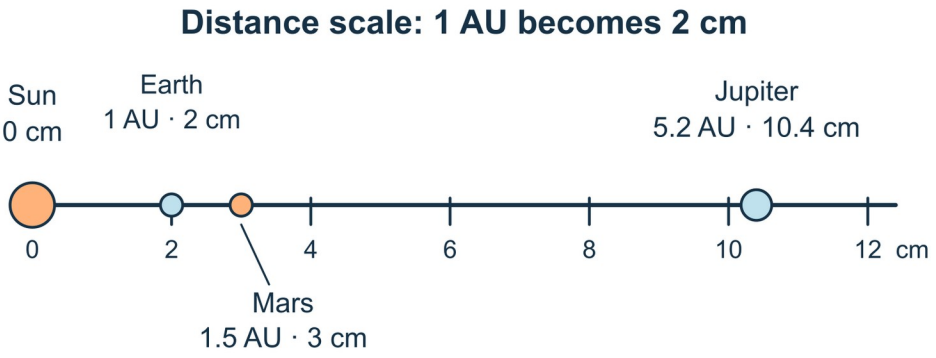
A space map with honest scale labels

Which comparisons can one small Solar System drawing show accurately?

Use rounded orbital-distance values to make a labelled scale line, and show which parts are not to scale.

Make | 15–25 minutes, or one calculation | The supplied example, read or heard, Optional scrap paper and a pen or pencil

Start here Use these rounded average distances from the Sun: Earth 1 AU, Mars 1.5 AU, Jupiter 5.2 AU. Let 1 AU occupy 2 cm on a model line.



One scale for rounded average Sun distances

1 Convert the values

Multiply each supplied AU value by 2: Earth 2 cm, Mars 3 cm and Jupiter 10.4 cm. A labelled sketch is enough if no ruler is available.

2 Place the markers

Start at a Sun reference mark 0. Put each distance marker the calculated distance along a single line. Treat this as a comparison of distances, not a picture of current planet locations.

3 Make simplifications visible

Use readable planet symbols and label ‘symbol sizes not to scale’. The supplied averages are rounded; planets travel around orbits rather than staying in this line.

4 Check one claim

Explain why Jupiter’s marker is farther along than Mars’s. Do not call the 1 cm gap between Earth and Mars markers their actual separation in space.

Worked scale 1 AU becomes 2 cm

This constructed distance line uses rounded NASA average values. It is not an observation of a real alignment.

• Earth: 1 × 2 = 2 cm; Mars: 1.5 × 2 = 3 cm.

• Jupiter: 5.2 × 2 = 10.4 cm from the Sun reference.

• All marks use one distance scale; their symbol sizes and current directions are not represented.

What this example can show The difference between two average Sun-distance markers is not a general Earth-to-planet distance. This line is not a sky chart or an observing instruction.

A different way

Use the printed line and compare labels, or explain just Earth and Mars aloud. A ruler, telescope and outdoor observation are unnecessary.

If you want to go further

Change the distance scale to 1 AU = 1 cm. Predict and calculate all three new positions; keep planet symbol sizes separately labelled.

Something to notice

Which distances share a scale, and which visual details are only symbols?

Read or explore more

Horizon topic Astronomy

https://launchhorizonhq.com/learn/astronomy/

Horizon topic Orbits Solar System

https://launchhorizonhq.com/learn/orbits-solar-system/

Horizon topic Galaxies Cosmic Scale

https://launchhorizonhq.com/learn/galaxies-cosmic-scale/

NASA Science Mars Facts

https://science.nasa.gov/mars/facts/

NASA Science Jupiter Facts

https://science.nasa.gov/jupiter/jupiter-facts/