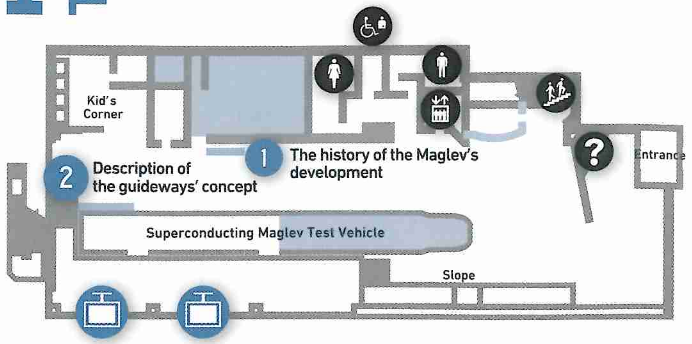
1F



1 The history of the Maglev's development

The history of the Maglev's development

1962	Research on linear motor propulsion railway system begins
1972	ML100 makes the first success in magnetic levitation running at the Japanese National Railways' Railway Technical Research Institute (currently the Railway Technical Research Institute)
December 21, 1979	The first test vehicle ML-500 runs unmanned and records 517km/h. This is the world's fastest speed at the time.
November 1980	Guideways are modified from reversed T-types to U-types. Running tests start with MLU001, a vehicle capable of manned test runs.
February 4, 1987	MLU001 records 400.8 km/h in a manned run
February 24, 1994	MLU002N records 431 km/h in a manned run
January 26, 1995	MLU002N records 411 km/h in a manned run
December 2, 2003	MLX01-2 records 581 km/h in a manned run *World's fastest railway speed at that time
August 29, 2013	The extension work comes to an end, completing the 42.8-km Yamanashi Maglev Test Line. Running tests start on the Yamanashi Maglev Test Line with Series L0, a new rolling stock model aimed for commercial use.
April 21, 2015	Records 603 km/h, the world's fastest manned running speed

Image provided by the Railway Technical Research Institute

*You can watch documentaries of these events on the monitor.

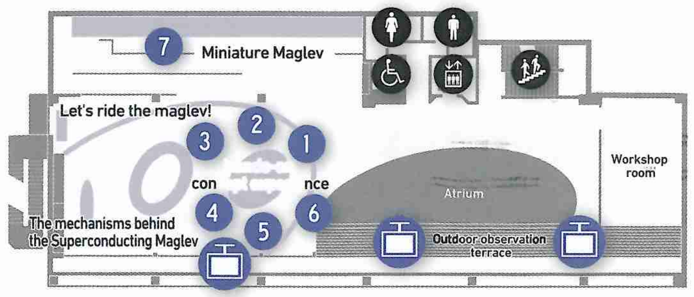
2 Description of the guideways' concept

Superconducting Maglev Test Vehicle

An animated video presents, in an easy-to-understand manner, how the superconducting magnetically-levitated vehicle floats and propels in relation to the guideways.

Length of video: 2 minutes

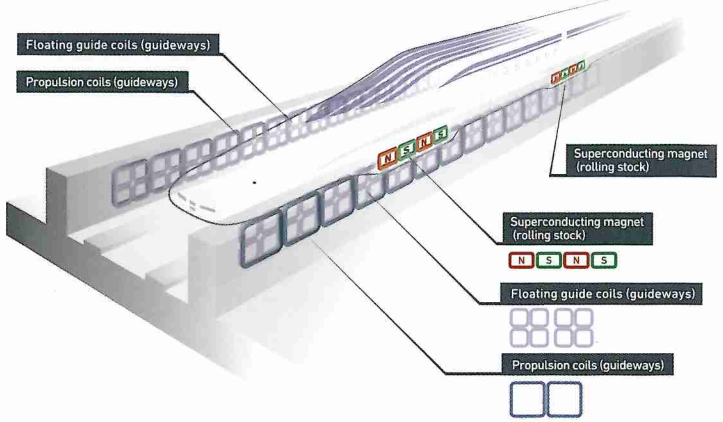
2F



1 The secret of the three coils

Hands-on concept experience

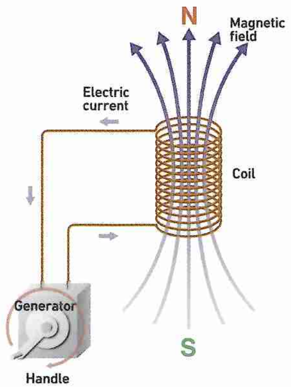
Why can the Superconducting Maglev levitate? Why can it move forward if it's floating in the air? Unravel this mystery while getting hands-on experience!



2 Making magnetic fields with an electric current

Hands-on concept experience

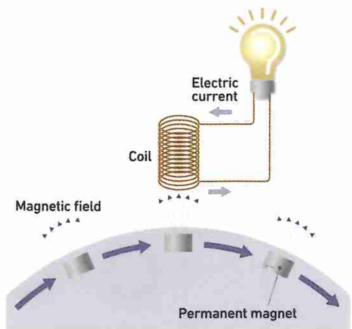
Why can the rolling stock float in the air? Why can it move forward? An electric current and magnetic fields are the key to answering these questions—the former refers to the flow of electricity, and the latter are areas where the magnetic force works. What you see at the center of this device is a cable-wound coil. When an electric current runs through the coil, magnetic fields form around the coil. Magnetic fields are not visible to the human eye, but on this device, you can observe it through the movements of the wires. If you turn the handle quickly, the electric current going through the coil increases, intensifying the magnetic force.



3 Creating an electric current with the magnetic field

Hands-on concept experience

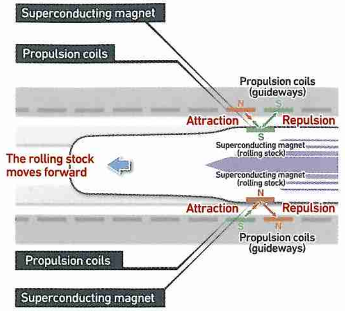
The mechanisms at work here use the opposite phenomenon from what you saw in the previous device. In other words, you can make the electric current run by moving the magnetic field. Four permanent magnets are attached to the device's disk, and there's a coil under the lightbulb. The magnets are arranged so that they pass by the coil, and the lightbulb turns on only when the magnets come near the coil. What's happening here is a phenomenon in which an electric current runs to counter the variation in the magnetic field when the magnetic field—made by the magnets—passes near the coil. The electric current increases in proportion to the magnetic field's changing speed.



4 The mechanism behind the Superconducting Maglev's propulsion

Hands-on concept experience

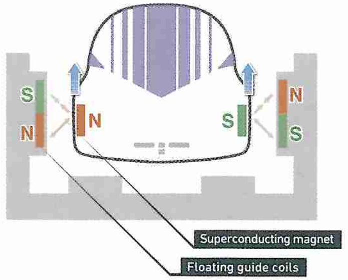
The word linear, as in the term "linear motor," indicates something that moves in a straight line. The circular motor at the top of this device and the linear motor at the bottom have different shapes, but function in the same way. The Superconducting Maglev travels forward by harnessing the force of magnets that work between the propulsion coils (electromagnets), attached to the guideways, and the superconducting magnets stacked on the rolling stock. The superconducting magnets never change their polarities, whereas propulsion coils either turn into north- or south-pole electromagnets as the electric current's running direction switches depending on the position of the rolling stock. Attraction and repulsion forces come into play between the superconducting magnet and the propulsion coils, and this makes the rolling stock move. Once the rolling stock starts moving, the north and south poles of the propulsion coils reverse based on where the vehicle has moved to. The rolling stock repeats this process to travel forward.



5 The concept behind the Superconducting Maglev's levitation

Hands-on concept experience

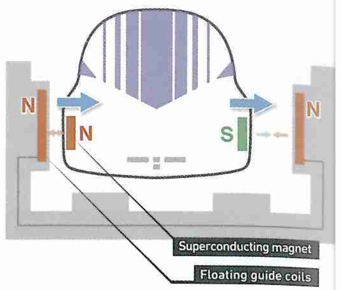
The rolling stock model of this interactive model has strong permanent magnets. Meanwhile, many figure-eight-shaped coils are attached to the transparent circulating drum, simulating the levitating guide coils on the guideways. As you can see, no cable is running through the figure-eight-shaped coils. Turn the transparent drum, and you will witness the same process that takes place when the Superconducting Maglev runs: An electric current going through the levitating guide coils as the rolling stock's powerful magnet passes by those coils, making the levitating guide coils momentarily function as electromagnets. Attraction and repulsion forces work between the rolling stock and these temporary electromagnets, in turn levitating the rolling stock.



6 The mechanism behind the Superconducting Maglev's ability to turn its body

Hands-on concept experience

The high-speed Superconducting Maglev's rolling stock does not touch the guideways; and yet, it can smoothly navigate through curves without hitting the guideways. How can this be possible? Here again, the attraction and repulsion forces between electromagnets come into play. When the Maglev moves away from the guideways' center—coming too close to the guideways' sides, or shifting upward or downward—the levitating guide coils work to push the rolling stock back to its original position. This is a mechanism referred to as the magnetic spring. In the figure to your right, the rolling stock is trying to shift toward the left, but is pushed back to its proper position as the levitating guide coils on the left side turn into north-pole electromagnets.



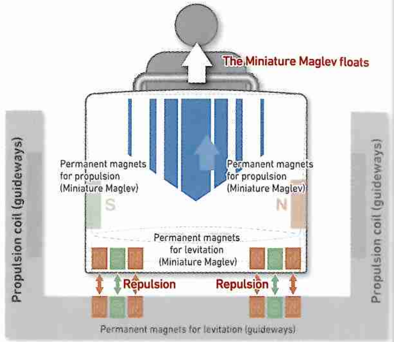
7 The mechanism behind the Miniature Maglev

Miniature Maglev

The Miniature Maglev, available for you to experience here, levitates and carries itself forward by applying the attraction and repulsion forces working between magnets. A real Superconducting Maglev rolling stock is equipped with superconducting magnets, but the Miniature Maglev uses permanent magnets.

The mechanism behind levitation

The Miniature Maglev and its guideways have levitation-geared magnets, placed so that the same poles face each other. Given that magnets with the same polarity repel one another, the Miniature Maglev floats above the guideways.



Running location display monitor

With the running location display monitor set up on each floor, you can see the Maglev's speed, where it's running at the moment, and other information in real time. Announcements will be made through the building's broadcasting system when the Maglev is about to pass the Center. Guests can relax and look around the Center without worrying about missing the Maglev zooming by in front of them.

안녕하세요 你好

A Multilingual Subtitles Service Application
Guide to using UDT Maglev Exhibition Center

1. Downloading UDT Maglev Exhibition Center

Download the free application UDT Maglev Exhibition Center to your mobile device (smartphone or tablet). The application is available for download using the QR codes below.

The application may not function depending on your device's model or your environment. Please be sure to check the application's operation before using it.

Available on the App Store

Requires iOS 11 or later.

GET IT ON Google Play

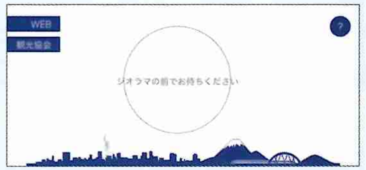
Requires Android 5.0 or later.

2. How to use the UDT Maglev Exhibition Center

1 Download the app, then launch it.

2 When a message is displayed saying "Please wait on this screen", wait for the content you are seeking to be displayed.

3 The video will be displayed simultaneously with subtitle data. Use UDT Maglev Exhibition Center to enjoy exhibit content in various languages.



Standby Screen

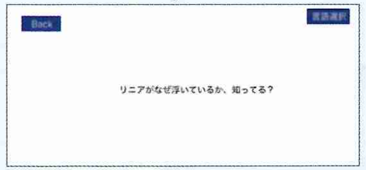
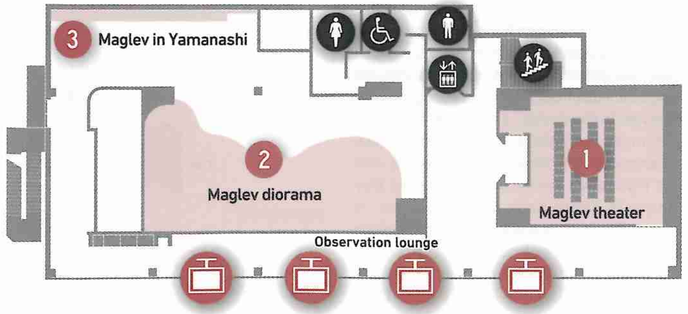


Image of Multilingual Display

Hello 你好 안녕하세요

3F



1 Maglev theater

Subtitles Maglev theater

The Maglev: Reshaping Japan's Future (Around 8 minutes)

This video presents the history of transportation in Yamanashi, along with the benefits and significance of opening the Chuo Shinkansen. Get a taste of what it's like traveling at 500km/h through the sounds and vibrations in the 4D theater.

Showtime	At the top of every hour, and every 12, 24, 36, and 48 minutes past every hour

2 Maglev diorama

Maglev diorama

This is a railway diorama, boasting a length of 17 meters. It represents a future Yamanashi where the Chuo Shinkansen is in service. Conventional railways zoom through the diorama, not to mention the Superconducting Maglev.

● Main feature (Shown in alternation with the video presenting diorama scenes)

- Presentation of Yamanashi's four seasons and introduction of tourist attractions (12 minutes)
- Takeda Hishimaru's Adventure in Yamanashi (12 minutes)

  Introduces Yamanashi's sightseeing areas・Takeda Hishimaru—Yamanashi Prefecture's mascot—goes for an adventure through the diorama.

Some of the installed building models look exactly like the ones in real life. There's also moving models including ropeways and amusement park attractions, along with many other fun features.

● Video presenting diorama scenes

- Presentation of many different scenes arranged in the diorama (8 minutes)

*The railway model is closed for the time being.

Showtime	10, 30, and 50 minutes past every hour Final showing at 16:30

3 Maglev running through Yamanashi

Maglev running through Yamanashi

The Chuo Shinkansen's route within Yamanashi Prefecture reaches a total of 83.4 km: 27.1 km above ground and 56.3 km through tunnels. The route's minimum curve radius is 8,000 m, and its maximum grade is 40 per mille*.

*A per-thousand-based unit

Yamanashi Prefectural Maglev Exhibition Center

A Multilingual Subtitles Service App
A Guide to UDT Maglev Exhibition Center

こんにちは Hello

A Multilingual Subtitles Service App
What is UDT?

UDT is an application service that provides synchronized subtitle data for the audio for films and other visual works, eliminating language barriers using smartphones or tablets. By running this application, visitors can view the Center's video content in English, Chinese (simplified), and Korean. Wi-Fi is available at the Center, so visitors can install UDT to their smartphones or other mobile devices and enjoy the Center's exhibition in any of the three available languages.

*The UDT application uses the audio detected by your device's microphone to synchronize with the main video feature. Please be careful not to cover the microphone on your mobile device.

How to connect to Wi-Fi

Choose a network to connect to on your mobile device
*If not automatically detected, please enable Wi-Fi in your device settings.

↓

Choose "**linear-museum**" on the Wi-Fi settings screen

↓

Enter the password posted inside the Center.

UDT-supported content in the Center is marked with icons.