



INSTRUCTIONS

How to choose the place for the measurement

Take the measurement in an open area, away from any objects that could cause shadow (trees, lighting, traffic, houses etc). The surface of the ground must be flat and as level as possible.

How to choose the stick (called gnomon) for measuring the shadow

The stick must be straight as possible, without irregularities (ie. a broomstick). This stick is called gnomon after the name of the stick used in sundial that casts the shadow on a surface where is possible to read the time (solar time)

The gnomon must be placed in a perpendicular position with respect to the surrounding ground. It must protrude exactly 100cm above the ground.

All the participants should carefully verify the precision of the watch used for measurements (see [useful resources](#)).

Which values you need for each measurement?

Each participant need to provide the following values for each measurement:

1. **Authors of the measurement** (Name or School or Institutions)
2. **City where the measurement has been taken.** You only need to provide the name of the closest town and his country.
3. **Country where the measurement has been taken.**
4. **Email box of the authors.** Indicate the email of the referent of the project that will be contacted and, eventually, involved in further activities.
5. **Latitude of the place** (in °, ' and ", N or S) You can provide the value of the closest town (or village) to the place of measurement, or use a GPS or use Google Earth to define it more accurately.
6. **Longitude of the place** (in °, ' and ", E or W). You can provide the value of the closest town (or village) to the place of measurement, or use a GPS or use Google Earth to define it more accurately.
7. **Date and Local (civil) time** defined at the exact moment of the measurement and taken with a watch setted on the relative Time Zone of the place (UTC/GMT - Greenwich Mean Time zone). For instance all the Central Europe has the time zone UTC+1).
8. **Daily Saving Time DST** (0 for NO 1, 2 3 ecc for YES) Indicate the presence of the Daily

Saving Time in the place where the measure has been made. To verify the presence of DST check this resource <http://worldtimezone.net/daylight.html>

9. **Length of the shadow** (in cm, mm) Measure the length of the shadow as accurately as possible and taken from the base of the gnomon to the edge of its shadow.
10. **Solar noon.** If possible would be better to make the measure at the Solar Noon. To know the exact time and hour of the Solar Noon of the chosen place, go here <http://www.solar-noon.com/> You have to give the geographic coordinates and the website will show the local (civil) time where the Sun will be at the highest point (culmination) for the given place and day of the year. The website needs the coordinates in decimal form not sexagesimal. To convert the values you can go here (bottom page) <http://zonalandeducation.com/mmts/trigonometryRealms/degMinSec/degMinSec.htm>
11. **Other measures and notes** (further measures with the astrolabe, for instance, or general infos like weather conditions, problems during the measures or other).
12. **Import Google EARTH placemark file**

The first 9 values are compulsory