|  |  |  |  |
| --- | --- | --- | --- |
| OPTICS | | | |
| *Complete 20 stars* | | | |
| Rating | No | Exercises in Optics | Sign |
| \* | 1 | Write an original poem or song about “Light”. At least 7 lines |  |
| \* | 2 | Collect and make a collage of pictures of optical instruments. A3 or larger |  |
| \* | 3 | Draw a *large* diagram of the eye, labelling at least the iris optic nerve, macula, retina, lens and cornea |  |
| \* | 4 | Write a short account (in your own words) about a scientist famous for his / her work in light or radiation |  |
| \*\* | 5 | Build a simple working periscope |  |
| \*\* | 6 | Build a pin-hole camera |  |
| \*\*\* | 7 | Take some photos with a 126 cartridge pinhole camera and print at least two negatives |  |
| \*\* | 8 | Do a library research project on how colour films work |  |
| \*\*\* | 9 | Find out what a photometer is. Build a simple grease-spot photometer and demonstrate to your class teacher how you would use it to compare the intensities of two bulbs |  |
| \*\* | 10 | Make a simple Kaleidoscope |  |
| \*\*\* | 11 | Build a simple light meter using a light dependent resistor (LDR) or a photo transistor, a battery, current meter, and suitable resistor |  |
| \*\* | 12 | Devise a system to check the magnification of a pair of binoculars. Describe in your report how you found the magnification, what your result was, and how it compared with the manufacturer’s figure |  |
| \*\* | 13 | Using two convex lenses, build a simple *astronomical telescope* |  |

|  |  |  |  |
| --- | --- | --- | --- |
| \* | 14 | Demonstrate some important point about polarisation of light |  |
| \*\*\* | 15 | Take a series of photos of the same object but with different aperture numbers (say *f*1.8 to *f*16), label the photos and explain any differences in the photos |  |
| \*\* | 16 | Make a large poster project (A3) or larger on how a laser works and some of its uses |  |
| \*\*\* | 17 | Build a simple projector or epidiascope to operate off 12 volts or less |  |
| \* | 18 | Draw a “colour triangle” to show how the three *primary colours* of light (red, green, blue) combine |  |
| \*\*\* | 19 | Build a simple optical range finder using mirrors. Calibrate the range finder so that you can measure distances up to about 0.5km |  |
| \*\* | 20 | Using mirrors, construct a system for seeing “through” and “around” at least five (5) opaque objects or screens arranged randomly |  |
| \*\* | 21 | Ascertain and list some common eye defects. Select two of these and describe how an optometrist would go about testing for these defects |  |
| \*\* | 22 | Construct a flip flop chart showing the uses and applications of fibre optics |  |
| \*\* | 23 | Find or devise a simple test for eye dominance. Test 20 people and graph your results |  |
| \*\* | 24 | Explain why the moon appears bright in the sky while the sky appears dark. Draw a diagram to make your explanation clear |  |
| \*\* | 25 | Find out the difference between concave and convex mirrors. With diagrams show what happens to parallel beams of light hitting the mirrors |  |
| \* | 26 | Explain why a red apple looks red under red light and under white light, but black under green light |  |