

The Museum of the History of Science

Discovering the Top Floor Gallery

The Top Floor Gallery shows objects, mainly from the Medieval and Renaissance periods, which make use of mathematical principles to observe or measure the world.

You can use this guide to help you discover what's on display.

1. Many of the objects in this gallery are models showing different ideas about the solar system or the universe.

As you enter you will find an object called an *armillary sphere* immediately in front of you.

What do you think it is meant to show?

It was also designed to be a decorative piece of furniture. In what sort of place might it have been used?

3. Beside the clockwork planetarium are two large globes; a *terrestrial globe* and a *celestial globe*.

What is the difference between them?
Name two constellations you can see.

Why do you think globes like these were so popular?



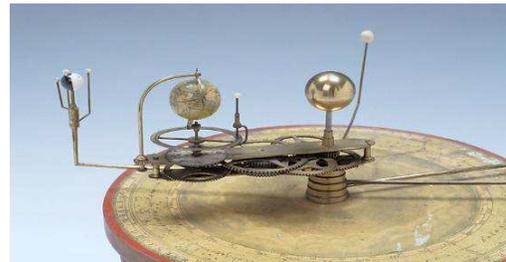
There are different types of *orrery* that show all or part of the solar system

2. Behind this object by the window you will find another impressive piece of furniture which is a clockwork *model of the solar system*, a type of *orrery*, made in about 1758.

How many planets does it show?

Why do you think it doesn't show all of the planets?

How many planets have moons in this model?



A small geared table-top planetarium

4. To the left as you enter is a display called '*Spheres*' in which there are some other examples.

What does '*The world in your pocket*' show (middle shelf)?

Look at '*The clockwork world*' on the bottom shelf.

What do you think the marks on the glass sphere are?

5. On the right as you enter the gallery is a cabinet of '*Astrolabes*'.

Astrolabes are a type of astronomical calculator that were used for time-telling, astronomy, astrology and surveying. They were made by highly skilled craftsmen.

Look at the one on the top shelf by '*The Art of the Astrolabe*'. Can you see the star pointers?

There is also a rotating pointer (the *alidade*) for measuring the height of the sun or a fixed star.

The coordinate grid on the plate underneath only works for places at the same latitude.

Why do you think the '*universal astrolabe*' on the middle shelf has several different plates?

Who do you think might have used this astrolabe?



The museum has a world famous collection of astrolabes.

6. Look at the Italian astrolabe on the bottom shelf. The **Zodiac scale** marks the sun's path during the year.

7. Now find '*The Islamic World*' next to '*Spheres*'.

The spread of Islam from Arabia across North Africa and into Spain brought a lot of mathematical learning, astronomy and literature into Europe during the middle ages.

How can you tell that these objects were used by Muslims?

8. Find '*Sundials*' cabinet.

Before the clock or watch (time-keepers), the **portable sundial** was the most useful time-teller. This cabinet shows some different types of sundial.

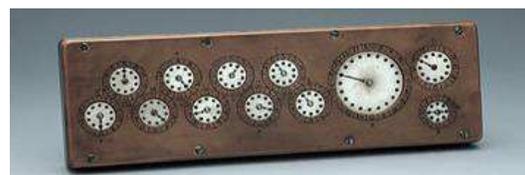
What other instrument is built into some of these sundials to help point them in the right direction?

Sundials often had extra information to make them look impressive. Which one would you choose?

9. Find the '*Calculation*' cabinet opposite '*Sundials*'. Here you will find all sorts of calculators.

Look for the '*Shepherd's tally*'. What do you think this was used for?

Which is the earliest **mechanical** calculator you can see here?



Early English adding machine, c.1780

10. Now cross back over to the '**Measurement**' cabinet. Over time it has become necessary to set a **standard** measure that everyone agrees on.

What example of a standard measure can you see on the bottom shelf?

What was a '**waywiser**' used for?

Look at the **Gunner's** measurement tools on the top shelf. What were the **callipers** used for?

11. Near the '**Measurement**' cabinet is the '**Drawing**' cabinet which shows different drawing instruments from the fifteenth century.

These were important for architects, engineers, surveyors and navigators who used them in making maps, plans and charts.

Find out what the following were used for:

A **compass** (top shelf):

An **ellipsograph** (bottom shelf):

12. Around the edges of the gallery you will find cabinets that show instruments made in different places at different times. They show how instrument-makers took great pride in their craft and had different styles, unlike today's scientific instruments which usually look the same anywhere.

Choose an instrument you like and make a sketch of it in the space below. Take care to show its special features.