

TEACHING PLAN

Teacher: HANAZAWA Noriyuki

1 Class: 1- * Class, Ohta First Senior High School

2 Class size: * Students (*boys and *girls)

3 Text: PRO-VISION ENGLISH COMMUNICATION I (PEARSON), Lesson 5 Talking Plants

4 Objectives of This Lesson

【Interest, willingness, and a positive attitude towards communicating in English】

·To help the students work on activities…①

【Ability to express themselves in English】

·To help the students have a small talk for the warm up activity…②

·To help the students write a short essay for the writing activity…③

·To help the students learn how to retell stories…④

【Ability to understand English】

·To help the students learn how plants are communicating…⑤

·To help the students learn why ants are moving in a line…⑥

【Knowledge and understanding of language and culture】

·To help the students learn the new vocabulary and structures…⑦

5 Time Allotment

Period	PART	contents of the text	objectives
1st	1	The communication between plants and insects	①・②・⑤
2nd	1	The communication between plants and insects	③・④・⑦
3rd	2	The plants' surprising system of defense	①・②・⑤
4th	2	The plants' surprising system of defense	③・④・⑦
5th	3	Plant-to-plant communication	①・②・⑤
6th	3	Plant-to-plant communication	③・④・⑦
7th	4	For farming and maintaining the diversity of species	①・②・⑤
8th	4	For farming and maintaining the diversity of species	③・④・⑦
<i>9th(This period) How ants are marching in a line (supplementary material)</i>			④・⑥

6 Objectives of This Period

【Ability to understand English】

·To help the students understand why ants are marching in a line

【Ability to express themselves in English】

·To help the students learn how to retell why ants are marching in a line

7 Teaching Aids: Textbook, Worksheet, Pictures

8 Teaching Procedure

PROCEDURE	TIME	ACTIVITIES		Notes
		Teacher	Students	©Formative Evaluation (Methods)
Greeting	1min.	Greets	Respond to the teacher	Cheerful response
Review	3min.	·To ask questions about Lesson5 Talking Plants	·To answer the questions	
Reading	1min.	·To give out the worksheet to the students	·To get the worksheet	T will give some hints for Ss if necessary
	3min.	·To tell the students to read the passage silently	·To read the passage silently	Tell students to check the answers together each time
	5min.	·To tell the students to answer the questions	·To answer the questions	© To evaluate if the students understand why ants are marching in a line (observative evaluation / worksheet evaluation)
	5min.	·To tell the students to rearrange the pictures	·To rearrange the pictures	
	5min.	·To tell the students to collect answers for the summary	·To read the worksheet	
Reading aloud	2min.	·To tell the students to listen to the teacher and check the pronunciation	·To listen to the teacher	Pay attention to the words whose pronunciation is difficult
	4min.	·To tell students to repeat after the teacher	·To repeat after the teacher	
	6min.	·To tell the students to make pairs and practice reading aloud	·To practice reading aloud in pairs	Tell the students to think about the meaning when they read aloud
Retelling	14min.	·To tell the students to pick up keywords	·To pick out keywords	Tell the students not to be afraid of mistakes and to take risks
		·To tell the students to choose their levels for this activity	·To choose their levels for this activity	© To evaluate if the students retell why ants are marching in a line (observative evaluation)
		·To tell the students to make pairs for retelling	·To make pairs and practice summary telling	
Closing	1min.	Concludes the lesson	Say farewell to the teacher	Cheerful response

【Summative evaluation】: Paper exam and speaking test

Lesson 5 Conclusion worksheet ~Why are ants moving in a line?~

①Read the passage silently.

When you are in a park or garden, you sometimes see ants marching in a line. This line can be as long as 50 meters. Why are they moving in a line?

After an ant finds something to eat, it comes back to its nest. On the way back home, chemicals come out of the ant's body and leave a trail on the ground. These chemicals are called pheromones. Other ants from the nest follow this trail to get to the food.

Since ants have very poor vision, they use their antennae to touch things and find out about them. A pheromone trail is a kind of message. Ants follow the trail by using their antennae. The pheromones are one way of communicating for them.

②Answer the questions below as T or F.

1. Ants march in a line to go to the park. []
2. Ants usually march in a line over 50 meters long. []
3. After finding food, an ant leaves a pheromone trail on the ground. []
4. Ants can see things very well. []
5. Ants can find out about things with their antennae. []
6. Ants use their eyes to follow the chemical trail. []
7. Ants use pheromones to communicate with other ants. []

- ① 黙読
- ② TF question
- ③ 並べ替え
- ④ 要約
- ⑤ 音読
- ⑥ key wordの抽出

と活動を繰り返すことにより、少しずつ少しずつ内容理解が深まるようにしました。

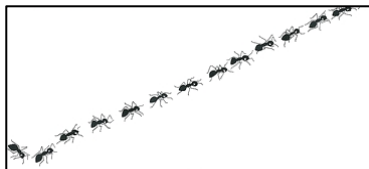
③Write down the number to put the pictures in the correct order.

pheromones come out



[]

follow the pheromone



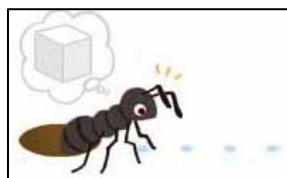
[]

find food



[]

find pheromones



[]

go back to the nest



[]

④Fill in the summary.

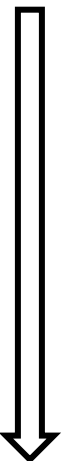
Sometimes you can see () marching in a long (). When ants find (), they make a () on the ground for other ants to follow. As they walk back to the (), they leave a (), a pheromone, on the ground. Other ants then follow it to the (). They have () vision, so they use their () for this purpose. The pheromone trail is a () to other ants.

【 line / food / poor / antennae / communication / trail / chemical / ants / nest / good / eyes / food 】

⑤ Practice reading aloud.

- (1) Repeat after the teacher. You CAN look at the textbook or the handout.
- (2) Repeat after the teacher. You CAN NOT look at the textbook or the handout.
- (3) Make pairs and practice reading aloud.

⑥ Read the passage once more and pick out the key words, key phrases and key sentences.



⑦ You are going to make pairs and tell this story.

1) Pick up your level

- Level 1 : Explain the story by using the summary of the text.
- Level 2 : Explain the story by using the summary below.
- Level 3 : Explain the story by using the key sentences and key phrases which you picked out.
- Level 4 : Explain the story by using the key words which you picked out.

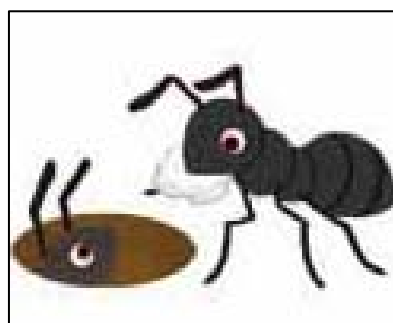
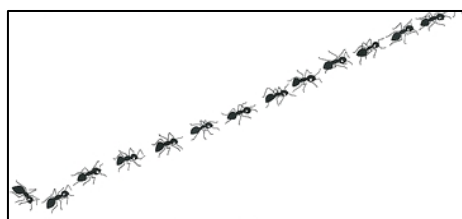
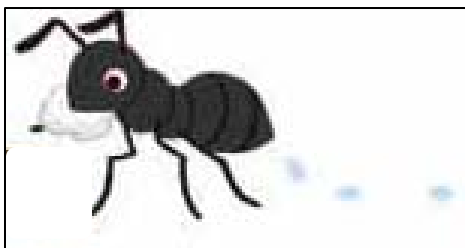
slow learners でも安心して言語活動に取り組めるように、また fast learners の知的好奇心も刺激できるように **4つ** のレベルを用意しました。

Sometimes you can see () marching in a long (). When ants find (), they make a () on the ground for other ants to follow. As they walk back to the (), they leave a (), a pheromone, on the ground. Other ants then follow it to the (). They have () vision, so they use their () for this purpose. The pheromone trail is a () to other ants.

My level is 【 1 · 2 · 3 · 4 】

両面印刷にすることにより、retellingの際、①の本文や④の穴埋めされたsummaryを見ないようにし、思考により負担をかけるようにしました。

2) Tell your partner “Why ants are moving in a line.”
You can use gestures and pictures.



各レッスンの各パートでこのよ
うなワークシートを学年共通で
用いて授業を行っています。

Lesson 5 Part 3 Worksheet

参 考

Class ____ No. ____ Name _____

①Introduction : Which do you like better, aquariums or zoos? Please tell your partner the answer and the reason why you think so.

②New words : Check the pronunciation of the new words.

Warm up 活動(帯活動)で、英検準2級レベルの面接の質問(教科書本文と関連のあるもの)をトピックとし、即興で話す活動をしています。

③Listening 1 : Listen to the CD and when you catch the new words, tap your desk two times.

④Listening 2 : Listen to the CD and answer the questions below.

Q1 What kind of experiment did Professor Takabayashi carry out?

A1 He carried out an experiment with () and mites.

Q2 What did he find in the experiment ?

A2 The healthy plant () a chemical signal.

Q3 Does plant-to-plant communication seem to take place among different kinds of plants?

A3 (Yes, it does. / No, it doesn't.)

②で新出単語を確認した後、

③新出単語を聞き取るリスニング



④gistをつかむリスニング



⑤大まかな流れを読み取るリーディング



⑥細部を読み取るリーディング



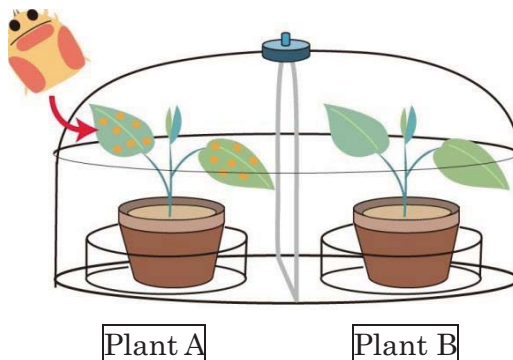
⑦要約文の穴埋め

と活動を繰り返すことにより少しずつ少しずつ内容理解が深まるようにしています。

⑤Reading 1 : Read the textbook and fill in the blanks.

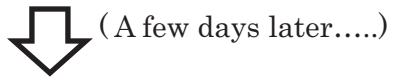
Topic: Plants nearby also r _____ the chemical signals f _____
The chemical signals from damaged plants are received **not only** by wasps **but also** by plants nearby. ⇔ **Both** _____ **and** _____ receive the chemical signals from damaged plants.

Prof. Takabayashi's experiment



Plant A: a bean plant _____

Plant B: _____ plant



Plant (A / B) _____ production of a _____ in its leaves.

⇒ Plant (A / B) _____ from Plant (A / B).

Topic: _____ "communication" _____ among different kinds of plants. (= h _____)

Some studies (= r _____) suggest that tobacco plants (near damaged sagebrush)

{ _____ their defensive _____ (= ways / plans)

{ _____ the damage from caterpillar

⇒ tobacco plants "hear" _____

Do you think it is a good idea for children to use cell phones? Write a short essay about it. Then tell your partner the answer and the reason why you think so.

生徒による授業アンケートの結果、「書く活動の充実が必要である」という結果が出たため、各パートの中盤で、3文程度で自分の考えを書く活動を行っています。

⑥Reading 2 : Read the textbook and answer the question below.

1 Do plants nearby receive the chemical signals from damaged plants like wasps?

2 What did Professor Takabayashi want to do with this experiment?

3 What did he use in his experiment?
He used _____

4 What did he find in his experiment?
He found that _____

5 Does plant-to-plant communication happen among different kinds of plants?

⑦Summary writing : This is the summary of part3. Read the textbook and fill in the blanks.

The () signals from damaged plants are () by plants nearby as well. Professor Takabayashi carried () an experiment with beans and () to confirm this phenomenon. He found that a () bean plant received a chemical signal from a bean plant being eaten by mites, and started to () itself from the mites. Furthermore, this kind of plant-to-plant "communication" seems to take place even among different () of plants.

⑧Reading aloud

(1)Repeat after the teacher. You CAN look at the textbook or the handout.

(2)Repeat after the teacher. You CAN NOT look at the textbook or the handout.

(3)Make pairs and practice reading aloud.

⑨Explanation : Please make a pair. Explain about part 3 to your partner.

Level 1 : Read and look up using the summary of ⑦.

Level 2 : Read and look up using the summary chart of ⑤.

Level 3 : Pick out the key words by yourself. Explain part 3 by using them.

Keywords

Para1

Para2

Para3

Your level is (1 / 2 / 3)

※When you listen to your partner, you evaluate your partner's speech.

A レベル3を選び、キーワードを自分なりに使って全てのパラグラフについて伝えることが出来た

B レベル3を選び、キーワードを自分なりに使っていくつかのパラグラフについて伝えることが出来た

レベル2を選び、

C レベル2を選び、

レベル1を選び、

D レベル1を選び、

Your evaluation is (A / B / C / D)

上記のように、活動を繰り返すことで内容理解を深めた後に、⑧で音読の練習を行います。

そして、最後にリテリングの活動を行います。ここでは、slow learnersでも安心して言語活動に取り組めるように、fast learnersの知的好奇心も刺激できるように3つのレベルを設けています。

以上のように、レッスンの各パートにおいて、リスニング・リーディング・ライティング・スピーキングの各技能を総合的に育成するように心がけています。

また、③④のリスニングで得た情報、⑤⑥⑦⑧のリーディングで得た情報を、⑨のスピーキングでリテリングするようにし、各パートを技能統合型の授業デザインにしています。

Talking Plants



Illustration from *Through the Looking-Glass and What Alice Found There*

私たち人間は、言葉や身振りなどでコミュニケーションをとっています。では植物はどうでしょうか。実は植物たちも、私たちが気づかない方法でまわりの生きものとの情報のやりとりをしています。植物たちの織りなすコミュニケーションの世界をのぞいてみましょう。

"We can talk," said the Tiger-lily, "when there's anybody worth talking to."
—Lewis Carroll

1

Get the Picture

In the book *Through the Looking-Glass and What Alice Found There* by Lewis Carroll, there are some flowers that can talk. A young girl named Alice comes upon a lily who speaks to her. Alice is so surprised that she doesn't know what to say, but finally she asks, "Can all flowers talk?"

Plants that talk to people are only seen in fantasy stories. However, recent scientific research shows that plants can "communicate" with some insects around them in a special way. How do they do this?

For example, when corn plants are being eaten by caterpillars, they send out a chemical into the air. Humans do not notice it, but insects do. The chemical attracts the natural enemies of the caterpillars: parasitic wasps. With the help of these wasps, corn



come upon ~ : meet or find someone or something by chance
send out ~ ex. The sun *sends out* light and heat.

Through the Looking-Glass and What Alice Found There [鏡の国のアリス]
Lewis Carroll [ルイス・キャロル] (1832-1898) イギリスの数学者・作家.

Alice [ælis] Lewis Carroll [ləʊɪs kærəl] lily [lɪli] fantasy [fæntəsi] scientific [saɪəntɪfɪk]
insect [ɪnsekt] caterpillar [kætəˈpɪləɹ] chemical [kɛmɪkəl] attract [əˈtrækt]
enemy [ɛnəmi] parasitic [pəˈræsɪtɪk] wasp [wɒsp]

plants reduce the damage caused by the caterpillars. The chemical signal ^{S1} may be compared to a cry for help. Corn plants are in a sense calling out to their “bodyguards” to save them.

Get the Picture

2

^F Corn plants are eaten by various kinds of caterpillars, and each kind of caterpillar has a specific enemy wasp. To defend themselves, corn plants use a different type of signal depending on the type of caterpillar eating them. By doing this, they attract only the enemy wasp of that particular caterpillar.

2. How do corn plants defend themselves from various kinds of caterpillars?

How do parasitic wasps destroy caterpillars?

When parasitic wasps receive the chemical signals given off by plants, they fly to where the caterpillars are. Then they lay eggs inside the caterpillars' bodies. When the eggs hatch, the offspring of the wasps start to grow inside the caterpillars. They feed off the caterpillars and eventually kill them.



WINDOW 1

Corn plants are not just saying, “I am being eaten!” They are also saying “who” is eating them.

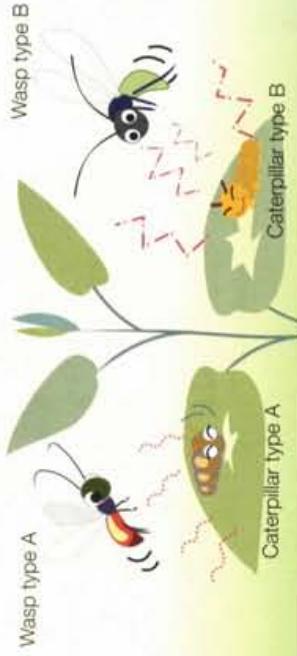
S1

Get the Picture

The chemical signals given off by corn plants are made up of various components. By changing the blends of those components in different ways, corn plants create a variety of chemical signals, and they can deal with attacks from various kinds of caterpillars.

Other kinds of plants such as tomatoes, apples, and beans also give off chemical signals when they are attacked. Professor Marcel Dicke of Wageningen University in the Netherlands says, “Talking to their bodyguards is likely to be a characteristic of most plant species.” It is surprising that they have such a complex system of defense.

3. What does Professor Dicke say about plant communication?



be made up of ~ ex. A soccer team is made up of eleven players.
 a variety of ~ ex. He has done a variety of jobs.
 give off ~ ex. The fire was giving off a lot of smoke. cf. send out ~
 be likely to do ex. Do you think it is likely to snow?

component [kəmpəʊnənt] blend [blænd] variety [vəraɪəti] professor [prəfəsə] Marcel Dicke [mɑrsəl dɪk] Wageningen [wɑːfɛnɪŋən] Netherlands [nədərləndz] characteristic [kærəktərɪstɪk] species [spiːʃiːz] complex [kəmplɛks] defense [dɪfɛns]

be compared to ~ ex. Life can be compared to a journey.
 in a sense ex. What he says is right in a sense.
 call out to ~ ex. I called out to you at the station, but you didn't hear me.
 depending on ~ ex. The students wear a different uniform depending on the season.

signal [sɪgnəl] bodyguard [bɒdɪgɑːrd] specific [spəˈsɪfɪk] defend [dɪfend]

Get the Picture



the healthy plant received a chemical signal from its neighbor and started to defend itself against the mites.

- 5 This kind of plant-to-plant "communication" seems to take place even among different kinds of plants. Some studies suggest that tobacco plants near damaged sagebrush start their defensive measures and reduce the damage from caterpillars. The tobacco plants "hear" the chemical signal from sagebrush.



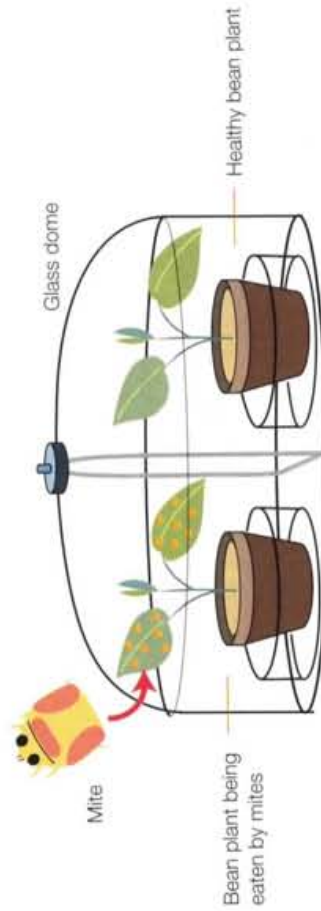
A wild tobacco plant (front) next to sagebrush (background)

Get the Picture

3

The chemical signals from damaged plants are received not only by wasps but also by plants nearby. These other plants are "listening in on the conversation." To confirm this phenomenon, Professor Takabayashi of Kyoto University carried out an experiment with beans and mites. He placed a healthy bean plant next to a bean plant being eaten by mites and left the two plants alone for a few days. As a result, the healthy plant increased production of a defensive substance in its leaves. In other words,

4. What did Professor Takabayashi find in his experiment?



- listen in on ~ ex. The kids listen in on our phone calls.
 carry out ~ ex. Lisa is carrying out research on Japanese history.
 next to ~ ex. He sat down next to me.
 as a result ex. The train was late. As a result, he was late for the meeting.
- nearby [niərbái] confirm [kən'fɜ:m] phenomenon [fínómə'nón] experiment [iks'pérəmənt]
 mite [máit] increase [ínkri:s] defensive [dífénsiv]

defend ~ against ... ex. The animal gives off a bad smell to defend itself against enemies.
 take place ex. The meeting will take place next Wednesday.

tobacco [təbákou] sagebrush [séidʒbrʌʃ]

Get the Picture

4

Our environment is filled with “conversations” among plants and insects, although we cannot really hear them. In fact, a great variety of species in nature are interacting with one another.

These interactions between plants and insects can help to reduce pesticide use in farming. Takabayashi’s research team has developed a method for using parasitic wasps as helpers. This is how they do it.

First, they produce the same type of chemical given off by damaged *mizuna* plants. With that chemical they attract wasps to a greenhouse filled with *mizuna*. These wasps then “patrol” the inside of the greenhouse and destroy caterpillars. “However, this method doesn’t work unless there are natural enemies of the caterpillars around the greenhouse,” says Takabayashi. “We need to maintain the diversity of species in the surrounding area.”

6. What method has the research team developed to reduce pesticide use in farming?

be filled with ~ ex. The room was filled with flowers.
 one another ex. They shook hands with one another.

interact [intərækt] interaction [intəræksjən] pesticide [péstəsáid] method [méθəd]
 helper [hélpər] greenhouse [grí:nháus] patrol [patróul] maintain [meintéin]
 diversity [dávərsítí] surrounding [səraundɪŋ]

WINDOW 2

Using parasitic wasps in *mizuna* farming

Professor Takabayashi’s research team created an artificial substance that attracts wasps. They placed this substance inside a greenhouse filled with *mizuna* and were successful in attracting wasps with it. However, after a few days, the wasps started to die inside the greenhouse because they didn’t have a food source (flower nectar). The research team used honey in place of flower nectar to feed them. The wasps were able to survive for about two weeks on it and were very effective in killing caterpillars.



Greenhouse filled with *mizuna*



Artificial substance that attracts wasps



Feeder for the wasps. The container is filled with honey.

5 Workshop

Summary Chart

本文の内容に合うように、表を完成しなさい。

Part 1 The "communication" between plants and insects

Corn plants can "communicate" with some insects

Corn plants being eaten by caterpillars send out a () to attract parasitic wasps.

Part 2 The plants' surprising system of defense

The way corn plants defend themselves from various kinds of caterpillars

They use a different type of () depending on the type of the caterpillar, and attract only the enemy wasp of that () caterpillar.

A characteristic of most plant species

They can "talk to their ()."

Part 3 Plant-to-plant "communication"

The experiment carried out by Professor Takabayashi

Procedure: Place a () bean plant next to a bean plant being eaten by () and leave the two plants alone for a few days.

Findings: The healthy plant increased production of a () () in its leaves. The healthy plant () a signal from the damaged plant and started to () itself.

"Communication" among different kinds of plants

Example: Tobacco plants near () sagebrush start their defensive measures.

Part 4 For farming and maintaining the diversity of species

The method developed by Professor Takabayashi's research team

Using parasitic wasps as helpers to () pesticide use in farming.

The diversity of species is being lost

Tens of thousands of species are () () every year because of people damaging the environment. We should listen closely to the "voices" in ().

A United Nations report says tens of thousands of species are now dying out every year largely as a result of human beings damaging the environment. Once one species is lost, it will have an effect on many other species. If we continue to destroy the environment, more and more species may be lost. We need to listen closely to the "voices" in nature so that this does not happen.

7. Why are tens of thousands of species dying out every year?



die out ex. Those animals died out over one hundred years ago.

United Nations 「国際連合 (国連)」

United Nations [junáitid néifənz]