she poured some additional water into the glass. Finally, she put an egg in the glass. The egg sank through the clear water at the top of the glass, but then floated when it hit the salty water in the middle of the glass. All of the students in our class were very surprised. This experiment was particularly interesting to me because it was the first time I realized that understanding science could help me to understand the world in a more profound way.

Unit 7　Optical Illusions

Part 1

Comprehension Questions

1. Saki found a website with interesting optical illusions.
2. Optical illusions occur when the information gathered by our eyes is perceived in a way which is different from reality.
3. The illusion seems to bend and move.

Dictation

Saki tells David that she found a (website) with interesting optical illusions. She explains that optical illusions occur when the information gathered by our eyes is (perceived) in a way which is different from reality. She proceeds to show David an example of an optical illusion in which the lines appear to (bend) (and) (move).

Part 2

1. He's reminded of another picture he has seen.
2. They are staring at each other.
3. dHe says that the two illusions are somehow different.

Dictation

Saki lets David know that she discovered a website with optical illusions that interest her. She tells David that when our eyes perceive something in a way which differs from reality, it's an optical illusion. She (proceeds) to show David a picture in which the lines look as if they bend and move. David is reminded of another picture he has seen, in which both a vase and　two) (people) (staring) at each other can be seen. David notes that the two illusions are somehow different.

Part 3

1. She says that they must be more dependent on our brains' past experience of interacting with the world.
2. She says that they help us to perceive the world in a new way.

Dictation 3

Saki tells David about a website she found. She talks about the characteristics of an optical illusion, and then shows David a picture as an example. In her example, the lines appear to bend and move. David then remembers another picture he has seen which includes both a vase and two people staring at each other. Saki tells David that there are three types of illusions, and describes them. For example, she says that (physiological) (illusions) must be more dependent on our brains' past experience of interacting with the world, while cognitive illusions must be more (dependent) on unconscious inferences. Saki says that optical illusions help us to perceive the world in a new way.

Exercise (A)

1. Warm water holds (little→less) oxygen than cold water.
2. The more you learn, the (much→more) you realize how little you know.
3. Fraternal twins are (common→more common) than identical twins.
4. Students are required to do as (many) math exercises as possible and upload them to the website before the due date of the assignment.
5. Some economists estimate that the demand for electricity grows almost (twice) as fast as the total amount of energy consumption.
6. Delicatessen foods are getting more and more (popular) compared to frozen foods.
7. Human brains are (a lot) more complex than people previously thought.
8. This book is (by far) the most comprehensive look at quantum theory produced by that publisher.
9. The tallest building in the world is only about (four times) taller than a certain type of tree.
10. Neil Armstrong was the (first) man to walk on the moon.

Exercise (B)

1. In the winter, it's (far better) to use an electric pot than (a) kettle to boil two liters of water.
2. There's (little) difference between them in their ability to boil a cup of water.
3. However, there will be a big difference between them while heating a large (amount) of water.
4. The electric pot needs (less) energy, and is more economical than the gas kettle. The gas kettle takes more time to heat.
5. In addition, because the gas flame needs (a lot of) oxygen and a continuous flow of fresh air, the kettle needs to be vented.
6. On the other hand, the electric pot doesn't need (any) ventilation in order to become heated. Even if it's snowing outside, you don't need to turn on a fan.
7. Thus, I recommend that you use (the) electric pot rather than the gas kettle to boil two liters of water when it's cold outside.

Exercise (D)

Answers will vary.

Exercise (E)

Answers will vary. Sample:

In my opinion, the newest version of my camera is better than the previous version. First, pictures taken with the new camera seem to have more vivid colors. For example, when I take a picture of a sunset, the orange really seems to jump off the photo. Second, the sensor in the newer camera is larger, and higher quality. It's able to capture more information. Finally, the newer camera has more megapixels. This is especially important if you want to create a bigger version of a photo. Clearly, the newer camera is a great improvement on the old one.

Unit 8　School Planning and Design

Part 1

Comprehension Questions

1. They discuss elementary school planning and design.
2. He asks about the school's location.
3. He asks about a situation in which they have to build a school building in a city close to busy roads and don't have much space.

Dictation

Professor Akiyama and students discuss the topic of (elementary) (school) (planning) (and) (design). First, Professor Akiyama asks about the (school's) (location), and students provide a lot of good ideas. Next, he asks about a situation in which they have to build a school building in a city close to (busy) (roads) and don't have much space.

Part 2

1. She thinks that school buildings should be built sufficiently apart from roads and streets, away from main traffic arteries.
2. He thinks they should be built in suburban areas in order to have a lot of playground space and allow the students to have the opportunity to interact with nature.
3. Akane calls attention to the fact that it would be destructive to the environment because trees would need to be cleared.

Dictation

Professor Akiyama and students talk about the subject of elementary school planning and design. First, Professor Akiyama asks the students about the location of the school. Rumi thinks that school buildings should be built (sufficiently) (apart) (from) (roads) (and) (streets), away from main traffic arteries. She feels that it would be effective both to reduce the possibility of dangerous accidents and to minimize traffic noise for classes. David thinks that it's better for schools to be built in (suburban) (areas) in order to have a lot of playground space and allow the students to have the opportunity to interact with nature. Akane calls attention to the fact that it would be (destructive) (to) (the) (environment) because trees would need to be cleared. Professor Akiyama then asks about a situation in which they have to build a school building in a city close to busy roads and don't have much space.

Part 3

1. Rumi says that they need solid walls to block noise and adapt to the local environment, including the ability to withstand strong storms. David thinks that the school's interior and grounds should be kept well lit at all times so that criminals can't hide in dark areas. Akane says that plants would protect children from airborne pollutants.

2. They feel that flowers should be used to create a comfortable atmosphere. Akane adds that flowers used near the entrance of the school would create a feeling of welcome for visitors.

Dictation

Professor Akiyama and students have a conversation about elementary school planning and design. Professor Akiyama begins by asking about the school's location. Rumi thinks school buildings should be built a good distance from roads and streets. In her view, this would help both to reduce the possibility of dangerous accidents and to minimize traffic noise for classes. David thinks that building in suburban areas would increase the amount of playground space and allow the students to have the opportunity to interact with nature. Akane notes that it would be destructive to the environment because trees would have to be cleared. Professor Akiyama proceeds to ask about a situation in which they have to build a school building in a city near busy roads and don't have much space. Rumi says that they need solid walls to (block) (noise) (and) (adapt) (to) (the) (local) (environment), including the ability to withstand strong storms. David thinks that the school's interior and grounds should be kept well lit at all times so that (criminals) (can't) (hide) (in) (dark) (areas). Akane says that plants would protect children from (airborne) (pollutants). David agrees with her idea and suggests that they use flowers, which in his view would help to create a comfortable atmosphere. Akane supports his idea, and feels that flowers near the entrance of the school would really help to (create) (a) (feeling) (of) (welcome) (for) (the) (visitors).

Exercise (A)

1. According to a report on the risk factor percentages of traffic accident frequency, human error is the biggest factor, (followed) by the environment and mechanical failure.

2. Improvement of infrastructure such as refrigeration systems and reliable transport networks is needed in some (developing) countries.

3. Some scientists say all the extreme weather events we've (been having) recently stem from global warming.

4. (Annoyed) by buzzing mosquitoes, the campers stayed awake all through the night.

5. (Having) sufficient energy, the plasma particles can excite the gas atoms into a higher energy state.

6. The incidence of brain tumors (is associated) with exposure to dental radiography.

7. Generally (speaking), teachers evaluate each student's performance by their participation and preparation.

8. Consumers agree with technology adoption, (provided) they get benefits.

Exercise (B)

1. The liquid starts to evaporate (when) the boiling point is reached because molecules expand.

2. What you would do if you (were) very rich and you didn't have to work?

3. I'm going to the school cafeteria and I'll tell you if I (find) your graph paper there.

4. (Had they known) your telephone number, they would have called you earlier.

5. (What if) you forget your password?

6. (But for) your assistance, I could not accomplish the objectives of the project.

7. (If only) science and technology were used for good!

8. Feel free to contact us (if necessary).

Exercise (D)

Answers will vary.

Exercise (E)

Answers will vary. Sample:

The most impressive building I have ever seen was the World Trade Center, in New York City. First, this building was really tall. It towered over all the other buildings in the city, including the Empire State Building. Second, it was so much fun to go to the top and take a look at the city from above. The view was incredible. Finally, it was a very functional building. Besides being a great spot for tourists to visit, it contained many important offices. A lot of very important business transpired in that building. I am sorry that it no longer stands.

Unit 9 Art and Science

Part 1

Comprehension Questions

1. He's using a tablet computer.

2. He said it's light and convenient.

3. He says that they can be seen in popular science fiction TV programs and movies.

Dictation

David is using (a) (tablet) (computer), and says that it's light and more (convenient) (for) (reading) (books) (and) (articles) than a laptop computer. He says that tablet-like computers can be seen (in) (popular) (science) (fiction) (TV) (programs) (and) (movies) like Star Trek and 2001: A Space Odyssey.

Part 2

1. She says that seeing his movies is like looking around inside the mind of a genius.

2. HAL is a computer that tries to hurt people.

3. t explores the danger inherent in the computer control of nuclear weapons.

Dictation

David is using a tablet computer, and claims that it's light and more convenient for reading books and articles than a laptop computer. He tells Asako that that tablet-like computers can be viewed in science fiction TV programs and movies such as Star Trek and 2001: A Space Odyssey. Asako has also seen a few Kubrick movies, and she thinks he has an extremely (unique) (perspective). She feels that seeing his movies is like looking around inside (the) (mind) (of) (a) (genius). David talks about the movie 2001: A Space Odyssey and its main character, called "HAL." HAL is a computer that tries to hurt people, and today it's used as (a) (kind) (of) (example) (of) (what) (can) (go) (wrong) (with) (artificial) (intelligence). Dr. Strangelove is another Kubrick movie, and it explores a similar idea: (the) (danger) (inherent) (in) (the) (computer) (control) (of) (nuclear) (weapons).

Part 3

1. She says that he was a visionary, not unlike many scientists.
2. He feels that scientists and artists inspire each other through their creative endeavors to push society forward.

Dictation

David uses a tablet computer, and states that it's light and more convenient for reading books and articles than a laptop computer. He says that tablet-like computers appear in popular science fiction TV programs and movies like Star Trek and 2001: A Space Odyssey. Asako has also seen a few Kubrick movies. She feels that he has an extremely unique perspective, and viewing his movies is similar to looking around inside the mind of a genius. David discusses the movie 2001: A Space Odyssey and its main character, a computer named "HAL." HAL tries to injure people, and these days it's used as a kind of example of problems that can arise from the use of artificial intelligence. Dr. Strangelove is also a Kubrick movie, and it explores the idea that there is danger inherent in the computer control of nuclear weapons. Asako says that Kubrick was seemingly a (visionary), (like) (many) (famous) (scientists). David adds that scientists and artists inspire each other (through) (their) (creative) (endeavors) (to) (push) (society) (forward).

Exercise (A)

1. This kind of research is vital to (those who) study and value the environment, nature, and animals in the wild.

2. They say that there are a lot of people in Asia and Africa (who) eat insects as part of their regular diet.

3. It is a non-profit organization (whose) purpose is to improve the lives of deprived children.

4. You can search job openings (which) may include modern health care, hospitals, pharmaceuticals, and so on.

5. For Whom the Bell Tolls is a novel written by Ernest Hemingway, (which) depicts the brutality of the Spanish Civil War.

6. The owner of the fruit store is very proud of his business, and would never sell his customers (anything that) he wouldn't bring home to his own family.

7. The old ship was covered in coral, (which) made it difficult to see from a distance.

8. It's hard to let your friends know (what) kind of help you need, in particular, when you ask for and accept their assistance because of serious illness.

Exercise (B)

1. Physics is a science (that) involves matter and energy, and a wide variety of systems as well, (about which) theories have been developed that are used by physicists.

2. The cell phone salesman was very surprised when he visited a remote village (in which) locals had never owned cell phones.

3. In the Devonian period, jawed fishes included the placoderms and spiny sharks, (both of which) became extinct.

4. The characteristics of igneous rocks are defined by the size and shape of the grains (of which) they are composed.

5. One of the professors is looking for a student (with whom) to do research.

Exercise (D)

Answers will vary.

Exercise (E)

Answers will vary. Sample:

In my opinion, "life imitates art" is a more accurate phrase than "science imitates art". I feel that great art reflects many emotions. People may feel inspired when they see this art and it may provoke them to feel similar emotions. For example, when people look at "The Scream", they may feel a little fearful. In addition, I feel that people often copy what they see in movies and TV programs. For example, if a popular actress wears her hair in a certain way, it's inevitable that some of her fans will also wear their hair in the same manner. On the other hand, I don't really understand how science could possibly imitate art. It seems like a completely separate subject to me.

Unit 10　Breakfast

Part 1

Comprehension Questions

1. They go there to eat breakfast.

2. He asks why the number of American-style fast food restaurants has been decreasing in Japan.

3. He asks how the prices can be kept so low.

Dictation

David and Yoshikazu go to Pumpkin' Donuts to (have) (breakfast). While walking, David asks Yoshikazu why the (number) of American-style fast food or sandwich restaurants (has) (been) (decreasing) in Japan. Then, David asks how the (prices) can be kept so low.

Part 2

1. Yoshikazu explains to him that Japanese are more likely to choose Japanese fast food, like onigiri,

2. The main reason he answers this way is because it is cheap and not too heavy.

3. He says that they can produce a large number of rice balls very fast.

Dictation

David and Yoshikazu (agree) to have breakfast at Pumpkin' Donuts. On the way to the restaurant, David asks Yoshikazu why the number of American-style fast food or sandwich restaurants has been decreasing. Yoshikazu explains to him that Japanese are (more) (likely) to choose Japanese fast food, like onigiri, because it is (cheap) and (not) (too) (heavy). David asks how the price can be kept so low, and Yoshikazu answers that they can (produce) a huge number of rice balls very (fast).

Part 3

1. Yoshikazu answers that they can be produced very rapidly because multiple machines are used in each process.

2. It's also successful for diminishing the contamination risk due to foodborne bacteria.

Dictation

David and Yoshikazu (agree) to have breakfast at Pumpkin' Donuts. On the way to the restaurant, David asks Yoshikazu about the (reason) why the number of American-style fast food or sandwich restaurants in Japan is decreasing. Yoshikazu explains that Japanese (tend) to choose Japanese fast food, like onigiri, (because) (of) their low price and consistency. Then, David asks why the price is so low, and Yoshikazu answers that they can be (produced) very rapidly because (multiple) machines are used in each (process). It's also (successful) for diminishing the contamination (risk) due to foodborne bacteria.

Exercise (A)

1. I'm so glad that this semester's almost finished!
   c) You can say that again.

2. I don't like to swim in a pool.
   c) I don't either.

3. Why don't we have lunch outside on the terrace?
   a) Sure.

4. I have a feeling that everything's going to be just fine.
   b) So do I!

5. This summer is really hot.
   a) I'll say!

Exercise (B)

1. I couldn't agree (more).
2. I (see) your point.
3. You've got a (point).
4. I was thinking the (same) thing.
5. (Good) thinking.
6. That (stands) to reason.
7. (You) bet!
8. Same (here).
9. You're (absolutely) correct!
10. (Fair) enough.

Exercise (D)

Answers will vary.

Exercise (E)

Answers will vary. Sample:

In my opinion, a rice ball is better for breakfast than a hamburger. First, I think hamburgers are too heavy to eat for breakfast. If I ate a hamburger in the morning, I'm sure I would feel very full and a little sleepy as a result. Second, I don't have much time to prepare breakfast in the morning. Hamburgers take a long time to cook, but I can make a rice ball in less than a minute. Finally, I think it's good to eat something healthy in the morning. It's important to start the day feeling like you are doing something beneficial for your body. Therefore, I feel lucky that rice is so cheap, and easily available.

Unit 11　The structure of the universe（1）

Part 1

Comprehension Questions

1. The topic of the lecture is the structure of the universe, and our location in it.

2. We see many little points of light.

3. We can view some of them in considerable detail.

4. Jupiter and Saturn are visible in the professor's two photographs.

Dictation

Professor Coleman gives a lecture on (the) (structure) (of) (the) (universe) (and) (our) (location) (in) (it). He suspects that many people don't actually know where they are. He says that when we look up at the sky at night, (objects) (in) (space) (look) (like) (points) (of) (light). However, with a telescope, we can see objects in space (in) (considerably) (more) (detail). Professor Coleman shares (photos) (of) (Jupiter) (and) (Saturn) (he) (took) using a telescope. He likes his photos even though they do not rival the quality of pictures taken using the Hubble Space Telescope.

Part 2

1. Without a telescope, we see most stars, planets, and other objects in space as points of light.

2. He says that people feel like space is "up there" and "far away".

3. We live in space, we are part of space.

4. Most of the elements in our bodies were created inside stars.

5. Most people like to know where they are so they don't feel disoriented.

Dictation

Professor Coleman says that we don't pay much attention to objects in space because they appear quite small without a telescope, and thus (space) (seems) (abstract). We feel that the earth is separate from space. Space seems (far) (away). Professor Coleman says that (we) (are) (part) (of) (space) because the earth is part of space. In theory, most of the elements in our bodies were created (inside) (stars). The professor also says that most people like to know where they are (so) (they) (don't) (feel) (disoriented) because disorientation is a very (uncomfortable) (and) (confusing) feeling.

Part 3

1. He says we are like goldfish in a tank called "earth".

2. Many people feel disoriented because they don't have any idea where they are, so the universe seems confusing and mysterious.

3. He feels that it's a good idea to learn about the structure of the universe, and our exact location inside it.

Dictation

Professor Coleman says that our situation is analogous to that of (a) (goldfish) (in) (a) (tank). If we don't know where our location is in the universe, (we) (don't) (have) (any) (idea) (where) (we) (actually) (are). According to the professor, that's probably why many people often feel a bit disoriented. The universe seems confusing and mysterious, so it's a good idea to learn about (its) (structure), (and) (our) (exact) (location) (inside) (it). Once we learn these things, perhaps life and existence will feel less disorienting, and more comfortable.

Exercise

Answers will vary. Sample:

Prof. Coleman gives a lecture about the structure of the universe. He discusses stars, planets, and other objects in space. He says that although they look like points of light to the naked eye, with the aid of a telescope we can observe them in much greater detail. He also discusses the fact that although most people feel that space is something far away and abstract, it is actually our home. We are part of space. He goes on to talk about how we feel comfortable when we know our location on earth, so it makes sense that we'd feel even more comfortable if we understood our location in the universe, because we'd no longer feel disoriented. In his opinion, we need not feel that the universe is confusing and mysterious.

Unit 12　The structure of the universe（2）

Part 1

Comprehension Questions

1. He discusses Japan.

2. He says that it consists of the Earth, other planets, moons, and various other objects which revolve around the sun.

3. It would take about 165,000 years to travel to Alpha Centauri.

Dictation

Professor Coleman describes (our) (location), using presentation software for assistance. He begins with Japan, then moves on to the planet Earth. (The) (solar) (system) consists of the Earth, other planets, moons, and various other objects (which) (revolve) (around) (the) (sun). The class takes a virtual trip into space. If they turn around and look behind them near the beginning of the trip, they can see (the) (inner) (solar) (system).

Part 2

1. They can see the entire solar system.

2. The inner planets are much closer to the sun, and much closer to each other, than the outer planets.

3. We might feel very small, and very alone.

Dictation

Professor Coleman and students continue their imaginary trip, and they see (the) (entire) (solar) (system). (The) (inner) (planets) are much closer to the sun and each other (than) (the) (outer) (planets). The professor comments that as our solar system is really not close to anything else, we feel (that) (we) (are) (very) (small), (and) (very) (alone) when we see mostly empty space.

Part 3

1. Proxima Centauri is closest to Earth.

2. We can see Alpha Centauri from the southern hemisphere of the Earth.

3. It is 4.37 light years away.

4. It would take approximately 165,000 years.

5. They are too far away.

Dictation

The students can finally view (Alpha) (Centauri), a system of three stars. The closest star to Earth is (called) (Proxima) (Centauri). Alpha Centauri is only visible from the southern hemisphere of the Earth. It is (4.37 = four point three seven) (light) (years) away, and it would take the Space Shuttle (approximately) (165,000=one hundred sixty-five thousand) (years) to travel to these stars. Scientists believe that there could be planets in the Alpha Centauri star system which contain life, but (it's) (impossible) (to) (go) (there) (and) (investigate), so we can't confirm it. Some people don't believe that aliens exist, but there could easily be millions, even billions of different types of creatures living all over the universe.

Exercise

Answers will vary. Sample:

Prof. Coleman says that Japan is on the planet Earth, and Earth part of the solar system. He tells the students to imagine that they will travel into space, in order to get a better view of the universe. After the trip into space begins, he tells the students to look behind them, and they will see the inner solar system. As they continue to travel, they can then see the outer solar system. Next, they move further away from our solar system, and can finally view some other star systems. They view Proxima Centauri, which is the closest star to Earth. It's a part of a system of three stars called Alpha Centauri. Prof. Coleman says that planets in this star system may harbor life, but it's impossible to go and investigate. He says that some people don't believe that aliens exist, because they haven't visited us. However, he disagrees with this argument, because he feels that the problem is distance.

Unit 13　The structure of the universe（3）

Part 1

Comprehension Questions

1. It's located in the local arm of the Milky Way Galaxy.

2. The Galactic Bulge is at the center of our galaxy.

3. It is thought that at its center is a black hole.

4. There are thought to be about 300,000,000,000 stars.

5. It takes about 220,000,000 years.

Dictation

Professor Coleman and his students continue their imaginary journey away from the Earth. The professor says that our solar system is located in (the) (Local) (Arm) (of) (the) (Milky) (Way) (Galaxy). At the center of our galaxy is (the) (Galactic) (Bulge). It is a mysterious and amazing place because it is believed that there is (a) (massive) (black) (hole) at its center, and it has (the) (highest) (density) (of) (stars) in the galaxy. There are thought to be (about) (300,000,000,000=three hundred billion) (stars) in the entire Milky Way. Everything in the Milky Way orbits around the Galactic Bulge. It takes about 220,000,000 years for us to complete a single revolution around it, and it is believed that we have completed less than 25 orbits since it formed.

Part 2

1. The Large Magellanic Cloud and Small Magellanic Cloud come into view.

2. It's called the Local Group.

3. It's called the Andromeda Galaxy.

4. In theory, they will move together and combine to form a huge new spiral galaxy.

5. It would take about 80,000,000,000 years.

Dictation

Professor Coleman and his students move further away from home, and can now see (a) (few) (other) (much) (smaller) (galaxies), including the Large Magellanic Cloud and the Small Magellanic Cloud. These smaller galaxies are next to the Milky Way. Next, they

can see our group of more than 30 galaxies, called (the) (Local) (Group). The largest one is called the Andromeda Galaxy, which is (similar) (in) (size) (and) (shape) (to) (the) (Milky) (Way). The Milky Way and Andromeda will theoretically move together and combine (to) (form) (a) (huge) (new) (spiral) (galaxy) in the future. Using a spacecraft like the Space Shuttle, it would take (more) (than) (80,000,000,000=eighty billion) (years) to travel to Andromeda.

Part 3

1. They can see the Virgo Supercluster.

2. It contains about 5000 galaxies.

3. Its volume is about 100,000,000,000 times that of the Milky Way.

4. According to the professor, there are about 100,000,000,000 galaxies in the universe.

Dictation

Professor Coleman and his students continue to travel further away, and they can see the Local Group, which part of a much larger group of galaxies called (the) (Virgo) (Supercluster). The Virgo Supercluster is a large group of smaller galaxy groups and includes (more) (than) (5000=five thousand) (galaxies). Its volume is (about) (100,000,000,000=one hundred billion) (times) that of the Milky Way. There are reportedly around 10,000,000 superclusters of galaxies in the universe, which would mean that there are (more) (than) (100,000,000,000) (galaxies) in total. The professor remarks that the entire universe consists of millions of superclusters of galaxies.

Exercise

Answers will vary. Sample:

Prof. Coleman says that our solar system is located in the Local Arm of the Milky Way Galaxy. He says that the Galactic Bulge is located at the center of the galaxy, and it is thought that at its center is a massive black hole. He adds that the Galactic Bulge is thought to contain the highest density of stars in the galaxy. Then, as they continue on their trip through space, they see both the Large Magellanic Cloud and the Small Magellanic Cloud. He says that we are part of a group of more than 30 galaxies called the Local Group, and the Andromeda Galaxy is similar in size and shape to the Milky Way. In the future, it is believed that the Milky Way and Andromeda will move together and combine to form a huge new spiral galaxy. Finally, he says that the Local Group is part of a much larger group of galaxies called the Virgo Supercluster. It is believed that the entire universe contains more than 100,000,000,000 galaxies in total.