LESSON 3

It's Always Sunny in Space!

PART 1 →教科書 p.46-47

Grammar Point
- 名詞を修飾する分詞（後置修飾）
- 現在完了

1 Put the appropriate word below into each sentence.(Change the form if necessary.)

(1) This passage says that there can be a future energy (　　).

(2) As our "modern life" needs a lot of energy, it can cause a severe (　　) of energy.

(3) The graph shows that the world (　　) has grown largely.

(4) The political situation of the country was not (　　).

[crisis population shortage stable]

2 Put the appropriate words into each sentence.

(1) 科学者たちは将来のエネルギー不足を心配している。

Scientists (　　) (　　) (　　) a future energy shortage.

(2) グリーンエネルギーの生産は天候に大きく左右される。

The production of green energy largely (　　) (　　) the weather.

(3) わたしたちの「近代的な生活」を支えるためには，太陽や風のエネルギーが使える。

(　　) (　　) (　　) support our "modern lives," solar and wind power can be used.

3 Put the words in bracket into the correct order.

(1) 最近ますます多くの学生がアジアの国々からやってきます。

Recently (students / increasing / of / come / an / number / Asian countries / from).

Recently _____.

(2) あの割れた窓を全部修理するには多くの費用がかかるだろう。

(those / all / windows / broken / money / will / a lot of / repairing / cost).

_____.

4 Read the following passage and answer the questions below.

This is a report that an exchange student is going to make about a space project in a JAXA program: (①) The world's population has been growing rapidly. (②) Scientists are worried there may be an energy shortage to support the large population. (③) However, the sources of green energy are not stable. (④)

Q1. Where do you put the following sentence into the passage? Choose the appropriate part from ①②③④.

So today, green energy such as wind and solar power is beginning to get a lot of attention.

Q2. According to the passage above, what is a problem about green energy?

a. That it is not well known.　　b. The color of the energy.

c. That its sources are limited.　　d. That its sources are not stable.

1 Connect a word and a phrase that have the same meaning with line.

(1) satellite ・ ・a way of solving a problem or dealing with a difficult situation

(2) antenna ・ ・a very short electric wave that is used in sending messages by radio

(3) solution ・ ・a machine that has been sent into space and goes around the Earth

(4) microwave ・ ・a wire rod used for receiving radio or television signals

2 Put the appropriate words into each sentence.

(1) JAXA は宇宙で衛星を作る事業に取り組んでいる。

JAXA is (　　) (　　) a project to build a satellite in space.

(2) 太陽が存在する限り，私たちは太陽光エネルギーを得ることができる。

We will get solar energy (　　) (　　) (　　) the sun exists.

(3) 太陽エネルギーはレーザー光線の形で地球に送られることができる。

Solar energy can be sent to the earth (　　) the (　　) of laser beams.

3 Put the words in bracket into the correct order.

(1) ABC ジャンクションに通じる道はいつも混んでいる。

(ABC Junction / to / always / crowded / leading / are / the roads).

_____.

(2) 世界中で最も読まれている本は何ですか。

(the world / most / read / the / book / is / in / what)?

_____?

4 Read the following passage and answer the questions below.

JAXA may be able to solve the energy problem. First, they will build satellites in space and produce energy from sunlight there. (　①　), they will send it to the earth in the form of microwaves or laser beams. This project will provide stable, clean energy. Also, we can use it as long as the sun exists.

Q1. Choose the appropriate word to put into the blank ①.

a. First　　b. However　　c. Also　　d. For example

Q2. According to the passage, what is right about solar energy? (You may choose more than one option.)

a. limited　　b. stable　　c. clean　　d. cheap

1 Read the following passage and answer the questions below.

Is there any solution (①) the energy problem? JAXA is now working (②) a big project. They are planning to build satellites (③) space and produce energy there. (a) (will / by JAXA / from / building / energy / the satellites / produce / sunlight / built). But how will they send the energy to the earth? In the form of microwaves or laser beams! People on the earth will catch them (④) big antennas called rectennas.

What does this mean for the future? If the project succeeds, we will be able to get energy produced in space all the time. There are no rainy days and no nights there. There will always be sunlight as long as the sun exists.

JAXA (b) has worked on this project (⑤) a long time. However, they still need to solve some problems. The biggest one is its costs. JAXA will have to send many satellite parts into space. (c) This will cost a huge amount of money.

Another problem is space debris moving around the earth. Because of its high speed, even a small piece of debris can cause great damage to a satellite.

Also, it is difficult to focus microwaves or laser beams on exact points very far away. In the JAXA project, the antennas on the earth will be about 36,000 kilometers away. This is another big problem for JAXA to solve.

(1) Put the appropriate words into blanks ①～⑤.

① ( ) ② ( ) ③ ( ) ④ ( ) ⑤ ( )

(2) Put the words in underlined part (a) into the correct order. In the words, there is one word that you don't use.

(3) Choose one of the following sentences that has the same usage as (b).

a. The train has arrived at the station.
b. I have climbed Mt. Fuji twice.
c. We have finished the report yesterday.
d. He has lived in that house since 2000.

(4) What does the word (c) refer to? ( )

(5) What is one more problem for JAXA to solve other than the cost?

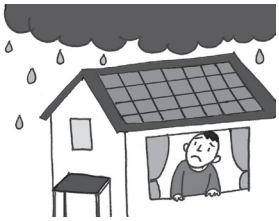
a. How to focus microwaves or laser beams on exact points very far away.
b. How to build satellites in space that move around the earth.
c. How to find many space debris into space.

(6) According to the passage above, one fact is that ( ).

a. JAXA has already built satellites in space and produced energy there.
b. Even a small piece of debris can cause great damage to a satellite.
c. There are no rainy days and no nights in the space.
d. We will be able to get energy produced in space all the time if the project succeeds.

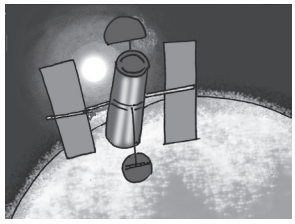
1 Four English sentences [A] - [D] will be read for the following pictures. Choose the most appropriate one to describe the contents of each picture.

(1)



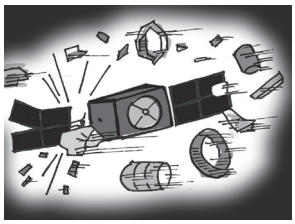
[A] [B] [C] [D]

(2)



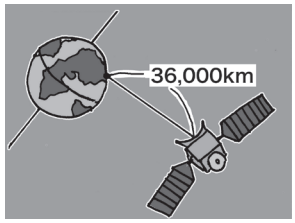
[A] [B] [C] [D]

(3)



[A] [B] [C] [D]

(4)



[A] [B] [C] [D]

2 This is a list of the Mix of Energy Sources in Japan. Listen to the explanation and choose the correct place for "solar energy."

Mix of Energy Sources in Japan (2018)

Energy Source	Percentage (%)
Natural gas	37.4
ア	28.3
Thermal	8.5
Hydro	7.8
イ	6.5
Nuclear	4.7
Oil	3.7
ウ	2.2
エ	0.7
Geothermal	0.2

Source: https://www.isep.or.jp/en/717/

3 Listen to the summary of Part 3 in Lesson 3. Choose the most appropriate answer to the question below.

Q: Why is solar power not stable now?

Time 30 min

1 次の英文は「蓄電システム」について述べたものです。（ア）～（コ）に入れる最も適当なものを選択肢から選びなさい。（金沢工業大）

A major problem that electric power companies have to deal with is the need to be prepared to provide large amounts of power at times of peak usage. If there is enough generating (ア) to handle demand at times of maximum power use, such as during the day in the summer, then some of the power company's equipment will be idle during times of normal or low power use. This is inefficient and uneconomical. To help (イ) this problem, many power companies around the world use various methods of storing energy so that it can be provided during times of high demand.

Batteries store electrical power, of course. However, there are no batteries which can store and discharge the very large amounts of energy at the speeds needed by power companies. (ウ), the most widely used system of storing energy is "pumped-storage hydropower" or PSH. The basic principle of PSH is to use energy during times of low demand to pump water from a lower position to a higher one. Most (エ), this is done where two reservoirs of water at different heights are conveniently located not too far apart. When extra power is needed, the water is released from the higher reservoir through turbines which generate electricity.

Unfortunately, sites appropriate for this type of PSH are not common, and they are very expensive to develop. That is (オ) researchers and developers are considering alternative types of PSH which can be installed more easily and cheaply. Several ideas involve pumping water in underground facilities. Such systems can be installed where large amounts of land are not available.

Another type of energy storage relies on compressed air (カ) than pumped water. In compressed air energy storage (CAES), surplus power is used to compress air and store it. The compressed air is released and used to run generators when extra power is needed. Unfortunately, the CAES systems are less (キ) than PSH systems because energy is lost as heat during compression. Several developers are currently working on CAES systems that store and reuse the heat caused by compression.

A third category of energy storage transfers heat directly. One company has developed a system which uses argon gas to transfer heat (ク) two large tanks filled with gravel. One tank reaches 500℃ and the other cools to -160℃ . The stored heat can be used to generate electricity when needed. Other systems use molten (liquid) salts to store heat and release it for (ケ) use.

As demand for energy continues to rise, the importance of efficient large-scale energy storage systems is (コ) to increase.

（ア）	1. about	2. capacity	3. electrical
	4. industrial	5. staff	6. when
（イ）	1. cause	2. generator	3. increasing
	4. nuclear	5. of	6. overcome
（ウ）	1. All	2. Especially	3. Eventually
	4. Fortunate	5. Instead	6. Possible
（エ）	1. case	2. commonly	3. countries
	4. difficult	5. operate	6.use
（オ）	1. about	2. engineering	3. help
	4. most	5. problem	6. why
（カ）	1. expands	2. expensive	3. less
	4. production	5. rather	6. technology
（キ）	1. compressed	2. cost	3. efficient
	4. inside	5. pump	6. reliability
（ク）	1. between	2. control	3. increases
	4. pipe	5. place	6. whenever
（ケ）	1. environment	2. later	3. lost
	4.relatevely	5. they	6. which
（コ）	1. believe	2. certain	3. late
	4. report	5. research	6. used