

What This Means Is . . .



Model Presentation 6



CD-33

"The Ruby Laser"

Let's practice the following presentation.

Slide 1

1

A Ruby Laser

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Opening—Greeting


Good morning. I'm Eiichi Yumoto. I'm a freshman at Tozai University.

Slide 2

2

Introduction

- What is a ruby laser?
- Lasers are widely used in technology.
- How does it work?



Introduction

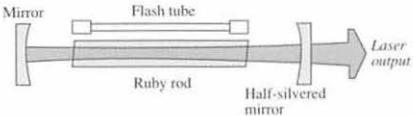
A laser is a device **that** produces coherent, amplified light. Lasers are widely used in technology because of this property. Today, I'll explain the mechanism of a ruby laser, the first laser ever developed.

Slide 3

3

Components

- Flash tube
- Ruby rod
- Mirror
- Half-silvered mirror



Body (1)

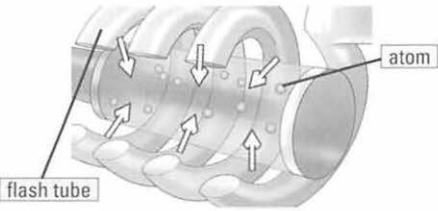
It consists of a flash tube, a ruby rod, one regular mirror and one half-silvered mirror.

Slide 4

4

Mechanism 1

- Light stimulates atoms.
- Atoms reach high energy levels.



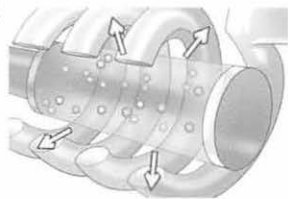
Body (2)

Initially, the flash tube fires and bathes the ruby rod in light. This light stimulates the atoms in the ruby rod and brings them to high energy levels.

Slide 5

Mechanism 2

- Atoms return to low energy levels.
- Excess energy released as photons

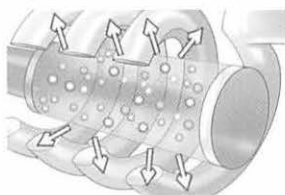
**Body (3)**

When the electrons in these excited atoms return to their previous, low-energy state, they release their excess energy as photons.

Slide 6

Mechanism 3

- Reflecting back and forth
- The more excited atoms, the more photons.

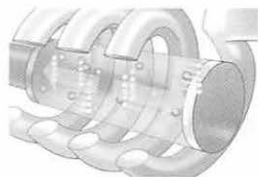
**Body (4)**

As some of these photons reflect back and forth between the mirrors, they pass through the ruby crystal and stimulate more atoms. These atoms in turn emit their excess energy as photons.

Slide 7

Mechanism 4

- Many photons with the same wavelength
- The light is coherent and amplified.

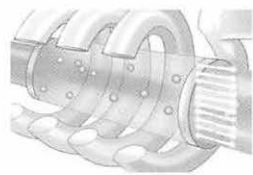
**Body (5)**

Very quickly, there are many photons in the tube, each with an identical wavelength. As a result, the light inside the laser is coherent and amplified.

Slide 8

Mechanism 5 & conclusion

- Some photons pass through the half-silvered mirror at the end of the laser. → Laser light is created.
- The laser is an amazing device.

**Conclusion**

While the photons bounce between the mirrors, some pass through the half-silvered mirror at the end. This is a laser beam. The laser is used in communications, in industry and in medicine since it is such an amazing device.

Closing—Thanks

Thank you.

NOTES

property 「特性」 ruby laser 「ルビーレーザー（最初に発明されたレーザーとされる）」
 flash tube 「閃光管」 half-silvered mirror 「半反射鏡」 stimulate 「刺激する」
 excited atom 「励起原子」 photon 「光子」 emit 「放出する」 wavelength 「波長」
 coherent 「干渉性の」 amplify 「増幅する」 bounce 「跳ね返る」



Useful Words & Phrases

■ Defining

Defining an object using a dictionary-style definition

Example 1

"A laser is a device that produces coherent amplified light."

subject/topic

broad definition

additional details

Defining an object by listing its components

Example 2

"A ruby laser consists of a flash tube, a ruby rod, one mirror and one half-silvered mirror."

subject/topic

components

Exercise A

Use the table below to make definitions. Use Example 1 (above) as a model.

| | Subject / Topic | Broad definition | Additional details |
|---|-----------------|--------------------|--|
| 1 | space station | structure in space | designed to be occupied for long periods |
| 2 | engineer | person | trained in practical science |
| 3 | bridge | structure | carries a pathway or roadway over a depression or obstacle |

1. _____

2. _____

3. _____

Exercise B

Use the table below to make definitions. Use Example 2 (above) as a model.

| | Subject / Topic | Components |
|---|-----------------|--|
| 1 | solar car | engine, solar panels, body, three or more tires |
| 2 | solar system | sun, eight planets, other objects that orbit the sun |
| 3 | atom | nucleus, one or more electrons |

1. _____

2. _____

3. _____

Exercise C



Listen and make sentences from the following scrambled words and phrases. Begin the first word in each sentence with a capital letter.

1. is / a / disc / 1.2-millimeter-thick / plastic / a CD / .
2. a CD / a laser / encoded data / that / are / carries / read / by / .
3. and lands / a CD data track / of / pits / consists / .
4. that / is / the way / a laser / that / energized atoms / a device / release / photons / controls / .
5. of / a flash tube, / CO₂ gas and / a CO₂ laser / consists / two mirrors / .

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

NOTES

encoded data 「符号化したデータ」 pit 「ピット (CD 基板上的くぼみの部分)」
land 「ランド (ピット以外の平面部分)」 energized atom 「励起原子 (= excited atom)」



Language Skills

Listening Practice



Listen to the presentation on CD technology, and fill in the following transcript.

CDs are very common today. They became popular in the mid-1980s and are now used for storing music, data and software.

In your book there are four illustrations.

Please look at Illustration 1. This shows a

1) _____ of a CD. A CD is a 2) _____

plastic disc with a 3) _____ track stamped

on it. This plastic disc consists of four layers. On top of the

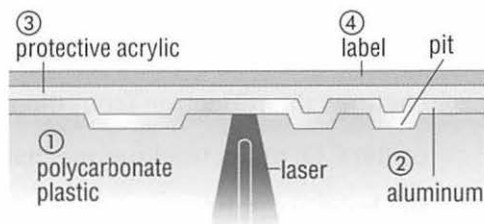
stamped plastic (①) is a very thin 4) _____ of aluminum

(②). Then there is a protective layer of acrylic plastic (③) that

was sprayed over the 5) _____. Finally, a label (④) was

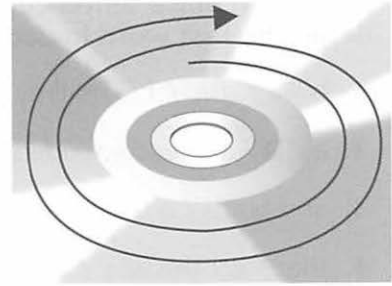
printed on the acrylic after it dried.

Illustration 1
Cross-section of a CD



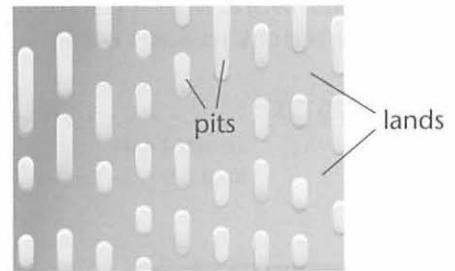
Now please look at Illustration 2. This illustration represents the data track. The data track carries the encoded information of the CD. As I just mentioned, the data track is stamped on the surface of the CD disc. It is a long spiral that starts at the center of the disc and goes to the outer edge.

Illustration 2
Data track of a CD



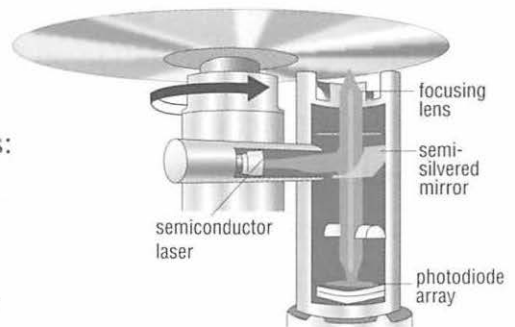
Now look at Illustration 3. This close-up view shows how the data track carries encoded information. Pits are small rectangular indentations that are pressed into the plastic during the stamping stage. The pits are 0.5 microns wide and at least 0.83 microns long.

Illustration 3
CD surface magnified



So, how does the CD player get data or music information from the data track? Look at Illustration 4. This illustration shows a CD drive. The CD drive is the engine of a CD player. A CD drive consists of three components: a drive motor that spins the disc, a laser lens system that shines onto the data track and captures the reflection from the aluminum layer of the CD, and a tracking mechanism that moves the laser assembly.

Illustration 4
CD drive



NOTES

.....

cross-section 「横断面」 **stamp** 「刻印する」 **layer** 「層」 **label** 「ラベル, レーベル」
indentation 「くぼみ」 **stamping stage** 「打ち抜き (プレス) 加工段階」 **tracking mechanism** 「トラッキングメカニズム」 **laser assembly** 「レーザーアセンブリ」 **photodiode array** 「フォトダイオード (感光性半導体素子) アレイ」

Homework

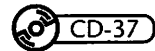
Make an outline of the body of this presentation. Use one slide for each illustration.

- Key: ① Cross-section of a CD – thin plastic disc, four layers
 ② Data track of a CD – encoded, spiral, from the center to the outer
 ③ CD surface magnified – pits / lands
 ④ CD drive – engine, three components

Pronunciation Practice

1. Listen. Mark the pauses in each sentence. Use slashes (/) to show the pauses. Then repeat the sentences. Be sure to make appropriate pauses.
 - i) It is a long spiral that starts at the center of the disc and goes to the outer edge.
 - ii) A CD drive consists of three components: a drive motor that spins the disc, a laser lens system that shines onto the data track and captures the reflection from the aluminum layer of the CD, and a tracking mechanism that moves the laser assembly.

2. Listen and repeat. Pay special attention to the underlined parts.



- i) This plastic disc consists of four layers.
- ii) How does the CD player get data or music information from the data track?
- iii) Finally, a label was printed on the acrylic after it dried.

First, Be Sure to . . .


Model Presentation 7


CD-38

“Music and Plant Growth”

Let's practice the following presentation.

Slide 1

1

Music and Plant Growth

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Opening—Greeting


Hello. My name is Yukiko Kawai. I'm a student at Tozai University.

Slide 2

2

Introduction

- Does music affect plant growth?



Introduction


Do you think that there is any causal relation between music and the growth of plants? We did an experiment to determine if music affects the growth of plants, and I'd like to talk about it here today.

Slide 3

3

Equipment

- Six pots of soil
- Three packages of radish seeds
- Two CD players



Body (1)


The things you will need for the experiment are six pots of soil, three packages of radish seeds and two CD players.

Slide 4

4

Method ①

- Plant five radish seeds in each pot.
- Place two pots in each of three different rooms with different conditions.



Body (2)

Five radish seeds are planted in each of the six pots of soil, and then two pots are placed in each of three different rooms, under different conditions.

Slide 5

Method ②

- Measure the heights of the radish plants in each room.
- Record once a week over four weeks.
- Plot the results on a graph.

5

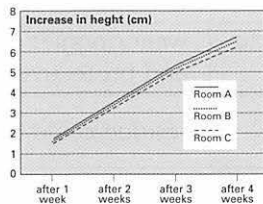
Body (3)

The heights of the radish plants in each room are measured and recorded once a week over a four-week period. All the results are plotted on graph paper.

Slide 6

Results

- Radish plants respond to music by growing at a faster rate.
- Plants prefer more hours of music.



6

Body (4)

Finally, we found that radish plants respond to music by growing at a faster rate. Our experiment also indicated that plants prefer more hours of music per day.

Slide 7

Conclusion

- We need to . . .
- repeat the experiment, controlling the level of light.
 - repeat the experiment with different types of plants.

7

Conclusion

In conclusion, we need to repeat the experiment and control the level of light that the plants receive. In our experiment the plants may have received different amounts of light. We could also repeat the experiment with different types of plants to see how they respond to music.

Closing—Thanks

Thank you very much.

NOTES

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 determine if . . . 「…かどうかを決定（判断）する」 **plot** 「(グラフ上に) 点を書く」



■ Instructing

When you give instructions, it is important for the listener to know what is to be done (purpose), how it is to be done (method), and why it is to be done (reason). Often, the reason does not need to be explicitly stated.

Instructions = purpose + method (+ a stated reason)

| | Purpose | Method |
|---|---------------------|-----------------------------|
| 1 | to heat the mixture | use a Bunsen burner |
| 2 | to heat the mixture | a Bunsen burner can be used |

1. To heat the mixture, use a Bunsen burner.
2. A Bunsen burner can be used to heat the mixture.

Exercise A

Use the table below. Make instructions in the format [method + purpose + additional info]. Only the second sentences are given.

| | Purpose | Method | Additional info |
|---|--------------------------------|--|--|
| 1 | to report a fire | use the red switch | the switch is behind a glass cover |
| 2 | to put out a fire | just point and shoot the fire extinguisher | the foam will cover a large area |
| 3 | to help prevent accidents | consider all chemicals to be dangerous | wear goggles or safety glasses and protective clothing |
| 4 | to remove any chemical residue | wash all equipment thoroughly | residue could be hazardous |

1. _____ . It is behind a glass cover.
2. _____ . The foam will cover a large area.
3. _____ . Wear goggles or safety glasses and protective clothing whenever handling chemicals.
4. _____ . The residue could be hazardous.

NOTES
residue 「残留物」

Exercise B

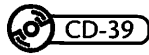
Read the following paragraph carefully, then fill in the blanks to write a set of five direct instructions.

Five different types of plant seeds are planted in each of the six pots of soil. Then, each set of two pots is exposed to different levels of light. The heights of the plants in each room are measured and recorded once a week for four weeks. All the results are plotted on graph paper. Finally, all the data is analyzed.

1. ¹⁾_____ five different types of ²⁾_____ ³⁾_____ in each of the six pots of soil.
2. Expose each set of two pots to ⁴⁾_____ ⁵⁾_____ of light.
3. ⁶⁾_____ and ⁷⁾_____ the heights of the plants ⁸⁾_____ a week for four weeks.
4. ⁹⁾_____ the ¹⁰⁾_____ on graph paper.
5. ¹¹⁾_____ the ¹²⁾_____.



Listening Practice



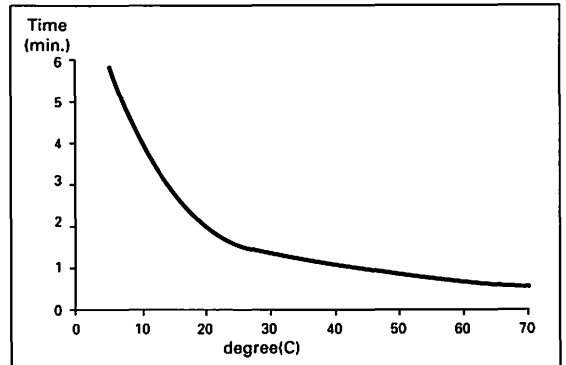
Listen to the instruction for an experiment, and fill in the following transcript.

The purpose of this experiment is to determine how temperature affects the time it takes an antacid tablet to dissolve in water. You will need the following equipment for the experiment: 1) a beaker, 2) a thermometer, 3) a stopwatch, 4) three antacid tablets, 5) hot water and 6) ice water.

First, fill the beaker with water from the tap. ¹⁾_____ the thermometer to measure the temperature of the water. Record the temperature. Now, ²⁾_____ one antacid tablet into the water. Use the stopwatch to time how long it takes for the antacid tablet to dissolve completely. ³⁾_____ this time. Repeat the experiment, this time, using a beaker of hot water. Then, ⁴⁾_____ the experiment one more time using a beaker of ice water. Plot your results on graph paper. ⁵⁾_____ the temperature on the horizontal, or x, axis. Plot the time on the vertical, or y, axis. You can use a large dot to mark each result. Finally, draw a smooth curve through the three marks.

Let's look at the results. The line shows how the time needed for dissolving the tablet depends on the temperature of the water.

From our results, we can reasonably conclude that antacids dissolve more quickly in hot water than in cold water.



NOTES
antacid tablet 「制酸剤」

Homework

Make an outline of the body of this presentation. Use four slides.

Key: ① Equipment ② Method (1) ③ Method (2) ④ Results



"Pinhole Camera Photography"

Let's practice the following presentation.

Slide 1

1

Pinhole Camera Photography

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Opening—Greeting

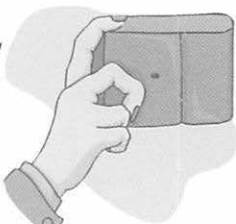
Hello. I'm Ayako Yasuda.

Slide 2

2

Introduction

- Photographs made with a pinhole camera can be very artistic.
- Do you know how to use this type of camera?



Introduction


Are you interested in photography? Do you know that photographs made with a pinhole camera can be very artistic? I'll explain how I used a pinhole camera.

Slide 3

3

Preparation

- Load the camera in a darkroom.
- Place it in a lightproof bag.



Body (1)

I loaded my pinhole camera with photographic paper in my darkroom, and then placed the camera in a lightproof bag.

Slide 4

4

Before exposure

- Use beanbags both on and under the camera.
- Stop the camera from wobbling during the long exposure time.

Body (2)

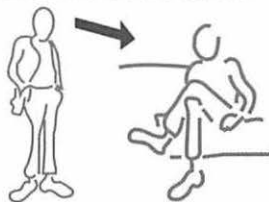
At the location, I placed the camera on top of a beanbag, which stopped the camera from wobbling. **Next**, I put another beanbag on the top of the camera in order to stop the wind from moving the camera during the long exposure time.

Slide 5

5

During exposure

- Leave the pinhole open for two minutes.
- Change positions a few times.

**Body (3)**

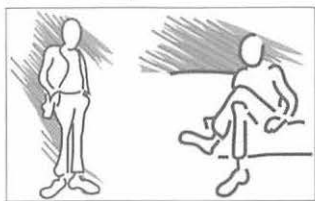
In order to capture movement, I left the pinhole open for two minutes. **After opening** the shutter, I stood in front of the camera for 15 seconds, then changed my position, sat in front for a minute, stood up and replaced the shutter and immediately put back the camera into the lightproof bag.

Slide 6

6

After exposure

- Process the film
- Most objects—very clear
- My image—blurry

**Body (4)**

Finally, I processed the film. Most objects in the photograph are very clear, while the image of me, the photographer, is blurry.

Slide 7

7

Conclusion

- Achieved both objectives:
 1. Take an artistic image
 2. Capture movement

Conclusion

I achieved both my objectives: one, to take an artistic image with a pinhole camera; and two, to capture movement.

Closing—Thanks

Thank you.

NOTES

load a camera with 「カメラに（フィルム等を）装填する，入れる」 photographic paper 「印画紙」
 lightproof 「光を通さない，遮光の」 beanbag 「ビーンバッグ（カメラを安定させるために使う袋状の付属品）」 wobble 「ぐらぐらする」 exposure 「露出，露光」 capture 「とらえる，（カメラに）取る」
 process the film 「フィルムを現像する」 blurry 「ぼやけた，ピンぼけの」



■ Transitions

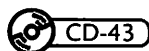
Transitional words help your audience navigate through your presentation. Without transitions, your audience will have to wade across the river and work against the current to follow you. You can instead give your audience a bridge so they can easily stay with you as you travel from point to point.

| | | |
|---|--------------------------|--|
| 1 | To show sequence | first, to begin, then, before, after, after that, following that, next, to continue, as soon as |
| 2 | To show similarity | also, in the same way, just as . . . , likewise, similarly |
| 3 | To show an example | as an illustration, for example, for instance, namely, specifically, one example of . . . , another example of . . . , to illustrate, to demonstrate |
| 4 | To show contrast | but, however, in spite of . . . , nevertheless, nonetheless, notwithstanding, on the other hand, still, yet |
| 5 | To show emphasis | indeed, in fact, of course, truly |
| 6 | To show addition | and, finally, further, furthermore, in addition, lastly, moreover, next, too, what's more |
| 7 | To show cause and effect | accordingly, consequently, hence, so, therefore, thus |

■ Describing

Processes can be described step by step. To do this you first need to identify the key steps of the process. Once the key steps are understood, then the audience can fill in the gaps between these stages.

Exercise A



Listen to how to make a pinhole for a pinhole camera. Fill in the appropriate verbs.

Step 1: ¹⁾ _____ the materials: a pair of strong scissors, a clean aluminum can, a sewing needle and some very fine sandpaper.

Step 2: First, ²⁾ _____ a 5 cm x 5 cm piece of metal from the can.

Step 3: Then, sand the edges of the piece of metal to make it smooth.

Step 4: ³⁾ _____ the needle through the metal. Gently twist it around.

Step 5: Carefully sand around the hole.

Step 6: ⁴⁾_____ steps 4 and 5 a few times until you have a very smooth pinhole that is about half a millimeter in diameter.

Step 7: Wash the metal in running water to ⁵⁾_____ any dirt from the hole.

Exercise B

Complete the passage with these words: glass, inverted, passes, straight, tiny

A pinhole camera can be made from a cereal box. Instead of having a ¹⁾_____ lens to let light into the camera, a ²⁾_____ pinhole is used. The hole is drilled in a piece of aluminum cut from a soda can. Light from an object ³⁾_____ through the pinhole and hits the photographic paper at the back of the camera. As light travels in ⁴⁾_____ lines, the image of the object is ⁵⁾_____.

Exercise C

Complete the instructions below using the following verbs. You will need to change some of the verb forms.

Verbs (base form): arrive, load, put, uncover, wait

(Introduction)

Today, I'm going to tell you how to take a picture using a pinhole camera.

(Body)

1. First, in a darkroom, ¹⁾_____ the film into the camera.
2. Next, make sure that the shutter is covered.
3. Then, ²⁾_____ the camera into a lightproof bag.
4. Take the camera to the place where you will use it.
5. When you ³⁾_____ at the location, take the camera out of the bag.
6. Position the camera on a small beanbag.
7. Then, ⁴⁾_____ the shutter.
8. ⁵⁾_____ at least 30 seconds.
9. Cover the shutter.
10. Put the camera back in the bag.

(Conclusion)

Today, I showed you how to take a photograph using ten simple steps. I think you are now ready to use a pinhole camera yourself.



Listening Practice



The presenter is describing how to load film into a pinhole camera. Listen and fill in the following transcript.

Today I'm going to tell you how to 1) _____ photographic film into your pinhole camera. When you load the photographic film into your camera, you will need to use the darkroom. This is a place where there is no light. Once inside the darkroom, 2) _____ off all the lights except for the safelight. A safelight is a special light that does not affect photographic film. Take the lid off your pinhole camera. Then take one sheet of paper film. Pinhole cameras use black and white photographic paper that is about 13 by 18 centimeters in size. Since this paper is mounted on paper instead of transparent plastic, it is called paper film. Now find the film side of the paper. This is the shiny side, and you will see this with the safelight. Another way to check which is the shiny side is to use your finger and touch the paper. The sticky side is the film side. Gently slide the film into your camera with the film side of the paper toward the pinhole. 3) _____ sure that the center of the paper film is behind the shutter. The shutter is the piece of paper that 4) _____ the pinhole. Finally, 5) _____ the lid back on the camera. Your camera is now ready to take a photograph.

I'll go over these simple steps again. One, open the camera in a darkroom. Two, use a safelight. Three, find the film side of the piece of paper film. Four, slide the film into the camera with the film side facing the shutter. Five, close the camera.

NOTES
safelight 「安全光, 暗室光」 photographic film 「写真用フィルム」

Homework

Make an outline of the body of this presentation. Use at least five slides.

- Key: ① darkroom
- ② safelight
- ③ photographic paper (paper film)
- ④ shutter
- ⑤ lid

Pronunciation Practice

Listen and repeat. Pronounce the underlined parts carefully.

- i) You will need some special photographic paper, a pinhole camera, a safelight and a darkroom.
- ii) Then take one sheet of paper film. / This is the shiny side, and you will see this with the safelight.