

The Pocket Telescope

All-included kit for a mini-telescope
Based on the design by Galileo Galilei with 3.5x magnification.

© Klaus Hünig, Andreas Schröer (Revision of English Instructions)

Assembly Instructions

Before commencing, read through all steps carefully. Cut out the parts as accurately as possible using a sharp craft knife and a ruler, or a sharp pair of scissors. Use only standard solvent based all purpose glue, e.g. UHU, Evo-Stik Impact, B&Q Diall All Purpose Glue. Do not use water-based glue : it softens and warps the cardboard.

A round modelling core, 15 mm in diameter (for example the body of a marker pen or a round piece of wood) is needed so the cardboard can be wrapped around it to form a tube. If necessary the diameter of the core can be increased with extra layers of paper. We recommend trying a dry assembly of the parts before applying any glue.

Step 1, Winding the objective holder: Cut out and bend the ends round. Starting with the black printed part facing inwards, wrap around the modelling core and glue together to form a tube of 15 mm in length. Important: The tube should be tight around the core (but should not stick to it) and the edges should be exactly flush so that you get a smooth opening onto which the lens can be glued later. It is easier to first just glue the start of the wrapping and to make sure that the edges are flush before continuing with the rest. If necessary, cut off any rough edges after the glue has set.

Step 2, Winding the eyepiece holder: Follow the same instructions as in Step 1. You get a tube with the same diameter but of 51 mm in length.

Step 3, Winding the objective tube: Fit the two finished tubes onto the modelling core to increase its diameter and then wrap the objective tube around it with the printed side facing outwards. Glue the objective tube together, but make sure it doesn't stick to the objective and eyepiece holders. You now have a tube of 65 mm in

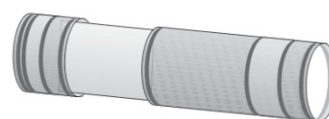
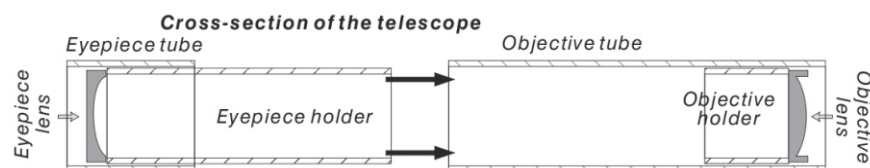
length whose inner diameter is the same as the outer diameter of the objective and eyepiece holders.

Step 4, Winding the eyepiece tube: Follow the same instructions as in Step 3. The result is a tube of 22 mm in length.

Step 5, Glueing in the lenses: The eyepiece lens (301.OM.1) is a concave lens with a focal length of -35 mm. The lens can be easily recognised as it reduces in size. The objective lens (307.OM.6) is a convex lens with a focal length of +120 mm; this lens enlarges. The eyepiece lens is glued onto the long eyepiece holder with its concave curved side inwards so that the flat side is on the outside. The objective lens is glued onto the short objective holder with its convex curved side on the outside (see cross section below). Now cut out the eyepiece diaphragm and glue it with its back onto the eyepiece lens. Caution: Apply glue only to the edge, so it doesn't get on the middle of the lens.

Step 6, Assembling the lens system: Push the end of the eyepiece holder with the lens into the bottom end of the eyepiece tube. Keep pushing until the lens is about 2 mm inside from the top end. Fix it in this position with some glue. Now a long piece of the eyepiece holder protrudes out of the eyepiece tube. Then push the open end of the objective holder into the opening of the objective tube (from the side with the broader rim) until the lens is also 2 mm deep inside and glue it in place. After the glue has set, the protruding eyepiece holder can be inserted into the objective tube.

Congratulations! Your pocket telescope is finished.
To focus it, you can rotate the eyepiece and move it in and out until the picture is sharp.
Important: Never look directly at the sun with a telescope! This can lead to permanent eye damage.



This is how the finished telescope looks, only three times bigger.