

# NAMAZU CHALLENGE 2018 - 2019



*The Namazu challenge is a fun competition between schools that allows you to get acquainted with seismology, and in particular this year, with the planet Mars, that the INSIGHT mission will explore! The challenge is open rather to classes from grade 8 to grade 10 ... but everyone can compete.*

*Episode 1 – Questions issued on 10/09/18 ; answers due on or before the 04/11/2018 to [namazu@geoazur.unice.fr](mailto:namazu@geoazur.unice.fr)*

## **Part I. Discovering InSight.**

The first part of this questionnaire will help you to discover the InSight Mission that will allow us to explore the planet Mars and to have fun with a multitude of scientific challenges throughout the school year.

Find the correct answer to each of the following questions.



for each correct answer

1. What are the goals of the InSight Mission ?
  - Study of the internal structure of Mars
  - Study of solar radiation
  - Study of the movement of the moon
  
2. What nickname is often given to the planet Mars ?
  - The red planet
  - The yellow planet
  - The blue planet
  
3. Which planet has the smallest diameter, Earth or Mars ?
  - Earth
  - Mars
  - The diameter is the same
  
4. The InSight Mission was/will be launched on :
  - 5 May 2019
  - 26 October 2019
  - It has already been launched
  - The date is yet to be set
  
5. Launch of the InSight mission took place or will take place :
  - in Kourou in French Guiana
  - in Houston on the East Coast of the United States
  - at the Vandenberg military base in California
  - in Baikonur in Russia

6. Where exactly will InSight be placed ?
  - Elysium Planitia
  - Mont Olympe
  - Tharsis Montes
  - Uranus Patera
  
7. The InSight mission includes scientists from many countries. In the following list, however, there is a nationality that is not present in this mission:
  - American
  - French
  - Danish
  - Japanese
  
8. What is the distance between Earth and Mars ?
  - 76 thousand kilometers
  - 56 million kilometers
  - It varies over time
  - 400 million kilometers
  
9. The planet Mars
  - Does not have natural satellites
  - like the Earth a natural satellite
  - two known natural satellites
  - like Jupiter four known satellites
  
10. The landing on Mars is difficult because:
  - There are many clouds and acid rain
  - There is very little atmosphere
  - There are very violent windstorms
  - There is like Venus a very dense atmosphere

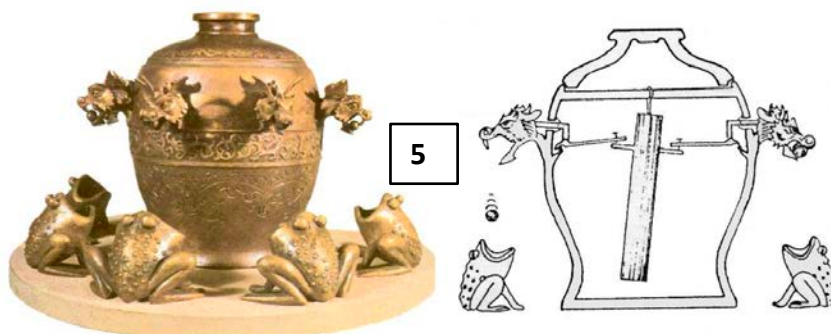
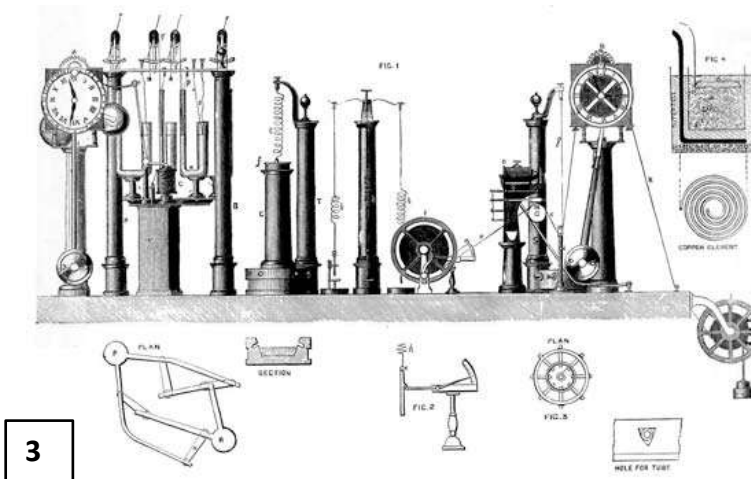
## Part II – Seismometers - throughout History - and mine !

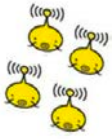
A seismometer named SEIS is embarked on the InSight Mission. (<https://mars.nasa.gov/insight/mission/instruments/seis/>). Although this device is ultra modern, evidence of the study of earthquakes and the creation of seismometers dates back many centuries.



### Question 2.1

Below are photographs of seismometers that made a significant impression in their time. Over to you to discover their inventor and date of creation :





## Question 2.2

### JUNIOR level

Drawing inspiration from the models invented throughout the course of history and/or using your own ingenuity, create a seismometer capable of recording vertical movements of the ground.

### EXPERT level

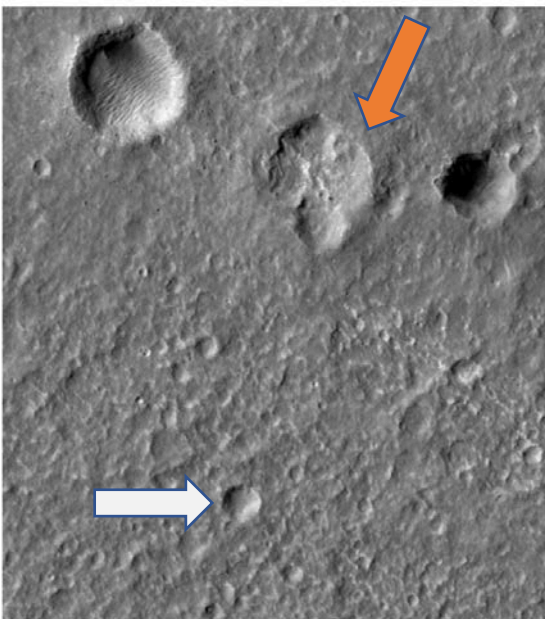
Drawing inspiration from the models invented throughout the course of history and/or using your own ingenuity, create a seismometer capable of recording both vertical and horizontal movements of the ground.

**For this question, you will need to record your seismometer in action and explain how it works.**

The video will have to be deposited on a site of transfer of files of which you will provide the link.

## **Part III - Comparing the InSight Landing Area to a City Block!**

The image on the left was taken by the Mars Reconnaissance Orbiter's High-Resolution camera. It shows a possible landing area for the InSight mission. The image to the right is a satellite view from GOOGLE Earth of a neighborhood somewhere in the United States. Both images have a width of 400 meters.





**Question 3.1** – How wide are the streets in this neighborhood in meters?



**Question 3.2** – What is the crater diameter indicated by the white arrow in the image?



**Question 3.3** – What is the diameter of the largest crater you can see in the image?



**Question 3.4** - Find the tennis court in the neighborhood. Which crater is about the same size as a tennis court?



**Question 3.5** - Observe the crater indicated by the orange arrow. What is the origin of its form?



**Question 3.6** – The shadows on the craters are different sizes – what are the reasons for this?