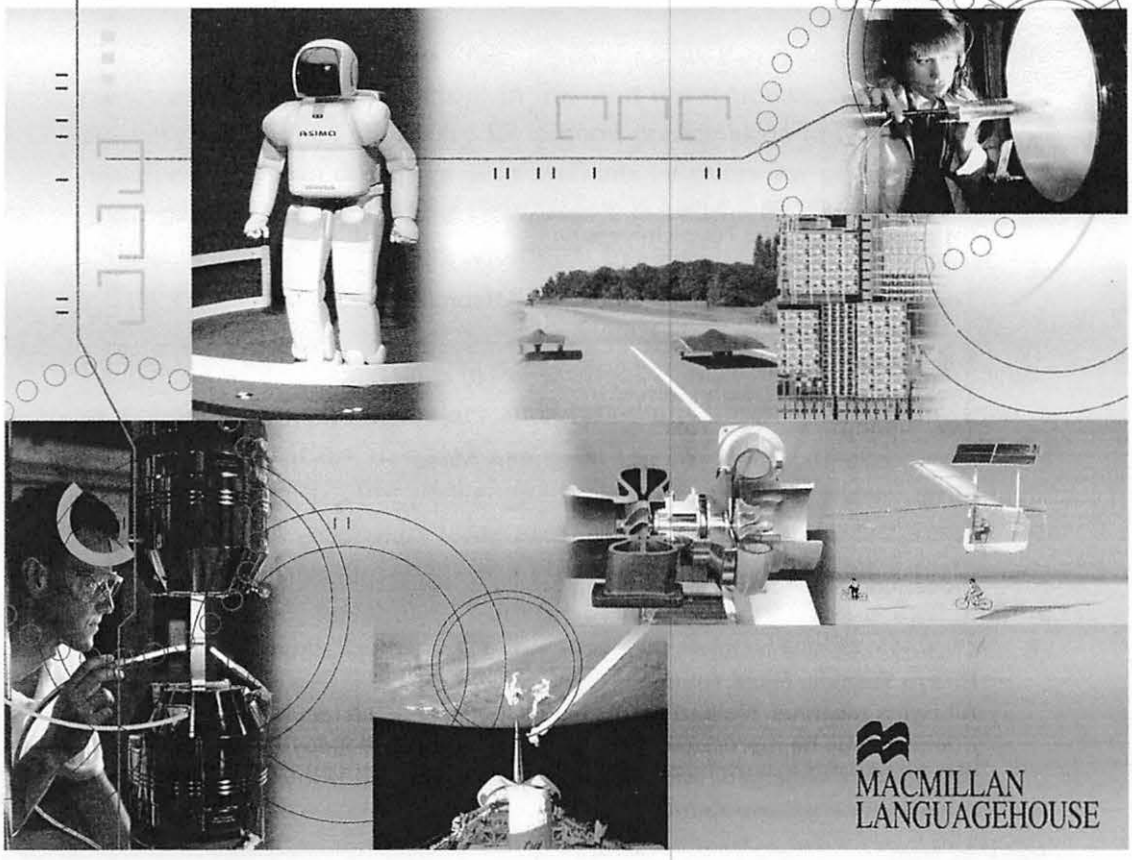
A Technical English Course for Engineering Majors

PRESENTING SCIENCE

Second Edition

Timothy Kiggell / Kevin Cleary
Kenji Hitomi / Hiroyo Yoshida / Eiichi Yubune



MACMILLAN
LANGUAGEHOUSE

UNIT 1

What's Your Position?

Model Presentation 1

CD-02

"The Most Energy-efficient Vehicle"

Let's practice the following presentation.

Slide 1

1

The Most Energy-efficient Vehicle

Taro Kimura
Tozai University
School of Engineering
Department of Mechanical Engineering

taro@tozai.ac.jp

Opening—Greeting
Good morning. I'm Taro Kimura.

Slide 2

2

Introduction What is a bicycle?

- Most energy-efficient vehicle
- Food energy → motion

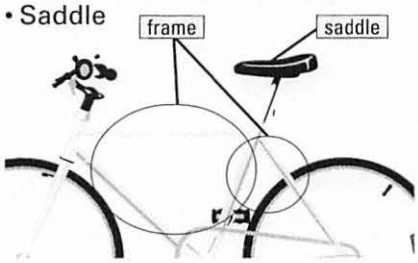
Introduction
Today, I would like to show that the bicycle is the most energy-efficient vehicle. It enables us to convert food energy into motion. I will explain how a modern bicycle does it.

Slide 3

3

Central parts

- Frame—a pair of triangles
- Saddle



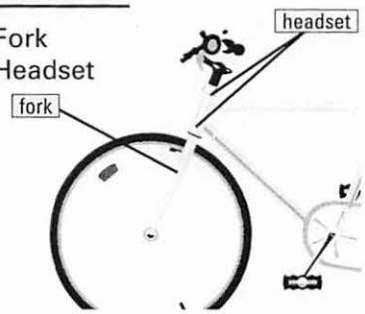
Body (1)
The frame, consisting of two **triangles**, is the most important part. The **large front triangle under** the saddle distributes the rider's weight to the **front** and **back**.

Slide 4

4

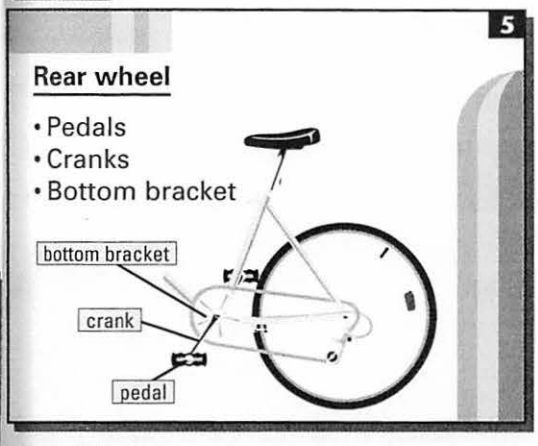
Front wheel

- Fork
- Headset



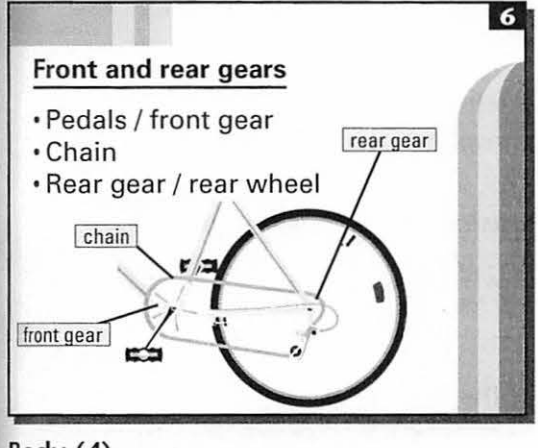
Body (2)
The **top** of the fork **on** the **front** wheel runs through a bearing system known as the headset which allows the rider to turn the **front** wheel.

Slide 5



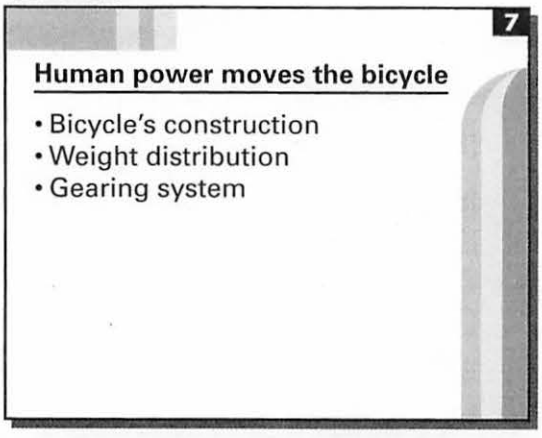
Body (3)
A drive system transfers power from the rider to the **rear** wheel. The rider turns the pedals, which turn the cranks fixed to the **bottom** of the **front** triangle via a bearing system, known as the **bottom** bracket.

Slide 6



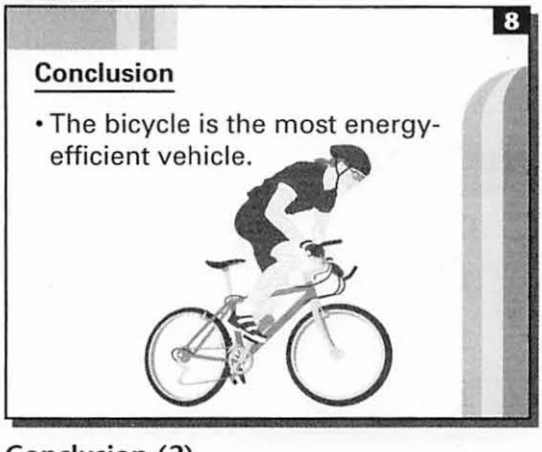
Body (4)
As the cyclist turns the pedals and the **front** gear, the chain running **between** the **front** gear and the **rear** gear turns the **rear** gear and the **rear** wheel.

Slide 7



Conclusion (1)
As a result of the bicycle's construction, weight distribution and gearing system, most of the cyclist's power is converted into moving the bicycle.

Slide 8



Conclusion (2)
Therefore, the bicycle is the most energy-efficient mode of transportation on the planet.

Closing—Thanks
Thank you for your attention.

NOTES

energy-efficient「エネルギー効率の良い」 **convert [A] into [B]**「A を B に変換する」
consist of . . .「…から構成される」 **distribute to . . .**「…に分配する」 **system**「装置」
allow [A] to [B]「A が B できるようにする」 **transfer**「伝える」 **via**「…によって」
as a result of . . .「…の結果として」 **construction**「構造」

Useful Words & Phrases

■ Describing objects and their position

We use the following words and phrases:

[Describing objects] CD-03

i) Nouns and adjectives

- ☐ circle / circular
- ☐ cone / conical
- ☐ cube / cubic(al)
- ☐ cylinder / cylindrical
- ☐ rectangle / rectangular
- ☐ sphere / spherical
- ☐ triangle / triangular
- ☐ square / square

ii) Opposites

- ☐ curved / flat
- ☐ long / short
- ☐ rounded / pointed
- ☐ thick / thin
- ☐ full / empty
- ☐ large / small
- ☐ solid / hollow
- ☐ bright / dark
- ☐ opaque / transparent

[Describing position] CD-04

- ☐ above / below
- ☐ behind / in front of
- ☐ between
- ☐ close to, near
- ☐ inside / outside
- ☐ next to
- ☐ on
- ☐ rear, back / front
- ☐ to the left of / to the right of
- ☐ over / under
- ☐ top / bottom
- ☐ flat / upright
- ☐ through

Exercise A

Complete the sentences using words or phrases from the model presentation.

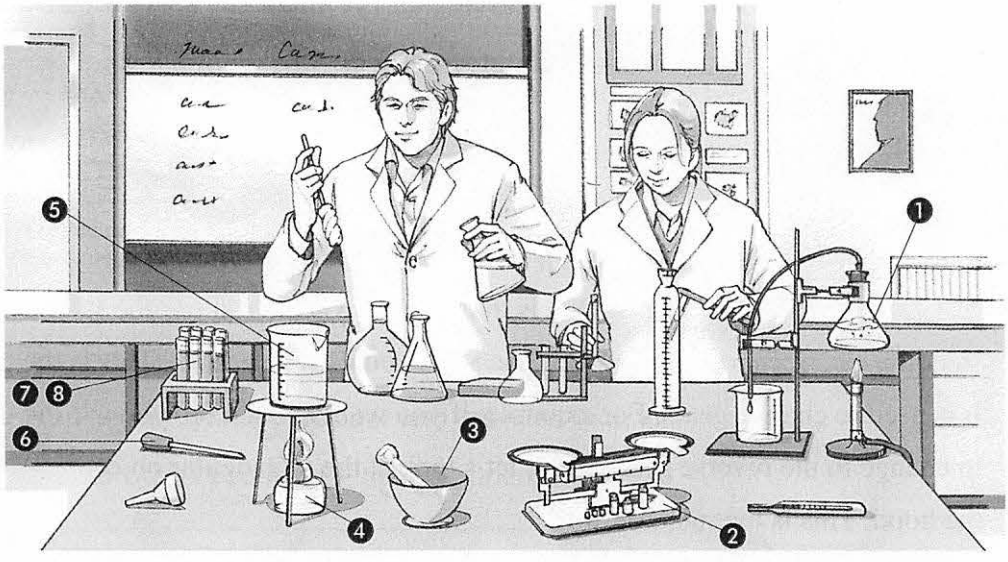
1. The top of the fork is _____ the front wheel.
2. The headset allows the rider to turn the _____ wheel.
3. The crank is attached to the _____ of the large front triangle.
4. The chain runs _____ the front gear and the _____ gear.
5. The frame is made of two _____.
6. The top of the fork runs _____ the headset.

Now, work with a partner and check your answers. Take turns reading the sentences to each other.

Exercise B

CD-05

Look at the picture below. Laboratory apparatus and other materials for an experiment are on the table. Make sentences from the following scrambled words and phrases. Begin the first word in each sentence with a capital letter.



[Example]

is / beaker / a / table / the / on / there / . → There is a beaker on the table.

1. shape / is / the / conical / flask / in / .
2. between / the scales / the mortar / are / and the thermometer / .
3. there is / the lamp / a pestle / the mortar / to the right of / in / .
4. the alcohol lamp / made / of / glass / is / .
5. alcohol / the / lamp / beaker / above / the / is / .
6. pipette / is / transferring / used / the / for / liquids / of / small / amounts / .
7. are standing / the / upright / test tubes / .
8. test tube / there / each / is / some / inside / water / . (= Each test tube contains some water.)

Now, work with a partner and check your answers. Take turns reading the sentences to each other.

Exercise C

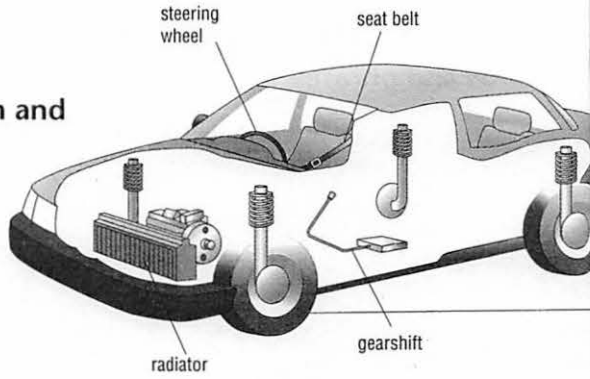
Make sentences to describe the following objects and their positions. Use as many words and phrases from page 10 as you can.

Bunsen burner / tripod / test tube rack / funnel / clamp stand / measuring cylinder / pan scales and weights / jar

Language Skills

Listening Practice CD-06

Listen to a driving instructor's lesson and fill in the following transcript.



Welcome to the Good Luck Driving School. Today I'll show you some important parts of a car. First, let's look at the circular object [1)]_____ the windshield. This is the steering wheel. You use the steering wheel to steer the car. Second, [2)]_____ the seats you can see a lever. This is the gearshift. It is used to change gears. For example, if you want to back up, you use the gearshift to change to the reverse gear. Third, let's look at the rectangular object [3)]_____ the hood. This is the radiator. It is [4)]_____ _____ _____ the engine. It is used to cool the engine. Fourth, the tires are the round objects under the car. They are made of rubber and are filled with air. Finally, let's look at the strap that is [5)]_____ _____ the seat. This is the seat belt. You must wear the seat belt when you are in the car. It protects you in case of an accident. Be sure you know the location and purpose of these important parts of a car.

NOTES . . . . . .

windshield「フロントガラス」 **reverse gear**「バックギア」

Homework

Make an outline of the body of this presentation. Use one slide for each part.

Key: steering wheel, gearshift, radiator, tires, seat belt

Pronunciation Practice CD-07

1. Listen and repeat the following sentences. Underline the words that are stressed.

i) Today I'll show you some important parts of a car.

ii) They are made of rubber and are filled with air.

iii) It protects you in case of an accident.

2. Listen and repeat the sentences again. Pay special attention to the linking of the words. CD-08

i) Today I'll show you some important parts of a car.

ii) They are made of rubber and are filled with air.

iii) It protects you in case of an accident.

3. Listen and compare the underlined sounds. Then repeat. CD-09

en**gine** /dʒən/ limou**sine** /ziːn/ clo**thing** /ðɪŋ/

UNIT 2

Precisely Speaking

Model Presentation 2

CD-10

"The International Space Station"

Let's practice the following presentation.

Slide 1

1

The International Space Station

Jiro Maeda
Tozai University
School of Engineering
Department of Electronics and Communication Engineering

jiro@tozai.ac.jp

Opening—Greeting
Good morning. I'm Jiro Maeda.

Slide 2

2

Introduction—What is the ISS?

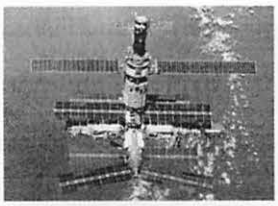
- Research facility in space
- Joint project
  —16 countries (11 from the ESA)

Introduction
Do you know anything about the International Space Station? When completed, it will appear as the third brightest object in the sky. The ISS is a research facility involving 16 nations, including Japan and the 11 nations of the European Space Agency.

Slide 3

Measurements

- Weight—450,000 kg
- Dimensions—108.5 m × 88.4 m × 43.6 m



Body (1)
It will weigh around **450,000 kilograms** and will measure **108.5 meters in width**, **88.4 meters in length** and **43.6 meters in height**

Slide 4

Description

- Solar panels—4,000 m^2
- 6 laboratories
- 7 astronauts
- Pressurized modules—1,303 m^3

Body (2)
Over **4,000 square meters** of solar array pa will provide electrical power to six state-of- art laboratories. The ISS will support up to seven astronauts in a shirtsleeve environme of **1,303 cubic meters**.

Slide 5

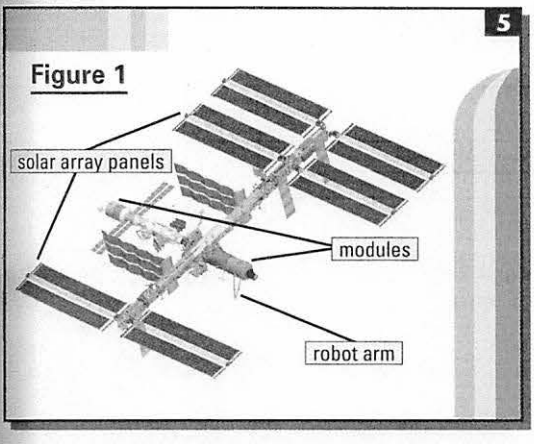
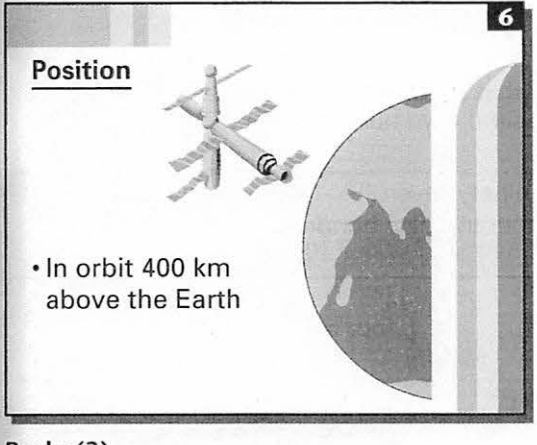


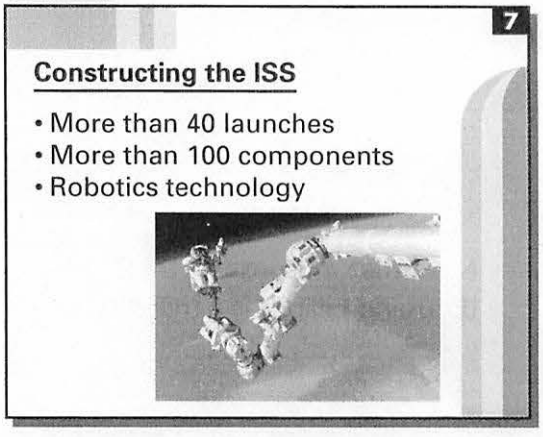
Figure 1

Slide 6



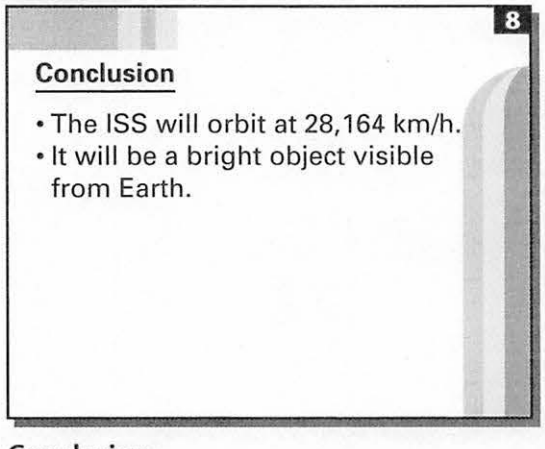
Body (3)
It will be in orbit **400 kilometers** above the Earth's surface.

Slide 7



Body (4)
Constructing the ISS will require more than **40** launches of space vehicles, which will deliver more than **100** components. The astronauts will need to make thousands of hours of space walks to assemble these components, although they will be assisted by robotics technology.

Slide 8



Conclusion
Within the first decade of this century, the ISS will be orbiting the Earth at a speed of **28,164 kilometers per hour**. Because of its brightness and the nature of its orbit, it will be visible to nearly all of the people on Earth.

Closing—Thanks
Thank you.

NOTES

solar array panels「太陽電池パネル」 **state-of-the-art**「最新式の」 **shirtsleeve environment**「シャツ1枚で過ごせるほど暖かい環境」 **astronaut**「宇宙飛行士」 **assemble**「組み立てる」 **robotics technology**「ロボット工学の技術」 **visible**「目に見える」

Useful Words & Phrases

■ Numbering & Counting

The following categories are used for numbers:

ones	tens	hundreds	thousands	millions	billions	trillions	quadrillions
1	10	10^2	10^3	10^6	10^9	10^{12}	10^{15}

Note that a thousand thousands is a million, a thousand millions is a billion and a thousand billions is a trillion.

Exercise A

How do you say these numbers? Fill in the blanks.

1	1,214	[1]] thousand, [2]] hundred and [3]]
2	11,204	eleven [4]], two [5]] and four
3	147,312	one [6]] and forty-seven thousand, [7]] hundred and [8]]
4	2,257,091	two [9]], two hundred and fifty-seven [10]], and ninety-one
5	94,678,258 km/hr	[11]] million, six [12]] and seventy-eight thousand, two hundred and fifty-eight kilometers per [13]]
6	605,968,210 m^2	six hundred and [14]] million, [15]] hundred and sixty-eight thousand, two hundred and ten [16]] meters
7	397,435,510 m/s	three hundred and ninety-seven [17]], four hundred and [18]] thousand, five hundred and [19]] meters per [20]]
8	120,798,419,000 m^3	one hundred and [21]] [22]], seven hundred and ninety-eight [23]], four hundred and nineteen thousand [24]] meters
9	1879	Einstein was born in [25]] [26]]
10	81-49-239-1045	For more information, please call the Research Center at [27]] one, dash, four nine, dash, two three [28]], dash, one zero [29]] [30]]

Exercise B

CD-11

Listen and check your answers. Then work with a partner. Take turns in saying the numbers.

Exercise C

CD-12

Listen and complete the table.

	Symbols	Words
1	x^2	x [1]]
	x^3	x [2]]
2	x^n	x to the [3]] of n
3	x^{-6}	x to the power of [4]] 6
4	$\sqrt{xy}$	the square [5]] of x times y
	$\sqrt[3]{xy}$	the [6]] root of x times y
5	a - b = d	a minus b [7]] d
6	a/b = f	a [8]] b equals f
7	(a-b) (a+b) = y	a minus b in brackets [9]] a [10]] b in brackets equals y
8	$\Sigma = (T+P)^2 - (c+e)^3$	[11]] equals [12]] brackets T plus P [13]] brackets [14]] squared minus [15]] brackets c plus e [16]] brackets all cubed
9	$x \propto y$	x is [17]] to y
10	$x \propto 1/y$	x is inversely [18]] to y

Exercise D

Write the following equations using symbols.

1. x squared equals 27y

_____

2. x to the power of 4 equals y over 12

_____

3. the square root of 144 equals 12

_____

4. open brackets, a plus b, close brackets, all squared equals 49

_____