

The Hand Spectroscope AstroMedia

Shows the spectrum of light and measures the wavelengths of spectral lines

With diffraction grating 1,000 lines / mm, nanometre scale and magnifying lens. Accuracy: 5 nanometres

Cardboard kit for a fully functional hand spectroscope

Contents

1 casing (printed cardboard), 1 diffraction grating (1,000 lines / mm), 1 magnifying lens (focal length $f = +120$ mm), 1 film with nanometre scale (400 to 700 nm) and light slot (0.25 mm).

Instructions

You will need: a pair of sharp scissors, a craft knife, a blunt knife for grooving the flaps, some thin white paper, some adhesive tape and a solvent based all-purpose glue (eg UHU). Do not use superglue as this can cloud the lens. Assembly is carried out in 12 easy steps which are also listed on the casing itself at the relevant points. Construction time is about 1 hour.

Step 1: Cut out all parts, fold back along the dashed lines. Only one line (eyepiece cover, the one with little dots) is folded forwards.

Step 2: Cut out the rectangular eyepiece window and glue the lens with its rim onto the white circle so that its flat side is facing up. **Caution:** Avoid getting glue on the lens! (Replacement lens: 307.OM6 from AstroMedia)

Step 3: Assemble the casing by gluing the long flap underneath the opposite side.

Step 4: Bend the supporting piece over the back opening of the casing and glue it behind the opposite flaps.

Step 5: Cut out the rectangular black film with the scale and the light slot and glue it onto the two long, narrow flaps and the casing support. The scale must be legible from the inside (check by looking through the lens).

Step 6+7: Fold over the two tabs on the narrow sides and stick them onto the film. They prevent light entering at the corners.

Step 8+9: Glue the light slot tube together, giving it a square cross section and then glue it over the light slot onto the casing.

Step 10: Attach the diffraction grating on one side with some adhesive tape onto the inside of the eyepiece flap.

It is not important which side of the film is facing inwards. Close the flap temporarily without glue, point the light slot at a bright light source and darken the scale with your hand. If the spectrum appears on the scale, attach the diffraction grating on the other side as well and glue the eyepiece flap on. Otherwise reattach the grating film slightly twisted.

Step 11: To dim the light which shines through the nanometre scale you can glue a strip of thin white paper (20 x 70 mm) onto the small flap beside the scale and then fix it to the other end with adhesive tape. Another 2 to 3 strips are placed on top, but in such a way that they can be easily removed if more light is needed.

Last step: Glue the eyepiece cover around the eyepiece.

This is what the finished hand spectroscope looks like:

