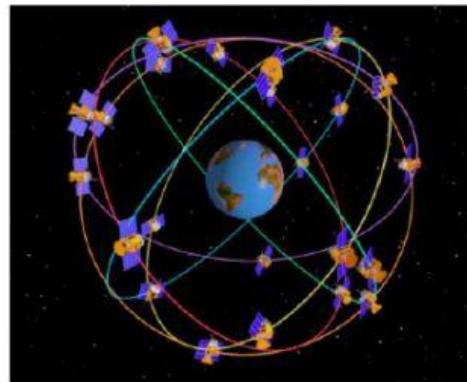


## Where on earth are we?

### 1/ Match the positioning systems to their countries

GPS	China
GLONASS	Europe
Galileo	India
IRNSS	Russia
BeiDou	USA



### 2/ How do satellite positioning systems work? Drag the words to their places to complete the text.

A satellite navigation or satnav system is a system that uses \_\_\_\_\_ to provide autonomous geo-spatial positioning. It allows small \_\_\_\_\_ receivers to determine their location (longitude, \_\_\_\_\_, and altitude/elevation) to high precision (within a few centimeters to metres) using time signals transmitted by \_\_\_\_\_ from satellites. It works by \_\_\_\_\_ the time needed for the signals to reach the receivers. The system can be used for providing position, navigation or for \_\_\_\_\_ the position of something fitted with a receiver. The signals also allow the electronic receiver to calculate the current local time to high \_\_\_\_\_. Satnav systems operate independently of telephonic or \_\_\_\_\_ reception.

calculating      electronic      internet      latitude

precision      radio      satellites      tracking

### 3/ Watch the video. Decide, whether the sentences are true (T) or false (F).

1. Satellite navigation is not used by ships.
2. GPS stands for Geographical Positioning System.
3. Galileo started its services in 2016.
4. It consists of 32 satellites.
5. Galileo can cooperate with other systems.
6. All satellite systems are operated by military services.
7. Galileo can be used for commercial applications.

**4/ Guess the correct answers. Then watch the video (from 0:35 to 3:20) and check.**

1. The receiver on Earth needs to receive signals from \_\_\_\_ satellites at once.
2. Each Galileo spacecraft has \_\_\_\_ atomic clocks.
3. The passive hydrogen maser works with the accuracy of 1 second in \_\_\_\_ million years.
4. The accuracy of rubidium clock is \_\_\_\_ seconds in a million years.
5. The error of 1 second in timing would equal to positioning mistake of \_\_\_\_ thousand kilometres.
6. The satellite travel from the temperatures of + hundreds degrees Celsius to - \_\_\_\_ degrees.
7. Galileo system has \_\_\_\_ control centres around Europe.

(note: The headquarters of Galileo are in Prague.)

**5/ What services does Galileo offer? Listen and fill in the words.**



Galileo tracks anything that moves by road, rail, air and at \_\_\_\_\_ and offers new services for all types of needs.

The **open service** provides \_\_\_\_\_ accuracy and robustness in complex environments like cities.

The **commercial service** delivers authentication and high accuracy \_\_\_\_\_ applications.

The **search-and-rescue channel** \_\_\_\_\_ people in distress and leads first responders.

The public regulated service **encrypted channel** \_\_\_\_\_ greater and safer availability.