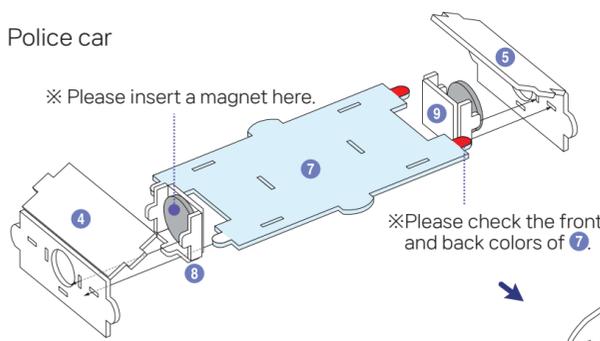


# Instructions

\*Please follow the instructions and assemble the educational kit in the order specified.

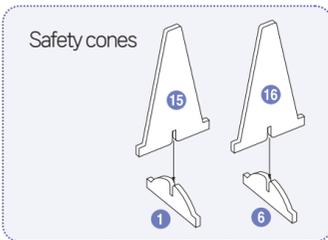
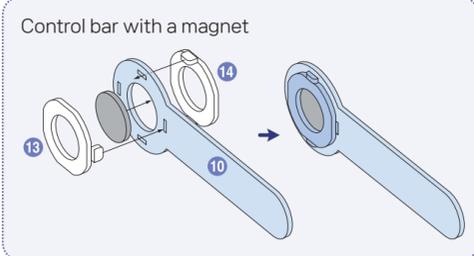
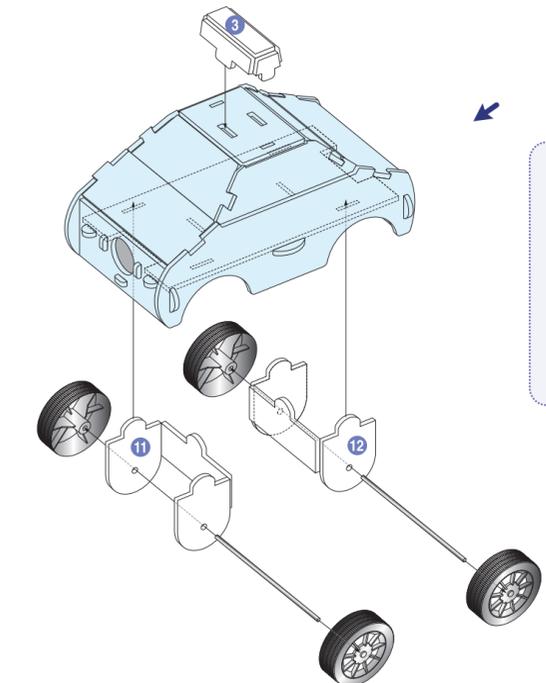
## A Police car

※ Please insert a magnet here.

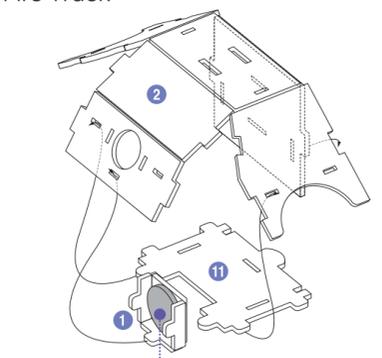


- ※ Please check the contents below.
- Wheels: 8pcs
  - Shafts: 4pcs
  - Circle magnets: 6pcs
- (Please wash your hands after using them, as the magnetic powder may stick to your hands.)

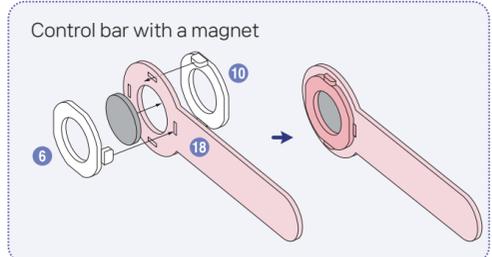
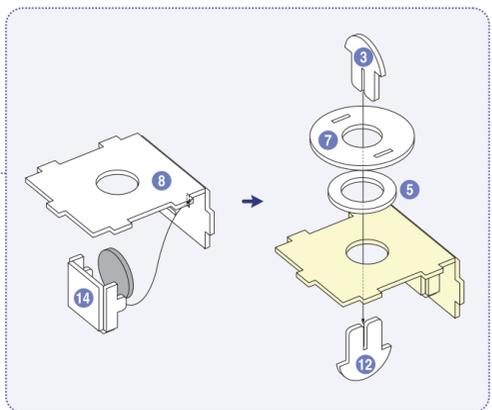
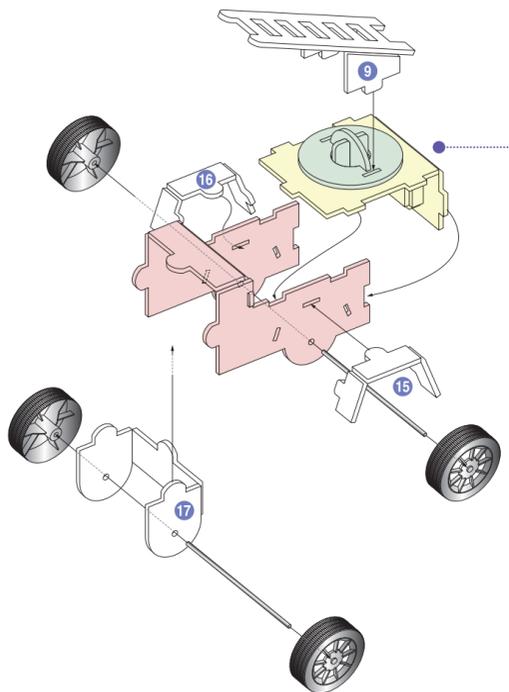
※Please check the front and back colors of 7.



## B Fire Truck



※ Please insert a magnet here.

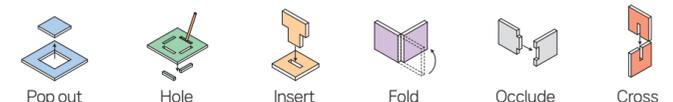


※Instructions  
Do not pop out all the parts at once.  
Please follow the instructions and pop them out one by one in the order specified.

<Caution>  
After assembling the 3D puzzle, please put the small leftover parts in the trash bin. Also, be careful that children do not put the product or plastic packaging in their mouth, nose, or ears.



### How To Make



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Made in Korea

- You can firmly assemble the 3D puzzle without glue or scissors.
- The 3D puzzle is an educational kit designed to enhance problem solving skills and spatial perception.



### Learning Objectives

Be able to investigate the usage of magnets in everyday life and explain how their properties relate to their functions.  
Ages: 8+

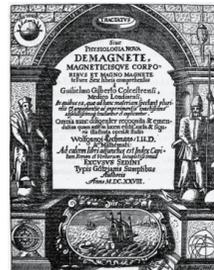


William Gilbert

## Who Am I?

I was born in England in 1544. I served as the personal physician to Queen Elizabeth I and King James VI. Although I was a doctor, I was also a scientist who took an interest in various fields, such as physics, chemistry, and astronomy. But my favorite subject was magnetism. I wrote a book titled "On the Magnet, Magnetick Bodies Also, and on the Great Magnet the Earth a New Physiology, Demonstrated by Many Arguments and Experiments.", which is often referred to as "On The Magnet."

During the period in which I lived, researchers typically followed the methods of the Greek philosopher Aristotle, which I found unscientific. I rejected this approach and believed that only experiments could reveal



William Gilbert's book <On The Magnet>

the true nature of natural phenomena. I conducted experiments on magnets and carefully documented the results in my book. Galileo Galilei, after reading my book, became intrigued by magnetism and conducted experiments based on the methods I described. He referred to me as "the first scientist".

One of my most groundbreaking discoveries was that the Earth is a massive (①). I discovered that the North Pole of the Earth behaves like the S pole, and the South Pole behaves like the N pole and that the North pole of a compass is attracted by the Earth's North Pole, which behaves like the (②) pole, and always points to the (③). Just to avoid any misunderstanding, I must mention that there is no huge bar magnet inside the Earth.

In 585 BC, Thales, the Greek philosopher, observed that rubbing amber (fossilized tree resin) with wool caused it to attract dust, revealing static electricity. From the Greek word 'elektra' for amber, I coined the term 'electricity' to highlight that static electricity and magnetism are different forces. I am often referred to as the father of magnetism.



William Gilbert conducting experiments in front of Queen Elizabeth.

Who am I? (④)

## The Secret of the Compass

### Observing Magnetism I

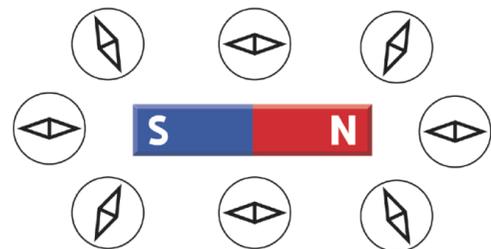
Place two bar magnets as shown in the diagram and bring them closer together gradually. Observe the forces acting between the magnets.

<p>When two magnets are brought closer, they (⑥) each other.</p>	<p>As two magnets come closer, they (⑦) each other.</p>	<p>As two magnets get closer, they (⑧) each other.</p>
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When opposite poles such as the N pole and S pole are brought near, an (⑨) force acts, pulling them together. But when like poles—either two N poles or two S poles—are brought close, a (⑩) force occurs.

### Observing the Compass I

Place a compass next to a bar magnet as shown in the diagram and observe how the needle moves. Color the N pole of the compass in red. (⑩)



Which pole of the magnet does the N pole of the compass point toward? (⑪)

### Thinking Like a Scientist I

Why does the compass always direct towards the north of the Earth? In ancient times, sailors are said to have used a compass to find their direction in the middle of the ocean. The first compass was created in China, and the Chinese compass consisted of a square plate with a ladle-shaped magnet placed on it, with the handle of the ladle pointing south. Later, smaller compasses were created that could be carried around, playing a vital role in the Age of Discovery. The modern compass always points north. Based on the experiments with magnets and compasses, can we figure out why this happens?



Traditional Chinese Compass

North Pole



South Pole

The Earth is a giant magnet. The North Pole of the Earth acts like a (⑫) pole, while the South Pole behaves like the (⑬) pole. Because opposite poles attract, the N pole of the compass always points to the Earth's north.

## The Use of Magnets in Everyday Life

Activity 1 | Follow the assembly instructions to assemble the magnet car models.

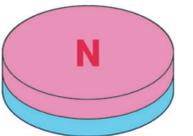
Activity 2 | Look for examples of magnets in everyday objects.

Observe objects around you that use magnets and write down where the magnets are used and what kind of force is acting.

Objects	Use of magnets	Objects	Use of magnets
Crane	⑭	Screwdriver	⑮
Refrigerator Door	⑯	Promotional flyer	⑰

Activity 3 | Race your magnet car

Once you have assembled the car, use the magnet on the stick to move the car forward. What magnetic force should you use? If the magnetic face of the stick is the N pole, what pole will face the car's magnet? Complete the blanks below to figure it out. In a round magnet, the circular faces serve as the poles, with the upper and lower surfaces having different poles.



Round magnet's poles

Magnet car's direction of movement	Force acting between the magnets
<p>Direction of the car's movement →</p>	The magnet in the car and the magnet in the rod (⑱) each other. Consequently, the sides of the rod's magnet and the car's magnet that face each other are (⑲) poles.
<p>Direction of the car's movement →</p>	The car's magnet and the rod's magnet (⑳) each other. Therefore, the facing sides of the rod's magnet and the car's magnet are (㉑) poles.

Correct Answers: ① Earth, ② S, ③ North, ④ William Gilbert, ⑤ Attraction, ⑥ Attract, ⑦ Repel, ⑧ Repel, ⑨ Attraction, ⑩ Attract, ⑪ North, ⑫ S, ⑬ S, ⑭ Attraction, ⑮ Repel, ⑯ Attraction, ⑰ Repel, ⑱ Attraction, ⑲ Attract, ⑳ Repel, ㉑ Repel.

