Light Path and Accommodation

Note: In OneNote, set this worksheet as background. Use the simulation's "Export" button to save an image and insert it at the marked place in the worksheet.

Part 1 - The Light Path

When light passes from one transparent medium into another, for example from air into glass or water, its speed of propagation changes. As a result, the light ray is refracted at the boundary surface; in other words, its direction changes. A converging lens (convex) bends light rays inward and focuses them. A diverging lens (concave) bends light rays outward and spreads them apart.

Task 1: Path of the light rays

a) With lens 1 (converging lens), set a sharp visual impression and change the colour of the top light ray. Describe how you can tell that the image is sharp, and explain this using the light path and the refractive power of the lens.

Figure 1: Sharp visual impression (light path)

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c) Replace lens 1 with a diverging lens. Try to focus the image again. Explain why a sharp visual impression is not possible with this lens in this arrangement.

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Task 2: Extending the light path

Activate lens 2 (corrective lens). Choose a converging lens as the corrective lens and set the refractive power of both lenses so that a sharp visual impression is produced again. Briefly describe the light path.

Figure 2: Sharp visual impression with corrective lens

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Task 3: Displaying objects

Switch the display to "Use image" (object) and focus the object at maximum distance. Describe how the object is shown on the retina (size, position, orientation) compared with the visual impression.

Figure 3: Object on the retina (maximum distance)

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Task 4: Comparing near and far objects

Now focus the object at minimum distance (near), export the image, and then compare the two representations from Tasks 3 and 4 on the retina.

Figure 4: Object on the retina (minimum distance)

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