

Science English

for Presentation

Student's Book



Hiroshima University High School

Class Number Name

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CHAPTER 1 Presentation

0. What is a presentation?

A way of giving information to **a group of people**, usually in a **formal** way

1. The purpose of presentation

- a) Persuasive e.g. 企画、販売促進 etc.
- b) () e.g. 会議、広報、ゼミの発表 etc.
- c) Ceremonial e.g. 式典での挨拶、祝辞 etc.

2. Three Types of Presentation Message

1) () message

Your words are not the only message. How you stand, where you look, how you move your hands, and the tone of your voice also convey meanings.

- **Voice Inflection** (how you change the tone of your voice)
- Eye contact
- Gesture
- **Posture** (the way you stand, etc)

2) () message

This is probably the main message in your presentation. Organize your message into a story so that your audience can enjoy it. Your story should:

- be in plain English
- include questions to the audience (probably rhetorical)
- be structured so that it is logical and easily followed by your audience. → 3
- be interesting!

3) () message

Visual aids, such as pictures or graphs, also help your audience understand your presentation. You have varieties of tools such as:

- Presentation software such as Power Point and Keynote
- Blackboard
- **Poster**
- Tablet, flip cards
- Actual things

3. Structure of a presentation

Your speech should be well structured so that your audience can understand you without difficulty. Most well-structured presentations are made up of three parts:

- a) ()
- b) ()
- c) ()

Research Proposal for your Project Study

Group Members : _____

Title of the Research Project : _____

1. Why is the study needed?

1.1. What is known about the topic of study?

1.2. What is not known about the topic of study?

1.3. What should be known about the topic of study? Why?

2. What are you going to do?

2.1. What do you want to find out / make clear?

2.2. What can you do with your resources available?

3. What is your study going to be like?

3.1. What is the purpose / goal of your study? What is your hypothesis?

3.2. What method are you going to adopt? / What procedure are you going to follow?

3.3. What results do you expect? What results are desirable in your study?

3.4. What good will your study do? Why should the nation's precious tax be used on your study?

CHAPTER 2 Physical Message

1. Voice Inflection

- a) ()
- b) ()
- c) ()
- d) ()

Practice 1

(From a Japanese folk tale)

Once upon a time, there lived an old man and an old woman. One day the man went up to the mountain, and his wife went down to the river.

Practice 2

(From Mother Goose)

Humpty Dumpty sat on a wall

Humpty Dumpty had a great fall

All the king's horses and all the king's men

Couldn't put Humpty together again.

2. Eye Contact

Practice 3

It is important to learn presentation skills from experienced presenters. However, you have to remember this: it is *your* presentation, and it must be coherent with *your* personality and reflect *your* style. This is crucial when learning the art of presentation making. If the style of your presentation is at odds with your personality, then your audience may get an impression that it is not your talk, and they may discount your conclusions.

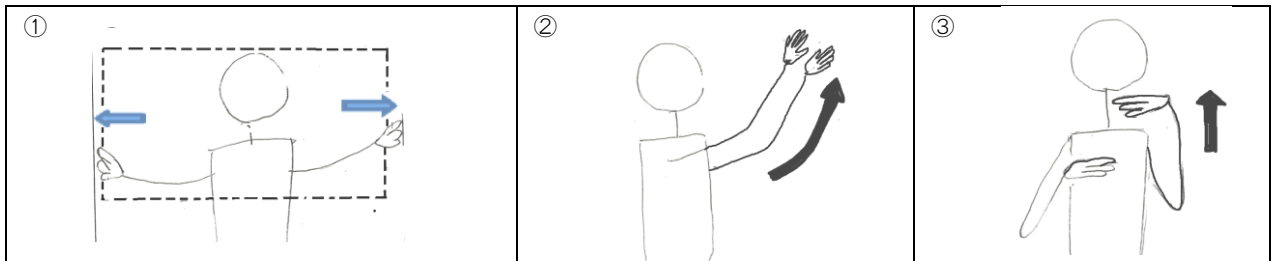
3. Gesture

4) Posture

- feet
- shoulders
- hands
- head
- movements

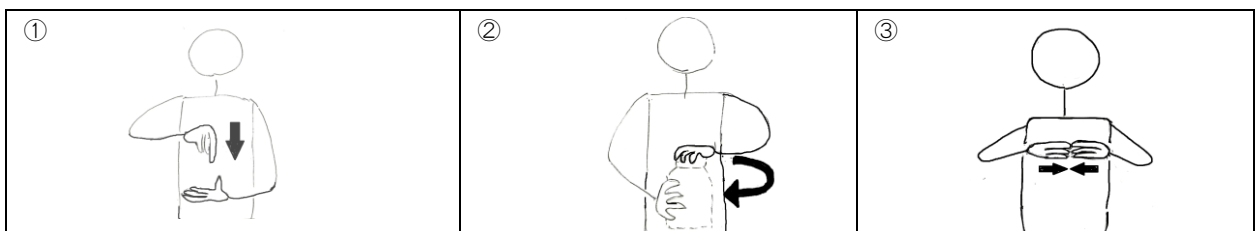
Practice 4

(1)



- ① My TV screen is this big.
- ② It's in the top right corner.
- ③ The price of gas is higher than last year.

(2)



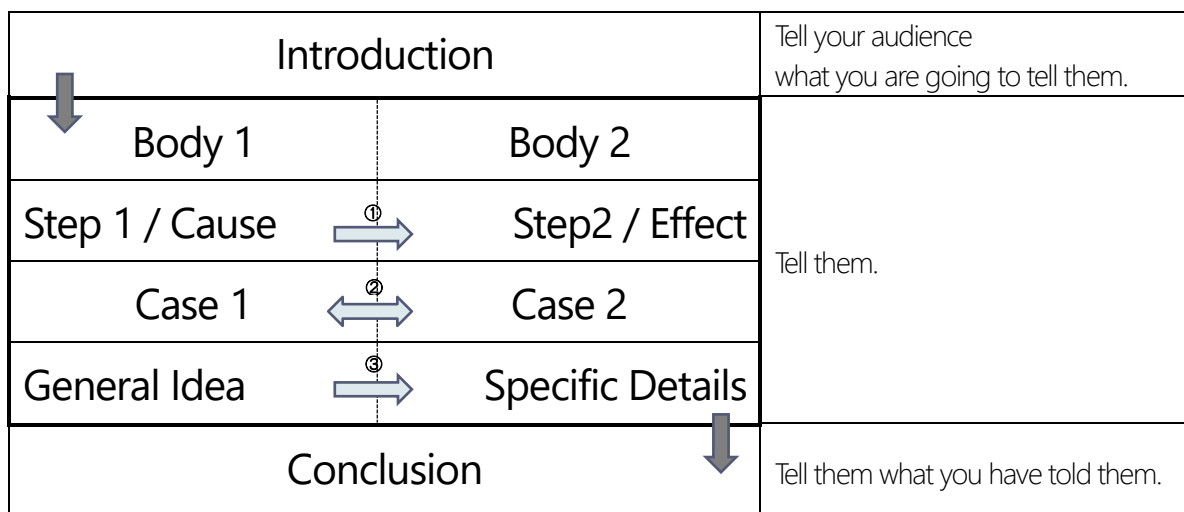
- ① It is in the middle.
- ② Twist it like this.
- ③ Both sides should be equal.

CHAPTER 3 Story Message

1. 3-part structure of a presentation

- 1)()
- 2)()
- 3)()

2. 3 basic patterns of reasoning



① *Cause* → *Effect* / *Reasons* → *Results* / *Procedure* / *Chronological order* / *Induction*

② *Comparison* / *Contrast*

③ *General* → *Specific* / *Effect* → *Cause* / *Results* → *Reasons* / *Deduction*

3. Take-home messages

4. Transitions

(～は直前に述べたこと。…はその次に話すポイント。)

[現在完了形→未来]

- I've shown you ～. Next, I'm going to tell you about
- I have talked about ～. Next, I will talk about ...
- We have seen ～. Now, let's look at....
- I have finished explaining～. I will describe...next.

[現在完了形→修辞疑問]

- I've shown you～. Now how can you ...?
- I have talked about ～. But how about ...?
- We have seen ～. Next, what...?
- I have finished explaining ～. Now, why ...?

Practice 5

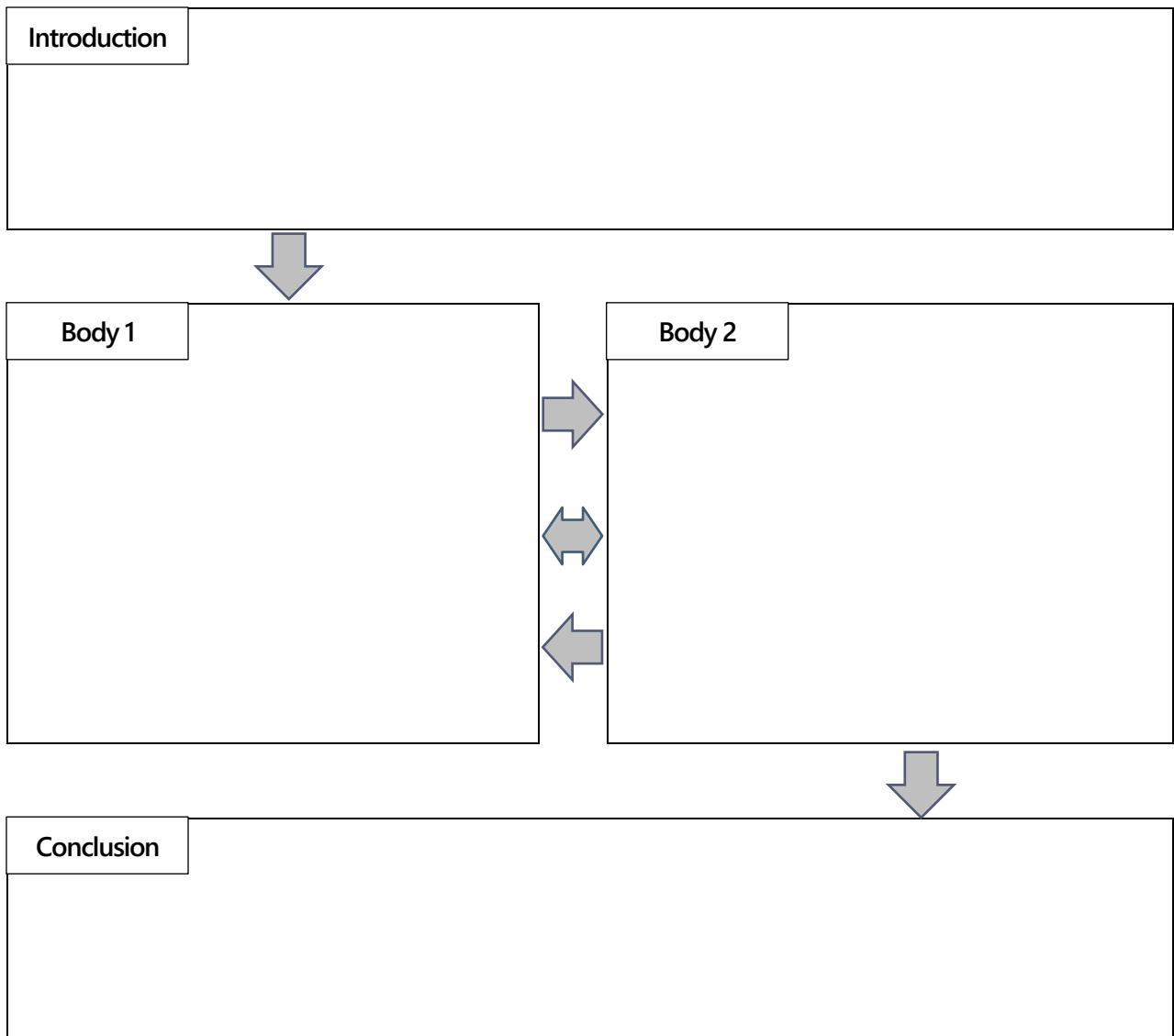
Body Clocks

- ① Animals and plants have their own natural rhythms. These come from their body clocks. Body clocks tell them when to get up, when to eat, and when to sleep. For example, the body clocks in four-o'clock flowers tell them to open in the late afternoon.
- ② Humans have body clocks, too. We have many local body clocks in our bodies, and they move separately. These clocks control many things, like changes in blood pressure, body temperature, hunger, and sleepiness.
- ③ What sets each person's body clocks? Cycles of light and dark play the most important role. They give us the rhythm of a 24-hour cycle. Everyone's rhythm is different, but most people are active during the day. Once the body clocks are set, it is important to keep regular hours. In other words, we should get up, have meals, and go to bed at about the same time every day.
- ④ Look at the figure below. This shows human body conditions created by body clocks. This person starts to feel awake at 7:30 a.m., and his brain is most active at 10 a.m. He has the fastest reaction time at around 3:30 p.m., has the highest body temperature at 7 p.m., and has the deepest sleep at 2 a.m. From the figure, we see that he can concentrate in the morning, but not after midnight. On the other hand, it is very difficult for him to get up at 2:00 in the morning, because his body is asleep.
- ⑤ In 2009, a research group at Northwestern University in the U.S. found an interesting relationship between the body clock and weight. They found that eating at irregular times influences weight gain. They did research with two groups of mice, group A and group B. The two groups of mice ate the same food, as much as they wanted, for six weeks. The only difference was the time that they ate. The mice in group A ate during the day, while the mice in group B ate at night.
- ⑥ All of the mice ate well, and after six weeks, they all gained weight. However, the mice in group B weighed only 20 percent more, and the mice in group A weighed 48 percent more! This experiment showed that, for animals active at night, eating at night is better for their health. The timing of our meals is an important factor in our weight.
- ⑦ As we discover more about body clocks, we are starting to apply this new knowledge to our everyday life. We can find many things around us that may relate to our body clocks. Some people cannot sleep well at night. Doctors are resetting their body clocks with light, and the results are good. With more information on body conditions, doctors have started to find the best times of the day for us to take medicine. We may be able to find more ways to adjust our body clocks. The more we find out, the healthier we may be in the future!

(出典: *ONE WORLD English Course 3 Reading 2 Body Clocks*. 教育出版. 2012 年.)

Practice 6

Topic	
Introduction	<hr/> <hr/> <hr/> <hr/>
Body 1	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Body 2	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
Conclusion	<hr/> <hr/> <hr/> <hr/>



cf) the IMRaD structure

Introduction (Background, Purpose)

Method

Results

and **Discussion**

cf) Three Types of Stories

- 1) **AAA:** And.... And.... And....
- 2) **ABT:** And.... But.... Therefore....
- 3) **DHY:** Despite.... However.... Yet....

CHAPTER 4 Visual Message

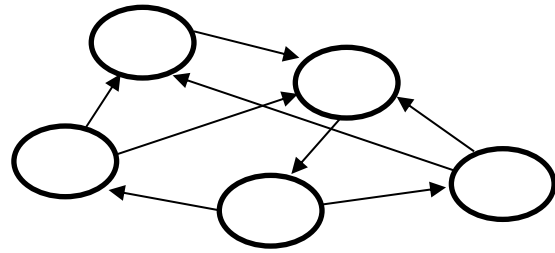
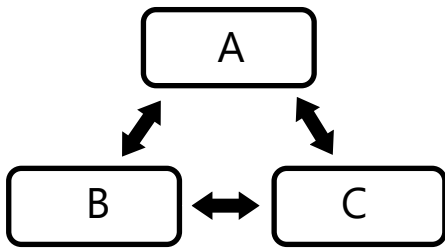
1. Layout of a Poster

1.1. Standard Format

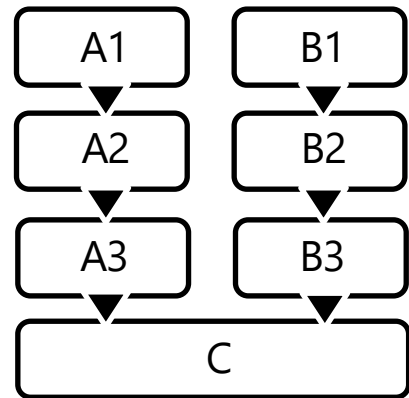
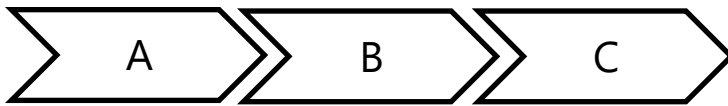
<table border="1"><tr><td>Title</td><td>An Economical Way to Make a Semiconductor</td></tr><tr><td>Name / Affiliation</td><td>Fuzoku Midori, Hiroshima University High School</td></tr></table>		Title	An Economical Way to Make a Semiconductor	Name / Affiliation	Fuzoku Midori, Hiroshima University High School
Title	An Economical Way to Make a Semiconductor				
Name / Affiliation	Fuzoku Midori, Hiroshima University High School				
Abstract					
Introduction : Background / Purpose	Body 2 : Method / Results				
Body 1 : Hypothesis / Method	Conclusion : Discussion / Prospects				
Notes / References					

1.2. Basic Patterns to Organize Information

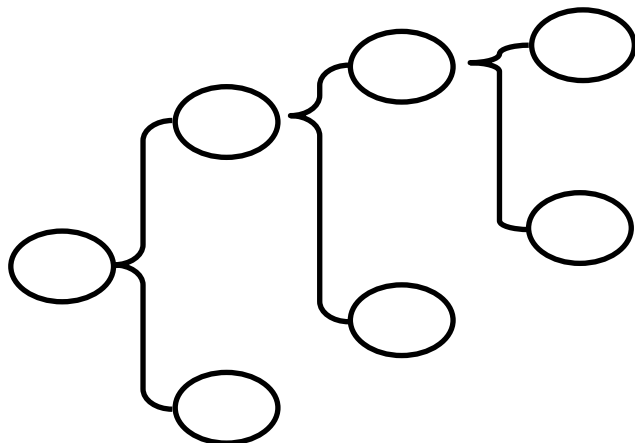
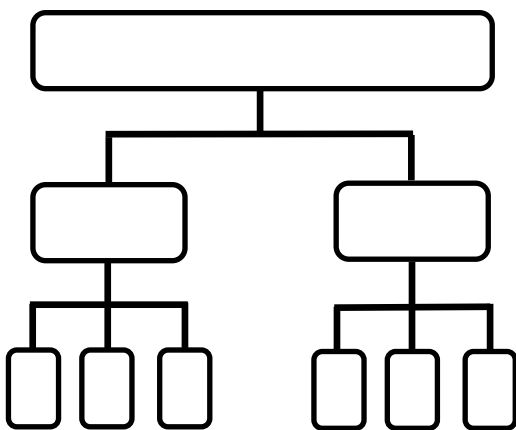
(1) Relational Chart



(2) Flow Chart

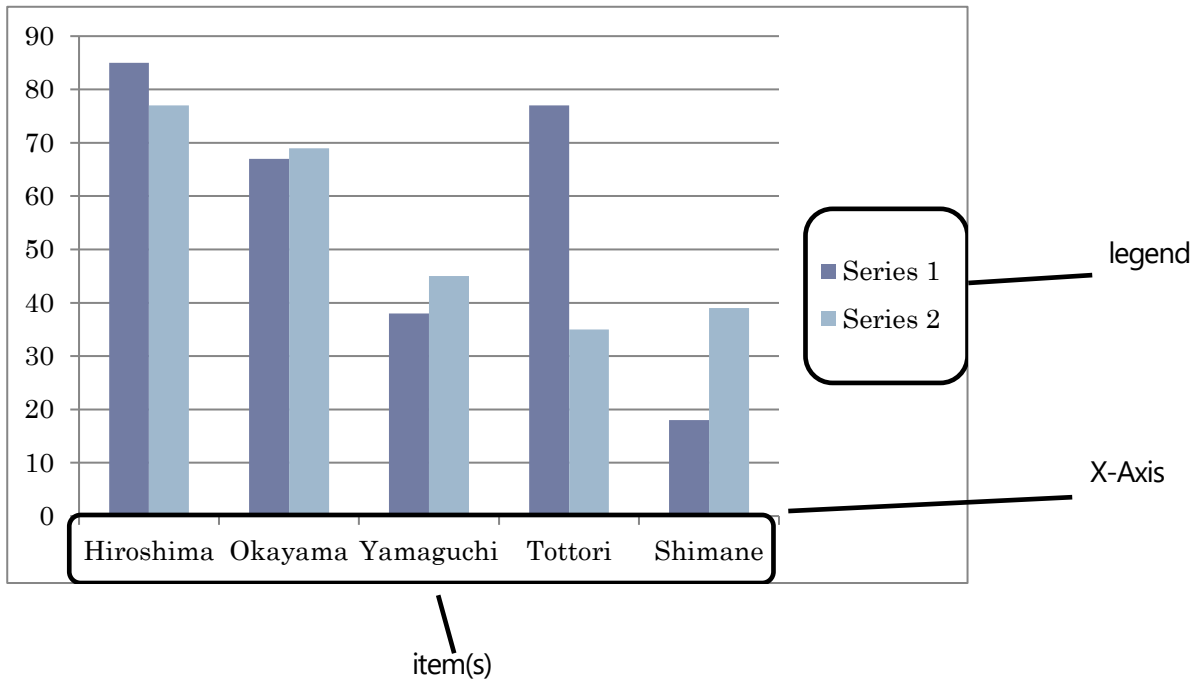


(3) Tree Diagram

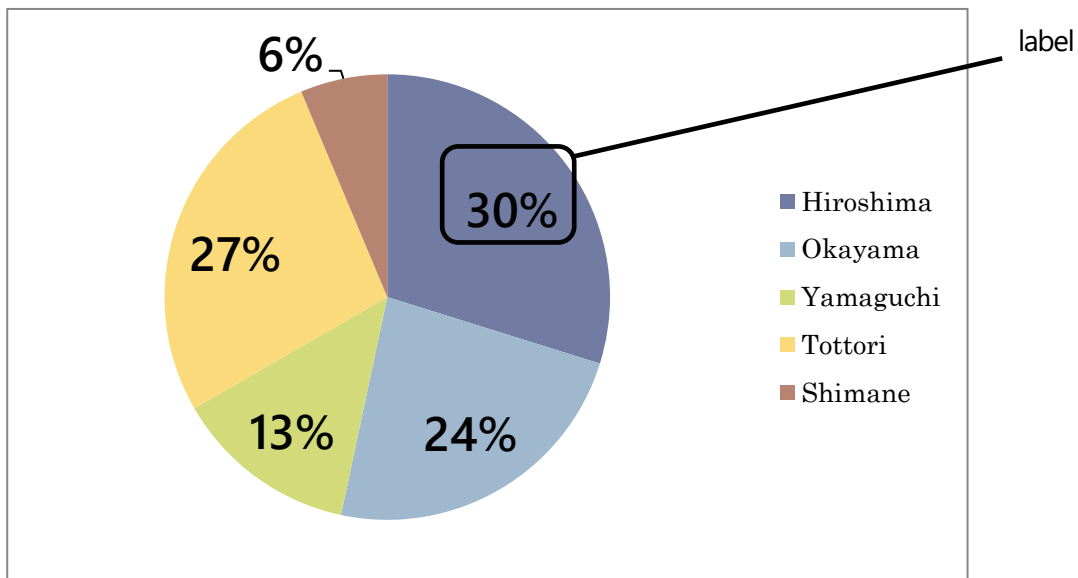


2. Graphs, Diagrams, and Illustrations

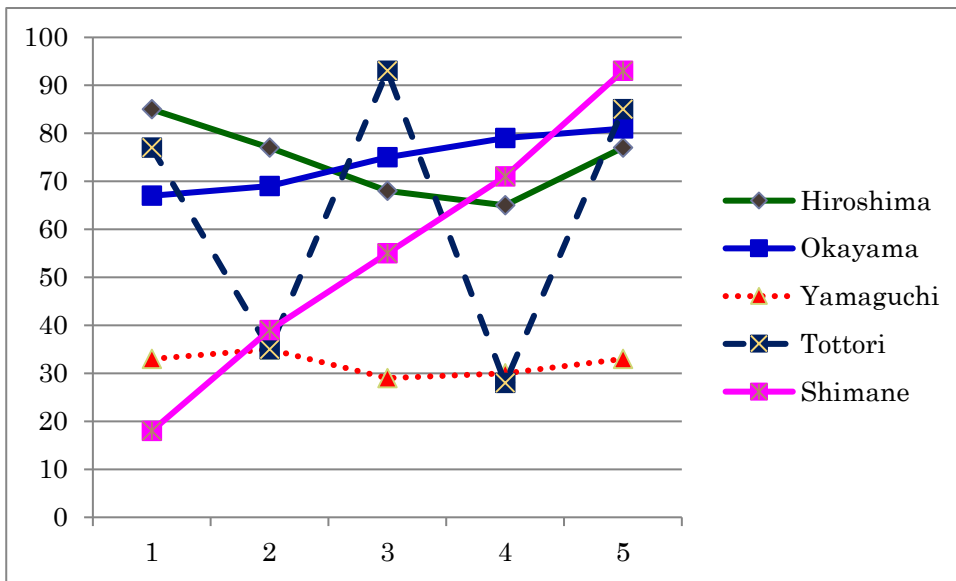
(1) Bar Chart [Graph] : used to show **different values of different items independently of one another**



(2) Pie Chart : used to show **the proportion [percentage] each item occupies in relation to the other items**



(3) Line Graph : used to show **changes of different items over time**



—— 実線 solid line

..... 点線 dotted line

--- 破線 broken line

↗ increase, rise, go up

↘ decrease, fall, go down

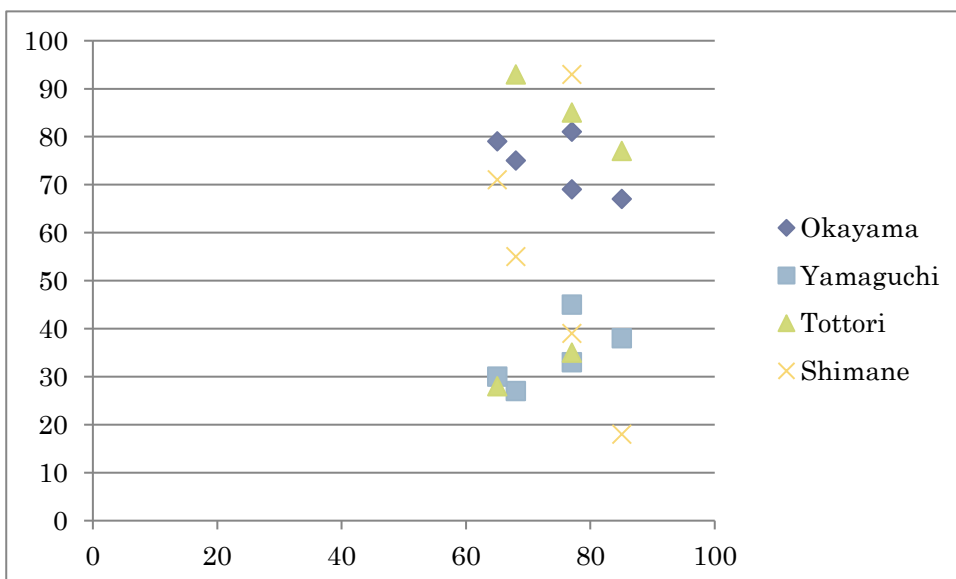
→ stay flat, remain (almost) the same level, do not change

↗↘↗ swing up and down (wildly)

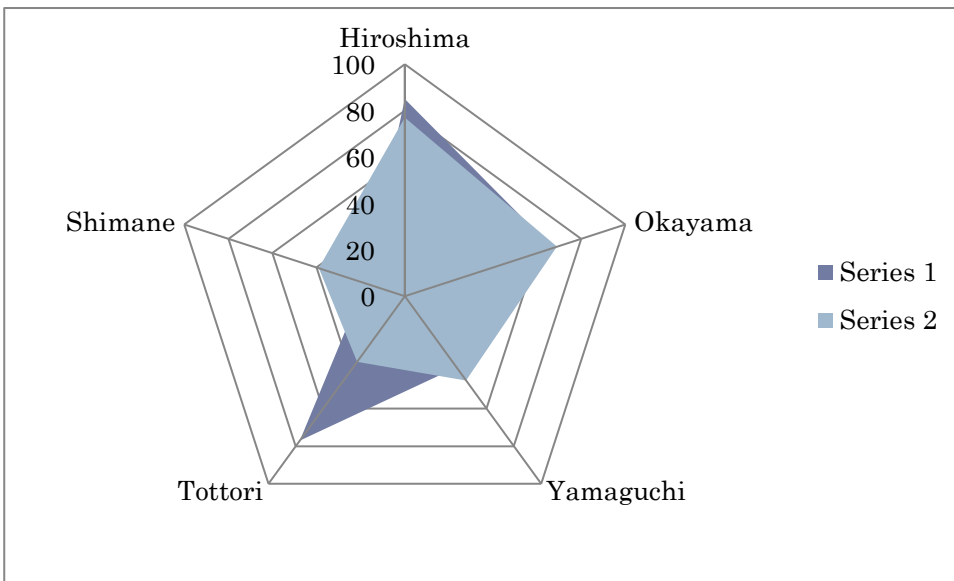
急激に sharply, rapidly 緩やかに gradually, slowly

突然 abruptly 上昇[下降]に転じる turn upward [downward]

(4) Scatter Diagram : used to show **correlation between two variables**



(5) Rader [Cobweb] Chart : used to show **balance among different variables**



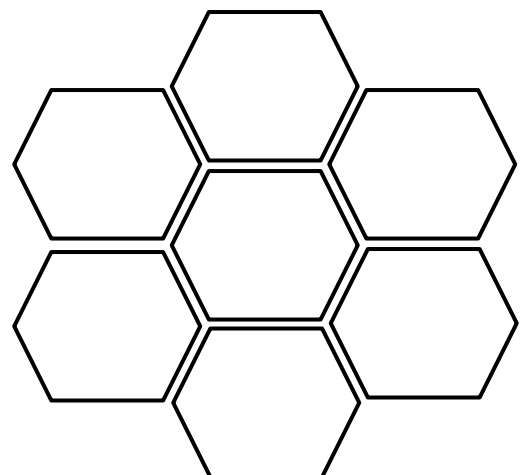
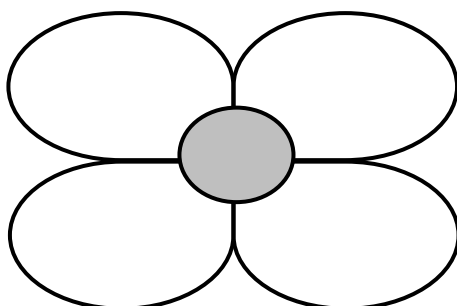
(6) Table : used to **show the values simply**

	Series 1	Series 2	Series 3	Series 4	Series 5
Hiroshima	85	77	68	65	77
Okayama	67	69	75	79	81
Yamaguchi	33	35	29	30	33
Tottori	77	35	93	28	85
Shimane	18	39	55	71	93

行 row

列 column

(7) Illustration



Expressions to explain graphs and charts

① グラフに注目してもらう (Drawing attention to the graphs)

- > Take a look at this (bar / line / pie) graph.
- > The bar graph shows / indicate... (...を示しています)
- > Figure 1 shows... (図1は...を示しています)
- > Table 1 shows... (表1は...を示しています)
- > If you take a look at the graph, you can see... (グラフをご覧になると...が分かります)
- > As you can see from the graph, ... (グラフからわかるように)

② 折れ線グラフにかかわる表現

- a) 上昇・下降
 - ↑ rise, increase, go up, climb, move up (from A to B / by A%)
 - ↓ fall, decrease go down, decline, move down
- b) 変化の程度
 - sharply, dramatically, rapidly, considerably, significantly
 - gradually(徐々に), steadily(着実に), slightly, slowly, gently
- c) そのほかの表現
 - remain stable(一定である) / fluctuate(変動する) /
 - reach a peak(ピークに達する)
- d) 例文: There was a slight increase of 2% in November, but...
- e) 横軸・縦軸
 - 横軸: The horizontal axis indicates the calendar year, and...
 - 縦軸: The vertical axis shows the number of units sold.
- f) 線の種類
 - solid line(実線) ...dotted line (点線) ---- broken line (破線)
 - · - · - · broken and dotted line

③ Bar Graph(棒グラフ)

- a) 高低の比較 bar: higher / lower
- b) 違いの程度 much, greatly, considerably, significantly, somewhat, a bit, slightly, a little
- c) 比較の表現
 - in contrast... / On the other hand... / On the contrary,... / Unlike... / Contrary to... / As opposed to... /

④ Pie Chart(円グラフ)

- a) 部分を示す The

{	shaded
	unshaded
	dotted

 area/section/part/segment
- b) 占める率 This pie chart shows **the ratio of...**
The A **accounts for** ...%, while the B accounts for~
The A holds the major share **at ...%**, while...
- c) ~別 Sales **by** Market (マーケット別売上)

CHAPTER 5 Modes of Persuasion

1. 3 modes of persuasion.

- 1) **Ethos** : *the speaker's personal quality*
- 2) **Pathos** : *appeal to the audience's emotions*
- 3) (): *appeal to the audience's reason*

2. Logos

1) Syllogism 三段論法


Conclusion (結論) Socrates will die.

↑

Minor Premise (小前提) Socrates is a human being.

↑

Major Premise (大前提) All human beings will die.

Conclusion	Socrates		will die
Minor Premise	Socrates	a human being	
Major Premise		human beings	will die

2) The Toulmin Model トゥールミン・モデル

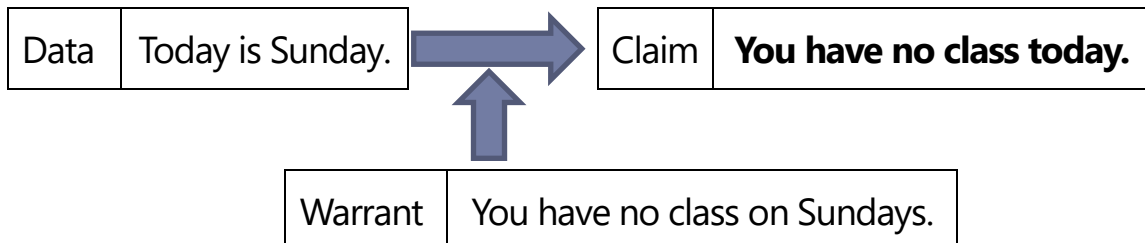
Claim (主張) You have no class today.

↑

Data (データ・根拠) Today is Sunday.

↑

Warrant (前提) You have no class on Sundays.



Verbs to say what you do in your presentation

We will argue that... …ということを主張します

assume / presume that... …と仮定します

conclude that... …と結論づけます

hypothesize that... …という仮説を立てます

propose / suggest that... …と提案します

analyze... …を分析します

clarify... …を明らかにします

classify... …を分類します

construct... …を構築します

create / invent... …を新しく作ります

criticize... …を批判します

demonstrate... …を示します

deny... …を否定します

determine... …を決定します・結論を出します

discuss... …について論じます

exemplify... …を例証します

experiment... …を実験します

explore... …を探ります

improve... …を改良(改善)します

investigate... …を調べます

modify... …を修正します

organize... …を整理します

prove... …を証明します

review... …を吟味します

specify... …を特定します・明示します

streamline... …を効率化(合理化)します

systematize... …を体系化(組織化)します・系統立てます

verify... …の妥当性を示します

CHAPTER 6 Questioning

1. How to *create* questions

1.1. Applying the CUBING technique

Point of View	What You Do	How to Apply to Questioning
Describe	対象の見た目(全体像・細部)を描写する How does it look? What do you see when you take a close look at it? What do you see when you look at it from a distance?	・その発表において外見が提示されていないもの、外見がイメージしにくいものについて、それがどのようなものを描写してもらう。 ・対象物の全体像や局所的な特徴を説明してもらう。
Compare	対象を類似のもの・異質なものと比較する Do you think of anything that is similar to or different from it?	・その研究について、類似の研究や対照的な研究と比べて類似点や相違点を説明してもらう。特に、研究手法の細部や先行研究との違いなどに焦点を当てる。
Associate	対象から自由に・創造的に連想を広げる: ・自分の知識・経験とどのように結びつか What comes into your mind when you see it? Can you connect it to something else?	・その研究から連想したことを述べ、そこに関連性を見出すことが適切かどうか判断してもらう。 ・その研究対象や研究手法を、自分ならどのように扱うかを想像して、それについての意見を求める。
Analyze	対象を分析する: ・どんな要素に分解できるか ・要素どうしはどのような関係か ・要素どうしはどのように組み合わさっているか ・その要素の歴史(起源・将来像) How can you break it down to smaller elements? What relationships do the elements have?	・その研究が扱っている対象について、自分なりに分析してみて、その分析が正しいかどうか判断してもらう。 ・大きな対象について、どのような要素に還元できるか説明してもらう。 ・小さな対象について、どのような要素に統合できるか説明してもらう。
Apply	対象を応用する: ・どのような使い道があるか What can you use it for? Is there any other way to use it?	・その研究で明らかになったことが、何の役に立つのか説明してもらう。 ・その研究で採用された研究手法は、他の対象を研究する際にも利用できるか説明してもらう。
Argue	対象についての賛否など意見を述べる What is your opinion about it?	・調査・実験データの解釈や研究手法の適否について自分の考えを述べる。 ・その研究の研究倫理について自分の考えを述べる。

1.2. Applying the SCAMPER technique

Point of View	What You Do	How to Apply to Questioning
Substitute	対象を他のものと置き換えてみる。 What happens when you replace it for something else?	・その研究のある要素を、類似のもの、あるいは対照的なものと置き換えてみることができるか、置き換えたなら何が起こるか説明や意見を求める。
Combine	対象を他のものと組み合わせてみる。 What happens when you put it together with something else?	・その研究のある要素を、他のものと組み合わせてみることができるか、組み合わせたら何が起こるか説明や意見を求める。
Adapt	対象を何かの用途に適用してみる。 What happens when you use it for a particular purpose?	・その研究の成果を、何らかの用途に使うことはできるか、使ったら何が起こるか説明や意見を求める。
Modify	対象を変形させてみる。 What happens when you change its (external) shape or (internal) structure?	・その研究のある要素の、外見や内部構成などを変えることはできるか、変えたら何が起こるか説明や意見を求める。
Put to other uses	対象を他の用途に適用してみる。 What happens when you use it for other purposes?	・その研究の成果を、本来とは異なる用途に使うことはできるか、使ったら何が起こるか説明や意見を求める。
Eliminate / Minify	対象から何かを削ってみる・小さくしてみる What happens when you take away something from it or make it smaller?	・その研究の要素を、削除したり縮減することはできるか、削減・縮減したら何が起こるか説明や意見を求める。
Rearrange / Reverse	対象の配列を変えてみる／逆にする What happens when you change its arrangement, partly or completely?	・その研究の要素を、順序を入れ替えたり正反対にすることはできるか、変えたら何が起こるか説明や意見を求める。

CHAPTER 7 Answering

1. How to respond to questions TRAC Procedure

Thank	<ul style="list-style-type: none"> · Thank you for your question. · Thank you for asking that. · That is a good question. · That's what matters here. · That's exactly what I want to make clear. · Actually it is a tough question. · Actually it is not easy to answer that question. 	
Repeat	<ul style="list-style-type: none"> · Your question is ..., right? · You are asking about ..., right? · What you mean is Am I right? · Let me rephrase your question like this. "..." · Could I say your question is about...? · Your point is... 	
Answer	Basis (Something Obvious)	<ul style="list-style-type: none"> · In principle,... · In the first place,... · As everyone knows,... · The definition of ... is ... / I define ... as ... in my study. · The reason why I take up this in my study is that... · The bottom line of my study is that.... · From the perspective of... · The simple conclusion here is that.... · What I'd like to make clear here is that....
	Core (Actual Answer)	<ul style="list-style-type: none"> · The most important thing here is.... · Let me emphasize this. · The essence (of the experiment) is that....
Check	<ul style="list-style-type: none"> · This is my answer. · Does that answer your question? · Am I clear? · What do you think? · Could I ask what suggestion you have? 	

2. How to go beyond the question

Principle : It is not enough to ANSWER the question. You should () over it so that you can () the most from it

Strategy : In order to leap over a question, you need to imagine the questioner's **motive** for asking that question.

By providing what the questioner wants as well as emphasizing the points you want to make, you can achieve **mutual benefit**.

Why is the questioner asking the question?

- 0) To get information about your presentation.
- 1) To **deepen** their knowledge and understanding.
- 2) To be **polite** by avoiding silence.
- 3) To teach you something.

What you are expected to offer:

- 0) **Accurate** information.
- 1) **Background** information to your study:
 - the theory you base your study on
 - interesting earlier studies
 - incidental findings in your study
- 2) Any **additional** information you can offer about your study.
 - Anything you want to **emphasize** or impress the audience with.
- 3) **Open** ears with **respectful** attitudes.

Tactics : Use a ().

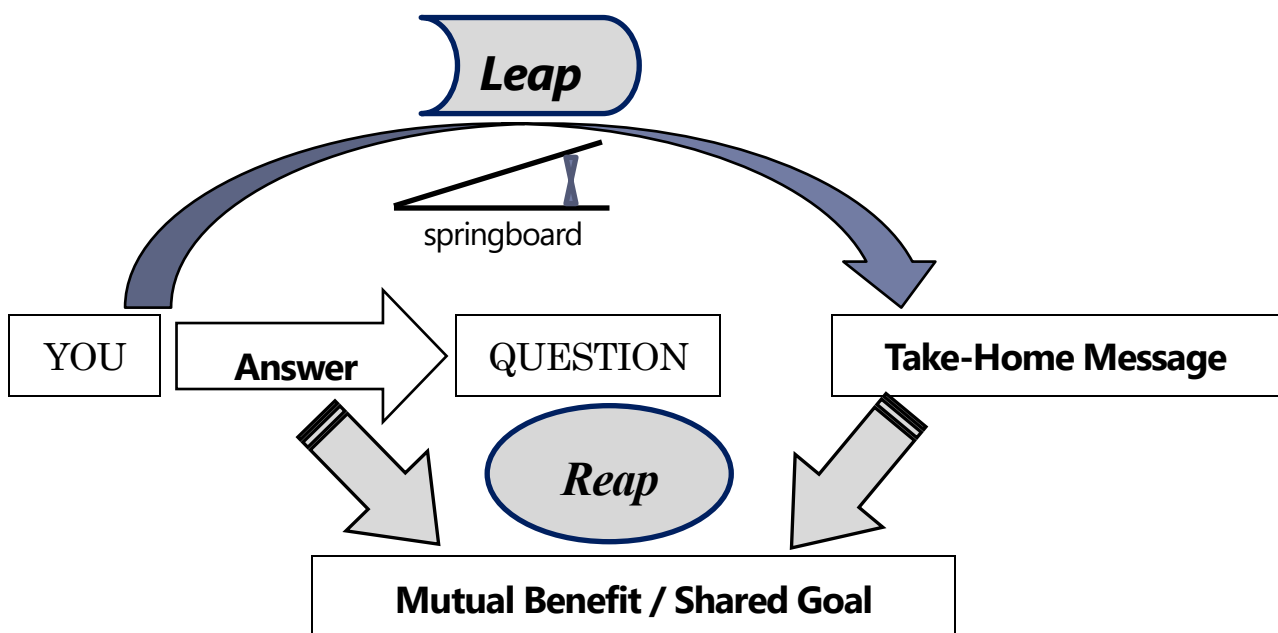
1) the Key Word Technique :

You pick out from the question one or two **key words** that you will focus on.

Say something **related** to those key words. It does not have to directly answer the question. Rather, you refer to something that you want to **emphasize** about your presentation or about your study, especially when you failed to discuss your **take-home message** during the presentation time.

2) the Redirecting Technique

You add to a short direct answer to the question something you want to emphasize about your presentation or about your study. It does not have to directly relate to the question. Rather, you **take advantage of** the question to appeal not only to the questioner but also to the audience. For example, you can repeat the **take-home message** of the presentation in the form of an answer to a question.



Springboard Expressions

I would like to draw your attention to...

I would like to stress that...

I would like you to remember that... / I would like you to remember this. +

What is more important is... / What is more important is this. +

If we think about this from a different perspective...

This reminds me of...

What I would like to tell you is... What I would like to tell you is this. +

The point I want to make here is... / The point I want to make here is this. +

Let me emphasize that... / Let me emphasize this. +

Your question is really inspiring. Now let me go beyond your question to think about this more deeply.

Practrice 7

Leap over the questions.

(1) How can your study contribute to humanity?

(2) My own research indicates the opposite.

(3) (Random Question)

CHAPTER 8 Oral Presentations to Written Articles

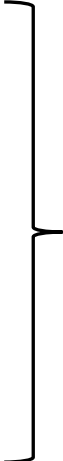
1. What constitutes a scientific article

1) Title

- > Declarative Title: *Increase in Study Hours Leads to Increase in Test Scores*
- > Descriptive Title: *Relationship between Study Hours and Test Scores*
- > Interrogative Title: *How does Study Hours Affect Test Scores?*

2) Abstract :

Topic
Other studies
Objectives / **Research question**
Methods
Results / Major findings
Conclusion / Future Prospects



An abstract is an abridged version of the article. It is read **independently** of the article for the readers to decide whether to read the full-length article. For this reason, an abstract should provide the most important points of the article in a **self-contained** way.

3) Introduction :

Motivation
Significance / Necessity

4) Body 1:

Previous studies
Research question : Setting issues to address

5) Body 2: Current study

Purpose

Method

Results

Discussion

6) Conclusion :

Summary

Issues to be addressed

7) References

2. Abstract

(著作権上の理由により不掲載)

COMPARE:

Some researchers say everyone who learns English as a second language learn grammatical morphemes in the same order. In other words, there is a “natural” order in learning grammatical morphemes. But we do not know why we have such an order. We collected and compared twelve studies on this topic to see if this order can be explained by five factors. First, how easy it is to notice the grammatical morpheme. Second, how complex in meaning the grammatical morpheme is. Third, to what degree the grammatical morpheme is used in a regular manner. Fourth, what grammatical category the grammatical morpheme is. Fifth, how often a learner sees the grammatical morpheme. The twelve studies we looked at came from a time span of 25 years, and they involved 924 people in total. We analyzed the data with multiple regression analysis and found that the five factors explained the “natural” order very well. We think we also need to study other factors and other languages.

3. Academic writing:

the KISS approach =

the 3 Cs =

能動態で Use the active form.

(例) 珍しい現象が観察された。

An unusual phenomenon was observed.

⇒ An unusual phenomenon happened. / We observed an unusual phenomenon.

(練習) 誤った考え方が多くの高校生に共有されていた。

The wrong idea was shared among many high school students.

⇒

肯定文で Write positive sentences.

(例) 2度目の実験では、1度目の実験と同じ結果が出なかった。

The second experiment did not show the same results as the first experiment.

⇒ The second experiment showed different results to the first experiment.

(練習) 方法 A ではなく方法 B を選んだ。

We did not choose method A but method B.

⇒

一般動詞で Use action verbs

(例) 物質Aの量の増加がみられた。

There was an increase in the amount of substance A.

⇒ The amount of substance A increased.

(練習) 装置の改良がそのプロセスに正の影響を与えたことは明らかだった。

It was evident that the improvement of the apparatus had a positive effect on the process.

⇒

意味の強い動詞・名詞で Use strong verbs and nouns

(例) より正確な予測を得るためには、実験結果についてより丁寧に検討することが必要である。

It is necessary to think more carefully about the results of the experiment in order to gain a more accurate prediction about the future.

⇒ Accurate future prediction requires a more careful analysis of the results of the experiment.

(練習) 物質Xを溶液Yに加えると、反応Bが生じている間に反応Aが生じる。

When substance X is added to solution Y, reaction A occurs during reaction B is occurring.

⇒

動名詞主語で Use the *-ing* form for subjects

(例) 18世紀の文章のサンプルを、適切な量集めるのは難しかった。

It was difficult to collect an appropriate amount of sample text from the 18th century because not so many books of the time are available digitally.

⇒ Collecting an appropriate amount of sample text from the 18th century was beyond our ability because we had limited access to digital data of the books of the time.

(練習) その化学反応を可視化するためには、特殊な装置を使う必要がある。

In order to visualize the chemical reaction we need to use special equipment.

⇒

使役構文で Use causative constructions

(例) この新しい方法を使えば、人が心的外傷にどのように対処するか、よりよく理解することができる。

With this new method we can have a better understanding of how people deal with trauma.

⇒ This new method enables us to understand how people overcome trauma.

(練習) インタビューでの回答を見ることで、今日の大学生の心理についてより深い洞察を得ることができる。

By looking at the interview responses we can gain a deeper insight into the psychology of college students today.

⇒

具体的な情報で Be concrete and specific

(例) その溶液の温度は急激に変化した。

The temperature of the solution changed dramatically.

⇒ The temperature of the solution increased by 67 degrees in 60 seconds.

(練習) 方法Aは方法Bよりも効果的である。

Method A is more effective than Method B.

⇒

単純な語句・構文で Write with basic vocabulary. Write in simple sentences.

(例) 高校生が学校の友人と真剣な話題について話し合う目的で SNS を使う傾向を明らかにすべく行った調査は、先行研究とは食い違う結果を示した。

The survey that was conducted for the purpose of revealing the tendency of high school students using SNS for discussing serious matters with their school friends has shown results that contradict earlier studies.

⇒ Do high school students use SNS when they discuss serious matters with their school friends? We conducted a survey about this, and the results contradicted earlier studies.

(練習) 子ネコが母ネコを呼んだ頻度の高さは、見知らぬ場所でひとり残されることにより不安が増大したことをうかがわせた。これは、他の動物種でも頻繁に観察されることである。

The high frequency with which kittens called their mother cats implied their heightened anxiety of being left alone in a strange place, which is often observed in other species.

⇒

Practice 8

1)

WORSE Remarkable congruity was observed between the results of the two experiments.

→ **BETTER**

2)

WORSE One of the hindrance factors pertaining to the liquid processing method was the variability of temperature of the apparatus which affected the viscosity of the liquid being processed.

→ **BETTER**

3)

WORSE Copper ion was found to be contained in the solution through the analysis.

→ **BETTER**

4)

WORSE We did not turn off the agitator until the two liquids were mixed completely.

→ **BETTER**

5)

WORSE We carried out an investigation as to what gave rise to the bias.

→ **BETTER**

6)

WORSE The glass blocked a lot more sunlight from outside.

→ **BETTER**

7)

/ Avoid ambiguity and confusion about how one sentence relates to another

WORSE The results showed that this procedure had curbed the conditioning effect. We increased the number of trials in the second experiment to verify the effectiveness of the procedure.

→ **BETTER**

8)

WORSE The first experiment being unsuccessful, we increased the voltage in the next experiment.

→ **BETTER**

9)

WORSE We experimented on the traditional method and the newly-developed way and the results were compared.

→ **BETTER**

10)

WORSE This study focused on the damage that invasive alien species made in the suburban areas of Hiroshima City. A two-year survey has revealed the damage on native species of butterflies was greater than was reported in earlier studies.

→ **BETTER**

Appendix 1 Expressions for Presentation

Introduction

We are interested in...

The purpose of this presentation is...

Today, the topic of our presentation is...

We will divide the discussion into three parts. First,... Second,... Finally,...

Let us begin our talk by giving you an explanation of...

To start with, we will provide background information on...

We would like to comment on the problem of...

We would like to briefly mention (that)...

There are two points we would like to make.

We'll show you the data later.

How can we explain...?

Is there a link between...?

Is there a solution to...?

Next, we will demonstrate...

After that, we will take a look at...

We'll give you more information about this in the next section.

Generally speaking,...

Body

So far, we have reviewed....

Let us now turn to...

Let's move on to the next point.

This leads us to another question of...

To illustrate this point, let's consider...

This apparatus consists of...

We'd like to define the term X. X refers to... / X can be defined as...

We'd like to show you the experimental set up we used.

These results show...

On the one hand, I would say..., but on the other hand,...

In spite of..., we should remember...

Despite the fact that...

Although... we still think... because...

What do these results tell us about...?

What can we conclude from these results?

What do we mean by X?

What is the experimental set up?

First of all,...

To begin with,...

At the outset,...

In addition,...

As well as..., there is also...

Moreover,...

For example,...

It seems to us...
We have to say...
As far as we are concerned...
To put it simply...

Conclusion

In conclusion, we have made the following points. Number one... Number two...
In closing, we'd like to mention that...
In conclusion, we would like to say...
We'd like to go over our major findings.
We'd like to summarize the main findings of this study.
The main findings of this study are as follows.
As you can see, there are three main points.
In this study, we found that...
Our future work will be to...
We plan to look at...
The next stage in this research is to...
Our future goal is to...
That's we all have to say. Thank you for your attention.
That concludes our presentation. Thank you.
That covers everything we want to say. Thank you.
On the whole,...

Q & A (disagreeing)

I agree in principle, but...
You have a point there, but...
I can see your point of view, but...
I see what you mean, but...
That may be true, but...
I agree with you on the whole, but...
I respect your opinion, but...

but...+
it could also be said that...
we should still think... because...
that is only one of the many contributing factors
that is too much simplified.
our data tell us the opposite

I'm afraid...

Q & A (unable to give an appropriate answer)

At present we don't have enough data to answer that question, but generally speaking...
I'm afraid we can't give you a definite answer, but my speculation is that...
I'm sorry, but that is outside the area of this study.
I'm sorry, but we did not look at that point.
I'm afraid that is a very complicated point and we do not have enough time to discuss it now. Could we talk later?

Appendix 2 Nouns for Science

(1) 数字	number	(26) 割合	proportion
(2) 整数	integer	(27) 比	ratio
(3) 偶数	even number	(28) 速さ	speed / velocity
(4) 奇数	odd number / uneven number	(29) 目盛り	scale
(5) 小数	decimal / decimal fraction	(30) 比例	proportion
(6) 小数点	decimal point	(31) 反比例	inverse proportion
(7) 小数点第1位	the first decimal point	(32) 図形	figure
(8) 分数	fraction	(33) 円	circle
(9) 分子	numerator	(34) 正方形	square
(10) 分母	denominator	(35) 長方形	rectangle
(11) 3等分(する)	trisection (trisect)	(36) 三角形	triangle
(12) 式(数式・公式)	formula / numerical expression	(37) 正三角形	equilateral triangle / regular triangle
(13) 平均	average	(38) 直角三角形	right triangle
(14) 合計	total / sum	(39) 二等辺三角形	isosceles triangle
(15) 7以上(以下)	seven or more (less)	(40) ひし形	rhombus
(16) 四捨五入する	round off	(41) 平行四辺形	parallelogram
(17) 切り上げる(捨てる)	round up (down)	(42) 台形	trapezoid
(18) 2乗(する)	square	(43) 五角形	pentagon
(19) 3乗(する)	cube	(44) 六角形	hexagon
(20) 10^{13}	ten to the (power of) thirteen / ten to the thirteenth power	(45) 八角形	octagon
(21) 乗数	multiplicator / multiplier	(46) 角度	angle
(22) 絶対値	absolute value	(47) 頂点	apex
(23) 単位	unit	(48) 直角	right angle
(24) 重さ	weight	(49) 直線	straight line
(25) 長さ	length	(50) 曲線	curved line / curve

(51) 対角線	diagonal line	(76) 窒素	nitrogen
(52) 底辺	base	(77) リン	phosphorus
(53) 高さ	height	(78) 硫黄	sulfur
(54) 半径	radius	(79) 塩素	chlorine
(55) 直径	diameter	(80) 銅	copper
(56) 円の中心	center	(81) 質量	mass
(57) 円周	circumference	(82) 物質	matter / substance
(58) 円周率	pi	(83) 物体	body
(59) 平行(であること)	parallel(ism)	(84) 化学反応	chemical reaction
(60) 線対称	line symmetry	(85) 運動エネルギー	kinetic energy
(61) 点対称	point symmetry	(86) 位置エネルギー	potential energy
(62) 直方体	cuboid /	(87) 弾性エネルギー	elastic energy
(63) 立方体	rectangular parallelepiped cube	(88) 熱エネルギー	thermal energy
(64) 三角柱	triangular prism /	(89) 放射線	radiation
(65) 四角柱	triangular pole quadrangular prism /	(90) 同位体	isotope
(66) 円柱	square pole cylinder	(91) 慣性の法則	inertial law / law of inertia
(67) 面積	area	(92) 摩擦	friction
(68) 体積	volume	(93) 遠心力	centrifugal force
(69) 平方センチメートル	square centimeter	(94) 重力	gravity
(70) 立方センチメートル	cubic centimeter	(95) 磁力	magnetic force
(71) 原子	atom	(96) 電磁波	electromagnetic wave
(72) 分子	molecule	(97) 周期表	periodic table
(73) 酸素	oxygen	(98) 陽子	positron
(74) 水素	hydrogen	(99) 電子	electron
(75) 炭素	carbon	(100) 中性子	neutron

Appendix 3 Verbs for Science

- (1) absorb **absorb** carbohydrate 炭水化物を吸収する
- (2) accelerate **accelerate** a particle to light speed 粒子を光速まで加速する
- (3) accumulate Greenhouse gases **accumulate** in the atmosphere. 温室効果ガスが大気中に蓄積する
- (4) adapt **adapt** to the climate change 気候変動に適応する
- (5) add **add** the compound to the solution その化合物をその溶液に加える
- (6) adsorb control rods **adsorb** atomic particles 制御棒は原子の粒子を吸着する
- (7) alternate **alternate** walking and running ウォーキングとランニングを交互に行う
- (8) amount The total loss **amounted to** about 35% 総減少量は約 35%に達した
- (9) analyze **analyze** the relationship その関係性を分析する
- (10) apply **apply** a force perpendicular to... …に垂直な力を加える
- (11) assemble **assemble** the apparatus その装置を組み立てる
- (12) assess **assess** the intensity その強度を評価する
- (13) assimilate **assimilate** carbon dioxide 二酸化炭素を吸収する
- (14) attract Unlike charges **attract**. 異なる電荷はひきつけあう。
- (15) behave Solids and liquids **behave differently**. 固体と液体のふるまいは違う。
- (16) bend **bend** metal using heat 熱を加えて金属を曲げる
- (17) bind Molecules **bind** together. 分子どうしが結合する。
- (18) calculate **calculate** the circumference 円周を計算する
- (19) cause Heating ice will **cause** it to melt. 氷を熱すれば溶ける。
- (20) capture **capture** CO₂ 二酸化炭素を回収する(捉える)
- (21) charge **charge** a battery バッテリーを充電する
- (22) classify **classify** whales as mammals クジラを哺乳類に分類する
- (23) code **code** a computer program コンピュータ・プログラムを書く

- (24) coexist Humans and animals **coexist** 人間と動物が共存する。
- (25) coincide Sneezing and blinking **coincide**. くしゃみとまばたきが同時に起こる。
- (26) combine **combine** hydrogen with oxygen 水素と酸素を結合させる
- (27) communicate The disease is **communicated** by fleas. その病気はノミによって伝染する。
- (28) compare **compare** your results 結果を比較する
- (29) comply **comply** with safety regulations 安全規定を順守する
- (30) compose Water is **composed** of hydrogen and oxygen. 水は水素と酸素からできている。
- (31) compress **compress** files ファイルを圧縮する
- (32) conceive Sleep deprivation can decrease the possibility to **conceive**.
睡眠不足は妊娠の可能性を下げうる。
- (33) concentrate The lenses **concentrate** sunlight. そのレンズは日光を集める。
- (34) condense Water vapor **condenses** into tiny drops. 水蒸気が凝結して小さな水滴になる。
- (35) condition **condition** rats to press the button ラットをボタンを押すように条件付けする
- (36) conduct **conduct** an experiment 実験を行う
- (37) consist The experiment **consists** of three stages. その実験は3つの段階から成っている。
- (38) constitute Lime and sand **constitute** mortar. モルタルは石灰と砂でできている。
- (39) construct **construct** a hypothesis 仮説を立てる
- (40) consume **consume** a lot of energy エネルギーを大量に消費する
- (41) contain Cigarette smoke **contains** carbon monoxide. たばこの煙には一酸化炭素が含まれている。
- (42) control **control** other variables 他の要因を統制する
- (43) convert **convert** inches into centimeters インチをセンチメートルに換算する
- (44) correlate The temperature **correlated** with the production rate. 温度と産出速度に相関があった。
- (45) correspond The results **corresponded** with our hypothesis. その結果は我々の仮説と一致していた。
- (46) corrode Acid rain **corrodes** buildings. 酸性雨は建物を腐食させる。
- (47) decode **decode** the message そのメッセージを解読する

(48) define	define categories clearly カテゴリー(範疇・分類)を明確に定義する
(49) demonstrate	demonstrate that the hypothesis is correct その仮説が正しいことを証明する
(50) derive	derive from fossil fuels 化石燃料に由来する(から作られる)
(51) describe	describe the procedure clearly その手順を明確に説明する
(52) detect	detect contaminants 汚染物質を検知する
(53) deteriorate	Hearing deteriorates with age. 聴力は加齢とともに落ちる。
(54) determine	determine the cause 原因を突き止める
(55) develop	develop a cat phobia 猫恐怖症になる
(56) differ	the results differ 結果が異なる
(57) dilute	dilute the solution その溶液を希釈する
(58) discharge	The human body discharges waste. 人体は老廃物を排出する。
(59) discover	discover the relationship 関係性を発見する
(60) disinfect	disinfect water with ultraviolet light [UV rays] 水を紫外線で殺菌する
(61) display	display your findings 分かったことから示す
(62) dissolve	dissolve in acid 酸に溶ける
(63) distort	distort the image 画像をゆがめる
(64) distribute	The samples distributed evenly. 標本(サンプル)は均等に分布していた。
(65) diversify	diversify your experiment locations 実験場所に変化をもたせる(多様化する)
(66) document	Its negative influence is well documented . その負の影響は十分に立証されている。
(67) drain	drain water from the container 容器から水を排出する
(68) drive	The machine is driven by water power. その機械は水力で動く。
(69) elevate	elevate the body temperature 体温を上昇させる
(70) ease	ease muscle tension 筋肉の緊張をやわらげる
(71) emit	emit greenhouse gases 温室効果ガスを排出する / light-emitting diode = LED

(72) employ	employ a new method in the experiment 実験で新しい方法を用いる
(73) engage	The two gears engaged . その2つの歯車がかみ合った。
(74) engineer	genetically engineered bacteria 遺伝子組み換え細菌
(75) equal	Two to the power of five equals 32. 2の5乗は32。
(76) evaporate	Heat evaporates water. 熱は水を蒸発させる。
(77) evolve	Small dinosaurs evolved into birds. 小型の恐竜が鳥類に進化した。
(78) exhale	exhale carbon monoxide 一酸化炭素を吐き出す
(79) exhibit	exhibit initial symptoms of a heart attack 心臓発作の初期症状を示す
(80) expand	The universe is expanding . 宇宙は膨張している。
(81) experiment	experiment on human subjects 人間を被験者として実験する
(82) explode	The chemicals exploded. 化学薬品が爆発した。
(83) explore	explore for methane hydrate メタンハイドレートの採掘調査をする
(84) expose	be exposed to heat and acid 熱と酸にさらされる
(85) express	express the relationship in an equation その関係性を数式で表す
(86) extend	extend downward 下方に向かって伸びる
(87) extract	extract DNA from a cell 細胞からDNAを抽出する
(88) facilitate	facilitate a chemical reaction 化学反応を促進する
(89) fashion	fashion the apparatus from plastic bottles ペットボトルでその装置を作る
(90) flow	control how electric current flows 電流を制御する
(91) freeze	The system froze . システムがフリーズした
(92) function	function in a similar way 同じように機能する
(93) furnish	the apparatus was furnished with a battery charger その装置には充電器が付いていた
(94) heat	heat the solution to 80°C その溶液を80°Cまで熱する
(95) generate	generate electricity for commercial use 商業用に発電する

(96) identify	identify the extracts その抽出物が何であるかを突き止める(同定する)
(97) illustrate	illustrate the importance of balance in the ecosystem 生態系のバランスの重要性を示す
(98) improve	improve energy efficiency エネルギー効率を高める
(99) include	include the data in our analysis そのデータを分析に含める
(100) indicate	The test results indicated a substantial change 大きな変化があったことを示す検査結果だった。
(101) induce	A current was induced in the coil. コイルの中に電流が誘導された。
(102) influence	The stimulus influenced the rats' behavior. その刺激がラットの行動に影響を与えた。
(103) inhale	inhale oxygen and exhale carbon dioxide 酸素を吸入して二酸化炭素を排出する
(104) inhibit	inhibit an allergic reaction アレルギー反応を抑制する
(105) integrate	integrate visual and auditory information 視覚情報と聴覚情報を統合する
(106) interfere	interfere with enzymes 酵素を阻害する
(107) invent	invent a device 装置を開発する
(108) investigate	investigate the relationship between study hours and test scores 学習時間とテストの点数の関係を調べる
(109) locate	locate the cause of the problem 問題の原因をつきとめる
(110) magnify	magnify the image by 250% 画像を250%に拡大する
(111) maintain	maintain a constant density 一定の密度を保つ
(112) measure	measure the speed 速さを計測する
(113) melt	Ice melts into water. 氷が溶けて水になる。
(114) mitigate	mitigate air pollution 大気汚染を緩和する
(115) modify	genetically modified crops 遺伝子組み換え作物
(116) number	number each cell from 1 to 15 それぞれのセルに1~15の数字を振る
(117) neutralize	neutralize alkali [acid] アルカリ[酸]を中和する
(118) observe	observe the phenomenon その現象を観察する
(119) obtain	obtain energy from food 食物からエネルギーを得る

(120) operate	The device operates on battery power. その装置はバッテリー電源で作動する。
(121) plot	plot temperature on the y-axis 温度をY軸に取る(置く・描く)
(122) position	Global Positioning System (GPS) 全地球測位システム
(123) power	power the motor モーターに電力を供給する
(124) precipitate	precipitate in the solution 溶液中で沈殿する
(125) protect	protect the surface from drying 表面を感想から守る
(126) provide	provide the cell with energy 細胞にエネルギーを供給する
(127) range	range in height from 10cm to 120cm 高さが 10cm(のもの)から 120cm(のもの)まである
(128) react	Oxygen and hydrogen react with each other. 酸素と水素が反応する
(129) reduce	reduce nitrates to nitrites 硝酸塩を亜硝酸塩に還元する
(130) refer	Refer to Table 2 for details. 詳細については表2を参照のこと。
(131) refine	refine crude oil 原油を精製する
(132) reflect	The sunlight reflected off the white sand. 日光が白い砂に反射した。
(133) regulate	regulate body temperature 体温を調節する
(134) release	release heat into the atmosphere 熱を大気中に放出する
(135) renew	The tropical rainforest cannot renew itself. その熱帯雨林は再生しない。
(136) repel	repel dirt 泥をはじく
(137) replenish	replenish lost water 失われた水分を補給する
(138) resist	resist corrosion 腐食に耐える
(139) resolve	Water is resolved into oxygen and hydrogen. 水は酸素と水素に分解される。
(140) respond	respond to stimulation 刺激に反応する
(141) result	result in a complication 合併症を引き起こす
(142) retrieve	retrieve information from the Internet インターネットで情報を検索する(取り出す)
(143) reverse	The Earth's magnetic field has reversed a number of times. 地球の磁場は何度も反転している。

(144) revise	revise downward 下方修正する
(145) seal	a lead-sealed container 鉛の密閉容器
(146) sense	sense the change in the Earth's magnetic field 地球の磁場の変化を感知する
(147) serve	serve as a catalyst 触媒として働く
(148) signal	signal the end of processing 処理の終了を知らせる
(149) simplify	simplify the design 設計を単純化する
(150) specify	specify all the factors すべての要因を特定する
(151) steady	steady the panel パネルを固定する
(152) steam	steam the cloth to remove stains 蒸気を布に当ててしみを取る
(153) stimulate	stimulate an immune response 免疫反応を促す
(154) strain	strain the soup スープを漉す
(155) stream	The liquid streamed down. その液体が流れ落ちた。
(156) structure	a structured interview 構造化面接法(あらかじめ決められた質問に沿って行う面接)
(157) survey	survey global environmental changes 地球環境の変動を調査する
(158) suspend	suspend further testing さらなる実験を中止(一時中断)する
(159) synthesize	synthesize glucose from amino acids アミノ酸からグルコースを合成する
(160) transfer	transfer between hemispheres 脳半球(右脳と左脳)の間で伝達する
(161) transform	transform a table into a graph 表をグラフに変換する
(162) utilize	utilize deep-sea resources 深海の資源を活用する
(163) vary	vary according to conditions 条件によって変わる(変動する)
(164) verify	verify password パスワードを照合する
(165) yield	yield a by-product 副産物を生む

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