

# バーチャル留学：ワークシートの使い方

## はじめに

バーチャル留学では、英語で海外の大学教授の講義を聞き、英語でディスカッションに参加します。映像やワークシートで講義に参加するために必要な英語に慣れておくことができます。講義当日まで、毎日できる範囲で学習に取り組んでみましょう。

ワークシートは以下の「Video」「Reading」「Brainstorming Ideas and Opinions」の項目から構成されています。

## 1



## Video

映像をみて、ワークシートでその内容と英語を理解します。

ワークシートの項目名	学習方法
<b>First viewing</b>	映像をみて、内容を大まかにつかみましょう。
<b>Confirming</b>	質問に答えて映像の内容が理解できたか確認しましょう。辞書で単語を引いてもかまいません。
<b>Summing up!</b>	日本語の要約文は映像の内容を日本語にまとめたものです。内容を理解した上で、英語の要約文の空所を埋めてみましょう。 ※英語の要約文は <b>Video</b> の内容をもとに新しく書き下ろした英文です。日本語の要約文の英訳ではありません。
<b>Second viewing</b>	英語表現を勉強した後に、もう一度 <b>Video</b> を視聴しましょう。理解しやすくなったか確認してみるとよいでしょう。

※時間がない人は解答編を見ておくだけでも勉強になります。

## 2



## Reading

**Video** の発展活動として、もう少し詳しい内容を読み、英語の表現を学び、発音を練習して、英語で内容を説明できるようにします。

手順	学習方法
<b>ステップ①</b>	【音声素材】を聞きながら、英文を読みましょう。
<b>ステップ②</b>	音声なしで、英文を読みながら、 <b>The expressions we need</b> の日本語に合う表現を英文の中からさがして書き入れましょう。
<b>ステップ③</b>	もう一度【音声素材】を聞きながら英文を読み、理解できるか試しましょう。
<b>ステップ④</b>	<b>The information we need</b> の表に読んだ内容・情報を整理しましょう。

## 3



## Brainstorming Ideas and Opinions

**Video** と **Reading** で学んだことを振り返り、英語で自分の意見や考えをまとめるセクションです。

イベント当日のディスカッションに役立てましょう。

イベント当日は **The expressions we need** や、**The information we need** で整理した内容も参照しながら参加しましょう。

農業から考える環境問題。農業が及ぼす土地、空気、水への影響と、その対応策とは？

Lincoln University (ニュージーランド)

Mr. Daryl Streat/ Mr. Jason Reimer

## Agriculture: Pre-lecture Packet


Lecturers ( )

### Activities 事前学習の流れを確認しましょう。

- ☐  Video 1: *Dairy Farms in New Zealand* ..... pp. 2-3
- ☐  Video 2: *Measures Against Environmental Damage* ..... pp. 4-5
- ☐  Reading 1: *Livestock Farming and the Environment* ..... pp. 6-7
- ☐  Video 3: *Lincoln University and Agriculture*..... pp. 8-9
- ☐  Reading 2: *Farming Solutions in New Zealand* ..... pp. 10-11
- ☐  Reading 3: *Meeting Agricultural Challenges in Japan*..... pp. 12-13
- ☐  Brainstorming Ideas and Opinions ..... pp. 14-16

### After the lecture... 講義を終えてから内容を振り返ってみましょう。

- ☐  Reflecting on the Lecture..... p. 17

 ビデオ教材とリーディングの音声は、「バーチャル留学動画」の中に、大学別に用意されています。

チャプターを確認してご覧ください。

バーチャル留学動画 URL

<https://www.tec.metro.tokyo.lg.jp/vr.html>





## Video 1: Dairy Farms in New Zealand

### First viewing



Watch the video and answer the questions below.

映像を見て、内容をおおまかにつかんでみましょう。

### Confirming

Circle the letter of the best answer.

理解度チェック！ 空所に入る語句、質問の答えに○をつけましょう。

- The topic of Video 1 is the \_\_\_\_\_ of New Zealand.  
A. two largest islands    ☒ B. dairy industry    C. beautiful mountains
- How do cows make the ground hard?  
A. by eating grass    B. by growing plants    ☒ C. by walking around
- What do cows release into the air?  
☒ A. methane gas    B. grass    C. soil
- The number of cows in New Zealand has been \_\_\_\_\_.  
A. going down    B. staying the same    ☒ C. going up
- When agriculture is carried out, what should we do?  
A. respect the planet    B. consider the environment    ☒ C. both



## Summing up!

Complete the summary by filling in the blanks with items from The expressions we need below.

以下は予習教材動画の概要です。映像で見た内容について確認しましょう。

次に、理解した内容を踏まえて英文を読み、空所に合う語句を The expressions we need から選んで、英語の要約文を完成させましょう。

太平洋に浮かぶ、主に南北二つの島からなるニュージーランドは、美しい山河に囲まれ、酪農は一大産業になっています。しかし、国に利益をもたらしてくれる酪農がニュージーランドの環境問題も引き起こしています。牛が牧場を歩き回ると土が硬くなり、草が育ちにくなります。また、牛のゲップから出るメタンガスが空気中に放出されます。最近、牧牛の数が増えているため環境への影響が増加しています。ニュージーランドでは、環境を大切にするため、酪農が自然とどのように関わるべきなのかを考えています。

In New Zealand, agriculture is very profitable<sup>①</sup>. One successful part of this industry is dairy farming<sup>②</sup>. Cows in New Zealand have grass<sup>③</sup> to eat. However, the number of cows in New Zealand is increasing<sup>④</sup>, and dairy farming causes problems for the environment<sup>⑤</sup>. For example, when they walk around on the soil<sup>⑥</sup>, it becomes hard, and for plants, it is difficult to grow in this hard soil. Finally, methane gas<sup>⑦</sup> is released into the air by cows. We need to respect the planet and think about how agriculture is interacting with<sup>⑧</sup> the environment.

## The expressions we need

畜産業、農業	agriculture	酪農	dairy farming	環境	environment
牧草	grass	増加する	increasing	産業	industry
(〜と)関わる	interacting with	メタンガス	methane gas	収益が多い	profitable
放出される	released	大切に	respect	土	soil

## Second viewing



Watch the video again and confirm what you have learned.

学習した内容を踏まえて、もう一度映像を見てみましょう。今回はナレーションを聞き取ることに集中して、内容理解を深めましょう。



## Video 2: Measures Against Environmental Damage

### First viewing



Watch the video and answer the questions below.

映像を見て、内容をおおまかにつかんでみましょう。

### Confirming

Circle the letter of the best answer.

理解度チェック！ 空所に入る語句、質問の答えに○をつけましょう。

- Who is creating rules to stop environmental damage in New Zealand?  
A. dairy farmers    **B. the government**    C. both
- What is being controlled by these rules?  
A. numbers of cows    B. New Zealand's image    **C. levels of nitrogen**
- Fences stop cows from getting close to \_\_\_\_\_.  
**A. water sources**    B. fields    C. contaminants in soil
- When New Zealanders check a river or stream, they may ask "Is it safe to \_\_\_\_\_?"  
**A. swim here**    B. inspect the soil    C. prevent pollution
- Where can people learn about the water quality of a river?  
A. at the beach    **B. on a website**    C. from signs on fences



Farm fence in New Zealand





## Video 2: Measures Against Environmental Damage

### Summing up!

Complete the summary by filling in the blanks with items from The expressions we need below.

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ニュージーランド政府や自治体は、環境保全を目的とした新しい規制をつくりました。窒素の排出基準や水路の保全などです。たとえば、牛が水路に侵入しないように柵を設置したり、土壌が汚染されていないか定期的に検査をしなければなりません。さらに、河川の水質は随時調査され、その結果はウェブサイトで公表されています。水質を測定する一つの基準が「そこで泳げるかどうか」です。このように、ニュージーランドは環境汚染に対して様々な取り組みを行い、環境に優しい国というイメージが保たれています。

In New Zealand, new <sup>①</sup> regulations are protecting the environment. For example, the <sup>②</sup> government is working to control <sup>③</sup> nitrogen levels. One rule says that soil must be <sup>④</sup> inspected on a regular basis. Other rules help people <sup>⑤</sup> monitor water quality and protect <sup>⑥</sup> waterways like rivers and streams. <sup>⑦</sup> Fences are built to keep cows away from <sup>⑧</sup> water sources. A website shows the quality of water in rivers and streams. People learn that if the water is clean enough to swim in, then it may be safe.

### The expressions we need

柵、囲い	fences	政府	government	検査される	inspected
監視する	monitor	窒素	nitrogen	定期的に	on a regular basis
守っている	protecting	質	quality	規制	regulations
小川	streams	水源	water sources	水路	waterways

### Second viewing



Watch the video again and confirm what you have learned.

学習した内容を踏まえて、もう一度映像を見てみましょう。今回はナレーションを聞き取ることに集中して、内容理解を深めましょう。



## Reading 1: *Livestock Farming and the Environment*

🔊 音声素材あり

Read the article below to find out more about how raising animals impacts nature in New Zealand.

ニュージーランドの畜産業が自然に及ぼす影響について、さらに理解を深めましょう。3ページと5ページの The expressions we need も参考にしてください。

**Livestock** is an important part of New Zealand's agriculture. Most of the country's farm land is used for livestock like **dairy cows**, **beef cattle**, sheep, pigs, and chickens. However, livestock farming has **negative effects** on New Zealand's soil and water.

One problem farming causes is **soil erosion**. When land is **cleared** for farming and **grazing**, **the top layer of soil** may be taken away by wind and water. Between 200 and 300 million tons of New Zealand's soil are carried to the ocean every year through erosion.

Another **issue** is soil **fertility**. Forests have been cleared for farmland, but that forest soil is low in **nutrients**. **Chemical fertilizers** are used to **replace** them and end up in waterways. Chemicals like nitrogen and **phosphorus** help water plants grow too much. These plants **damage** the **habitats** of fish and stop people from swimming, boating, and fishing.

In rainy areas of the country, farmers often **drain** the land so it will be dry enough to **raise** livestock. However, this means that **wetlands** are lost and wild animals **lose** their habitats. On the other hand, in dry areas, farmers **irrigate** the land, leaving less water in the ground.

Solving these problems needs careful planning. Everyone must work together for a greener future.

### The expressions we need

日本語に合う英語の語（句）を英文からさがして書き入れましょう。

家畜	<b>livestock</b>	乳牛	<b>dairy cows</b>	肉牛	<b>beef cattle</b>
負の効果	<b>negative effects</b>	土壌侵食	<b>soil erosion</b>	更地になる	<b>cleared</b>
放牧	<b>grazing</b>	上層の土	<b>the top layer of soil</b>	課題	<b>issue</b>
肥沃度	<b>fertility</b>	栄養	<b>nutrients</b>	化学肥料	<b>chemical fertilizers</b>
置き換わる	<b>replace</b>	リン	<b>phosphorus</b>	損なう、害する	<b>damage</b>
生息地、住まい	<b>habitats</b>	水はけをよくする	<b>drain</b>	育てる	<b>raise</b>
湿地	<b>wetlands</b>	失う	<b>lose</b>	灌漑する、水を引く	<b>irrigate</b>



## Reading 1: Livestock Farming and the Environment

### The information we need

Organize the key information from *Livestock Farming and the Environment* by completing the table below with your notes.

*Livestock Farming and the Environment* を読んで、土壌の浸食、肥沃度、水位の調整について読み取った内容をチャートにまとめましょう。

#### Soil erosion: Stages

Land	Cleared for farming and grazing
	↓
Top layer of soil	Taken away by wind and water
	↓
Every year	200-300 million tons carried to the ocean

#### Soil fertility: Stages

Forests	Cleared for farmland Soil: Low in nutrients
	↓
Farmers	Add fertilizers made with chemicals
	↓
Fertilizers	End up in waterways (streams, rivers)
	↓
Chemicals	Help water plants grow too much
	↓
Water plants	- Damage the habitats of fish - Limit swimming, boating, fishing

#### Controlling water levels

Rainy areas	Farmers: Drain the land → dry enough to raise livestock → Wetlands lost, wild animals lose habitats
Dry areas	Farmers: Irrigate farmland → less water in the ground





## Video 3: *Lincoln University and Agriculture*

### First viewing



Watch the video and answer the questions below.

映像を見て、内容をおおまかにつかんでみましょう。

### Confirming

Circle the letter of the best answer.

理解度チェック！ 空所に入る語句、質問の答えに○をつけましょう。

1. Who is trying to improve agriculture?

A. researchers    B. the government    C. farmers    **D. all three**

2. New Zealand's agriculture sector is \_\_\_\_\_.

A. saving cows    **B. leading the world**    C. reducing water

3. Many of Lincoln University's students have backgrounds in \_\_\_\_\_.

**A. farming**    B. research    C. technology

4. What is one thing Lincoln University is working to improve?

A. feed technology    **B. seed technology**    C. farm animal technology

5. Many international students at Lincoln hope to improve agriculture \_\_\_\_\_.

A. in New Zealand    B. at the university    **C. in their home countries**



*Feeding dairy cows*



### Summing up!

Complete the summary by filling in the blanks with items from The expressions we need below.

以下は予習教材動画の概要です。映像で見た内容について確認しましょう。

次に、理解した内容を踏まえて英文を読み、空所に合う語句を The expressions we need から選んで、英語の要約文を完成させましょう。

農業・畜産業の技術革新は、農業経営においても食糧問題においても非常に重要です。研究者、政府、自治体、農業従事者が努力を惜まず、改善し続けてきました。ニュージーランドの農業・畜産業も進歩を続け、今では世界的な産業になりました。リンカーン大学は、酪農における水質保全、種の開発技術、牛や他の畜産動物の飼料開発といった農業改革のための先進的な研究をしています。学生は大切な研究共同者です。学生の多くは畜産業、農業、ワイン醸造に従事しており、大学生も大学院生も一緒に研究しています。また、留学生も自国の農業の発展に寄与したいという思いで、新しい農業技術について学んでいます。気候変動、農業・畜産業が環境に与える影響など、将来直面するであろう問題を解決し、より良い農業・畜産業にしていけるために、一緒に学びましょう。

One of the greatest human <sup>①</sup>inventions is agriculture. A series of <sup>②</sup>improvements have helped humanity achieve <sup>③</sup>innovation in agriculture. <sup>④</sup>Researchers and governments have worked with farmers on these improvements. Now, New Zealand's agricultural <sup>⑤</sup>sector is a leader in the world. Lincoln University and its students have been <sup>⑥</sup>at the forefront, finding new ways to save water, feed cows, and cut <sup>⑦</sup>greenhouse gases. Our world is facing problems like <sup>⑧</sup>climate change, but Lincoln's students are helping to improve how agriculture is carried out.

### The expressions we need

最前線に立つて	at the forefront	行われる	carried out	気候変動	climate change
直面する	facing	牛に餌をやる	feed cows	温室効果ガス	greenhouse gases
人類	humanity	改善	improvements	新しい考え、革新	innovation
発明、開発	inventions	研究者	researchers	部門	sector

### Second viewing



Watch the video again and confirm what you have learned.

学習した内容を踏まえて、もう一度映像を見てみましょう。今回はナレーションを聞き取ることに集中して、内容理解を深めましょう。



## Reading 2: Farming Solutions in New Zealand

音声素材あり

Read the article below to find out more about how New Zealand is solving some of the problems caused by farming.

ニュージーランドでは、農業や畜産業による問題にどのように対処しているのか、さらに理解を深めましょう。これまですべての The expressions we need も参考にしてください。

Farming is key to New Zealand's **economy**. More and more **progress is being made** to solve environmental problems caused by agriculture.

Soil erosion is one problem New Zealand is working on. One solution is “grassing,” where grass **seeds** are spread by hand, machine, or airplane. Grass helps **prevent** wind and water from taking away the soil. Another solution is digging **ditches** to help control **rainwater** flow. Chemical fertilizers are another problem. There are now **stricter** regulations about how much fertilizer can be used, and farmers are using more **organic** fertilizers. This means better water quality.

There are also new guidelines for protecting waterways. Farmers are building fences that stop livestock from reaching rivers and streams. This keeps the water cleaner and prevents livestock from falling into the water. Putting in native plants along the banks of waterways makes the banks more **stable** and protects **wildlife** habitats.

Wetland areas in New Zealand are being **restored** and, **organizations** are bringing back **native plants** and fish. Tourists can go to a website and learn about how to help keep wetlands safe when they visit. Solving the problem of irrigation in drier areas is difficult, but “**transfer of water**” plans are being set up to move water from areas that **have more of it**.

### The expressions we need

日本語に合う英語の語（句）を英文からさがして書き入れましょう。

経済	<b>economy</b>	進歩している	<b>progress is being made</b>	種	<b>seeds</b>
防ぐ	<b>prevent</b>	溝	<b>ditches</b>	雨水	<b>rainwater</b>
より厳しい	<b>stricter</b>	有機の	<b>organic</b>	(地盤が)安定する	<b>stable</b>
野生動物	<b>wildlife</b>	元の状態に戻される	<b>restored</b>	関連機関	<b>organizations</b>
自生植物	<b>native plants</b>	水の移動	<b>transfer of water</b>	(水が)より豊富にある	<b>have more of it</b>



## Reading 2: Farming Solutions in New Zealand

### The information we need

Organize the key information from *Farming Solutions in New Zealand* by completing the table below with your notes.

*Farming Solutions in New Zealand* を読んで、ニュージーランドの農業や畜産業が取っている環境問題対策について、読み取った内容をチャートにまとめましょう。

#### Soil erosion: Solutions

1. Grassing

Grass seeds spread by hand, machine, airplane



Helps prevent wind, water taking away soil

2. Ditches

Control rainwater flow

#### Chemical fertilizers: Solutions

1. Regulations

How much chemical fertilizer can be used

2. Farmers

Using more organic fertilizers



Better water quality

#### Protecting waterways: Solutions

1. Fences

Stop livestock from reaching rivers, streams



Keep water cleaner, prevent livestock accidents

2. Native plants

Along waterway banks



Stable banks, protects wildlife habitats

#### Water levels: Solutions

Wetland areas

- Bringing back native plants, fish
- Website for tourists

Dry areas

Transfer of water plans: Move water from other areas



## Reading 3: Meeting Agricultural Challenges in Japan

音声素材あり

Read the article below to find out about how agriculture in Japan meets challenges.

日本の農業の問題とその対策について、さらに理解を深めましょう。これまですべての The expressions we need も参考にしてください。

Like many countries around the world, Japan is looking toward the future of its agriculture sector. What are the problems the country faces and how can they be solved?

For most of Japan, soil erosion by rainwater is more serious than erosion by wind. Especially where the land is sloping, farmers protect the soil by digging ditches to drain water away. They also plant trees and cover the soil with strips of grass. Another issue is the chemicals in Japan's farmland soil. Most farmers in Japan use chemical fertilizers, and since the 1990s, the levels of nitrogen in the soil have been very high. However, starting in 2011, farmers who have cut their use of fertilizers by 50% or more have received subsidies from the government. In 2018, the government started following international rules for deciding which farmers should receive them.

Japan's water quality has improved greatly since new rules started controlling industrial pollution. However, agriculture is still a source of chemicals, pesticides, and salts in the country's rivers and lakes. Scientists are studying ways to manage water pollution, and new regulations have helped to solve specific pollution problems.

Between 1950 and 1970, Japan's economic boom caused water pollution around the country, and the wetlands were seriously affected. Since the 1990s, there has been another boom: one in river and wetlands restoration. Over 23,000 projects have taken place, joined by local people, scientists, and river managers. Stricter rules for the agriculture industry have supported these projects.

### The expressions we need

日本語に合う英語の語（句）を英文からさがして書き入れましょう。

傾斜している	<u>sloping</u>	掘る	<u>digging</u>	草地	<u>strips of grass</u>
助成金	<u>subsidies</u>	受け取る	<u>receive</u>	殺虫剤	<u>pesticides</u>
扱う	<u>manage</u>	好景気	<u>economic boom</u>	大きな影響を受ける	<u>seriously affected</u>
回復	<u>restoration</u>	行われてきた	<u>have taken place</u>	参加した	<u>joined</u>



## Reading 3: Meeting Agricultural Challenges in Japan

### The information we need

Organize the key information from *Meeting Agricultural Challenges in Japan* by completing the table below with your notes.

*Meeting Agricultural Challenges in Japan* を読んで、日本の農業の問題とその対策について、読み取った内容をチャートにまとめましょう。

#### Soil: Erosion

Problem	Rainwater more serious than wind
Solutions	<ul style="list-style-type: none"> <li>- Sloping land: dig ditches to drain water</li> <li>- Plant trees</li> <li>- Cover soil with strips of grass</li> </ul>



#### Soil: Chemical levels

Problem	<p>Most farmers use chemical fertilizers</p> <p>→ Since 1990s: nitrogen levels high</p>
Solutions	<ul style="list-style-type: none"> <li>- Since 2011: farmers who cut by 50% more: subsidies</li> <li>- 2018: started following international rules</li> </ul>



#### Water: Quality

Problem	Agriculture: source of chemicals, pesticides, salts
Solutions	<ul style="list-style-type: none"> <li>- Scientists studying ways to manage water pollution</li> <li>- New regulations</li> </ul>



#### Wetlands

Problem	<p>1950s-70s: boom caused water pollution, affected wetlands</p> <p>Since 1990s: boom caused river/wetlands restoration</p>
Solutions	<ul style="list-style-type: none"> <li>- 23,000+ projects: local citizens, scientists, river managers joined</li> <li>- Stricter rules</li> </ul>





# Brainstorming Ideas and Opinions

How can we continue solving environmental problems caused by agriculture?

農業・畜産業が、さらに積極的に環境問題に取り組んでいくために何をしたらいいか、自分の意見をまとめてみましょう。

## Step 1: Reviewing

Take another look at the reference materials in this packet.

この Pre-lecture Packet の全資料を読み返して、概要を把握しましょう。

- ☐  Video 1: *Dairy Farms in New Zealand* ..... pp. 2-3
- ☐  Video 2: *Measures Against Environmental Damage* ..... pp. 4-5
- ☐  Reading 1: *Livestock Farming and the Environment* ..... pp. 6-7
- ☐  Video 3: *Lincoln University and Agriculture*..... pp. 8-9
- ☐  Reading 2: *Farming Solutions in New Zealand* ..... pp. 10-11
- ☐  Reading 3: *Meeting Agricultural Challenges in Japan*..... pp. 12-13

**Step 2: Comparing two countries**

How are these countries solving some of the problems they face? Complete the table below with information from the video and reading worksheets.

ニュージーランドと日本は、それぞれの農業が抱える問題にどのように対処しているでしょうか。14ページの Step 1: Reviewing で集めた資料から情報を探して、表を埋めていきましょう。

**Solving Problems in New Zealand and Japan**

Soil: Solutions	
New Zealand	Creating regulations, controlling nitrogen levels, inspecting on a regular basis, grassing, regulations, organic fertilizers
Japan	Digging ditches on sloping land Planting trees Covering soil with strips of grass
Water: Solutions	
New Zealand	Monitoring water quality, protecting waterways, building fences, setting up websites, putting in native plants on banks, restoring wetlands, bringing back native plants and fish, setting up "transfer of water" plans
Japan	Studying ways to manage pollution Making new regulations Restoring wetlands Local people, scientists, river managers working together
Other Solutions	
New Zealand	Researchers, governments working with farmers, finding ways to feed cows, cut greenhouse gases
Japan	日本の農業について、政府や研究者が何をしているかを調べてください。そして、ニュージーランドにならって英語で書いてみましょう。Step 3 の(2)の解答欄に答えを記入しましょう。

**Step 3: Writing your ideas!**

- Which of these solutions do you think are the most effective? Why?
- What are some other things we should do to solve environmental problems caused by agriculture?



## Brainstorming Ideas and Opinions

### Step 4: Taking notes

On September 23rd, take notes on the lecture below.

イベント当日は、メモを取りながら講義を受けましょう。



## Reflecting on the lecture

After the lecture on September 23rd, look back on what you have learned from this packet. Write some notes on each point. Write as much as you can about what you have learned from Mr. Streat and Mr. Reimer's lecture.

すべてのワークシートを読み返し、ストリート先生とレイマー先生の講義を振り返って、今回学んだことを英語でまとめましょう。

1. Problems caused by agriculture, especially raising livestock
2. Ways New Zealand is working to solve these problems
3. Ways Japan is working to solve some of its agricultural pollution problems
4. New information you have learned from Mr. Streat and Mr. Reimer