英　　語

問題冊子 2

注　　意

「**問題冊子 2**」に印刷されている問題は，2 から 3 までで，2 ページから 14 ページまであります。

2 次の対話の文章を読んで，あとの各問に答えなさい。
（＊印のついている単語・語句には，本文のあとに〔**注**〕がある。）

Ken, Amy and Bob are high school students in the U.S. Ken is from Japan. They belong to the science club. One day, at school, they are talking with Ms. Ward, their science teacher.

Ken: Yesterday, my sister was playing with a *bubble wrap sheet used for a package. That bubble wrap reminded me of soap *bubbles. Then suddenly I had a question. Why does soap make bubbles? We see soap bubbles in the bath and in the kitchen.

Amy: I had a similar question a few days ago. I visited a science show in our town with my family. My little brother joined the project of *blowing bubbles. He made a big round bubble like a soccer ball! But how is the round bubble made?

Ms. Ward: You asked some good questions, Ken and Amy. In fact, the secret is in a soap *molecule. You may not think that there is anything special about it. (1) Well, actually, a soap molecule is very unique. It has a "head" and a "*tail."

Amy: A head and a tail like a *tadpole? Does soap we use in our house or at school have such things? I've never thought of that because [(2)].

*Ms. Ward opens a science textbook. She shows two *figures on the page. One has the title, "Soap molecules in *soapy water." The other has the title, "The inside of a soap bubble."*

Ms. Ward: Look at **Figure 1**. A soap molecule has two parts. The head part loves water. It is always trying to join with water. But the tail part hates water. Instead, it *mixes with oil.

Bob: Yes. I've heard about that. When we use soap to wash our hands, that tail part catches dirty oil on our hands.

Amy: [(3)－a]

Bob: [(3)－b]

Amy: [(3)－c]

Bob: [(3)－d]

Ms. Ward: Great, Amy and Bob! By the way, if there's no oil, most soap molecules gather around the *surface of soapy water. They *stick out their tails above the surface of the soapy water.

Amy: Look at **Figure 1**. This is funny! The soap molecules are standing on their heads!

Ms. Ward: Then what about a soap bubble? Now look at **Figure 2**. This shows a soap bubble *floating in the air. The surface of the bubble is a thin *film made of two *layers.

Ken: Wow! This film looks like a sandwich! The film has some water between its two layers. Soap molecules are like bread, and the water is like egg inside.

Figure 1 Soap molecules in soapy water

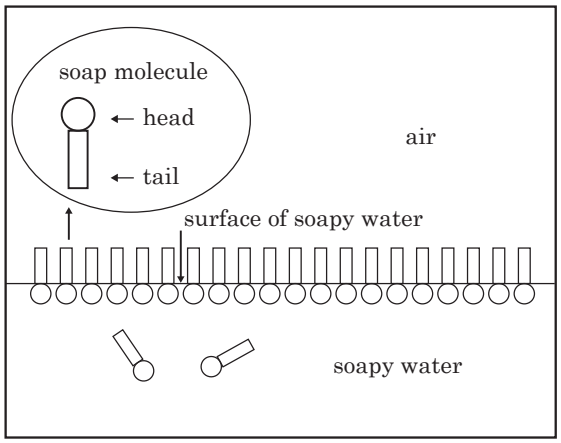
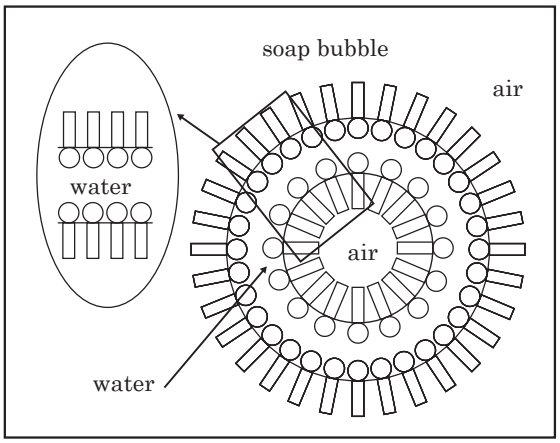


Figure 2 The inside of a soap bubble



Amy: That's interesting. But why does a soap bubble have a round shape?

Ms. Ward: You have to understand a water molecule to get the answer. (4) A water molecule is unique, too. Have you ever tried to add some water to a glass already full of water?

Bob: Yes. I remember what happened. The water was trying very hard to stay in the glass. The surface of the water was *swelling like a mountain.

Ms. Ward: Water molecules at the surface of water attract each other very *strongly. This strong power is called "*surface tension." Water molecules cannot spread out because of this surface tension.

Amy: I didn't know that. Then why can we make bubbles by adding some soap to water?

Ms. Ward: **Figure 2** will give you the answer. Now water is covered with soap molecules and *stretched. Water is in a narrow film of a big bubble.

Ken: (5) Probably,【① water molecules ② let ③ hold ④ not ⑤ soap molecules ⑥ together ⑦ do】 strongly in soapy water. Water molecules don't come together because of soap molecules.

Ms. Ward: Wonderful. Also, there is a reason for the round shape of a bubble. In a big soap bubble, its film and water are stretched. The bubble wants to *shrink back, but it cannot do so because of air inside. So, it tries to be the smallest size possible.

Bob: I got it! (6) So, the round shape is a way to explain that!

Ms. Ward: Exactly. Then I have one last question. Imagine you are putting some air in soapy water. An air bubble is coming up. At this time, what is happening around the air bubble?

Ken: I have no idea. Air in soapy water is a new situation for me.

Ms. Ward: (7) No, it's not, Ken. In science, we have to look at things we already know in a different way. Then you will find a new meaning to them.

Ken: In a different way? What do you mean? But anyway, let's find the answer. Let's see….

Bob: Oh! I think I found the answer. I'll draw a picture. Look. (8) This is the picture of an air bubble coming up in soapy water. We have to return to the *basic fact. Soap molecules want to touch water with their heads.

Ken: You're right, Bob. So, a layer of soap molecules covers the surface of the air bubble. The heads of soap molecules are in soapy water, and their tails are in the air.

Bob: Right. Oh, I've thought of something. When this air bubble comes up to the surface of soapy water, it will probably push up the second layer of soap molecules standing on their heads there. Then, that second layer will cover the outside of the air bubble, too.

Amy: So, this bubble will soon have two layers of soap molecules. There may be some water between the two layers. Then, if you see this bubble from above,…it will be exactly like the bubbles you see in the bath!

Ms. Ward: Bob, Ken and Amy, you are wonderful.

Ken: So, in soap science, the story of a head and a tail appears again and again.

Amy: We found new ways of thinking about this basic story, and we suddenly learned the whole picture of a soap bubble.

Bob: Ms. Ward, I think all of us have realized one thing. You told us that we should look at (9) the same old things in a different way to make a new discovery. Your advice was very helpful. We have learned a lot about soap science today.

〔**注**〕 bubble wrap sheet　空気の入った丸いビニールの粒があるこん包材のシート

bubble　泡	blow bubbles　シャボン玉を吹く	molecule　分子
tail　尾	tadpole　オタマジャクシ	figure　図
soapy water　石けん水	mix　混ざる	surface　表面
stick out　突き出す	float　浮く	film　膜
layer　層	swell　膨らむ	strongly　強く
surface tension　表面張力	stretch　引き伸ばす	shrink　縮む
basic　基本的な		

〔問 1〕 (1)Well, actually, a soap molecule is very unique. とあるが，このとき Ms. Ward が言いたかったこととして最も適切なものは次の中ではどれか。

ア　Certainly, a soap molecule is very different.
イ　Surprisingly, a soap molecule is very special.
ウ　As you may think, a soap molecule is not common.
エ　In fact, it is difficult to understand a soap molecule.

〔問 2〕 本文の流れに合うように，［ (2) ］に英語を入れるとき，最も適切なものは次の中ではどれか。

ア　soap is always around us
イ　soap has a very long history
ウ　soap is not an everyday thing
エ　soap is not an important discovery

〔問 3〕 ［ (3)－a ］～［ (3)－d ］の中に，それぞれ次の A ～ D のどれを入れるのがよいか。その組み合わせとして最も適切なものは下の**ア**～**カ**の中ではどれか。

A　Do you remember what the other part is doing?
B　Yes it is.
C　Of course.　So, the job is done by a team of two parts.
D　Then, how is it washed away with water?

	(3)－a	(3)－b	(3)－c	(3)－d
ア	A	B	D	C
イ	A	C	B	D
ウ	C	B	D	A
エ	C	D	A	B
オ	D	A	C	B
カ	D	B	A	C

〔問 4〕 (4) A water molecule is unique, too. とあるが，このとき Ms. Ward が考えた内容を次のように書き表すとすれば，［　　］の中にどのような英語を入れるのがよいか。**本文中の連続する 2 語**で答えなさい。

A water molecule is also unique, because water molecules have especially ［　　］ to be close together.

〔問 5〕 (5) Probably,【 ① water molecules ② let ③ hold ④ not ⑤ soap molecules ⑥ together ⑦ do 】strongly in soapy water. とあるが，本文の流れに合うように，【　　】内の単語・語句を正しく並べかえたとき，**2 番目**と**5 番目**と**7 番目**にくるものの組み合わせとして最も適切なものは次の**ア**～**カ**の中ではどれか。

	2 番目	**5 番目**	**7 番目**
ア	⑦	⑤	⑥
イ	⑦	①	⑥
ウ	④	⑤	②
エ	④	①	②
オ	②	⑤	③
カ	②	①	③

〔問 6〕 (6) So, the round shape is a way to explain that! とあるが，その内容を次のように書き表すとき，［　　］に入れるのに最も適したものは次の中ではどれか。

The round shape is the best solution ［　　］.

ア to create water molecules of the smallest size
イ to reduce the number of the smallest bubbles
ウ to remove air from the smallest size bubble
エ to give a bubble the smallest possible size

〔問 7〕 (7) No, it's not, Ken. とあるが，このとき Ms. Ward が考えた内容として最も適切なものは次の中ではどれか。

ア Think carefully because you have not met this type of problem yet.

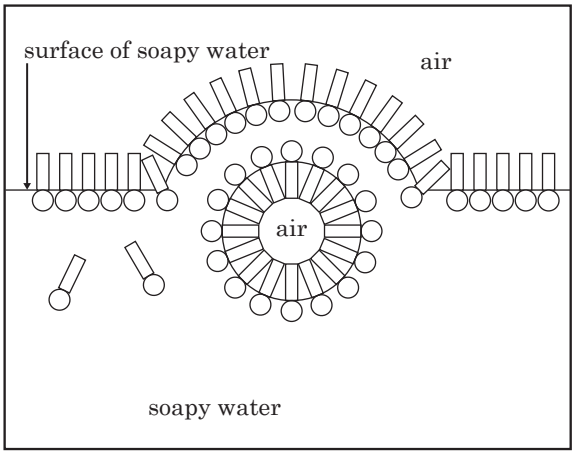
イ You will get an answer if you learn more about this type of problem.

ウ You have experience of thinking about this type of problem before.

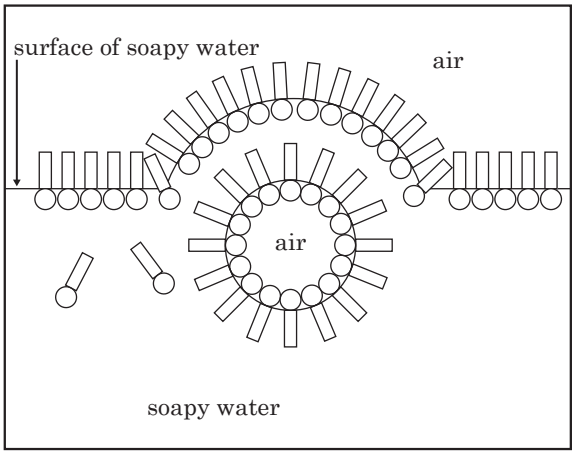
エ Don't give up before you actually start solving this type of problem.

〔問 8〕 (8) This is the picture of an air bubble coming up in soapy water. とあるが，ここで Bob が描いた石けん水の中における空気の泡と石けんの分子を正しく表している絵は次の中ではどれか。

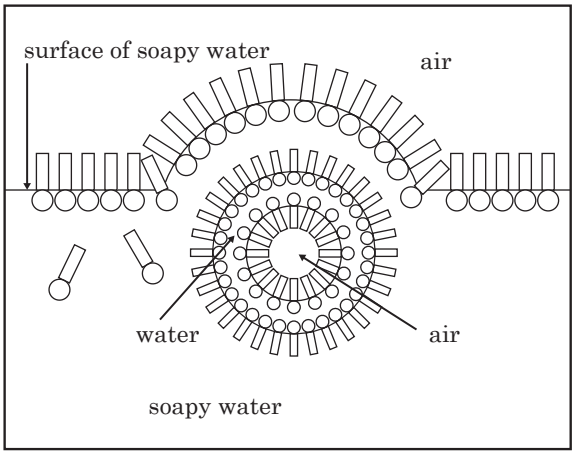
ア



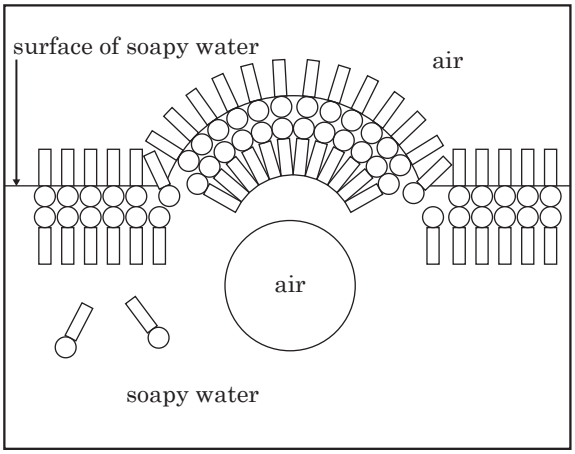
イ



ウ



エ



〔問 9〕 (9)the same old things とあるが，その内容を次のように書き表すとすれば，［　　］の中にどのような英語を入れるのがよいか。**本文中の連続する 4 語**で答えなさい。

When Bob used the words “the same old things,” he used them instead of the words “［　　］” that Ms. Ward used. These two expressions have almost the same meaning.

〔問 10〕 本文の内容と合っているものを，次の**ア**～**カ**の中から**一つ**選びなさい。

ア Ken and Amy were interested in a soap bubble after their families visited a science show.

イ A soap bubble film looks like a sandwich because of soap between two layers of water.

ウ The example of water swelling in a glass shows how easily water molecules are broken.

エ Ken, Amy and Bob learned that air bubbles coming up in soapy water would become soap.

オ The same basic fact that we meet again and again in science may bring a new idea to us.

カ Ken, Amy and Bob have found that it is necessary to learn the whole picture of science.

3 次の文章を読んで，あとの各問に答えなさい。
（＊印のついている単語・語句には，本文のあとに〔**注**〕がある。）

When spring comes, I miss “sakura,” cherry trees. I’m not talking about the cherry trees in Japan. You can find them along *the Potomac in *Washington, D.C. The image of those beautiful pink and white blossoms still stays in my mind.

When I was nine years old, my father was *transferred to the U.S. and all my family moved to a small town near Washington, D.C. I was very shocked to hear this. I said no. I told my mother that I would stay with my grandparents. I didn’t think I could survive because I knew almost no English. I couldn’t imagine living in the U.S. and going to elementary school there. Then, my mother said she understood my feelings. However, (1) she 【① my father ② to go ③ me ④ wanted ⑤ that ⑥ her and me ⑦ told】 together. She added, “Living in the United States will be a very precious experience for all of us. If there is a difficulty, I am sure we can solve it together.” My father also said, “Don’t worry. (2) If it happens, it happens.” He is such a positive person. I only felt worried, but I finally agreed.

Then, in 2017, our family started living in the town with just over 2,000 people. It had only one elementary school, and my parents chose that local school. They thought learning there would be perfect for my future. Imagine this. You are a student who has just moved to a foreign country and you do not understand the language used there. I felt that (3) I was just like a baby deer walking alone in the woods. *Getting used to a new school abroad and understanding most of the classes seemed almost impossible. Surprisingly, however, I quickly found I was wrong. The school had an excellent support program for kids like me. Every student and teacher welcomed and helped me in many ways.

A few months later, in a history class, we had a *pair work activity to write a report about something or someone unique in American history. I worked with Jack. I knew his face because he was our neighbor. However, I had no chance to talk with him. He looked sad, but said, “Jun, I have long wanted to talk to you, but I didn’t know what to say.” By working together, I soon discovered he was very kind and honest. He was interested in Japanese things. We liked sports, music, and drawings. He said to me, “Why don’t we write about *the Lincoln cent? You know the penny, one-cent coin. Lincoln was the sixteenth president and *the Lincoln Memorial is one of the most visited places.” (4) I said yes to his idea immediately. This is the report we wrote.

> Our topic is about the Lincoln cent. The U.S. has been making the penny since 1793. Since 1909, the penny has had the face of Abraham Lincoln. On the front side, the words “In God we trust” are at the top. The designer of the Lincoln cent said, “I have made a smiling face of Lincoln. I imagined he was talking to children. Of all the U.S. coins, Lincoln is the only president *facing to the right.”

In 1959, the back side of the penny was changed to a picture of the Lincoln Memorial, and the penny became the only U.S. coin to show the same person on both sides. Even many Americans do not know that the back of a Lincoln memorial cent has a very tiny President Abraham Lincoln sitting in his chair in the middle of the memorial. If you know he is there, you can find it with your eyes. But you can certainly see it with a good *microscope. When you turn the coin from left to right, the back side is *upside down.

In 2009, the U.S. stopped producing the Lincoln Memorial cent, but the government made four special pennies to celebrate Abraham Lincoln's 200th birthday. The image of Lincoln remained on the front and the back included four different designs from important stages of Lincoln's life. In 2010, a new Lincoln penny with a different back design appeared.

Lincoln did not have an easy life when he was a child. He went to school for only one year. But he loved studying and learned from borrowed books. His love of books changed his life and he changed the world. Even people today respect him as one of the greatest leaders in American history. There is something *nostalgic and sacred about Lincoln pennies, so people love these coins and want to keep using them.

Thanks to this class, Jack and I became very close friends. He helped me with my English. I taught him about Japanese things. We spent most of our time together during my stay in the U.S. *Gradually, my English improved and I *made progress in my subjects. I was really enjoying myself in the U.S.

One day at the end of my first school year, Jack and I decided to *save pennies in bottles to help people in need. Our rule is simple. We can put some pennies in our bottles when we have a happy day, when we get a good grade on a test, get a hit in a baseball game, eat delicious food, and help someone …. Each of us saved over two thousand pennies. We are still saving small coins and our bottles are almost full.

Suddenly, the time to say good-bye came. My family was moving back to Japan in May. I really liked living there, so I thought it was impossible to tell him so. Then, (5) I invited him to the Lincoln Memorial. I decided to let him know there.

Around the Lincoln Memorial, you can see a lot of cherry blossoms from March to April. It was in early April, and a beautiful day. We walked around *the National Mall and enjoyed cherry blossoms a lot. We were able to see the Lincoln Memorial through the cherry blossoms. That was awesome. There I told Jack that my family was leaving America. He kept silent, but we cried and cried. I was remembering that day in history class. He was so kind that he asked me to write about the Lincoln cent together. In the U.S., I found a fantastic friend and learned many valuable things. I really felt I belonged there. When I close my eyes, I can still remember those beautiful cherry blossoms.

Now I am back in Japan. I am in the 9th grade and preparing for the important exam in February. Jack and I exchange e-mails almost every day. We chat a lot online. I feel we are still close neighbors. Through living in America, I have become more positive, curious, and friendly. (6) If you have a problem, there's always a way to get out. You never know until you try. Trust yourself and do your best.

〔注〕 the Potomac ポトマック川　　Washington, D.C.　ワシントン D.C.
transferred to ～ ～に転勤になる　　get used to ～　～に慣れる　pair work　ペアワーク
the Lincoln cent　リンカーン大統領生誕 100 年を記念して作られた 1 セント硬貨
the Lincoln Memorial　リンカーン大統領の功績を記念して，1922 年に作られた記念館
facing to ～　～の方を向いている　microscope　顕微鏡　　upside down　上下逆さまの
nostalgic　感傷的な　　gradually　少しずつ　　make progress　進歩する
save　貯(た)める　　the National Mall　ワシントン D.C. の中心部に位置する国立公園

〔問 1〕 (1) she【 ① my father ② to go ③ me ④ wanted ⑤ that ⑥ her and me ⑦ told 】together とあるが，本文の流れに合うように，【　　】内の単語･語句を正しく並べかえたとき，**2 番目**と **4 番目**と **7 番目**にくるものの組み合わせとして最も適切なものは次の**ア**～**カ**の中ではどれか。

	2 番目	**4 番目**	**7 番目**
ア	①	③	②
イ	①	⑤	③
ウ	③	①	②
エ	③	④	⑥
オ	⑥	①	⑦
カ	⑥	⑤	③

〔問 2〕 (2) If it happens, it happens. とあるが，その表す意味として最も適切なものは次の中ではどれか。

ア　You need to wait long before you know what will happen in the future.
イ　You will wait and see what will happen in the future.
ウ　If you know the future, it can be changed as you like.
エ　Knowing what will happen in the future is very helpful.

〔問 3〕 (3) I was just like a baby deer walking alone in the woods とあるが，この文の表す内容を**20 語以上の英語**で説明しなさい。英文は**二つ以上**にしてもよい。

なお，「 , 」「 . 」「 ? 」などは語数に含めないものとする。 I'll のような「 ' 」を使った語や e-mail のような「 - 」で結ばれた語はそれぞれ 1 語と扱うこととする。

〔問 4〕 (4) I said yes to his idea immediately. とあるが，その内容を次のように書き表すとすれば，［　　］の中にどのような英語を入れるのがよいか。**本文中の連続する 8 語**で答えなさい。

He asked ［　　］, and I agreed with him right away.

〔問 5〕 (5) I invited him to the Lincoln Memorial とあるが，Jun は Jack に何と言ったのか。文脈に合うように自分で考えて，以下の［　　］に入る表現を，**20 語以上の英語**で書きなさい。英文は**二つ以上**にしてもよい。

なお，I said to Jack と「 , 」「 . 」「 ? 」などは語数に含めないものとする。 I'll のような「 ' 」を使った語や e-mail のような「 - 」で結ばれた語はそれぞれ 1 語と扱うこととする。

I said to Jack, “［　　］”

〔問 6〕 (6) If you have a problem, there's always a way to get out. とあるが，この文の内容と，ほぼ同じ意味を持つ発言を本文中から探し，その**始めの 2 語**と**終わりの 2 語**を答えなさい。

なお，「 , 」「 . 」「 ? 」などは語数に含めないものとする。

〔問 7〕 本文から判断し，次の質問の答えとして正しいものはどれか。

If you turn the Lincoln Memorial cent from left to right, which images do you find?

ア

表

裏

イ

表

裏

ウ

表

裏

エ

表

裏

〔問 8〕 本文に書かれている内容に関して，次のように表現したとき，空所に入る**適切な英語1語**を本文中から探して，その語を答えなさい。

Jack and Jun didn't put any pennies in their bottles when their day was [　　] .

〔問 9〕 本文の内容と合っているものを，次の**ア**～**ク**の中から**一つ**選びなさい。

ア In 2017, Jun's family began to live in a small town with around 1,000 people near Washington, D.C.

イ Right after Jun started going to school in the U.S., he found his idea about the school there was true.

ウ Jack wanted to speak to Jun for a long time, but he didn't know how to begin talking to Jun.

エ It is easy to find Abraham Lincoln on both sides of the Lincoln Memorial cent with your own eyes.

オ The U.S. government stopped making Lincoln pennies forever in 2010.

カ Lincoln pennies are respected because they remind American people of his love of books.

キ Jack and Jun saved almost 4,000 pennies and gave them to people in need.

ク Jack and Jun are living close to each other now, and they often visit each other's houses.

5
|
国

英

語