

# Maglev train

## Tuning-in

### Task 1

Study this diagram of a Maglev train. What differences can you note between this and a conventional train?



### Task 2

Now scan the following text quickly to check how many of the differences you have noted are mentioned. Add any other differences you find to your list.

#### **Magnetic levitation train**

A MAGLEV (magnetic levitation) train does not run along a track in the normal way. Instead, magnetic fields lift it above the track, so that the train 'floats' along.

Because they have no wheels, axles, suspension, dampers, or  
5 brakes, Maglev vehicles are light and compact. They are also pollution-free, as no fuel is burned within the train, and cheap to maintain.

The Maglev system at Birmingham Airport carries passengers from the terminal to the railway station and the National Exhibition  
10 Centre. The cars are made of lightweight fibreglass, carried on an aluminium chassis.

All the electrical equipment which powers the cars is situated under the floors or the seats. Each car can take 32 passengers and their luggage, up to a weight of 3 tonnes. The trains travel at a maximum speed of 42 km/h.

A concrete guideway above the ground supports a T-shaped track for the two-car Maglev trains. The train is lifted from the track by magnetic attraction. This is the force by which two opposite magnetic poles attract each other (just as two of the same poles repel each other). Powerful electromagnets at each corner of the train exert a pulling force which lifts the train upwards so that it floats 15 mm above the track.

As people get on and off, the weight of the train varies. It may drop closer to the track than the required 15 mm, or rise further from it.

To keep it at an even distance from the track, the force is varied by a microprocessor.

Each train is driven by an electric motor called a linear induction motor. Electromagnetic windings, or coils, on the train generate a magnetic field in which the magnetic poles shift along the train.

The field induces electric current in the track, which in turn generates its own magnetic field. The two fields in the track and the train interact so that the shifting field pulls the floating train along the track.

Source: 'Inside out: Magnetic levitation train', *Education Guardian*

### Reading 1 *Inferring*

#### Task 3

Make a list of the advantages of the Maglev train. You may use the text to help you.

#### Advantages

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_
- 5 \_\_\_\_\_
- 6 \_\_\_\_\_
- 7 \_\_\_\_\_

#### Task 4

Now list the disadvantages. You may use the text to help you.

#### Disadvantages

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_
- 5 \_\_\_\_\_
- 6 \_\_\_\_\_