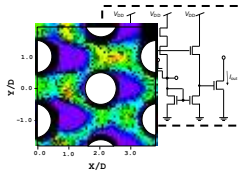


技術英語

Technical English

A hands-on textbook for intermediate to advanced level learners

実践的技術英語テキスト：中級～上級レベル



■ TEACHER'S MANUAL with ANSWER KEY ■

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In this manual, teaching suggestions and answer keys are provided for the textbook TECHNICAL ENGLISH: INTERMEDIATE TO ADVANCED LEVEL.

The textbook can be used as a follow on book for TECHNICAL ENGLISH: BEGINNING TO INTERMEDIATE LEVEL, or as a stand-alone book for teaching business and research oriented Technical English.

This manual, if printed, may be stapled on the left margin with ample room for reading.

Should you have any questions, please feel free to contact Prof. Eric Rambo at National Institute of Technology, Tsuyama College, Tel: 0868-24-8200.

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To begin the book, teachers may want to sensitize students to the importance of knowledge about global companies, by using the front piece table on p. ii (A sample activity is shown in Appendix 1). Additionally, teachers may want to have students read *To Students* (p. 1 and p. 53) before starting Part I or Part II to familiarize students with the need for *regular assignments*, *practice*, and *evaluation*.

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## ❖ Units 1 – 8 general guidelines

### I. Reading

#### a. Vocabulary

Significant time should be spent on learning the vocabulary. This can include having students highlight the vocabulary in the reading text, having students copy the words, administering spelling quizzes, doing pair work asking for the word's meaning and spelling, and so on.

#### b. Language Focus

The language focus should be explained, and students directed to specific places in the text where the structures are used. The structures are practiced in the "II. Writing" section, and again in the email writing section. Additional exercises may be devised by teachers for further practice.

#### c. Reading Comprehension

Significant time should be spent on the reading. Students can do a variety of activities to help them understand the reading, such as doing the "Study exercise for the Reading" shown below for each Unit, reading aloud with a partner, timed reading, studying the translations, and so on.

One activity that has proven successful is to have students write the answers for the "Study exercise for the Reading" to the right of the page (not in the underlined areas), and then memorize the answers and practice, in and outside of class.

To help students with the Reading Comprehension, teachers may direct students to appropriate places in the text. Correct answers may be shown by projector. Additionally, students can practice by reading the questions/answers aloud in pairs.

#### d. Self-evaluation

Students should check the boxes, and in general be sensitized to self-evaluation.

#### e. Listening

This is a teacher-led dictation exercise. Teachers should choose sections of the reading text, and read chunks aloud at an appropriate speed. When finished, students correct their work using a red pen. A dictation section can also be included on exams.

Additionally, for listening practice, students can use the web-based listening texts, which can be accessed at the NATIONAL INSTITUTE OF TECHNOLOGY, TSUYAMA COLLEGE homepage (<http://www.tsuyama-ct.ac.jp/>) by clicking on the box labeled "英語 E-learning" on the right hand side of the page. Teachers can have students do the listening exercise shown in Appendix 2, or devise different activities.

#### f. Reading aloud

This is a pair activity. The teacher chooses a section of the reading text for students to read aloud. One student is the *timer*, the other the *reader*. The *timer* instructs the reader when to start and when to stop (Ready...go!, Stop!). Finally, the time taken to read the passage is recorded in the box. Students can practice more and do the "2<sup>nd</sup> time", or do it for homework. The goal is to increase the reading aloud speed, while maintaining good pronunciation.

A related activity is to have students practice a section of the text with a partner (Student A reading the first sentence, B the second, A the third, and so on). Then the teacher nominates a team, or individual, to stand up and read for 30 seconds. The teacher can give an evaluation, such as: ■ EXCELLENT ■ GOOD ■ MORE PRACTICE PLEASE, and encourage students to work regularly on their reading aloud skills.

## II. Writing

### a. Exercises

The first exercise checks students command of word forms, and the second checks their understanding of the Language Focus. Students can do 1. and 2. in class, and then check the answers by projector or blackboard. Teachers may wish to devise further activities to develop students' ability to identify and use the correct word forms, as well as the Language Focus items.

Regarding 3, the collocations exercise, students can 1) simply copy the sentences from the reading, 2) devise their own sentences, or 3) find examples from web corpus resources (see p. 37 IIa.4. of this manual).

### b. Write Email

The teacher should explain the email following the directions provided in the textbook. The teacher can use the email templates shown below for each Unit to help students write. Students should write a first draft on the facing page in the textbook, and then type, improve, and turn in the email to be graded. The first (Unit 1) email should emphasize correct formatting, and points can be deducted for formatting mistakes. The grading for subsequent email should emphasize the students' efforts to explain and develop the main points, along with considerations for grammatical accuracy, punctuation, and so on. The email can also be used as a writing part of an exam.

As the Units progress, the students can add more personal information and opinions. They should be encouraged to write longer email for these Units, especially for Units 5-8.

### c. Peer Reading

To the degree possible, students should do peer evaluations to improve their editing skills and expand their understanding of the writing process. Teachers can use the form shown in Appendix 3, or devise their own forms. When students complete the form, they should conference with their partner. In sum, they should learn how to give advice to their peers.

### d. Self-evaluation

When students submit their email, they should also do the self-evaluation by checking a box, and explaining the reasons for their choice. For example, the student may feel that he or she did a good job explaining in the email, checked it carefully, improved it, or found it interesting to write.

*Finally*, teachers must decide how to implement the learning activities above with respect to their students' levels, the time allotted for the course, and the overall program goals. It is suggested that guiding principles in these decisions should include a balance of four skills development, an emphasis on practice followed by assessment, and a continuous effort to stimulate and enliven the learning.

The following sections contain translations of the readings, answers to exercises, and sample Email templates.

The activities *may be copied and modified* for classroom use only.



# UNIT 1

## ▶ p. 3, Study exercise for the Reading.

|    |                                                                                                                                                      |                                                                                                   |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| 1  | My name is Manabu Ikeda.                                                                                                                             | 私は池田マナブです。                                                                                        |
| 2  | I work _____ JMT,<br>located in Okayama, Japan.                                                                                                      | ... JMTで働いています。<br>日本の岡山県にある                                                                      |
| 3  | We _____, _____, and<br>_____ high quality cell phones.                                                                                              | 我々は...をデザインし、組み立て、販売しています。<br>高品質の携帯電話を                                                           |
| 4  | We are _____ low costs suppliers<br>to _____ components for our cell phones.                                                                         | 私たちは...低価格の納入業者を探しています。<br>携帯の部品を提供してくれる                                                          |
| 5  | Specifically,<br>we _____ to purchase<br>batteries from your company<br>to use in our cell phones.                                                   | もっと具体的に言えば、<br>私たちは...を...購入したいと思っております。<br>貴社の電池<br>自社の携帯電話に使用するために                              |
| 6  | We _____ Lithium-Ion batteries<br>that have long life and _____ quickly.                                                                             | 私たちは...リチウムイオン電池を必要としています。<br>長い寿命をもち、素早く再充電できる                                                   |
| 7  | We need a battery<br>that can provide 300 minutes of _____.                                                                                          | 私たちは...電池を必要としています。<br>120 分の通話時間を提供することができる                                                      |
| 8  | The capacity must be 700mAh, 3.7V.                                                                                                                   | 性能は 700mAh, 3.7V でなければなりません。                                                                      |
| 9  | The standby time should be<br>_____ 55 hours.                                                                                                        | 待機時間は...でなければなりません。<br>少なくとも 55 時間                                                                |
| 10 | At first,<br>we would like to purchase 100,000 batteries.                                                                                            | まず最初に<br>10 万個の電池を購入したいと思っております。                                                                  |
| 11 | Therefore,<br>_____ you please tell me<br>the price you would charge<br>to manufacture and ship 100,000 batteries<br>_____ the specifications above? | したがって、<br>どうか...を教えてくださいませんか。<br>...あなた方が請求する（提示する）価格<br>...10 万個の電池を製造し出荷するのに<br>上記のスペック（仕様）どおりに |
| 12 | Also,<br>_____ you tell us<br>when you could start deliveries?                                                                                       | それから、<br>...を教えてくださいませんか<br>いつから発送始めることができるか                                                      |
| 13 | _____ we are satisfied with<br>with the performance of the batteries,<br>we _____ to continue<br>purchasing batteries from TEC                       | ...に満足したと想定した場合、<br>電池の性能<br>私たちは...を続けたいと思っております。<br>T E Cからの電池購入                                |
| 14 | Thank you very much<br>for your _____.                                                                                                               | ありがとうございます<br>ご協力していただき                                                                           |
| 15 | I look _____ to<br>doing business together in the future.<br>Sincerely yours,                                                                        | ...を楽しみにしております。<br>将来、取引をすること<br>敬具                                                               |

► p. 2, Reading Comprehension.

|                                                                           |                                                                                                                                                                                                                                                              |
|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. What is the purpose of the email?                                      | JMT wants to buy low cost batteries for their cell phones. The purpose of the email is to ask Taipei Electronics Corporation what the cost would be to “manufacture and ship 100,000 batteries”.                                                             |
| 2. What does JMT do? Why do you think they are looking for new suppliers? | They “design, assemble, and sell” cell phones. They want to reduce the price of their cell phones.                                                                                                                                                           |
| 3. What technical specifications are required?                            | “300 minutes of talk time, capacity of 700mAH, 3.7V, and standby time of at least 5 days”                                                                                                                                                                    |
| 4. What polite (conditional) phrases are used in the email?               | <ul style="list-style-type: none"> <li>▪ <i>we would like to purchase</i> (line 11)</li> <li>▪ <i>could you please tell me</i> (line 15)</li> <li>▪ <i>could you tell us when</i> (line 17)</li> <li>▪ <i>we would like to continue</i> (line 18)</li> </ul> |

► p. 5, Exercises.

1. Write the correct word forms.

|              |                             |                |                               |
|--------------|-----------------------------|----------------|-------------------------------|
| supply (v)   | → (n) <b>a supplier</b>     | delivery (n)   | → (v) <b>to deliver</b>       |
| design (v)   | → (n) <b>a design</b>       | specify (v)    | → (n) <b>specification(s)</b> |
| recharge (v) | → (adj) <b>rechargeable</b> | satisfy (v)    | → (n) <b>satisfaction</b>     |
| require (v)  | → (n) <b>a requirement</b>  | assistance (n) | → (v) <b>to assist</b>        |

2. Write the correct answers.

- a) We **would like** to visit your office next week.
- b) **Could** you **please** send me an email?
- c) The company **checks**, **repairs**, and **upgrades** airplanes.
- d) We would like to **visit the factory** and **meet the president**

► p. 6, Email sample guidance.

**TO:** \_\_\_\_\_

**FROM:** (*your name*)

**RE:** Purchase of Blue Laser Diodes

**DATE:** \_\_\_\_\_

Dear Mr. Hanson,

My name is... I work for... (*see p.6*). We design, assemble, and sell... We are looking for a supplier who...

We would like to purchase...

Lasing Wavelength:

Laser Output Power:

Operating Current:

Operating Voltage:

Could you please tell me the price... (*see p.2*) 50,000 diodes per month? Also, could you please tell me... deliveries?

Thank you very much for... I look forward to...

Sincerely yours,

\_\_\_\_\_

Yotsubishi Electric Corporation

Yokohama, Japan

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## UNIT 2

▶ p. 9, Study exercise for the Reading.

|    |                                                                                                                                          |                                                                                                                                             |
|----|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | I have _____ your request for information _____ the purchase of Blue Laser Diodes.                                                       | 私は...情報のあなたの要求を受けました。<br>青半導体レーザーの購入に関する                                                                                                    |
| 2  | I welcome the _____<br>to be a _____ for Yotsubishi Electric,<br>and I would be happy to provide<br>the price information you asked for. | 私は ...機会を歓迎します、<br>ヨツビシ電気の納入業者になる<br>そして私は喜んで...を提供いたします<br>あなたが頼んだ価格情報                                                                     |
| 3  | However, because you are _____ a<br>large order<br>it will be necessary<br>for us to _____ certain<br>production capacity improvements.  | けれども、 <u>あなた</u> (Yotsubishi Electric Corporation) は多くの注文をしているため、<br>…が必要でしょう。<br>私たち (Shanghai Opto-components) が 一<br>定の生産能力の改善において投資すること |
| 4  | Moreover, there are further technical<br>_____ that would be necessary to<br>discuss before we would be able to reach an<br>agreement.   | さらに、...さらなる技術的スペックがある<br>討議することが必要だと思われる<br>私たちが合意に達することができる前に、                                                                             |
| 5  | It would be _____<br>for us to meet _____<br>to discuss the matter in detail.                                                            | …が望ましいでしょう<br>私たちが直接会うこと<br>詳細にそのことについて話し合うために                                                                                              |
| 6  | Would it be possible<br>for you to _____ to Shanghai?                                                                                    | …は可能でしょうか。<br>あなたが、上海にいらっしゃるの、                                                                                                              |
| 7  | Of course I would be happy<br>to _____ hotels and help with your travel<br>arrangements.                                                 | もちろん、喜んで<br>ホテルを提案し、あなたの旅行の手配のお手<br>伝いをいたします。                                                                                               |
| 8  | At the meeting in Shanghai,<br>we would like to begin with<br>the price information for the blue laser diode.                            | 上海での会合では、<br>…から始めたいと思います。<br>青半導体レーザーの価格情報 (についての話<br>し合い)                                                                                 |
| 9  | Then we would like to discuss<br>export _____ and import _____<br>from the Japan customs.                                                | それから、私たちは、...について議論したい<br>と思っています。<br>輸出ライセンスと日本の税関からの輸入税                                                                                   |
| 10 | Finally, we would like to _____ with a<br>delivery schedule.                                                                             | 最後に、配送スケジュールで、(会合を) 締<br>めくくりたいと思っています。                                                                                                     |
| 11 | Thank you very much<br>for your _____ of this matter.                                                                                    | ありがとうございます。<br>この件に関して配慮してくださり、                                                                                                             |
| 12 | I look _____ to hearing from you soon.                                                                                                   | あなたからすぐに返事がおききできることを<br>楽しみにしています。                                                                                                          |

► p. 8, Reading Comprehension.

|                                                                                     |                                                                                                                                                                                                                      |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. What is the purpose of the email?                                                | To tell you that that more information is needed before the cost of the blue laser diodes can be decided, and to ask you to come to Shanghai for a meeting.                                                          |
| 2. Mr. Hanson does not want to provide the price information in his email. Why not? | Because Shanghai Opto-Corporation will have to add production capacity. This means they will have to buy new machines, or hire new workers, or both. Also there are some technical details that he wants to discuss. |
| 3. What does Mr. Hanson want?                                                       | He wants you to come to Shanghai for a meeting.                                                                                                                                                                      |
| 4. What does he want to discuss at the meeting? Why?                                | He wants to discuss the “price information for the blue laser diodes”, export licenses, import duties and the delivery schedule.                                                                                     |

► p. 11, Exercises.

1. Write the correct word forms.

|                |                            |              |                             |
|----------------|----------------------------|--------------|-----------------------------|
| discuss (v)    | → (n) <b>a discussion</b>  | improve (v)  | → (n) <b>an improvement</b> |
| propose (v)    | → (n) <b>a proposition</b> | begin (v)    | → (n) <b>a beginning</b>    |
| desire (v)     | → (adj) <b>desirable</b>   | license (n)  | → (v) <b>to license</b>     |
| production (n) | → (v) <b>to produce</b>    | conclude (v) | → (n) <b>a conclusion</b>   |

2. Write the correct answers.

a) **Would** it be **possible** for you to **meet** me at 6 pm?

b) **Moreover**, it **would** be **desirable** for us to meet in person.

c) We **would** like to **begin with** a discussion about the product.

**Then (Next)** we **would like** to talk about the price.

**Finally**, we **would like** to sign a contract.

► p. 12, Email sample guidance.

TO: \_\_\_\_\_

FROM: \_\_\_\_\_

RE: To set up a meeting

DATE: \_\_\_\_\_

Dear Mr. Hanson,

Thank you very much for your email. I understand that you cannot provide...

I would be happy to travel to Shanghai to meet with you. I would be able to travel during...

I would like to stay... Moreover, I would like to see your manufacturing facilities. Could you please arrange...?

Thank you for helping with my travel arrangements. Could you please reserve a...? I would like...

I agree with the meeting agenda you proposed. I will summarize it below:

(1) Discuss the price for the Blue Laser Diodes (50,000 per month)

(2) Discuss...

(3) Decide...

Thank you again for your kind assistance. I look forward to seeing you in Shanghai.

Best regards,

\_\_\_\_\_  
Yotsubishi Electric Corporation  
Yokohama, Japan

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▶ p. 15, Study exercise for the Reading.

- |    |                                                                                                                                                                                        |                                                                                                              |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| 1  | We want to _____<br>the “geo-location” software in our cell phones.                                                                                                                    | わが社は、...をアップグレードしたい。<br>我が社の携帯電話の「位置測定」ソフトウェアを                                                               |
| 2  | In this email,<br>I will briefly describe the software,<br>and then give my _____.                                                                                                     | このメールでは、<br>私は簡単にソフトの説明をし、<br>それから、わたしの推薦するものを伝える。                                                           |
| 3  | As you know,<br>geo-location software _____ two things:<br>1) the cell phone user can find _____,<br>like hotels, restaurants, and friends,<br>and<br>2) it _____ the user's location. | ご存知のように、<br>位置測定ソフトは、二つのことを可能にする。<br>1) 携帯電話使用者は、...見つけることができる。ホテルやレストラン、友人などの位置を<br>また<br>2) 使用者の位置情報を報告する。 |
| 4  | This means that<br>the users' family, friends, etc.<br>can always know the location of the _____.                                                                                      | これは、...ということを意味している。<br>使用者の家族や友人が<br>常にその使用者の位置を知ることができる、                                                   |
| 5  | This is a _____ service to include in<br>our cell phones,<br>and we need to stay ahead of the<br>_____ with the latest versions of<br>geo-location software.                           | これは、携帯電話に含まれる極めて重要なサービスだ、<br>それに、我が社は...競争相手の先にとどまる必要がある（＝競争に勝ち続ける必要がある）。<br>位置測定ソフトの最新バージョンで、               |
| 6  | We have _____ the<br>search to two companies:<br>E-COM SOFTWARE, with _____<br>in Boston, Massachusetts,<br>and SIERRA SOLUTIONS, with headquarters in<br>Sao Paulo, Brazil.           | 我々は2つの会社に調査を絞っている：<br>(一つは)本社がマサチューセッツ州ボストンにある<br>イーコムソフトウェア、<br>それと(もう一つが)ブラジルサンパウロに本社がある<br>シエラソリューションズだ。  |
| 7  | My _____ is that<br>we _____ the software from<br>SIERRA SOLUTIONS.                                                                                                                    | 私の推薦は、...だ。<br>我が社がシエラソリューションズからのソフトウ<br>ェアの使用認可を受けること                                                       |
| 8  | Why?                                                                                                                                                                                   | なぜか。                                                                                                         |
| 9  | First,<br>Sierra has a _____ record in<br>location software development                                                                                                                | 第一に、<br>シエラは位置測定ソフトの開発において、実証済<br>みの業績がある。                                                                   |
| 10 | Sierra has been making location software for<br>ten years,<br>and is currently used by two of our major<br>_____.                                                                      | シエラは、10年間位置測定ソフトを作ってい<br>て、<br>私たちの主な競合会社のうちの2社によって現在<br>使用されている。                                            |
| 11 | Second,                                                                                                                                                                                | 2つめに                                                                                                         |

|    |                                                                                                                                   |                                                                                      |
|----|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|    | the Sierra software is highly _____.                                                                                              | シエラのソフトは非常に信頼性が高い。                                                                   |
| 12 | There have been very few customer problems, and almost no “_____ of service” periods.                                             | これまで、顧客の問題はほとんどなかったし、サービスの中止期間がほとんどなかった。                                             |
| 13 | _____,<br>Sierra will help us _____<br>the software into our services<br>and<br>continuously provide upgrades at no extra charge. | さらに、<br>シエラは、私たちがフソフトを私たちのサービスに統合化するのを助けるだろう<br>また<br>継続して追加費用なしでアップグレードを提供してくれるだろう。 |
| 14 | By next week,<br>please research E-COM and SIERRA<br>and _____ me your<br>recommendations.                                        | 来週までに<br>E-COM とシエラについて調べて<br>あなたの推薦するものを送ってください                                     |
| 15 | Then we will have a meeting<br>to make a _____ decision<br>between E-COM and SIERRA.                                              | それから私たちは...会議を開くでしょう<br>...最終決定するための<br>イーコムとシエラの間で（どちらにするかを）                        |

▶ p. 14, Reading Comprehension.

|                                                                  |                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. What is the purpose of the email?                             | Steve Conrad wants to tell the other division managers at INVIDA that they need to upgrade their geo-location software. He wants each division manager to write a recommendation to use either E-COM or SIERRA.                                                                            |
| 2. What is “geo-location” software? Do you use it? When?         | It is software that allows users to find places, and it reports the location of the user.                                                                                                                                                                                                  |
| 3. What company does Mr. Conrad recommend? What are his reasons? | He recommends SIERRA. He has three reasons for this recommendation. First, he says that SIERRA has a “proven record”. Next he says that the software is “highly reliable”. Finally, he says that SIERRA will help INVIDA integrate the software and “provide upgrades at no extra charge”. |
| 4. What does Mr. Conrad want the managers to do? Why?            | He wants them to first study E-COM and SIERRA, and then to choose one and write a recommendation for that company.                                                                                                                                                                         |

1. Write the correct word forms.

|               |                               |                |                             |
|---------------|-------------------------------|----------------|-----------------------------|
| recommend (v) | → (n) <b>a recommendation</b> | decision (n)   | → (v) <b>to decide</b>      |
| provide (v)   | → (n) <b>a provision</b>      | explain (v)    | → (n) <b>an explanation</b> |
| choice (n)    | → (v) <b>to choose</b>        | current (n)    | → (adv) <b>currently</b>    |
| solution (n)  | → (v) <b>to solve</b>         | reliable (adj) | → (adv) <b>reliably</b>     |

2. Write the correct answers.

- a) We need new computers. There are three reasons for this. **First**, our current computers are too slow. **Second**, we need to upgrade to the most recent operating system. And **third**, our current computers are quite vulnerable to viruses.
- b) **Furthermore**, our current computers do not work well with network connections.
- c) This essay needs to be improved. To begin with, it needs to be longer.  
**Furthermore**, it needs to explain the problem more clearly.

► p. 18, Email sample guidance.

**TO:** \_\_\_\_\_

**FROM:** \_\_\_\_\_

**RE:** Purchase of CCDs

**DATE:** \_\_\_\_\_

To \_\_\_\_\_ ,

As you know, we need to buy CCDs in order to make our... In this email I will...

As you know, a CCD is a... It is a crucial part of our automotive camera. We need to buy good CCDs because... However, ...

We have two choices. Company A's CCD... Company B's CCD...

The advantages of Company A's CCD are...

However, disadvantages of Company A's CCD are...

The advantages of Company B's CCD are...

But the disadvantages of Company B's CCD are...

My recommendation is that we buy CCDs from Company \_\_\_\_\_. There are two important reasons.

First, ..... Second, ....

For these reasons, I recommend Company \_\_\_\_\_.

Thank you.

\_\_\_\_\_  
Matsui Electric Company



## UNIT 4

▶ p. 21, Study exercise for the Reading.

|    |                                                                                                                                                       |                                                                                    |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| 1  | Thank you for _____ your recommendations.                                                                                                             | あなたの推薦案を書いてくれてありがとうございます。                                                          |
| 2  | We will have a meeting next week to make the final _____ between E-COM Software and SIERRA SOLUTIONS                                                  | 来週会議を開きます。<br>最終決断を下すための<br>イーコムとシエラソリューションズのどちらかの                                 |
| 3  | We will hold the meeting at 5 p.m. in the _____ boardroom next Thursday, Nov 15.                                                                      | 会議を 5 時に開きます。<br>重役会議室にて<br>11 月 15 日の来週木曜日に                                       |
| 4  | The _____ is as follows:<br>1. Announcements<br>2. Deliberation: E-Com or SIERRA?<br>3. _____                                                         | 協議事項は以下の通りです：<br>1) 告知<br>2) 審議：イーコムかシエラか？<br>3) その他                               |
| 5  | I have _____ all the recommendations from the other _____ Managers.                                                                                   | ...を添付しています。<br>すべての課長からの推薦案                                                       |
| 6  | Please note that we do not have a _____.                                                                                                              | ...ということを覚えておいてください。                                                               |
| 7  | About half of us recommend E-COM, and _____ recommend SIERRA.                                                                                         | 我々の意見が一致していない<br>約半分がイーコムを推薦し、<br>半分がシエラを推薦しています。                                  |
| 8  | This is an important decision.                                                                                                                        | これは、重要な決断です。                                                                       |
| 9  | Therefore, if you feel _____ about the decision, you should make _____ _____ in the meeting.                                                          | したがって、<br>この決断について強い意見を持っているのであれば<br>説得力のある論拠を示すべきです。<br>会議において                    |
| 10 | I will _____ the main pros and cons below.                                                                                                            | ...をまとめます。                                                                         |
| 11 | However, you should _____ read all the Division managers' recommendations _____ the meeting.                                                          | 以下に、主な良い点と悪い点<br>しかしながら、<br>...を注意深く読むべきです。<br>課長全員の推薦案を<br>会議の前に                  |
| 12 | Summary: E-COM - highly reliable software, low cost, _____ customer service<br>SIERRA - highly reliable software, higher _____, good customer service | まとめ イーコム非常に信頼性の高いソフトウェア<br>低価格、質の低い顧客サービス<br>シエラ 非常に信頼性の高いソフトウェア<br>高価格 質の高い顧客サービス |

► p. 20, Reading Comprehension.

|                                                                                        |                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. What is the purpose of Mr. Conrad's email?                                          | To tell the other Division Managers that they will have a meeting next week to make a final decision between E-COM and SIERRA.                                                                                                                                                                                                                                         |
| 2. What is the agenda for the meeting?                                                 | First general announcements, then the discussion about E-COM and SIERRA and making a final decision, and finally miscellaneous matters.                                                                                                                                                                                                                                |
| 3. What does "we do not have a consensus" mean?                                        | There is no agreement. The Division Managers do not agree which company (E-COM or SIERRA) would be better.                                                                                                                                                                                                                                                             |
| 4. What will happen in the meeting? Why?                                               | They will discuss and probably argue about which company is better, and then choose one company for the contract.                                                                                                                                                                                                                                                      |
| 5. What are the basic differences between E-COM and SIERRA? Which would you recommend? | E-COM has a good product with low cost, but poor customer service. That means INVIDA would have to do everything by itself, and pay for extra service.<br>SIERRA has a good product and good customer service, but it is expensive. This means that INVIDA would probably have to pass on these costs to its customers. Its cell phone services may be more expensive. |

► p. 23, Exercises.

1. Write the correct word forms.

|                  |                            |                 |                        |
|------------------|----------------------------|-----------------|------------------------|
| decide (v)       | → (n) <b>a decision</b>    | argument (n)    | → (v) <b>to argue</b>  |
| deliberation (n) | → (v) <b>to deliberate</b> | summarize (v)   | → (n) <b>a summary</b> |
| important (adj)  | → (n) <b>importance</b>    | carefully (adv) | → (adj) <b>careful</b> |
| convincing (adj) | → (v) <b>to convince</b>   | high (adj)      | → (adv) <b>highly</b>  |

2. Write the correct answers.

- If you feel** you should write the report again, then by all means do so.
- The machine will be returned **if it is** defective.
- The computers are more expensive than we would like. **However**, we should purchase them anyway.
- I sent the email yesterday. **However**, it is possible that not everyone has received it yet.

► p. 24, Email sample guidance.

TO: \_\_\_\_\_  
FROM: \_\_\_\_\_  
RE: Division Managers' Meeting  
DATE: \_\_\_\_\_

To \_\_\_\_\_,

As you know, we must decide which company (Company A or Company B) to buy our CCDs from. We will hold the meeting next...

The agenda for the meeting is:

1. ...
2. ...
3. Decision: Company A or B?

Some managers are recommending Company A, and some... Therefore, you should \_\_\_\_\_ read all the recommendations, and think hard about the... of each company.

I will give you a brief summary of the pros and cons of Company A and Company B. Company A's CCD... The strong point is... The weak point is... Company B's CCD, on the other hand, ...

This is an important decision. If you feel \_\_\_\_\_ about one company, make sure to have good \_\_\_\_\_ to \_\_\_\_\_ your position. Let's have a \_\_\_\_\_ on Tuesday.

Thank you.

\_\_\_\_\_  
Matsui Electric Company

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## UNIT 5

▶ p. 29, Study exercise for the Reading.

- |    |                                                                                                                                                          |                                                                                                          |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| 1  | As you know<br>we are _____ to design, manufacture,<br>and _____ an all new business jet,<br>the Galaxy Hawk I.                                          | ご存じのように<br>私たちは...をデザインし、製造し、売る予<br>定である<br>まったく新しいビジネスジェット、ギャラ<br>クシーホークス1を                             |
| 2  | The _____ for business jets<br>is highly competitive.                                                                                                    | ビジネスジェット機の市場は<br>競争が激しい                                                                                  |
| 3  | However,<br>we have new design technology<br>that will _____ us<br>to make a lighter and more fuel _____<br>aircraft, and jump ahead of the competition. | しかし<br>私たちは新しいデザイン技術を持っている<br>その技術は、私たちがより軽くより燃費の<br>よい飛行機を作ることができるし、そし<br>て、相手の一步先に飛びだすことを可能に<br>してくれる。 |
| 4  | But we are still too small<br>to build the aircraft by _____.                                                                                            | しかし私たちは小さすぎるので<br>独力で飛行機を製造できない                                                                          |
| 5  | So we must find a partner company<br>with advanced manufacturing _____<br>and propose a _____ _____.                                                     | だから私たちは...取引先を探さねばなら<br>ない<br>先進の製造に関する専門技術を持った<br>そして合弁事業を提案しなければならない                                   |
| 6  | I have _____ two companies<br>that could be good partners.                                                                                               | 私は... 2つの会社を選んだ<br>よいパートナーとなりうる                                                                          |
| 7  | They are:<br>Yokohama Precision Technologies (YPT)<br>and Kobe Technologies (KT),<br>both _____ _____ Japan.                                             | それらは...だ<br>横浜精密技術<br>神戸技術<br>両社とも日本に本拠がある                                                               |
| 8  | YPT designs and manufactures<br>a broad _____ of heavy machinery,<br>including trains and _____ power<br>equipment.                                      | YPT は...を設計し製造する<br>広範囲にわたる重機を<br>列車や原子力設備を含む                                                            |
| 9  | It is _____ in Yokohama, Japan,<br>has _____ of \$11 billion,<br>and has 23,500 employees.                                                               | 日本の横浜に本部を置いており、<br>年間110億の売り上げがある<br>そして23500人の従業員がいる                                                    |
| 10 | Most _____ for us,<br>YPT manufactures wings for passenger jets.                                                                                         | 私たちにとって最も重要なことは<br>YPT はジェット旅客機の翼を製造している<br>ことだ。                                                         |
| 11 | This is state of the art _____<br>_____ manufacturing.                                                                                                   | これは最先端の複合素材製品だ                                                                                           |

|    |                                                                                                                           |                                                                    |
|----|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| 12 | KT is also a large _____ ,<br>with headquarters in Kobe, Japan.                                                           | KT はまた大きなメーカーだ<br>日本の神戸に本部がある                                      |
| 13 | KT has annual sales of \$15 billion<br>and 30,000 _____.                                                                  | KT は 1 5 0 億の年間売上高があり、<br>3 万人の従業員がいる。                             |
| 14 | KT has designed and manufactured<br>a broad range of _____ aircraft and<br>helicopters.                                   | KT は...をデザインし、製造してきた<br>広範囲にわたる軍用飛行機やヘリコプター                        |
| 15 | It is currently a major supplier<br>of aircraft _____ and engines<br>for major aircraft companies<br>in the U.S. and E.U. | 現在のところ、...主な供給業者だ<br>...飛行機の部品やエンジンの<br>...主な航空会社の<br>アメリカや EU にある |
| 16 | KT likewise has advanced manufacturing<br>_____.                                                                          | KT は同じように先進の製造能力を持ってい<br>る                                         |

|    |                                                                                                                                    |                                                                                   |
|----|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| 17 | With YPT's or KT's expertise,<br>we could _____ manufacture<br>most of our Galaxy Hawk I business jet<br>with composite materials. | YPT あるいは KT の専門技術があれば<br>私たちは...を計画通りに製造できるだろう<br>私たちのギャラクシージェットの大部分を<br>複合素材を使って |
| 18 | And, since neither company is involved<br>in the business jets _____ ,<br>they may look _____ on<br>_____ a joint venture with us. | そして両方の会社が...かかわってないので<br>ビジネスジェットの部門に<br>両社は...を好意的に見るかもしれない<br>私たちとの合弁事業を交渉することを |

▶ p. 28, Reading Comprehension.

|                                                                       |                                                                                                                                                                                        |
|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. What is the purpose of this email?                                 | To find a business partner in order to manufacture and sell their new business jet, the Galaxy Hawk I.                                                                                 |
| 2. What does "the market for ... competitive" in line 8 mean?         | There are several companies that make business jets (For example, Bombardier, Gulfstream, and Dassault). They all make excellent business jets. They compete on price and performance. |
| 3. What does <i>Galaxy</i> have that will help them compete?          | A "new design technology" that uses composite materials (line 24) which are lighter and stronger than conventional materials like aluminum.                                            |
| 4. What facts about YPT and KT are reported?                          | The products, headquarters, annual sales, and number of employees for each company.                                                                                                    |
| 5. Why might YPT and KT agree to a joint venture with <i>Galaxy</i> ? | Both YPT and KT could enter the business jet market through a joint venture with Galaxy Australian Aircraft company.                                                                   |

► p. 31, Exercises.

1. Write the correct word forms.

|                 |                            |                  |                           |
|-----------------|----------------------------|------------------|---------------------------|
| strategic (adj) | → (n) <b>a strategy</b>    | equip (v)        | → (n) <b>equipment</b>    |
| compete (v)     | → (adj) <b>competitive</b> | employ (v)       | → (n) <b>employment</b>   |
| efficient (adj) | → (n) <b>efficiency</b>    | successful (adj) | → (v) <b>to succeed</b>   |
| choice (n)      | → (v) <b>to choose</b>     | negotiate (v)    | → (n) <b>negotiations</b> |

2. Write the correct answers.

- a) We have a license to manufacture and sell the equipment.
- b) We need to test, evaluate, and improve the jet.
- c) The report needs to be longer and better written.
- d) Our new video game is more difficult and exciting.

► p. 32, Email sample guidance.

TO: \_\_\_\_\_  
FROM: \_\_\_\_\_  
RE: Joint venture partner company  
DATE: \_\_\_\_\_

As you know, we are developing an all new electric "Green Car".

We need to find a good "joint venture" partner company to help us *develop* and *manufacture* the car.

In this email I will explain 2 companies that might be suitable.

The first company is \_\_\_\_\_. I will explain my research on this company. The headquarters is in... This company makes... The annual sales are... (*big? small?*)

As for the history, this company... The strong points...

The second company is \_\_\_\_\_. I will explain my research on this company. The headquarters...

\_\_\_\_\_

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## ▶ p. 35, Study exercise for the Reading.

- |    |                                                                                                                                                                                          |                                                                                                       |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| 1  | As you know,<br>the president has _____ now to select<br>one company as the best company to form a<br>_____ with<br>in order to manufacture and _____<br>our Galaxy Hawk I business jet. | ご承知のように<br>社長から私たちに...を選ぶように指示があった。<br>合併事業を行うのに最適な会社を一つ<br>...製造し販売するために<br>我々のギャラクシーホーク I ビジネスジェットを |
| 2  | I believe the best company _____<br><i>Yokohama Precision Technologies (YPT)</i> .                                                                                                       | 最適な会社は...だろうと私は考えている。<br>Y P T                                                                        |
| 3  | In this email, I _____<br>why YPT would be the best joint venture<br>partner for us.                                                                                                     | このメールでは、...を説明する。<br>なぜY P Tが我々にとって最適な合併事業のパートナ<br>ーであるのか                                             |
| 4  | First, YPT is a _____<br>in the use of Carbon fiber-reinforced polymer<br>(CFRP) for aircraft wings and other parts.                                                                     | 第一に、Y P Tは世界のリーダーだ。<br>...炭素繊維強化ポリマー (CFRP) の使用において<br>航空機の翼やほかの部品の                                   |
| 5  | YPT _____ makes the wings<br>for large _____ companies,<br>with a high CFRP content.                                                                                                     | Y P Tは現在...翼を製造している。<br>大きい航空機製造会社のために<br>高いCFRP の含有量で                                                |
| 6  | As you know,<br>the key for the _____ of our Hawk I<br>is to _____ by using carbon<br>composite materials.                                                                               | ご存知のとおり、<br>我々のホーク I の成功のカギは<br>炭素複合材を使って重量を軽減することだ。                                                  |
| 7  | YPT is the best company to help us<br>_____ .                                                                                                                                            | Y P Tは我々がそうする手助けしてくれる最良の会社<br>だ。                                                                      |
| 8  | Second, YPT is a very large company,<br>with over \$11 _____ in sales.                                                                                                                   | 第二に、Y P Tは...とても大きい会社だ。<br>年間110億ドル以上の売り上げのある                                                         |
| 9  | Therefore, YPT can _____ a lot of<br>money into our <i>Galaxy Hawk I</i> .                                                                                                               | したがって、Y P Tは...巨額なお金を投資することが<br>できる。<br>我々のギャラクシーホークス I に                                             |
| 10 | Third, YPT has many established _____<br>_____ to sell their products.                                                                                                                   | 三つ目に、Y P Tは既成の流通経路を多く持っている。<br>したがって、                                                                 |
| 11 | Thus<br>they can help us sell the <i>Galaxy Hawk I</i> in<br>_____, _____,<br>_____, in short, globally.                                                                                 | 彼らは我々がギャラクシーホークス I を売る手助けを<br>することができるだろう。<br>アジア、ヨーロッパ、北アメリカ、つまり世界的に                                 |
| 12 | Finally, YPT has no _____<br>in the business jet market.                                                                                                                                 | 最後に、Y P Tは...進出していない。<br>ビジネスジェットの市場には                                                                |

|    |                                                                                                                                                                                                                                |                                                                                                                                             |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| 13 | YPT makes some military aircraft,<br>but <i>no</i> _____ jet.<br>_____,<br>with our new design technology,<br>we may be able to _____ YPT to join us<br>in a partnership<br>to manufacture and sell the <i>Galaxy Hawk I</i> . | YPT は軍用機を製造している<br>が、ビジネスジェットは製造していない。<br>したがって、<br>我々の新しい設計技術をもってすれば<br>YPT を我々と合弁事業を行うように説得することが<br>できるかもしれない。<br>ギャラクシーホーク I を製造し販売するために |
| 14 | For these reasons I _____ believe<br>that we should try to form a joint venture with<br>YPT to _____ the <i>Galaxy Hawk I</i> .                                                                                                | これらの理由で、私は...と強く信じている。<br>我々が YPT との合弁事業を始める努力をするべきだ<br>ギャラクシーホークス I を製造するために                                                               |

► p. 34, Reading Comprehension.

|                                                                                                                       |                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. What is the purpose of this email?                                                                                 | To recommend a joint venture partner.                                                                                                                                                                                                     |
| 2. Summarize Mr. Matheson's reasons for choosing YPT.                                                                 | YPT is a "world leader" in CFRP. It is a large company with lots of capital (money) that it can use to invest. It has "established marketing channels" to sell the product. Finally, it doesn't make business jets.                       |
| 3. What does "justify a decision" mean?                                                                               | To give the reasons for making a decision. Of course, the reasons must be accurate and factual in order to be convincing.                                                                                                                 |
| 4. Do you think Mr. Matheson gave good reasons for his decision? Why? Can you think of some weakness in his argument? | Yes – he brought up the most important factors (products, capital, marketing) for considering a joint venture partner.<br><br>No – he did not give any financial details, and he did not give reasons why KT would not be a good partner. |

► p. 37, Exercises.

1. Write the correct word forms.

|             |                             |                |                            |
|-------------|-----------------------------|----------------|----------------------------|
| select (v)  | → (n) <b>a selection</b>    | invest (v)     | → (n) <b>an investment</b> |
| believe (v) | → (n) <b>a belief</b>       | product (n)    | → (v) <b>to produce</b>    |
| explain (v) | → (n) <b>an explanation</b> | globally (adv) | → (adj) <b>global</b>      |
| reduce (v)  | → (n) <b>a reduction</b>    | persuade (v)   | → (n) <b>persuasion</b>    |

2. Write the correct answers.

- a) In this essay, I will explain the causes of the economic crises.
- b) In this presentation, I will examine the use of CFRP in aircraft, and propose some ways we can use it in our new jet.
- c) We can improve the jet's performance by reducing the weight.
- d) By improving the aerodynamic design of our new car, we can make it more fuel efficient.

► p. 38, Email sample guidance.

TO: Vice President for Joint Ventures

FROM: \_\_\_\_\_

RE: Recommended Joint venture partner

DATE: \_\_\_\_\_

In this email I will recommend one joint venture partner for our electric "Green Car". I will give strong reasons for my recommendation in order to justify the decision.

The company I recommend is \_\_\_\_\_. First I will explain some background information for \_\_\_\_\_. The headquarters is in .....  
 .....

Next I will explain the reasons that justify my decision. First, .....  
 Second, ..... Third, .....

For these reasons I believe that \_\_\_\_\_ would be the best joint venture partner for our "Green Car".

\_\_\_\_\_

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## ▶ p. 41, Study exercise for the Reading

- |   |                                                                                |                                              |
|---|--------------------------------------------------------------------------------|----------------------------------------------|
| 1 | My name is Nurul Mawar Musa.                                                   | 私の名前はヌルル マワル ムサです                            |
| 2 | I would like to _____ the<br>Biotechnology Internship at Decade Bio-fuels Inc. | 私はデケード生物燃料法人の生命工学のインターン<br>シップに申し込みたいと思っています |
- 
- |   |                                                                                                                                                                                 |                                                                                               |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| 3 | I am currently a student in biological sciences<br>at the College of _____ Technology in<br>Kuala Lumpur, Malaysia.                                                             | 私は現在...生命工学の学生です<br>マレーシアのクアラルンプールにある応用技術大学<br>の                                              |
| 4 | I have a strong background in basic biological<br>sciences, including biochemistry and<br>_____ biology and a strong interest in<br>_____.                                      | 私には生化学と分子生物学を含む基礎生物学(の<br>分野)でかなりの経験と、生命工学に対する強い<br>興味があります。                                  |
| 5 | My main area of interest is in bio-fuels,<br>especially jet fuel _____ from<br>_____ and other plant products, as well<br>as _____ of non-food cellulose<br>into _____.         | 私が主に興味を持っている分野はバイオ燃料で<br>す。エタノールに加えて、特に藻や他の 植物生成<br>物から抽出されたジェット燃料です。                         |
| 6 | At my university we have tested several<br>_____ for converting cellulose into<br>ethanol, and we have run automobile engines<br>using these _____.                             | 大学で 私たちはセルロースをエタノールに換えるた<br>めのいくつかの方法を試してきたし、<br>私たちはこれらの燃料を用いて自動車エンジンを動<br>かしてきた             |
| 7 | I _____ believe that the market for bio-<br>fuels will grow _____ in the<br>future, both because they will be cheaper and<br>more environmentally friendly than<br>_____ fuels. | 私は バイオ燃料の市場は将来大きく成長するだ<br>ろうと強く信じている<br>それらが安くなるであろうという理由と石油燃料<br>よりもより環境に優しくなるであろうという理由<br>で |
| 8 | I dream of being part of the team that<br>_____ how to perfect the<br>production of bio-fuels and bring them to the<br>market.                                                  | 私は...チームの一員になることを夢見ている<br>バイオ燃料の生産を完全なものにする方法を解き<br>明かし、それらを市場にもたらす                           |
- 
- |    |                                                                                            |                                                              |
|----|--------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| 9  | My interests seem to be a perfect _____<br>with your company.                              | 私の興味はあなたの会社と完全に一致しているよう<br>です                                |
| 10 | I very much hope<br>that you will accept me into the _____<br>program at Decade Bio-fuels. | 私は...強く望んでいます<br>あなたが私をデケードバイオ燃料でのインターンシ<br>ッププログラムに受け入れることを |
| 11 | I understand the program is<br>_____.                                                      | 私はそのプログラムは非常に競争が激しいことを理<br>解しています                            |
| 12 | But I am a highly _____ student,<br>and I get _____ with                                   | しかし私は非常に意欲的な学生です<br>そして私は同僚と非常にうまくやっています。                    |

colleagues.

- 13 I would work hard and \_\_\_\_\_ positively to the program at Decade Bio-fuels. 私は一生懸命に働き、御社（デケードバイオ燃料）でのプログラムに有益に貢献するでしょう

- 14 If I can provide any further details about my \_\_\_\_\_ that would be helpful, please do not \_\_\_\_\_ to ask. Thank you very much. もし私の経歴について役立つようなより詳細な情報を提供できるなら、ご遠慮なく私にご質問下さい。ありがとうございます

- 15 \_\_\_\_\_ ,  
Nurul Mawar Musa  
College of \_\_\_\_\_ Technology  
Kuala Lumpur, Malaysia 敬具  
ニューラル マワル ムサ  
応用技術大学  
マレーシア クアラルンプール

► p. 40, Reading Comprehension.

|                                                                 |                                                                                                                                                |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. What is the purpose of the email?                            | To apply for an internship.                                                                                                                    |
| 2. What is Ms. Musa's background?                               | She is a student of biology at a technical college in Malaysia. She has done research in bio-fuels and tested bio-fuels in automobile engines. |
| 3. What does she want to do in the future? Why?                 | She wants to be "part of team" that researches bio-fuels" and successfully brings them "to the market".                                        |
| 4. What does the sentence "If I can...ask" mean?                | If Decade Bio-Fuels wants to know more about her, she will send them the information.                                                          |
| 5. What is your background? What are your goals for the future? | (personal academic background, interests, where you would like to work, and what you would like to do)                                         |

► p. 43, Exercises.

1. Write the correct word forms.

|              |                             |                  |                              |
|--------------|-----------------------------|------------------|------------------------------|
| apply (v)    | → (n) <b>an application</b> | environment (n)  | → (a) <b>environmentally</b> |
| interest (n) | → (adj) <b>interesting</b>  | motivate (v)     | → (n) <b>motivation</b>      |
| convert (v)  | → (n) <b>a conversion</b>   | positively (adv) | → (adj) <b>positive</b>      |
| grow (v)     | → (n) <b>growth</b>         | hesitate (v)     | → (n) <b>hesitation</b>      |

2. Write the correct answers.

- a) I have **a strong background** in designing electronic circuits.
- b) I **really like experimenting** with new designs and materials.
- c) I **like facing** new challenges, and **working with** different people.
- d) I am **good at** following directions and **completing projects**.

**TO:** \_\_\_\_\_ (Daevi Narayan? Marco Bonati?)  
**FROM:** \_\_\_\_\_  
**RE:** My internship application  
**DATE:** \_\_\_\_\_

Dear Ms. / Mr. \_\_\_\_\_,

My name is \_\_\_\_\_. I would like to apply for the “Internship in Industrial.....” at The \_\_\_\_\_ Institute. In this email, I will explain “My engineering background and my career goals”.

First, I will explain my engineering background. I am currently a student at... I am in the Department of \_\_\_\_\_. I.....  
*(What are some of your most important courses? What have you learned? What can you do? How about contests, experiments, research, clubs, or hobbies?)*

Next I will explain my career goals, and why I want to do the internship at The \_\_\_\_\_ Institute. First, .....  
*(What are your main interests? What job do you want in the future? Why do you want this internship? Are you motivated? Do work well with others? For example? How about English?)*

If I can provide any further details...(see p. 41) to ask. Thank you very much.

Sincerely,

\_\_\_\_\_  
(name of your school)



▶ p. 47, Study exercise for the Reading.

- |    |                                                                                                                           |                                                                              |
|----|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| 1  | I would like to _____ your _____ English Course during the coming summer vacation.                                        | 私はもうすぐくる夏休みにあなたの（学校の）集<br>中英語コースに参加したいと思っています。                               |
| 2  | In this email, I will explain “My background learning English and my goals for the future”, for my _____ to your school.  | このメールで、貴校への応募のために、私は英語<br>学習の経験と、将来の目標について説明します。                             |
| 3  | I have learned English at school _____ I was a junior high school student.                                                | 私は中学生だったときから、学校で英語を学んで<br>きました。                                              |
| 4  | We studied _____ and reading mostly.                                                                                      | 私たちは大部分文法や読解を学びました。                                                          |
| 5  | But I did _____ in an “English Speech Contest” for the _____ junior high schools.                                         | しかし私は地域の中学校の英語のスピーチコンテ<br>ストに参加しました。                                         |
| 6  | I enjoyed my English classes and _____ well on the tests.                                                                 | 私は自分の英語の授業を楽しんだし、試験でよい<br>成績を取りました。                                          |
| 7  | Also, I like to read song _____<br>(I like English rock music).                                                           | また、私は歌の歌詞を読むのが好きです。<br>(私は英語のロックミュージックが好きです。)                                |
| 8  | Now I’m studying at Tsubasa College of Technology in Japan.                                                               | 現在私は日本のつばさ高専で勉強しています。                                                        |
| 9  | We study the _____ skills and grammar.                                                                                    | 私たちは4技能と文法を学習しています。                                                          |
| 10 | In some classes we give _____.                                                                                            | いくつかの授業では私たちはプレゼンテーション<br>をします。                                              |
| 11 | In one class we read _____ English novels and _____ works, and short newspaper articles, like the <i>Japan Times ST</i> . | ある授業では私たちはやさしく書き直された英語<br>の小説や、ノンフィクションの作品や、ジャパ<br>ンタイムズ ST のような短い新聞記事を読みます。 |
| 12 | Still, I haven’t had lots of opportunities to _____ listening and speaking skills so far.                                 | それにもかかわらず、今までリスニングとスピー<br>キングの技能を習得するための十分な機会があ<br>りませんでした。                  |
| 13 | That’s why I _____ like to take the course at your school.                                                                | そういうわけで、私は貴校でのコースをとりたい<br>と思っています。                                           |
| 14 | I really want to _____ to have conversations in English, and communicate _____ with foreigners.                           | 私は本当に英語で会話をして、外国人と効果的に<br>意思伝達できるようになりたいと思っています。                             |
| 15 | I took a trip to China last year, and _____ to speak English all the time.                                                | 私は昨年中国に旅行しました<br>そしてそのとき英語を話さねばなりませんでした                                      |
| 16 | I also want to _____ to use the internet well in English.                                                                 | 私はまた英語でインターネットを上手に使えるよ<br>うになりたいと思います。                                       |

|    |                                                                                                                      |                                             |
|----|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| 17 | Additionally, I am _____ in mechanical engineering.                                                                  | それに加えて、私は機械工学を専攻しています。                      |
| 18 | I've studied machine design and _____ for five years.                                                                | 私は5年間機械デザインとメンテナンスを学習してきました。                |
| 19 | I plan to be a mechanical engineer after I _____.                                                                    | 私は卒業後機械エンジニアになるつもりです。                       |
| 20 | I will _____ work in a company that sells machines _____.                                                            | 私はおそらく機械を国際的に売る会社に勤めるでしょう。                  |
| 21 | Therefore, I need to learn _____ terms of mechanical engineering in English.                                         | したがって、私は機械工学の特定の用語を英語で学ぶ必要があります。            |
| 22 | I would be very happy if I could also _____ technical English and some business English through your course as well. | もし私が貴校のコースを通して技術英語とビジネス英語も身につけることができれば幸いです。 |
| 23 | Thank you so much for your attention.                                                                                | 最後まで読んで下さってありがとうございます。                      |
| 24 | I look forward to _____ from you soon.                                                                               | お返事を楽しみにしております。                             |

▶ p. 46, Reading Comprehension.

|                                                             |                                                                                                                                                                                                                 |
|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. What is the purpose of Mr. Uemura's email?               | To apply for admission to an Intensive English Course.                                                                                                                                                          |
| 2. What did he study in junior high school?                 | To learn English, he studied mostly grammar and reading.                                                                                                                                                        |
| 3. How is he studying now?                                  | He is doing four skills study (reading, writing, speaking, listening). He gives some presentations and reads newspaper articles in English.                                                                     |
| 4. What are his goals for English? Why?                     | To be able to "have conversations in English" and to "communicate effectively with foreigners", to be able to "use the internet well in English", and finally to be able to use English professionally at work. |
| 5. What is your background? Current study? Your goals? Why? | (Personal academic background, explanation of current course work, and future goals).                                                                                                                           |

1. Write the correct word forms.

|                 |   |                           |                       |   |                            |
|-----------------|---|---------------------------|-----------------------|---|----------------------------|
| intensive (adj) | → | (adv) <b>intensively</b>  | maintenance (n)       | → | (v) <b>to maintain</b>     |
| participate (v) | → | (n) <b>participation</b>  | graduate (v)          | → | (n) <b>graduation</b>      |
| simplify (v)    | → | (adj) <b>simple</b>       | internationally (adv) | → | (adj) <b>international</b> |
| acquire (v)     | → | (n) <b>an acquisition</b> | additionally (adv)    | → | (n) <b>an addition</b>     |

2. Write the correct answers.

- a) I have English a lot at school. **Also**, I often use English on the internet.
- b) I **really like (love)** to play soccer. In fact, I play almost every day.
- c) The government **will probably** raise taxes.
- d) We made a lot of money last year, **probably thanks to our new product**.

**TO:** \_\_\_\_\_ (Natalie Walker? Tim Mitchell?)

**FROM:** \_\_\_\_\_

**RE:** \_\_\_\_\_

**DATE:** \_\_\_\_\_

Dear Ms. / Mr. \_\_\_\_\_,

My name is \_\_\_\_\_. I would like to apply for the “Study English Abroad program” at the \_\_\_\_\_. In this email, I will explain “My background learning English and my goals for the future”.

First, I will explain my background learning English. I went to \_\_\_\_\_ Junior High School. At that school we did many things to learn English. We... I... Now I am studying at... We do many things to learn English here. In my first year we... In my second year... And now...

Now I will explain my goals for the future. I am majoring in... In the future I... There are several reasons why I want to study at the \_\_\_\_\_ (name of school). First, ... Second, ... Third, ...

Thank you so.....(see p. 47).....you soon.

Sincerely,

\_\_\_\_\_  
(name of your school)

## ❖ Units 9 – 16 general guidelines

### I. Reading

#### a. Vocabulary

Again, significant time should be spent on learning the vocabulary, including highlighting the words in the reading text, copying, administering spelling quizzes and so on.

#### b. Reading

Again, significant time should be spent on reading. Students can do a variety of activities to help them understand the reading, including the “Study exercise for the Reading” shown below for each Unit.

To help students with the Reading Comprehension, teachers may direct students to the appropriate places in the text. Correct answers may be shown by projector. Additionally, students can practice by reading the questions/answers aloud in pairs.

#### c. Listening

This is a teacher-led dictation exercise, as explained on p. 3. A dictation section can also be included on exams. Additionally, students can use the web-based listening texts, as explained on p. 3.

#### d. Reading aloud

This is a pair activity. The teacher chooses a section of the reading text for students to read aloud. One student is the *timer*, as explained on p. 3. The goal is to increase the reading aloud speed, while maintaining good pronunciation.

Again, an important related activity is to have students practice a section of the text with a partner (Student A reading the first sentence, B the second, A the third, and so on). Then the teacher can nominate a team, or individual, to stand up and read for 30 seconds, and give a short evaluation.

#### e. Verbal Summary

This is an integrated skills activity. Students write a short summary of the study following the guidelines, and try to memorize it. Next they practice with a partner, and finally the teacher calls on students to stand up and deliver the summary for the class. The teacher can give an evaluation, such as the one described on p. 3.

### II. Writing

#### a. Exercises

The first exercise checks students' command of word forms, and the second checks their command of the verb forms. Students can do 1. and 2. in class, and then check the answers by projector. Teachers may wish to frequently check students' ability to identify and use the correct word forms and verb tense.

Regarding 3., about collocations, students can do the same work as described on p. 3.

Regarding 4., about usage, students may wish to start with a simpler corpus, like the Tanaka corpus (at <http://www.manythings.org/corpus/>) or a more difficult corpus, like the Corpus of Global Web-Based English (<http://corpus.byu.edu/glowbe/x.asp?r1=&w=1280&h=720>).

#### b. Information for your report

The teacher should provide an overview of the Report, and query students about the purpose and the data on the following page of the textbook.

### c. Write your Report

The teacher should provide guidance, such as displaying or handing out the “Research Report sample guidance” shown below for each Unit. Teachers should explain that the data for the report must be **downloaded** from the publisher’s web site. Teachers should first check how to download the data from the web site (電気書院, <http://www.denkishoin.co.jp>; go to the textbook, then click on 関連ファイル) and explain this to students. There are four different data sets for each Report. Students should be assigned to a team, and given a member number (1-4). The advantage of this system is that students can later give presentations in their teams, each student with a different data set. The Research Report can also be used as a writing part of an exam.

As the Units progress, the students should be encouraged to write longer reports, and rewarded for success with higher scores.

### d. Peer Reading

Again, to the degree possible, students should do peer evaluations to improve their editing skills. Teachers can use the form shown in Appendix 4, or devise their own forms. When students complete the form, they should conference with their partner and give advice.

### e. Self-evaluation

When students submit their Reports, they should also do the self-evaluation by checking a box, and explaining the reasons for their choice.

## III. Presenting

### a. Make your PowerPoint

Using their knowledge and Research Reports, students should write drafts of the slides for their presentations in the textbook, and then prepare their slides (or virtual canvas) for homework. Teachers should explain and model the *Presenting focus*.

### b. Giving / Submitting your presentation

Students should print 4 copies of their handouts, practice their presentations at home, and then deliver their presentation to the team in class. Teachers can collect a copy of the handout for evaluation. If it is possible for each team to do presentations by projector, then the handouts can be omitted.

The following sections contain translations of the readings, answers to exercises, and sample Research Reports templates.

The activities *may be copied and modified* for classroom use only.



▶ p. 54-55, Study exercise for the Reading.

## 1. Introduction

Do you understand? If Yes, check Y ☐ ↓

- |   |                                                                                                                                                            |                                                       |                            |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------|
| 1 | A direct current (DC) circuit is the most basic _____ for students that belong to the electrical engineering _____ of technical colleges and universities. | 直流 (DC) 回路は技術単科大学や大学の電気技術系学科に所属する学生にとってはもっとも基礎的な内容です。 | Y <input type="checkbox"/> |
| 2 | Students learn Ohm's law and Kirchhoff's law so that they can _____ DC circuits.                                                                           | 学生は DC 回路の設計ができるようにオームの法則やキルヒホッフの法則を学びます。             | Y <input type="checkbox"/> |
| 3 | Thus, in this experiment, we _____ a DC circuit to understand these laws.                                                                                  | 従って、この実験において、これらの法則を理解するために、ひとつの DC 回路を私たちは測定しました。    | Y <input type="checkbox"/> |
| 4 | The DC circuit is the _____.                                                                                                                               | その DC 回路は分路です。                                        | Y <input type="checkbox"/> |
| 5 | The _____ results of the test circuit showed that the circuit has good performance.                                                                        | テスト回路の測定結果では、その回路は性能がよいということを示しています。                  | Y <input type="checkbox"/> |

## 2. Circuit

- |    |                                                                                                 |                                                                               |                            |
|----|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------|
| 1  | The test circuit was fabricated with _____, ampere meters and a DC power supply.                | テスト回路は抵抗器、アンペアメータ、DC 電源で作製されました。                                              | Y <input type="checkbox"/> |
| 2  | Figure 1 _____ the circuit.                                                                     | 図 1 は回路を示しています。                                                               | Y <input type="checkbox"/> |
| 3  | We call the _____ a "shunt".                                                                    | 私たちは回路を分路と呼びます。                                                               | Y <input type="checkbox"/> |
| 4  | The circuit is _____ with two resistors, $R_s$ and $r_a$ .                                      | 回路は 2 つの抵抗器、 $R_s$ と $r_a$ で構成されています。                                         | Y <input type="checkbox"/> |
| 5  | The current $I$ is _____ by ...                                                                 | 電流 $I$ は...で表されます。                                                            | Y <input type="checkbox"/> |
| 6  | Eq. (1) is _____ by Ohm's law and Kirchhoff's law.                                              | 方程式 (1) は、オームの法則とキルヒホッフの法則で得られます。                                             | Y <input type="checkbox"/> |
| 7  | The _____ of the shunt $n$ is represented by following equation...                              | 分路の割合 $n$ は、以下の式で表されます。                                                       | Y <input type="checkbox"/> |
| 8  | Figure 2 _____ the measured circuit.                                                            | 図 2 は測定された回路を示しています。                                                          | Y <input type="checkbox"/> |
| 9  | The $n$ in eq. (2) was set to about 10 by setting to $r_a=380\ \Omega$ and $R_s=42.2\ \Omega$ . | 方程式 (2) の $n$ は、 $r_a=380\ \Omega$ と $R_s=42.2\ \Omega$ に設定することにより約 10 としました。 | Y <input type="checkbox"/> |
| 10 | Then, $I_1$ is _____ to $0.1 \times I$ .                                                        | また、 $I_1$ は $0.1 \times I$ に等しいです。                                            | Y <input type="checkbox"/> |
| 11 | The test circuit was then measured with an _____.                                               | その後、テスト回路がアンペアメータで測定されました。                                                    | Y <input type="checkbox"/> |

### 3. Results

|   |                                                                                                             |                                       |                            |
|---|-------------------------------------------------------------------------------------------------------------|---------------------------------------|----------------------------|
| 1 | The measured results of the test circuit _____ in Fig. 3.                                                   | テスト回路の測定結果が図 3 に示されています。              | Y <input type="checkbox"/> |
| 2 | The measured results of the test circuit showed that the circuit has good _____.                            | テスト回路の測定結果では、その回路の性能がよいということを示していました。 | Y <input type="checkbox"/> |
| 3 | This is because the measured results (dots) and the _____ calculations (dotted line) lie on the same _____. | この理由は、測定結果（点）と理論上の計算（点線）が同じ線上にあるからです。 | Y <input type="checkbox"/> |

### 4. Conclusion

|   |                                                                  |                                  |                            |
|---|------------------------------------------------------------------|----------------------------------|----------------------------|
| 1 | We _____ the shunt, which is a DC circuit.                       | 我々は分路を測定したが、それは DC 回路です。         | Y <input type="checkbox"/> |
| 2 | The measured _____ showed that the circuit has good performance. | 測定結果はその回路の性能がよいということを示していました。    | Y <input type="checkbox"/> |
| 3 | We could _____ a DC circuit by this experiment.                  | この実験によってひとつの DC 回路を理解することができました。 | Y <input type="checkbox"/> |

▶ p. 54, Reading.

|                                                            |                                                                                                                                                                                                               |
|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. What is the purpose of this experiment?                 | To fabricate a DC circuit and to measure it. To understand a DC circuit. To understand Ohm's law and Kirchhoff's laws.                                                                                        |
| 2. How was the circuit fabricated?                         | The circuit was fabricated "with resistors, ampere meters and a DC power supply."                                                                                                                             |
| 3. Write equations (1) and (2) with words.                 | (1) Current equals the sum of 1 plus $r_a$ over $R_s$ , times $I_1$ .<br>(2) The ratio of the shunt equals 1 plus $r_a$ over $R_s$ .                                                                          |
| 4. The circuit has "good performance"? Why? (See Figure 3) | As figure 3 shows, "the measured results (dots) and the theoretical calculations (dotted line) lie on the same line." That is to say, the measured results are exactly equal to the theoretical calculations. |



► p. 57, Exercises.

1. Write the correct word forms.

|                |   |                          |                 |   |                          |
|----------------|---|--------------------------|-----------------|---|--------------------------|
| basic (adj)    | → | (adv) <b>basically</b>   | performance (n) | → | (v) <b>to perform</b>    |
| to measure (v) | → | (n) <b>a measurement</b> | calculate (v)   | → | (n) <b>a calculation</b> |

2. Write the correct verb form.

He **performed** an experiment.

She **has performed** an experiment.

Team \_\_\_\_ Member \_\_\_\_

I. \_\_\_\_\_

The purpose of the experiment is to make a test... and measure it.

In this experiment, we made a test digital circuit, and then measured the...

*(Make your report longer → Are digital circuits important? Why? explain!)*

2. \_\_\_\_\_

The digital circuit is fabricated with... (see p. 58, "Logic gates")

See Fig. 1... As you can see, this circuit has \_\_\_\_\_ gates, ...

See Fig. 2. The test circuit was fabricated on...



Fig. 1 \_\_\_\_\_ circuit

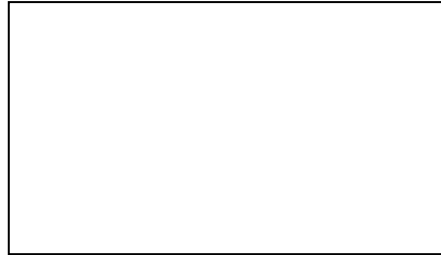


Fig. 2 Photograph of the test circuit

3. \_\_\_\_\_

Now I will explain the operation of the circuit, and the results. Please see

Table 1. It shows... When the inputs are..., the outputs are...

When the inputs are...

Next, the \_\_\_\_\_ of the circuit was measured. The results show that the circuit has...

*(Make it longer → What is this circuit used for? give examples!)*

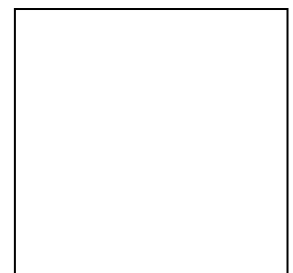


Table 1. Truth Table

4. \_\_\_\_\_

In this experiment we... We found that...

This circuit is important because...

▶ p. 60-61, Study exercise for the Reading.

### 1. Introduction

Do you understand? If Yes, check Y ☐

↓

- |   |                                                                                                                               |                                                                          |                            |
|---|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------|
| 1 | In Japan,<br>large-scale _____<br>are often _____ in hilly areas<br>where there is _____.                                     | 日本では、大規模電力発電機が、強風が吹く丘陵地に設置されていることがよくあります。                                | Y <input type="checkbox"/> |
| 2 | _____,<br>there are not so many places<br>that fulfill such _____ anymore.                                                    | しかしながら、もはやそのような条件を満たす場所は多くないのです。                                         | Y <input type="checkbox"/> |
| 3 | _____,<br>we measured the wind _____ around<br>Yoshii River (Fig. 1),<br>which has _____ topographical<br>features for Japan. | したがって、我々は日本の典型的な地形上の特徴を持つ吉井川周辺で風速を測定しました (図 1)。                          | Y <input type="checkbox"/> |
| 4 | We wanted to see<br>_____<br>to power small _____ generators,<br>like the Savonius _____<br>wind turbine (Fig. 2).            | 我々が確認したかったのは<br>たとえばサボニウス垂直軸風力タービンのような小型タービン発電機を動かすのに十分な風があるかどうかです。(図 2) | Y <input type="checkbox"/> |

### 2. Method

- |   |                                                                                                                           |                                                     |                            |
|---|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|----------------------------|
| 1 | Wind data _____ at the<br>Tawarai dam, which _____<br>_____ in a valley<br>with _____ slopes.                             | 風力データは、急な坂のある谷に位置している田原井ダムで収集されました。                 | Y <input type="checkbox"/> |
| 2 | The wind data consists of<br>_____ measurements<br>of 1-hour averaged wind _____<br>from the most common wind directions. | 風力データは、もっともよくみられる風の方向からの 1 時間平均の風速の時系列測定から成り立っています。 | Y <input type="checkbox"/> |

### 3. Results

- |   |                                                                                                                                                |                                     |                            |
|---|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------------------------|
| 1 | The _____<br>of seasonal and day/night variations<br>are _____ in Fig.3.                                                                       | 季節的及び日中・夜間変化の特徴が、図 3 に示されています。      | Y <input type="checkbox"/> |
| 2 | It can be seen<br>that the average wind velocities<br>in the afternoon _____ be the<br>highest,<br>and the late night velocities the smallest. | 午後の平均風速がもっとも強く、夜更けの風速がもっとも弱いとわかります。 | Y <input type="checkbox"/> |
| 3 | The _____ seasonal wind velocity is in<br>Spring and the _____ is in Autumn.                                                                   | もっとも強い風速の季節は春であり、もっとも弱いのは秋です。       | Y <input type="checkbox"/> |

#### 4. Conclusion

- |                                                                                                                                                                                                                                                                                                       |                                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1 Based on the results shown above, we concluded that:</p> <p>1) the average wind speed in daytime _____ to power small wind power generators, and</p> <p>2) it would be _____ to do _____ to determine where wind generators could be placed, and how they could be linked into a power grid.</p> | <p>上記結果に基づいて、我々の結論を以下としました。</p> <p>1) 日中の平均風力は、小型風力発電機を動かすのに十分であり、</p> <p>2) 必要なのは、さらに研究を重ね、風力発電機をどこに設置できるか、また、どうやったらそれらを送電網にリンクできるかを決定することです。</p> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|

Y □

#### ► p. 60, Reading.

|                                                                     |                                                                                                                                                                                  |
|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. What is the purpose of this study?                               | To “see if there was enough wind to power small turbine generators” along the Yoshii river in Okayama prefecture.                                                                |
| 2. What do you think is the advantage of a small turbine generator? | It is ecological. It produces electricity without generating CO <sub>2</sub> . It can be used wherever there is enough wind. Many of them can be connected to a main power grid. |
| 3. What are the results and conclusions?                            | There is enough wind. Small wind power generators could be used. But more studies are necessary.                                                                                 |
| 4. Do you think small turbine generators are a good idea? Why?      | Yes - they are ecological, and many can be connected to a grid.<br>No - they do not generate much power. They are not worth it.                                                  |

#### ► p. 63, Exercises.

##### 1. Write the correct word forms.

|                |                          |                 |                           |
|----------------|--------------------------|-----------------|---------------------------|
| to fulfill (v) | → (n) <b>fulfillment</b> | power (n)       | → (adj) <b>powerful</b>   |
| energy (n)     | → (adj) <b>energetic</b> | to conclude (v) | → (n) <b>a conclusion</b> |

##### 2. Write the correct verb form.

The data **is being** collected.

The data **has been** collected.

Team \_\_\_\_\_ Member \_\_\_\_\_

## I. Introduction

The purpose of this study is to investigate the characteristics of simple... Why is a robot swimming important? First, swimming robots are used to... Second, ... See Fig. 1. The Swimming Robot is constructed with... It has one DC-servo motor and PIC (Peripheral \_\_\_\_\_).



Fig. 1 The Robot

## 2. Method

Figure 2 shows three cases. In case 1, the Swinging angle is ... In case 2, ... In case 3, ...



Fig. 2 Swinging angle and speed

The thrust forces were measured with a..., as shown in Figure 3. As you can see...



Fig. 3 Experimental apparatus

## 3. Results

The results are shown in Table 1. As you can see, ...



Table 1. Results

## 4. Conclusion

In this experiment we investigated the characteristics of a... We found that... This result is important because...

(Page left blank)



▶ p. 66-67, Study exercise for the Reading.

## 1. Introduction

Do you understand? If Yes, check Y ☐

↓

|   |                                                                                                                                                              |                                                                |                            |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|----------------------------|
| 1 | With the spread of the internet, not only big companies but also _____ open their own web sites in order to sell products, advertise, and share information. | インターネットの普及と共に、大企業だけでなく小企業も、製品の販売、広告、情報共有のために自身のウェブサイトを開設しています。 | Y <input type="checkbox"/> |
| 2 | Moreover, many people enjoy making _____ web pages as a hobby.                                                                                               | それ以上に、多くの人々が個人のウェブページを作ることを、趣味として楽しんでいます。                      | Y <input type="checkbox"/> |
| 3 | Web pages can _____ information to the world immediately, and are a very cheap _____ for communication and _____.                                            | ウェブページは、世界に向け直ちに情報を広めることができ、また、コミュニケーションや商業用の大変安価な媒体です。        | Y <input type="checkbox"/> |
| 4 | Making a web page is easy, but requires some _____ of a software code.                                                                                       | ウェブページの作成は簡単ですが、ソフトウェアコードの知識がいくらか必要です。                         | Y <input type="checkbox"/> |
| 5 | The _____ of writing and images on a web page is _____ by HTML (Hyper Text Markup language).                                                                 | ウェブページにおける記述と画像の配置は、HTML（ハイパーテキストマークアップ言語）で制御されています。           | Y <input type="checkbox"/> |
| 6 | In this _____, we write the code for two web messages and then _____ the results.                                                                            | この実例では、2種類のウェブメッセージ用コードを書き、その結果を比較します。                         | Y <input type="checkbox"/> |

## 2. Using HTML / Making a web page

|   |                                                                                                                              |                                                                         |                            |
|---|------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|----------------------------|
| 1 | An HTML file is the basic _____ to make a homepage.                                                                          | HTML ファイルは、ホームページを作成するための基本的なファイルです。                                    | Y <input type="checkbox"/> |
| 2 | An HTML file is _____ with HTML, as shown in Fig. 1.                                                                         | HTML ファイルは、図 1 に示されているように HTML で書かれています。                                | Y <input type="checkbox"/> |
| 3 | The writing and _____ you want to put on the web page are written in code called “_____”.                                    | あなたがウェブページに載せたい記述と画像は、「タグ」と呼ばれるコードで書かれています。                             | Y <input type="checkbox"/> |
| 4 | In the HTML file below and the _____ web page (Fig. 2), you can see how the “head” of the web page and the message is _____. | 下記の HTML ファイルと対応するウェブページ（図 2）で、どのようにウェブページの「ヘッド」とメッセージが記号化されるかがわかるでしょう。 | Y <input type="checkbox"/> |
| 5 | Next, the same message is written twice.                                                                                     | 次に、同じメッセージが 2 度記述されています。                                                | Y <input type="checkbox"/> |

|   |                                                                                                        |                                                        |                            |
|---|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------------------|
| 6 | Which is _____ to read?                                                                                | どちらを読むのが簡単でしょうか。                                       | Y <input type="checkbox"/> |
| 7 | Of course, the larger _____ is better.                                                                 | もちろん、大きいフォントのほうがよいでしょう。                                | Y <input type="checkbox"/> |
| 8 | Can you find the line of _____ that causes the size differences in the two messages?                   | 2つのメッセージにおける大きさの違いを引き起こすコードの行が見つけられるでしょうか。             | Y <input type="checkbox"/> |
| 9 | By controlling _____ like size and position, the arrangement of writing and images on web pages _____. | サイズや位置といったパラメータをコントロールすることで、ウェブページにおける記述や画像の配置が制御されます。 | Y <input type="checkbox"/> |

### 3. Discussion

|   |                                                                                   |                                                 |                            |
|---|-----------------------------------------------------------------------------------|-------------------------------------------------|----------------------------|
| 1 | This _____ has constructed two web page messages.                                 | この実例では、2つのウェブページのメッセージを作成しています。                 | Y <input type="checkbox"/> |
| 2 | One of the messages is clearly _____, in terms of _____ and design.               | 明確さとデザインの観点から、メッセージのうちのひとつが明らかに、より優れています。       | Y <input type="checkbox"/> |
| 3 | This simple demonstration shows how _____ a web page is controlled.               | ウェブページにおける情報がどのようにコントロールされているかを、この簡単な実例は示しています。 | Y <input type="checkbox"/> |
| 4 | You may have the _____ that markup language needs special _____ and is difficult. | マークアップ言語は特別な知識を必要としており難しいという印象をあなたは持つかもしれません。   | Y <input type="checkbox"/> |
| 5 | However, anyone can make simple web pages with a little study and _____.          | しかしながら、少し勉強し練習をすれば、簡単なウェブページを誰でも作成できます。         | Y <input type="checkbox"/> |

#### ► p. 66, Reading.

|                                                                                  |                                                                                                                                                                |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. What do companies use web pages for? Give example companies.                  | They use websites "in order to sell products, advertise, and share information". For example, you can buy books, music, etc. online and do banking online.     |
| 2. What does HTML stand for?                                                     | Hyper Text Markup Language                                                                                                                                     |
| 3. Look at the HTML in Fig. 1. Do you think HTML is hard to understand? Explain. | Not hard to understand - because each line of text is sandwiched between two lines of code.<br>Hard to understand - because you have to know what code to use. |
| 4. Think of a company HP that you like. What company? Why do you like it?        | (personal opinion) Nice design? Easy to use? Reliable information? etc.                                                                                        |



► p. 69, Exercises.

1. Write the correct word forms.

arrangement (n) → (v) **to arrange**

to write (v) → (n) **writing**

demonstration (n) → (v) **to demonstrate**

clarity (n) → (v) **to clarify**

2. Write the correct verb form.

We need to **clarify** our position.

The problem has **been clarified**.

Team \_\_\_\_\_ Member \_\_\_\_\_

**Making a** \_\_\_\_\_

**and**

**Research about** \_\_\_\_\_

This report has two purposes. First, I explain how to **make a web page table**. Please see Fig. 1.

This is a web page table. Web page tables are very useful because....

The second purpose is to explain the **results of our research**. We researched \_\_\_\_\_.

Fig. 1 Web page table

**2.** \_\_\_\_\_

Now I will explain how we made the table with HTML. HTML means...

It is code that we use to make a web page, as in Figure 1. Now please look at \_\_\_\_\_ 2. As you can see the first line of code is <html>. It does not show up on the web page in Figure 1.

But next we write <head> and <title> and the title of our web page.

As you can see in Figure 1, the title “\_\_\_\_\_” shows up in the web page. Next we want to make the..., so we write...

As you can see... Next we want to...

(Fig. 2 HTML code)

**3.** \_\_\_\_\_

Now I will discuss the results of our research about...

Please see Figure 1 again. It shows the...

These results are very interesting. We can see that... (explain the meaning of the results)

**4.** \_\_\_\_\_

In this study we \_\_\_\_\_ and \_\_\_\_\_. This (was/ was not) very interesting. This is because...

▶ p. 72-73, Study exercise for the Reading.

### 1. Introduction

Do you understand? If Yes, check Y ☐

↓

|   |                                                                                                                 |                                                       |                            |
|---|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------|
| 1 | The "Tensile test" is one of the most _____ tests we use to learn about the _____ of a material, such as steel. | 「引張試験」は、鋼のような、ある材料の特性について知るために私たちが用いるもっとも一般的な試験の一つです。 | Y <input type="checkbox"/> |
| 2 | How _____ is it?                                                                                                | 強度はどれくらいか。                                            | Y <input type="checkbox"/> |
| 3 | How much can it _____?                                                                                          | どれくらい曲がることができるか。                                      | Y <input type="checkbox"/> |
| 4 | When will it _____?                                                                                             | 破壊はいつ起きるか。                                            | Y <input type="checkbox"/> |
| 5 | These properties are called the "_____ " properties of a material.                                              | これらの特性はある材料の「張力」特性と呼ばれます。                             | Y <input type="checkbox"/> |
| 6 | In this experiment, we performed a tensile test for a _____ steel by using an _____ testing machine.            | 本実験では、アムスラー試験機を使用し、低炭素鋼の引張試験を行いました。                   | Y <input type="checkbox"/> |
| 7 | We found the tensile _____ of the steel.                                                                        | 私たちは、その鋼の張力強度がわかりました。                                 | Y <input type="checkbox"/> |

### 2. Method

|   |                                                                                                                                                                                                                      |                                                                                    |                            |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------|
| 1 | The test _____ is a mild steel (low-carbon steel).                                                                                                                                                                   | 試験試料は軟鋼（低炭素鋼）です。                                                                   | Y <input type="checkbox"/> |
| 2 | Figure 1 shows the _____ of the test specimen.                                                                                                                                                                       | 図 1 は試験試料の構成を示しています。                                                               | Y <input type="checkbox"/> |
| 3 | We _____ it on an Amsler testing machine.                                                                                                                                                                            | それをアムスラー試験機に置きます。                                                                  | Y <input type="checkbox"/> |
| 4 | The Amsler machine _____ the material with a _____ speed.                                                                                                                                                            | アムスラー試験機は、一定の速度でその材料を延伸します。                                                        | Y <input type="checkbox"/> |
| 5 | This is called the _____ which the Amsler machine puts on the material.                                                                                                                                              | これは、アムスラー試験機が、その材料にかける負荷と呼ばれます。                                                    | Y <input type="checkbox"/> |
| 6 | The load $P$ and the length of the test specimen $L$ are measured during the stretching _____.                                                                                                                       | 負荷 $P$ 及びテスト試料の長さ $L$ が、延伸工程の間に計測されます。                                             | Y <input type="checkbox"/> |
| 7 | Nominal _____ $\sigma$ and _____ $\varepsilon$ are evaluated by the following equations: where $A_0$ is the initial cross section area and $L_0$ is the initial length of the parallel portion of the test specimen. | 公称応力・およびひずみ・が、次の公式によって得られます。<br>それでは、 $A_0$ が試験試料の初期断面積で、 $L_0$ がその平行部の初期長となっています。 | Y <input type="checkbox"/> |

### 3. Results

|   |                                                                                                         |                                          |                            |
|---|---------------------------------------------------------------------------------------------------------|------------------------------------------|----------------------------|
| 1 | Figure 2 shows a stress-strain _____ of the material.                                                   | 図 2 は、その材料の応力・ひずみ曲線を示しています。              | Y <input type="checkbox"/> |
| 2 | You can see that the stress increases _____ strain from the origin O to the point P.                    | 原点 O から P 点まで、ひずみに比例して応力が増加しているとわかるでしょう。 | Y <input type="checkbox"/> |
| 3 | The point E is the point where the test specimen can _____ its original length if the _____ is removed. | E 点は、負荷が除かれた場合、試験試料が元の長さに戻ることができる点です。    | Y <input type="checkbox"/> |
| 4 | It is called the “_____ limit $\sigma_e$ ”.                                                             | それは「弾性限界・ $\sigma_e$ 」と呼ばれます。            | Y <input type="checkbox"/> |
| 5 | However, after point E permanent _____ occurs.                                                          | しかしながら、E 点の後、永久変形が occurs.               | Y <input type="checkbox"/> |
| 6 | Stress achieves _____ value at the point B.                                                             | 応力は B 点で最大値に達します。                        | Y <input type="checkbox"/> |
| 7 | This point is called _____ strength.                                                                    | この点が張力強度と呼ばれます。                          | Y <input type="checkbox"/> |
| 8 | The point at which the test specimen is _____ is defined as the “breaking strength”.                    | 試験試料が破壊される点は「破壊強度」と定義されています。             | Y <input type="checkbox"/> |

### 4. Conclusion

|   |                                                                                                                                                                        |                                                                     |                            |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|----------------------------|
| 1 | In this experiment we tested the tensile _____ of low-carbon steel.                                                                                                    | 本実験において、私たちは低炭素鋼の引張強度を試験しました。                                       | Y <input type="checkbox"/> |
| 2 | We _____ the tensile strength.                                                                                                                                         | 私たちはその引張強度がわかりました。                                                  | Y <input type="checkbox"/> |
| 3 | After this point, the steel would be _____.                                                                                                                            | この点以降、その鋼は破壊されるでしょう。                                                | Y <input type="checkbox"/> |
| 4 | Therefore, if this steel is used in a machine or _____, we must make sure that it does not receive _____ greater than both the elastic limit and the tensile strength. | よって、もしこの鋼が、機械や建造物に使われるなら、弾性限界と引張強度より大きな応力を受けないことを、私たちは確かめなければいけません。 | Y <input type="checkbox"/> |

► p. 72, Reading.

|                                                              |                                                                                                                                                                                                |
|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. What is the purpose of this study?                        | To find the tensile strength of a steel. To understand the tensile test.                                                                                                                       |
| 2. How does the Amsler machine work?                         | The machine “stretches the material with a constant speed” until it breaks.                                                                                                                    |
| 3. Write equations (1) and (2) with words.                   | (1) The nominal stress equals the load divided by the initial cross section area.<br>(2) The strain equals the length minus the initial length divided by the initial length.                  |
| 4. What do the points E and B mean? Explain.                 | At point E, “the test specimen can recover its original length if the load is removed”.<br>At point B, “Stress achieves its maximum value”.                                                    |
| 5. Why is a tensile test important for engineering? Explain. | To make good machines, engineers need to use materials that will not break. By knowing the precise tensile strength of materials, they can choose the best materials for a particular machine. |

► p. 75, Exercises.

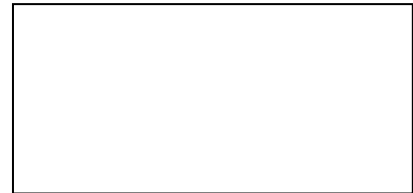
|                                               |                          |               |                           |
|-----------------------------------------------|--------------------------|---------------|---------------------------|
| 1. Write the correct <u>word forms</u> .      |                          |               |                           |
| to perform (v)                                | → (n) <b>performance</b> | length (n)    | → (adj) <b>long</b>       |
| to estimate (v)                               | → (n) <b>an estimate</b> | to define (v) | → (n) <b>a definition</b> |
| 2. Write the correct <u>verb form</u> .       |                          |               |                           |
| He <b>is measuring</b> the tensile strength.  |                          |               |                           |
| She <b>had measured</b> the tensile strength. |                          |               |                           |

Team \_\_\_\_\_ Member \_\_\_\_\_

1. \_\_\_\_\_

The purpose of this study is to perform a tensile test for two materials.

The materials are \_\_\_\_\_ and \_\_\_\_\_. We want to determine if these materials are...



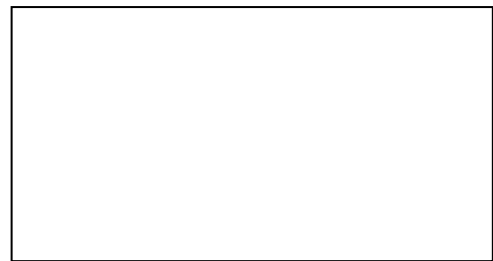
**Fig.1** Schematic diagram of the test specimen

2. \_\_\_\_\_

Figure 1 shows...

We used an Amsler...

(explain, See p. 73)



**Figure 2.** Stress-Strain diagram of mild steel SS400 and aluminum alloy A2024

3. \_\_\_\_\_

Figure 2 shows... (explain, See p. 73)

As you can see, ...

Finally, Table 1 shows... As you can see, A2024 is much \_\_\_\_\_ than...

But the tensile strength is... Therefore, ...

**Table 1.** Mechanical properties of SS400 and A2024

4. \_\_\_\_\_

In this experiment, we tested... We found that... Therefore... I think...

▶ p. 80-81, Study exercise for the Reading.

### 1. Introduction

Do you understand? If Yes, check Y ☐

↓

|   |                                                                                                                    |                                                |                            |
|---|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------|
| 1 | The _____ retina performs the preparation for image _____ in the brain.                                            | 脊椎動物の網膜は、脳で画像処理のための準備を行っています。                  | Y <input type="checkbox"/> |
| 2 | It has superior functions such as edge _____ in real time.                                                         | それはリアルタイムの輪郭検出のようなすぐれた機能を持っています。               | Y <input type="checkbox"/> |
| 3 | Real time image processing is necessary for _____ vision as well.                                                  | リアルタイムの画像処理はロボットビジョンにとっても必要です。                 | Y <input type="checkbox"/> |
| 4 | However, this is difficult in _____ image processing _____ that use Neumann-type computing.                        | しかしながら、これはノイマン型コンピュータを使う従来の画像処理システムでは難しいのです。   | Y <input type="checkbox"/> |
| 5 | Recently, Complementary Metal Oxide Semiconductor (CMOS) integrated circuits _____.                                | 近年、相補型金属酸化膜半導体 (CMOS) 集積回路が提案されています。           | Y <input type="checkbox"/> |
| 6 | However, these circuits have a problem of _____ structure.                                                         | しかしながら、これらの回路は複雑な構造の問題があります。                   | Y <input type="checkbox"/> |
| 7 | The purpose of this study therefore is to propose and test a simpler design for an analog _____ detection circuit. | 従って、本研究の目的は、アナログ輪郭検出回路のための簡単なデザインを提案し試験することです。 | Y <input type="checkbox"/> |

### 2. Circuit

|   |                                                                                                    |                                                       |                            |
|---|----------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------|
| 1 | The edge detection _____ is constructed with a one- or two-dimensional _____ of the unit circuits. | その輪郭検出ネットワークは一次元あるいは二次元配列のユニット回路で構成されています。            | Y <input type="checkbox"/> |
| 2 | The proposed _____ circuit for edge detection is shown in Fig. 1.                                  | 提案される輪郭検出用のユニット回路が図1に示されています。                         | Y <input type="checkbox"/> |
| 3 | The circuit is constructed with a _____ (PD) and 8 MOS _____.                                      | その回路は1つの光ダイオード (PD) と8つの MOS トランジスタで構成されています。         | Y <input type="checkbox"/> |
| 4 | The PD generates the current $I_p$ which is _____ the light intensity of the projected image.      | PD は投影画像の光の強度に比例している電流 $I_p$ を生成します。                  | Y <input type="checkbox"/> |
| 5 | When the edge image is _____ on the circuit, the _____ current $I_{out}$ becomes large.            | 輪郭画像が回路に投影される時、出力電流 $I_{out}$ は大きくなります。               | Y <input type="checkbox"/> |
| 6 | Thus, the circuits can _____ edge positions.                                                       | こうして、回路は輪郭の位置を検出できます。                                 | Y <input type="checkbox"/> |
| 7 | In this circuit, $I_{out}$ is _____ and the output voltage $V_{out}$ is the _____.                 | この回路では、 $I_{out}$ はデジタル化されており、出力電圧 $V_{out}$ が出力されます。 | Y <input type="checkbox"/> |

### 3. Results

|   |                                                                                             |                                                              |                            |
|---|---------------------------------------------------------------------------------------------|--------------------------------------------------------------|----------------------------|
| 1 | A two-dimensional network constructed with $46 \times 50$ unit circuits was _____ by SPICE. | $46 \times 50$ のユニット回路で構成される二次元ネットワークが SPICE でシミュレーションされました。 | Y <input type="checkbox"/> |
| 2 | Figure 2(a) shows the input _____, which is a soccer ball.                                  | 図 2(a) は入力画像を示しており、それはサッカーボールです。                             | Y <input type="checkbox"/> |
| 3 | Figure 2(b) shows the output voltage $V_{out}$ _____ by the image.                          | 図 2(b) はその画像で表わされる出力電力 $V_{out}$ を示しています。                    | Y <input type="checkbox"/> |
| 4 | $V_{out}$ was about $V_{DD}=5$ V at edge positions; at the other _____, it was about 0.     | $V_{out}$ は輪郭位置ではおよそ $V_{DD}=5$ V で、他の位置ではおよそ 0 でした。         | Y <input type="checkbox"/> |
| 5 | Thus, it was shown that the two- _____ network can detect edge positions.                   | かくして、二次元ネットワークは輪郭の位置を検出できることが示されました。                         | Y <input type="checkbox"/> |

### 4. Conclusion

|   |                                                                                                                    |                                                         |                            |
|---|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|----------------------------|
| 1 | A _____ analog edge detection circuit was proposed based on the _____.                                             | 新しいアナログ輪郭検出が網膜に基づいて提案されました。                             | Y <input type="checkbox"/> |
| 2 | The unit circuit is constructed with one photodiode and _____ 8 MOS transistors.                                   | ユニット回路は 1 つの光ダイオードとたった 8 つの MOS トランジスタで構成されています。        | Y <input type="checkbox"/> |
| 3 | The results with SPICE simulation showed that the proposed circuits can detect the edge _____ of the input image.  | SPICE シミュレーションによる結果は、提案された回路が入力画像の輪郭位置を検出できることを示していました。 | Y <input type="checkbox"/> |
| 4 | Therefore, an advanced vision chip for edge detection in real time can be realized by _____ the proposed circuits. | 従って、高度なリアルタイム輪郭検出用視覚チップが、提案された回路を応用することで実現可能です。         | Y <input type="checkbox"/> |

► p. 80, Reading.

|                                                    |                                                                                                                                                                                                                                                                        |
|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. What is a “vertebrate retina”? What does it do? | A “vertebrate retina” is the retina in the eye of an animal with a backbone (a vertebrate).                                                                                                                                                                            |
| 2. What is the purpose of this experiment ?        | To “propose and test a simpler design for an analog edge detection circuit”.                                                                                                                                                                                           |
| 3. How does the circuit “see” Explain.             | The circuit can detect the edges of objects (for example the soccer ball in Fig. 2). This is because the $V_{out}$ at edge positions is large. When $V_{out}$ is large, it is shown as white in Fig. 2(b). When $V_{out}$ is small, it is shown as black in Fig. 2(b). |
| 4. What are the results? Are you impressed?        | The circuit “can detect edge positions”.<br>Yes – I’m impressed. Robotic vision is difficult. It is difficult to make compact effective systems that allow robots to see.<br>No – I’m not impressed. (Why not?)                                                        |



► p. 83, Exercises.

1. Write the correct word forms.

|                |                         |                |                         |
|----------------|-------------------------|----------------|-------------------------|
| detection (n)  | → (v) <b>to detect</b>  | intensity (n)  | → (adj) <b>intense</b>  |
| superior (adj) | → (n) <b>a superior</b> | advanced (adj) | → (v) <b>to advance</b> |

2. Write the correct verb form.

The function of the chip **was demonstrated**.

The circuits can **detect** the edge positions.

Team \_\_\_\_\_ Member \_\_\_\_\_

I. \_\_\_\_\_

The purpose of this study is to make a... Why?

We want to create an advanced vision chip for robot vision. Why? Robot vision... For example...

2. \_\_\_\_\_

The proposed unit circuit for motion detection is shown in... The circuit is constructed with...

The PD generates a... Thus, the circuits can detect...

In this circuit,  $V_{out}$  is...

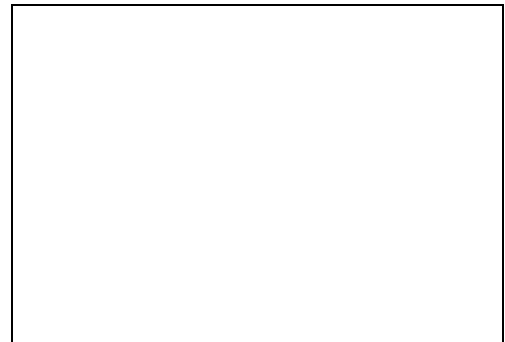


Figure 1. Motion detection circuit

3. \_\_\_\_\_

Figure 2 shows the...

As you can see, at about \_\_\_ ms, the circuit detected...

$V_{out}$  ....

Thus, it was shown that the network can detect...

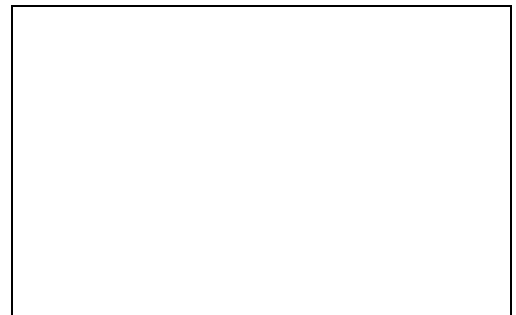


Figure 2. Results

4. \_\_\_\_\_

A motion .... (see p. 81) The unit circuit is constructed...

The results showed that... I think that... (important? why?)

▶ p. 86-87, Study exercise for the Reading.

### 1. Introduction

Do you understand? If Yes, check Y ☐

↓

- |   |                                                                                                                                           |                                                                        |                            |
|---|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|----------------------------|
| 1 | Flows across a tube bank in heat _____ are extremely complex and sometimes cause _____ of the tube bundles.                               | 熱交換器の配管列を通りぬける流れは非常に複雑で、時には有害な管束の振動を引き起こします。                           | Y <input type="checkbox"/> |
| 2 | _____ flows may negatively affect the heat _____ rate.                                                                                    | 乱流は熱伝導率に負の影響を与えることがあります。                                               | Y <input type="checkbox"/> |
| 3 | Therefore, an _____ understanding of flow characteristics and heat transfer rates is required to _____ design of heat exchangers.         | 従って、熱交換器の不適切な設計を避けるためには流れの特徴と熱伝導率の正確な理解が必要となります。                       | Y <input type="checkbox"/> |
| 4 | The PIV method, a powerful tool used to observe flow patterns, was _____ in this study to investigate _____ flow patterns in a tube bank. | 流れのパターンを観察するために用いられる強力なツールである PIV 法が、本研究において管群の空間流動パターンを調査するために使われました。 | Y <input type="checkbox"/> |

### 2. Method

- |   |                                                                                                                                                                                       |                                                                                             |                            |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------|
| 1 | The experimental _____ is shown in Fig.1.                                                                                                                                             | 実験器具が図 1 に示されています。                                                                          | Y <input type="checkbox"/> |
| 2 | A _____ arranged tube bank was placed inside the apparatus.                                                                                                                           | 千鳥状に配列された管群が器具内に配置されました。                                                                    | Y <input type="checkbox"/> |
| 3 | The average _____ flow velocity was kept low and the Reynolds number was 900, based on the _____ of tube (25mm).                                                                      | チューブの径 (25mm) に基づき、平均流入速度が低く維持され、レイノルド数を 900 としました。                                         | Y <input type="checkbox"/> |
| 4 | The size of the test section was 0.3m*0.3m*1m.                                                                                                                                        | 試験部位のサイズは 0.3m×0.3m×1m としました。                                                               | Y <input type="checkbox"/> |
| 5 | The complex flow field was _____ by using smoke, and an Argon Laser was used for sheeted lighting.                                                                                    | 複雑な流動場が煙を使って可視化され、アルゴンレーザがシート状の照光に使われました。                                                   | Y <input type="checkbox"/> |
| 6 | The longitudinal pitch ratio L/D and the transverse pitch ratio T/D are both 2 for the first arrangement (Type A), but they are 1.2 and 3, _____ for the second arrangement (Type B). | 縦軸のピッチ比 L/D と横軸のピッチ比 T/D は、最初の配列(タイプ A)では、両方 2 としましたが、2 番目の配列 (タイプ B) ではそれぞれ 1.2 と 3 としました。 | Y <input type="checkbox"/> |

### 3. Results

- |   |                                                                              |                            |                            |
|---|------------------------------------------------------------------------------|----------------------------|----------------------------|
| 1 | _____ diagrams of the mean velocity field are shown in Fig. 2.               | 平均速度場のコンター図が図 2 に示されています。  | Y <input type="checkbox"/> |
| 2 | Clear differences between the two types of _____ arrangements were observed. | 2 種類のチューブ配列間に明らかな差がみられました。 | Y <input type="checkbox"/> |

|   |                                                                                                                                                          |                                                               |                            |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|----------------------------|
| 3 | In the type-A bank, large dead water _____ are observed just after the first row of tubes, but _____ and shorter dead water region after the second row. | タイプ A 群では、大きな死水域が第 1 群の直後に観察されましたが、第 2 群以後、より狭くより短い死水域になりました。 | Y <input type="checkbox"/> |
| 4 | In the type-B bank, these regions are connected to the fore-region of the tube in the back row to make a single re-_____ zone.                           | タイプ B 群では、これらの領域が後ろの列の群の前の領域に接続され、ひとつの再循環区域を形成しました。           | Y <input type="checkbox"/> |

#### 4. Conclusion

|   |                                                                                                                                                     |                                                          |                            |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------|
| 1 | _____ passing through a tube bank were examined using _____ observation.                                                                            | 管群を通り抜ける流れが PIV 法による観察を使って調査されました。                       | Y <input type="checkbox"/> |
| 2 | A clear difference between the two types of tube arrangements was observed, and these flow patterns will _____ the performance of a heat exchanger. | 2 種類の管配列間には明らかな差が観察され、これらの流れのパターンが熱交換器の性能に負の影響をもたらすでしょう。 | Y <input type="checkbox"/> |

#### ▶ p. 86, Reading.

|                                                                                                |                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. What is the purpose of this experiment?                                                     | To “investigate spatial flow patterns in a tube bank” in order to avoid “improper design of heat exchangers”.                                                                                                                                             |
| 2. Why would “turbulent flows” make heat exchangers work poorly?                               | This is because turbulent flows “may negatively affect the heat transfer rate”, and “dead water regions” do not transfer the heat effectively.                                                                                                            |
| 3. How does the apparatus work? (Explain Fig. 1)                                               | The flow “was visualized using smoke, and an Argon Laser was used for sheeted lighting”. Thus the flow patterns could be seen.                                                                                                                            |
| 4. What are the results? Which type (A or B) do you think is better for a heat exchanger? Why? | There are “dead water regions” in both types of tube bank arrangements (Type-A and Type-B).<br>Type-A is better. This is because there are wider circulating areas between the tubes and less dead water regions. Therefore, the heat exchange is better. |

#### ▶ p. 89, Exercises.

##### 1. Write the correct word forms.

vibration (n) → (v) **to vibrate**      observe (v) → (n) **an observation**  
visualization (n) → (v) **to visualize**      negatively (adv) → (adj) **negative**

##### 2. Write the correct verb form.

In this study, the flows in a tube bank **were examined**.

The apparatus is designed to **examine** the flows in a tube bank.

Team \_\_\_\_\_ Member \_\_\_\_\_

I. \_\_\_\_\_

Many machines use heat exchangers. For example, \_\_\_\_\_ use heat exchangers in order to...

The purpose of this experiment is to....

See Fig.1. It shows...

We want to see how different materials (glass, aluminum) affect the...

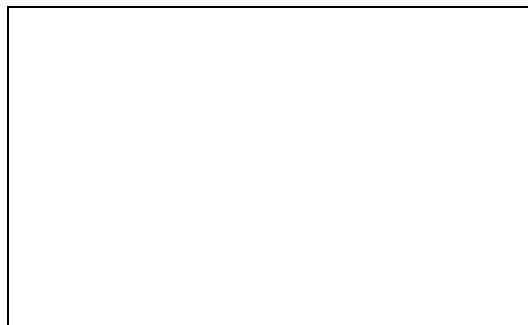


Fig. 1 The Alpha Stirling Cooler

2. \_\_\_\_\_

Please see Fig. 2. As you can see, the Stirling cooler has \_\_\_\_ cylinders. The left cylinder is the ...

When the machine runs, the left ...

Our research question is, "Which is better, the \_\_\_\_\_ cylinder or the ...?"

"Better" means which one cools faster.

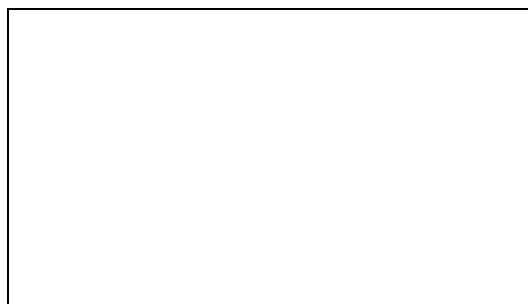


Fig. 2 Schematic diagram

3. \_\_\_\_\_

Please see Table 1...

As you can see, after 600 seconds the glass...

Therefore...

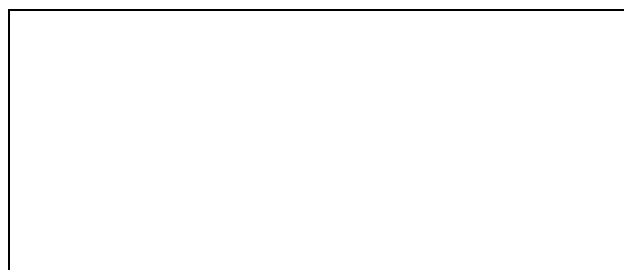


Table 1. Cooling capacity according to cylinder material and heat exchanger

4. \_\_\_\_\_

In this experiment we tested... The results were... This is important because... I think...

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▶ p. 92-93, Study exercise for the Reading.

### 1. Introduction

Do you understand? If Yes, check Y ☐

↓

|   |                                                                                                                                                                                             |                                                                             |                            |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|----------------------------|
| 1 | C-language is a _____ language that was developed at Bell _____ in 1972.                                                                                                                    | C 言語は 1972 年にベル研究所により開発されたプログラミング言語です。                                      | Y <input type="checkbox"/> |
| 2 | C-language aimed at effectively _____ Unix, which is one of the operating systems.                                                                                                          | C 言語は Unix、これはオペレーティングシステムのひとつですが、を効果的に開発することを目的としていました。                    | Y <input type="checkbox"/> |
| 3 | Compared to other languages, C-language has the _____ that it can be used for lower level writing (for operating hardware or memory) so that it can write _____ parts of operating systems. | 他の言語と比べると、C 言語はオペレーティングシステムの核部分を記述できるように低水準の記述（ハードやメモリーの操作）に使用できる特徴をもっています。 | Y <input type="checkbox"/> |
| 4 | C language is widely used for developing _____ systems, applications, and for _____.                                                                                                        | C 言語はオペレーティングシステムやアプリケーションや計算の開発に広く使われています。                                 | Y <input type="checkbox"/> |

### 2. Method

|   |                                                                                                                                                   |                                                                |                            |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|----------------------------|
| 1 | In this demonstration, we make a program to find the number of _____ under a million.                                                             | このデモンストレーションでは、100 万以下の素数の数を見つけるプログラムを作ります。                    | Y <input type="checkbox"/> |
| 2 | As you know, a prime number is a number that can be divided exactly _____ by itself and 1, such as 2, 3, 5, ...                                   | ご存知のように、素数というのはそれ自身と 1 のみできっちりと割り切れる数で、たとえば 2、3、5・・・、といったものです。 | Y <input type="checkbox"/> |
| 3 | It is very interesting to find how prime numbers are _____ and it has a lot to do with important mathematical problems such as the Riemann _____. | 素数がどのように分布されるのか、またリーマン仮説といった重要な数学の問題と大いに関係があるとわかるのはとても興味深いです。  | Y <input type="checkbox"/> |
| 4 | To find the number of prime numbers under a _____, we _____ the C-language program in Fig. 1.                                                     | 100 万以下の素数の数を見つけるために、私たちは図 1 の C 言語のプログラムを記述しました。              | Y <input type="checkbox"/> |
| 5 | If this program is run, 2-1000000 78498 _____.                                                                                                    | このプログラムが実行されると、2-1000000 78498 が表示されます。                        | Y <input type="checkbox"/> |
| 6 | Thus we learn that there are 78,498 prime numbers under a million.                                                                                | こうして、100 万以下の素数は 78498 あるとわかります。                               | Y <input type="checkbox"/> |
| 7 | It _____ about 650 seconds to do this calculation.                                                                                                | この計算を行うのには約 650 秒かかります。                                        | Y <input type="checkbox"/> |
| 8 | With C-language, there are many ways to perform an _____.                                                                                         | C 言語を使うと、ひとつの演算を行うのに多くの方法があります。                                | Y <input type="checkbox"/> |
| 9 | For example, look at the program in Fig. 2.                                                                                                       | たとえば、図 2 にあるプログラムをみてください                                       | Y <input type="checkbox"/> |

|    |                                                                                            |                                           |                            |
|----|--------------------------------------------------------------------------------------------|-------------------------------------------|----------------------------|
|    |                                                                                            | さい。                                       |                            |
| 10 | It _____ the same _____ as the one in Figure 1.                                            | 図 1 のものと同じタスクを実行しています。                    | Y <input type="checkbox"/> |
| 11 | However, it does it in 1.2 seconds.                                                        | しかしながら、これでは 1.2 秒で実行します。                  | Y <input type="checkbox"/> |
| 12 | This is about 500 _____ faster.                                                            | 約 500 倍も速いのです。                            | Y <input type="checkbox"/> |
| 13 | You can see that programming can be made faster or more simplified depending on the _____. | アルゴリズム次第でプログラミングはより速くより簡易化できることがわかったでしょう。 | Y <input type="checkbox"/> |

### 3. Conclusion

|   |                                                                                                              |                                                    |                            |
|---|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------------------|
| 1 | We have _____ two programs written in C-language that calculate the number of prime numbers under a million. | C 言語で 100 万以下の素数の数の計算をする 2 つのプログラムをデモンストレーションしました。 | Y <input type="checkbox"/> |
| 2 | The second program _____ wasteful calculations and is much more _____ and faster.                            | 2 番目のプログラムは無駄な計算を除外しており、はるかに効率的で速いものです。            | Y <input type="checkbox"/> |
| 3 | In this way, C-language programmers _____ the efficiency of a vast number of programing tasks.               | この方法で、C 言語のプログラマーは膨大な数のプログラミングのタスクの効率を向上させるのです。    | Y <input type="checkbox"/> |

#### ▶ p. 92, Reading.

|                                                             |                                                                                                                                 |
|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| 1. What are the characteristics of C-language?              | It can be used for lower level writing (for operating hardware or memory) and it can "write kernel parts of operating systems". |
| 2. What do the programs in Figs. 1 and 2 do?                | They both calculate the "number of prime numbers under a million".                                                              |
| 3. Why is the program in Fig. 2 better? Explain.            | Because it is faster. It does the calculation in 1.2 seconds, whereas the other program takes about 11 minutes.                 |
| 4. Have you used C-language? To do what? Explain in detail. | (Students explain their personal experience using C-language.)                                                                  |

#### ▶ p. 95, Exercises.

|                                                                       |                           |              |                          |
|-----------------------------------------------------------------------|---------------------------|--------------|--------------------------|
| 1. Write the correct <u>word forms</u> .                              |                           |              |                          |
| calculation (n)                                                       | → (v) <b>to calculate</b> | divide (v)   | → (n) <b>division</b>    |
| memory (n)                                                            | → (v) <b>to memorize</b>  | simple (adj) | → (v) <b>to simplify</b> |
| 2. Write the correct <u>verb form</u> .                               |                           |              |                          |
| Computer scientists try to make programs that <b>run</b> efficiently. |                           |              |                          |
| The programs that <b>were running</b> last week have been replaced.   |                           |              |                          |



Team \_\_\_\_\_ Member \_\_\_\_\_

1. \_\_\_\_\_

C-language is an important programming language. It is used for... The purpose of this study is to make a program that \_\_\_\_\_ in \_\_\_\_\_ order.

Please look at Fig. 1. As you can see, ...

This kind of a program is useful because...



Fig. 1 Execution

2. \_\_\_\_\_

In this section, I will explain how the program \_\_\_\_\_ in \_\_\_\_\_ order. Please see Fig. 3. As you can see, the program first...

Next, the program...

Now please see Fig. 2. This explains...

As you can see...



Fig. 3 Action that selects the sort

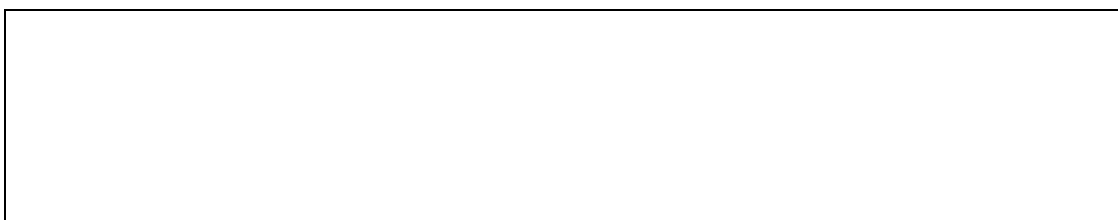


Fig. 2 Selection method

3. \_\_\_\_\_

In this study we made a... This type of program is important for engineering because...

For example...

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▶ p. 98-99, Study exercise for the Reading.

### 1. Introduction

Do you understand? If Yes, check Y ☒

↓

- |   |                                                                                                                                                                                                                      |                                                                            |                            |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------------|
| 1 | An _____ which is placed in a flow is _____ to a drag force.                                                                                                                                                         | 流れに置かれた物体は抗力の影響を受けやすいです。                                                   | Y <input type="checkbox"/> |
| 2 | In this experiment, we measure the drag of a car _____.                                                                                                                                                              | 本実験では、車両ボディの抗力を測定します。                                                      | Y <input type="checkbox"/> |
| 3 | Figure 1 shows the example of a _____ driving with velocity V in _____ air. It experiences drag D.                                                                                                                   | 図1は静止空気において速度Vで運転する車の例を示しています。それは抗力Dを体験しています。                              | Y <input type="checkbox"/> |
| 4 | The drag D is described by the following equation.<br>$D = C_D \frac{\rho V^2}{2} A$                                                                                                                                 | 抗力Dは以下の式で表されます。                                                            | Y <input type="checkbox"/> |
| 5 | Here V is movement velocity of the vehicle, $\rho$ is the _____ of air, A is the characteristic area which is usually the projected area _____ to the flow direction (Figure 2), and $C_D$ is the _____ coefficient. | ここでVはその車両の運動速度、 $\rho$ は空気密度、Aは通常流れ方向に対して正の投影面積である特徴領域（図2）、 $C_D$ は抗力係数です。 | Y <input type="checkbox"/> |

### 2. Method

- |   |                                                                                                             |                                             |                            |
|---|-------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------|
| 1 | Figure 3 shows the apparatus that was used to measure the drag on different car body _____ in a wind _____. | 図3は風洞で異なる車両ボディ形状にかかる抗力を測定するのに使われた装置を示しています。 | Y <input type="checkbox"/> |
| 2 | 1/24 _____ model cars were used for the experiments.                                                        | 1/24 縮尺の車の模型がこの実験に使われました。                   | Y <input type="checkbox"/> |
| 3 | The car model was connected with a _____ scale by a string.                                                 | その車の模型は、紐でばねばかりにつながれました。                    | Y <input type="checkbox"/> |
| 4 | The flow of air over the model (arrow) _____ a drag on the model which is measured by the scale.            | 模型の上の空気の流れ（矢印）が、はかりで測定される模型に抗力を引き起こします。     | Y <input type="checkbox"/> |
| 5 | Measurements for _____ car body shapes were made using this system.                                         | 数種類の車両ボディ形状の測定が、このシステムを使って行われました。           | Y <input type="checkbox"/> |

### 3. Results

- |   |                                                                                                                                                      |                                                                                                             |                            |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------|
| 1 | Table 1 shows the measurement results for one car body shape, the Ferrari F360 Spider ( $A=1,925 \text{ mm} \times 1,240 \text{ mm}$ , $C_D=0.40$ ). | 表1はフェラーリ F360 Spider の車両ボディ形状の測定結果を示しています。<br>( $A=1,925 \text{ mm} \times 1,240 \text{ mm}$ , $C_D=0.40$ ) | Y <input type="checkbox"/> |
| 2 | Experimental data _____ that drag force increases with increasing flow velocity.                                                                     | 実験データは抗力が流れの速度の増加と共に増加していると示しています。                                                                          | Y <input type="checkbox"/> |
| 3 | The drag coefficient $C_D$ can be                                                                                                                    | 抗力係数 $C_D$ は式 (1) から得ることができま                                                                                | Y <input type="checkbox"/> |

|   |                                                                  |                                                       |                            |
|---|------------------------------------------------------------------|-------------------------------------------------------|----------------------------|
|   | _____ from equation (1).                                         | す。                                                    |                            |
| 4 | Here $\rho$ is $1.2 \text{ kg/m}^3$ and A is $A/24^2$ .          | ここでは $\rho$ は $1.2 \text{ kg/m}^3$ で A は $A/24^2$ です。 | Y <input type="checkbox"/> |
| 5 | As a result, the $C_D$ shows _____ a constant value $C_D=0.42$ . | その結果、 $C_D$ はおよそ一定の値 $C_D=0.42$ を示しています。              | Y <input type="checkbox"/> |

#### 4. Conclusion

|   |                                                                                                                                 |                                                        |                            |
|---|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------------------|
| 1 | In this experiment we determined the drag _____ a car body.                                                                     | 本実験では車のボディに作用する抗力を測定しました。                              | Y <input type="checkbox"/> |
| 2 | By _____ the shape of a car body we can _____ lower drag and better fuel efficiency.                                            | 車両ボディ形状を改善することにより、より低い抗力やよりよい燃費を得ることができます。             | Y <input type="checkbox"/> |
| 3 | It is important to understand how drag coefficient _____ by changing the shape of bluff bodies like cars, airplanes, and _____. | 車、飛行機、潜水艦といった鈍頭物体の形状を変えることでどのように抗力係数が変わるかを理解することが重要です。 | Y <input type="checkbox"/> |

#### ► p. 98, Reading.

|                                                                                                |                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. What is the purpose of this study?                                                          | To “understand drag force” by measuring drag force in a wind tunnel.                                                                                                                                       |
| 2. Write equation (1) in words.                                                                | Drag equals the drag coefficient times the quotient of air density times velocity squared divided by two, times the characteristic area.                                                                   |
| 3. Explain the method in your own words.                                                       | Small car models are placed in a wind tunnel and attached to a spring scale. When air flow is applied to the car, drag is created. This drag is measured by the spring scale.                              |
| 4. Why is “pressure profile” important for designing bluff objects? Explain and give examples. | In order to improve the fuel efficiency of a car or other bluff body, the drag must be reduced. By understanding the “pressure profile” of an object, engineers can improve the design to reduce the drag. |

#### ► p. 101, Exercises.

|                                                                           |                                            |
|---------------------------------------------------------------------------|--------------------------------------------|
| 1. Write the correct <u>word forms</u> .                                  |                                            |
| to flow (v) → (n) <b>a flow</b>                                           | to indicate (v) → (n) <b>an indication</b> |
| to place (v) → (n) <b>a place</b>                                         | to achieve (v) → (n) <b>an achievement</b> |
| 2. Write the correct <u>verb form</u> .                                   |                                            |
| While the air <b>was flowing</b> over the car, the pressure was measured. |                                            |
| The study <b>has demonstrated</b> the effect of drag on performance.      |                                            |

Team \_\_\_\_\_ Member \_\_\_\_\_

**1.** \_\_\_\_\_

Reducing drag is necessary for car design. Why?

.....

The purpose of this experiment is.....

The formula for calculating the drag  $D$  on a car body is

$$D = C_D \dots$$

$D$  means drag,  $V$  means...

Figure 1 shows..., and Figure 2...

Fig. 1 Body of a car traveling at velocity  $V$  and the drag acting on it.

Fig. 2 The characteristic area  $A$

**2.** \_\_\_\_\_

Please see Fig. 2. It shows the apparatus that...

1/24 scale model cars were used. As you can

see .....

Our research question is, "Which car has lower drag, the Honda Fit or the Lamborghini Countach?"

**3.** \_\_\_\_\_

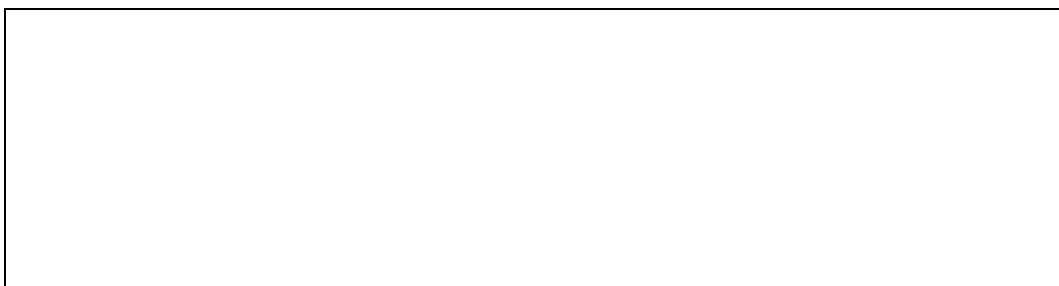
Table 1 shows the results for the Honda Fit, and Table 2 shows...

As you can see... Why is this? It is because...

However, the engineers who designed the Honda Fit needed to make room for...

So overall the...

Fig. 3 Measurement apparatus



Tables 1 -3

**4.** \_\_\_\_\_

In this experiment we measured... We found that... The reason... Overall, ...

## Appendices

### Appendix 1: Conversation about “**Large Companies**” in the world today

Directions: Using the Table on p. ii, students have the following discussion (EXAMPLE)

A: Let's talk about companies in     (China)    .

B: Ok.

A: What's one large technology and engineering company in     (China)    ?

B:     (CHINA MOBILE)    

A: Ok, what do you think     (CHINA MOBILE)     does?

B: I think     (they are a cellphone company, like AU)    .

A: How about the annual sales?

B: It's about     (\$48.9 billion US dollars)    . That's about 50 trillion yen.

A: Ah that's very interesting. What's one more company in     (China)    ?

→ continue with a new country/region

### Appendix 2: Sample listening homework

Unit 1: Request Information

Name: \_\_\_\_\_

Score = \_\_\_\_\_

| ▶ Go to the HP. Click the “英語 E-learning” sidebar. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.                                                 | 1 <sup>st</sup> time: Listen to parts. Then listen <i>and</i> read at the same time.                                                                                                                                                                                                                                                                                                                                                                                               |
| 2.                                                 | <div style="display: flex;"> <div style="flex: 1;">           2<sup>nd</sup> time: Listen to the sound in small chunks, and <b>repeat</b> the chunk.<br/>           Write three <b><u>phrases</u></b> that are hardest to pronounce.<br/>           (発音するのが難しかった<b>フレーズ</b>を3つ書き出さない。)         </div> <div style="flex: 1; border-left: 1px dashed black; padding-left: 10px;">           1.<br/><br/>2.<br/><br/>3.         </div> </div>                                         |
| 3.                                                 | <div style="display: flex; justify-content: space-between;"> <div>3<sup>rd</sup> time: Listen to the sound with your textbook closed. How much did you understand?</div> <div>_____%</div> </div>                                                                                                                                                                                                                                                                                  |
| 4.                                                 | <div style="display: flex;"> <div style="flex: 1;">           a) How much time did you spend on this assignment?<br/>           b) Do you think your listening is improving? (a little, a lot, the same?)<br/>           c) <i>Interesting thing?</i> <u>Why?</u><br/> <br/>           ▶write <b><u>English sentences</u></b>.         </div> <div style="flex: 1; border-left: 1px dashed black; padding-left: 10px;">           a)<br/><br/>b)<br/><br/>c)         </div> </div> |

### Appendix 3: Sample peer evaluation for Part I

#### Peer evaluation

EMAIL 1

Your name: \_\_\_\_\_

Partner's name: \_\_\_\_\_

Score = \_\_\_\_\_

**Directions:** Read your partner's Report. Fill in the boxes.

↓ **Comments • Suggestions**

|                                                                                                        |                                                          |  |
|--------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--|
| 1. <u>Header</u> : Read the TO: FROM: RE: DATE: lines. Does your partner have the correct information? | <input type="checkbox"/> Yes <input type="checkbox"/> No |  |
| 2. Does your partner have 4 paragraphs? Are the paragraph separations clear?                           | <input type="checkbox"/> Yes <input type="checkbox"/> No |  |

|                                                                                   |                                                                                            |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| 3. In your opinion, where could your partner <i>add explanation</i> (write more)? | Mark places in the text where your partner <i>could possibly add explanation</i> . Use a ★ |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|

|                                                                          |                                                                                                   |  |
|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|--|
| 4. Can you find any mistakes? (Circle them with a pencil)                | <input type="checkbox"/> Yes <input type="checkbox"/> No<br><input type="checkbox"/> I'm not sure |  |
| 5. Is the page layout good? (Is it easy to read? Does it look nice?)     | <input type="checkbox"/> Yes <input type="checkbox"/> No<br><input type="checkbox"/> I'm not sure |  |
| 6. Overall, do you think your partner can improve his or her EMAIL? How? | <input type="checkbox"/> Yes <input type="checkbox"/> No<br><input type="checkbox"/> I'm not sure |  |

7. Have a conference with your partner. Point out where your partner *could* explain more, and any places where there are problems or mistakes.

## Appendix 4: Sample peer evaluation for Part II

### Peer evaluation Research Report 1

Your name: \_\_\_\_\_

Partner's name: \_\_\_\_\_

Score = \_\_\_\_\_

**Directions:** Read your partner's Report. Fill in the boxes.

↓COMMENTS • SUGGESTIONS

|                                                                                |                                                                                                                  |                                                                                               |                                                                                         |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| <u>Header:</u> Is all the information there (title, name, team number-member)? |                                                                                                                  | <input type="checkbox"/> Yes<br><input type="checkbox"/> No                                   |                                                                                         |
| 1a.                                                                            | Does the <b>Introduction</b> explain the purpose? Does it have some background information?                      | <input type="checkbox"/> Yes<br><input type="checkbox"/> So-so<br><input type="checkbox"/> No |                                                                                         |
|                                                                                | b. Where could your partner <i>add explanation</i> →                                                             |                                                                                               | Mark places where your partner could add explanation. Use a ★                           |
|                                                                                | Are the Figures clear and well labeled?                                                                          | <input type="checkbox"/> Yes<br><input type="checkbox"/> So-so                                |                                                                                         |
|                                                                                | c. Can you find any mistakes? (circle them with a pencil)                                                        |                                                                                               | <input type="checkbox"/> Yes <input type="checkbox"/> Maybe <input type="checkbox"/> No |
| 2a.                                                                            | Does the <b>Method</b> (or <b>Circuit</b> ) section explain the method (or circuit) well?                        | <input type="checkbox"/> Yes<br><input type="checkbox"/> So-so<br><input type="checkbox"/> No |                                                                                         |
|                                                                                | b. Where could your partner <i>add explanation</i> →                                                             |                                                                                               | Mark places where your partner could add explanation. Use a ★                           |
|                                                                                | c. Are the Figures or Tables clear and well labeled? Well explained?                                             | <input type="checkbox"/> Yes<br><input type="checkbox"/> So-so                                |                                                                                         |
|                                                                                | d. Can you find any mistakes? (circle them with a pencil)                                                        |                                                                                               | <input type="checkbox"/> Yes <input type="checkbox"/> Maybe <input type="checkbox"/> No |
| 3a.                                                                            | Does the <b>Results</b> section explain the results well?                                                        | <input type="checkbox"/> Yes<br><input type="checkbox"/> So-so<br><input type="checkbox"/> No |                                                                                         |
|                                                                                | b. Where could your partner <i>add explanation</i> →                                                             |                                                                                               | Mark places where your partner could add explanation. Use a ★                           |
|                                                                                | c. Are the Figures or Tables clear and well labeled? Well explained?                                             | <input type="checkbox"/> Yes<br><input type="checkbox"/> So-so                                |                                                                                         |
|                                                                                | d. Can you find any mistakes? (circle them with a pencil)                                                        |                                                                                               | <input type="checkbox"/> Yes <input type="checkbox"/> Maybe <input type="checkbox"/> No |
| 4a.                                                                            | Does the <b>Conclusion</b> section explain the conclusions well? Does it explain why this research is important? | <input type="checkbox"/> Yes<br><input type="checkbox"/> So-so<br><input type="checkbox"/> No |                                                                                         |
|                                                                                | b. Where could your partner <i>add explanation</i> →                                                             |                                                                                               | Mark places where your partner could add explanation. Use a ★                           |
|                                                                                | c. Can you find any mistakes? (circle them with a pencil)                                                        |                                                                                               | <input type="checkbox"/> Yes <input type="checkbox"/> Maybe <input type="checkbox"/> No |
| <u>Page layout:</u> is the page layout clear and effective?                    |                                                                                                                  | <input type="checkbox"/> Yes<br><input type="checkbox"/> So-so                                |                                                                                         |
| <u>Overall:</u> Do you think your partner can improve his or her report?       |                                                                                                                  | <input type="checkbox"/> Yes<br><input type="checkbox"/> No                                   | How?                                                                                    |



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Acknowledgement

- The Japanese translations for Units 1 – 8 were done by Shinichi Yasugi and Noriko Rambo. The Japanese translations for Units 9 – 12 were done by Yoshiko Kondo.

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| End of Manual |
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