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The Kepler-Telescope

Instructions: Please read through before staring this project.

Making this project is not difficult . If you follow the 6 steps which are printed alongside the parts you cannot really go wrong. We wish you much fun with your project.

A few tips: So that the folds are sharp we suggest scoring them with the back of your scissors or an empty ball point pen. As for gluing we recommend a solvent free all purpose glue
such as, those from UHU or Tesa so that the lenses will be firmly held. Be careful not to get any glue on the lenses. If an accident should happen, you can order spare lenses from AstroMedia*
The performance of the telescope will be improved by if cover the objective lens is improved by making a cover with an even smaller hole.
Important : Never point your telescope at the sun as it can damage your eyes. The only
exception being is if you use a SPECIAL SUN FILTER which will block out 99.999% of the dangerous glare making it safe. This can be ordered form AstroMedia* eg. Baader AstroSolar
sun foil , Size A4

Johannes Kepler 1571-1630 was an astronomer and mathematician and founder of geometric optics and was one of the foremost scientists of his time. The observations of the planet by the Danish astronomer Tycho Brahe led him to discover the his so called Kepler laws. With these the course of the planets can be accurately charted. This helped to prove the theory by Kopernicus that the sun is in the middle of the universe. In his main work 'Harmonices Mundi' he studied and wrote about the harmony of the planets, the harmony of music and the wonderful forms of crystals

The first person to observe the heavens with a telescope was Galileo Galilei (1564-1642) the great Italian scientist . He made the first discoveries about the planets that under pinned the work of Kepler eg that Jupiter goes around the Moon. His telescope had a collector lens as the objective and a dispersion lens as the occular lens which gave him the possibility to make an upright picture with an enlargement of 80 times, although this was of a limited area.
Johannes Kepler improved on this with his understanding of opitics by using two collector lenses which allows a much larger degree of magnification to be achieved. In fact most of modern telescopes still use this principle. The picture you saw was upside down but this does not cause any particular problems when studying the stars

Step 1 Cut out this part and fold it along the broken lines, finally gluing the tab to make up a six sided (hexagonal) tube.

Astro Materials from AstroMedia*
Economical models for a practical
start in astronomy.
All you need is glue and scissors.

A*M1: The small star heaven
A*M2: The quadrant
A*M3: The star clock
A*M4: The sun dial 1

A*M5: The sundial 11
A*M6: The Jacob pole
A*M7: The Magnetic compass
A*M8: The sun compass

A*M9: The sun observation glasses
A*M 10 : The pocket telescope
A*M 12 : The Galileo telescope
A*M 13: The Lilliput folding binocular

AstroMedia* From our range 'Practical astronomy * card models by Astro Media*

The star heavens: Domed star card model (Dia 50cm) showing the constellation, complete with sparkling stars.
The table top Planetarium (Armillarsphere): This demonstrates the movement of the Sun, Moon and stars on everyday of the year and for all the places on the earth. Includes a star globe and description of the constellation.

The mirrored sextant: The classic instrument for sailors and explorers, precision card model

This Kepler telescope belong to..... Construction date.....

Important : Never point your telescope directly at the sun! As this can damage your eyes
If you wish to observe the sun you must use a SPECIAL FILTER filter in front of the objective, eg Baader, Astro-Solar, Sun Filter foil from AstroMedia

Step 6: Cut out this strip of card and glue it around the end of objective tube .(See Step 6 continuation)

Step 6 continuation: Fold and glue the strengthening strip around the tube here.

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Step 6: Cut out this strip of card and glue it around the end of objective tube .(See Step 6 continuation)

Step 6 continuation: Fold and glue the strengthening strip around the tube here.

Step 2 continuation: Glue the 6 tabs of the objective holder here, making sure that the lens is inside the tube.

Astro* Materials Nr.11

Astronomical Telescope based on a design by Johannes Kepler
With OPTI * Media lenses 3,7 and 9
Enlargement circa 10x

This ^ edge must be glued level with the edge of the Occular tube

Step 4 : This part is the holder for the field lens
Cut around the outside, and glue the middle lens (Nr.7, f+106mm) with its flat side over the middle of the hole, leave to dry well. Then fold the 'arms' in and insert the complete holder with the lens facing forward into the end of the Occular telescope tube, see continuation of Step 4 . The arms must be completely inserted into the tube until the ends of the 'arms'are level with the end of the tube and then glued Occular tube and then glued in position

.....Fold back here.....

Glue the middle lens (Nr 7) here with its flat side down

Step 2
This is the holder for the objective lens, cut out here and fold the 6 tabs inwards. The lens (Nr 9 F=+360mm) must be glued with its stepped edge to the reverse of this holder exactly over the hole. And then slide the holder in the telescope tube. See 'Step 2 continued'

Step 5
Cut out this part (Occular holder) and fold the 6 tabs inwards along the broken lines. Glue the lens MNr.3 F=+30 mm exactly over the hole on the reverse side. Finally glue the holder in place . See Step 5 continued.

Step 3: Cut out and fold along the broken lines. To make the hexagonal tube, glue the tab at the end in position.

Step 4 continuation: Insert the holder for the field lens Nr 7 completely in the tube making sure that it level with the edge of the line.

Step 5 continuation: On this edge glue the tabs that hold the Occular lens

The field lens sits in the tube level with this line

Occular holder Occular lens Field lens holder for the field lens

Section through the Occualar tube

Strengthening ring Objective tube Section through objective tube

Objective holder Objective lens

Your final telescope should look like this
To make the your view sharper slide the smaller tube (Occular tube) in and out