Exploring Space

S3 Physics

Lesson Title: Optical Telescopes

Learning Intention:

Today we are learning about optical telescopes.

Success Criteria:

✓I can draw a diagram showing the main features of a refracting telescope.

✓I can describe how a magnified image is produced by a refracting telescope.

✓I can make comparisons between refracting and reflecting telescopes.

Employability skill(s):

Reading

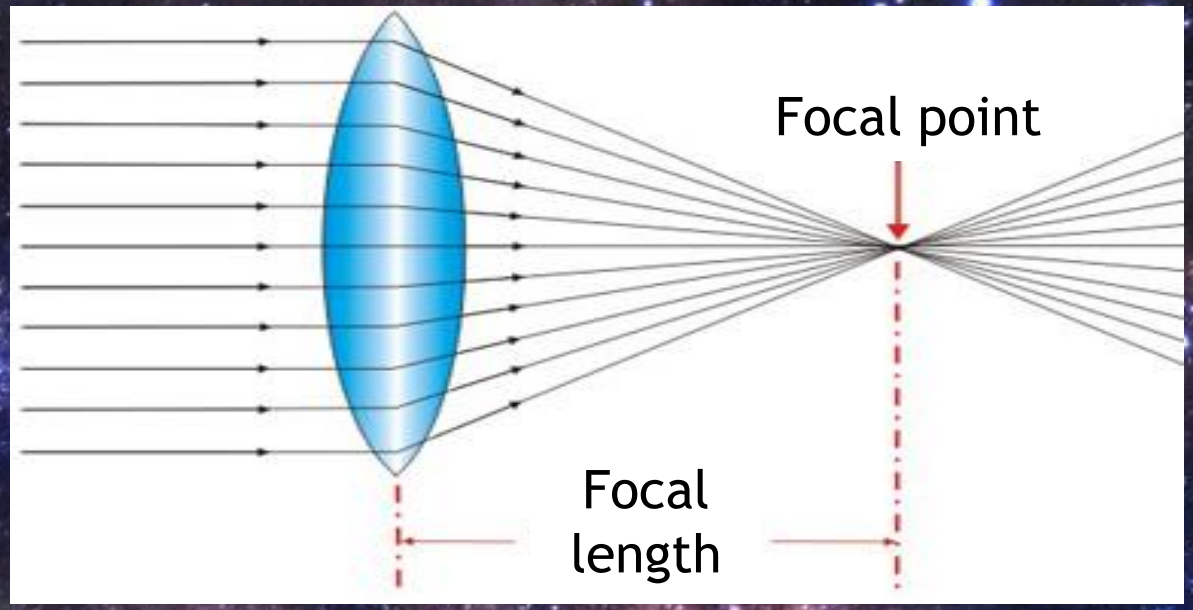
Optical Telescopes

Telescopes are an essential part of space exploration. They allow us to see objects that are far away in deep space.

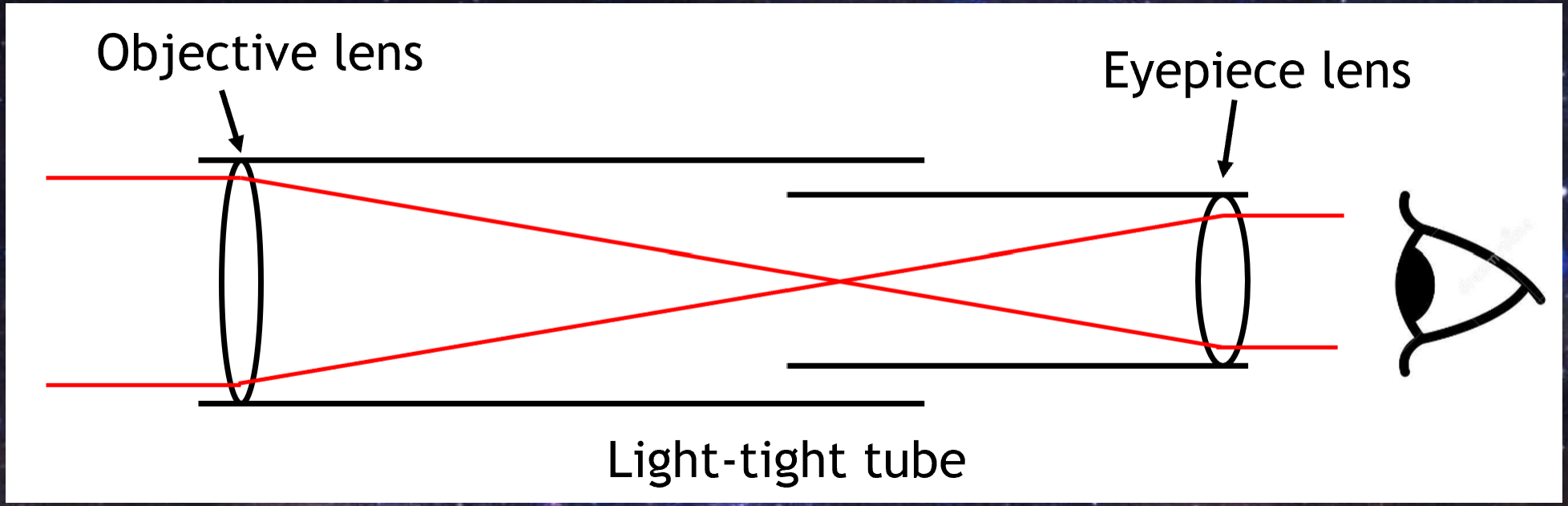
Lenses

Optical telescopes contain lenses to help produce a clear magnified image.

A convex lens converges light rays to a focus.



Refracting Telescopes



Refracting Telescopes

Objective Lens

Collects light from distant object. The larger the objective lens, the more light it can collect.

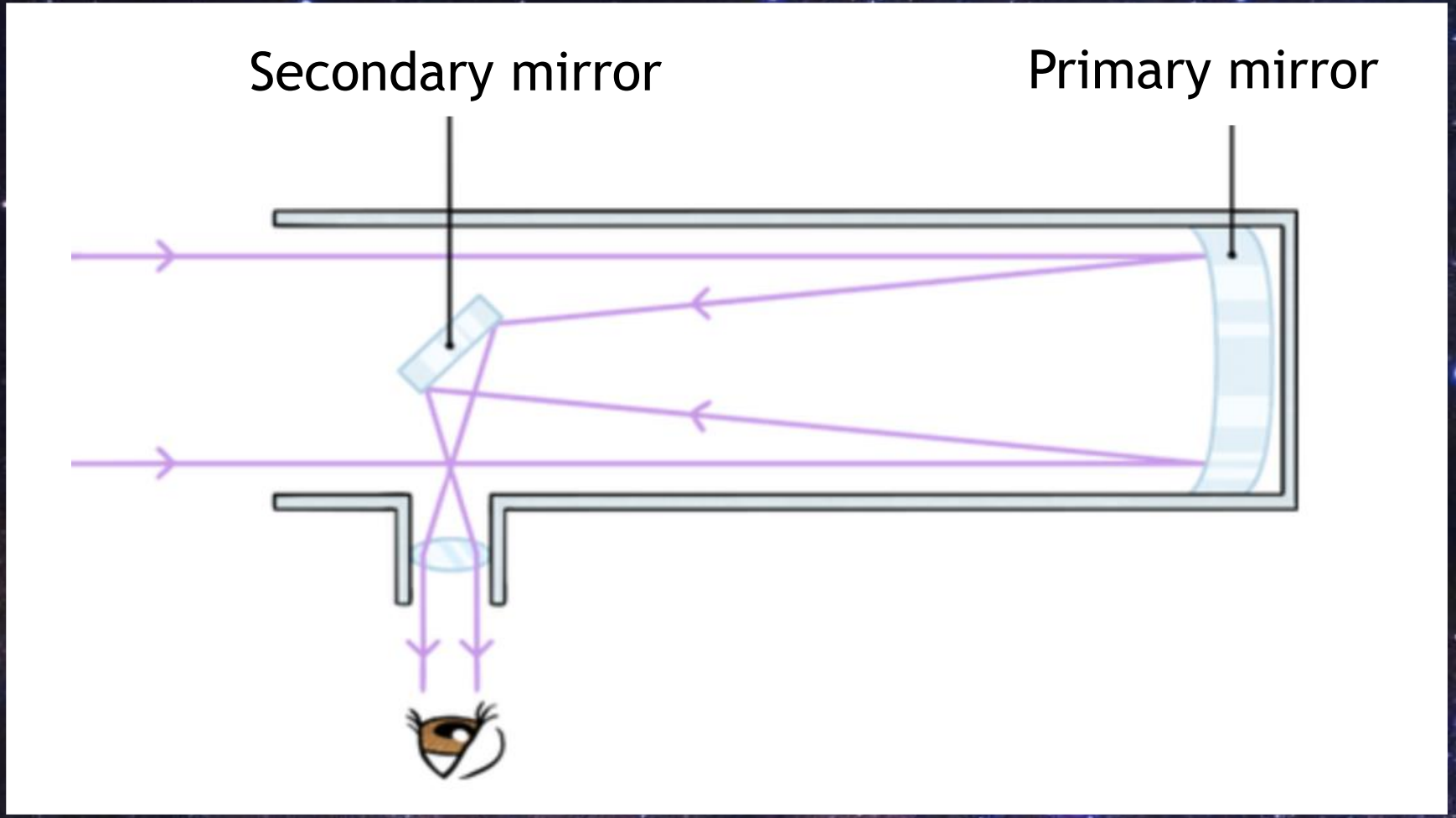
Light-tight tube

Designed to keep all light within the telescope.

Eyepiece lens

Magnifies the image to make distant objects appear larger.

Reflecting Telescopes



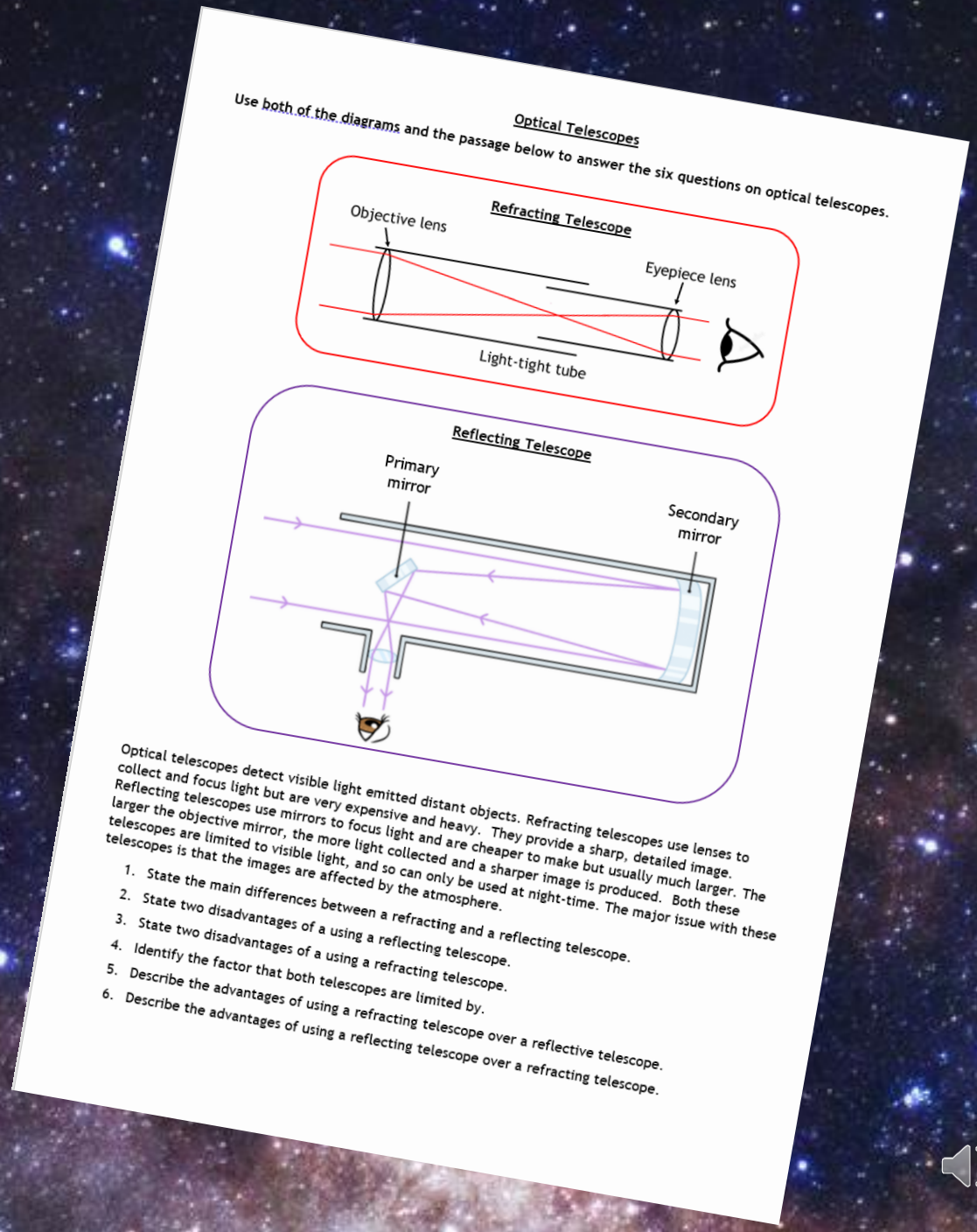
A reflecting telescope is a telescope that uses a single or a combination of curved mirrors that reflect light and form an image.

Task: Optical Telescopes

Your task is to complete the Optical Telescopes worksheet.

You can either do this in your jotter, photograph your work and email it to your teacher or you can complete the answers on a Word document and email it over to us.

Thanks!



Optical Telescopes

Use both of the diagrams and the passage below to answer the six questions on optical telescopes.

Refracting Telescope

Reflecting Telescope

Optical telescopes detect visible light emitted distant objects. Refracting telescopes use lenses to collect and focus light but are very expensive and heavy. They provide a sharp, detailed image. Reflecting telescopes use mirrors to focus light and are cheaper to make but usually much larger. The larger the objective mirror, the more light collected and a sharper image is produced. Both these telescopes are limited to visible light, and so can only be used at night-time. The major issue with these telescopes is that the images are affected by the atmosphere.

1. State the main differences between a refracting and a reflecting telescope.
2. State two disadvantages of a using a reflecting telescope.
3. State two disadvantages of a using a refracting telescope.
4. Identify the factor that both telescopes are limited by.
5. Describe the advantages of using a refracting telescope over a reflective telescope.
6. Describe the advantages of using a reflecting telescope over a refracting telescope.

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