



Name: \_\_\_\_\_

Group: \_\_\_\_\_



## Scientific investigation about the formation of images using the model of the eye

**Model of the eye**

This model of the eye will allow you to discover how images form using a convergent lens with a 10 cm focal length (the focal point is located 10 cm from the lens). It can generate well-defined images of everything around you. It may be a colleague's smile or a car turning the corner.

In addition, this model is simple to use. It is quick and easy to assemble. To this end, there is a user manual at the end of this document (Appendix 1).

## Your mandate

**Produce and carry out a process allowing you to determine the position of images formed by the model based on the distance of the observed objects.**

The position of the image is indicated by the adjustment handle that slides along the ruler.

Here are three examples of objects to observe:

### Distant objects (as far as possible)

- A landscape or a car in the distance
- Someone at the other end of the class

### Close objects (about 30 cm)

- A book cover
- A pencil case

### Very close objects

- The letters in a book
- The keypad of a calculator



## Suggest an explanation (*Hypothesis*)

For the distant object

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For the close object

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For the object that is very close

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Cr1

Appropriate representation of the situation

Formulation of hypotheses



## Planning and implementing the process

### Equipment at your disposal:

The diagram shows a grey cylindrical telescope-like model. A measuring tape is shown to the left of the model. A small white rectangular object labeled 'Model of the eye' is positioned at the top of the model. Three red-bordered boxes list objects at different distances from the model.

Measuring tape

"Appendix 1"  
User manual  
for the model

**Distant objects** (as far as possible)  
- A landscape or a car in the distance  
- Someone at the other end of the class

**Close objects** (about 30 cm)  
- A book cover  
- A pencil case

**Very close objects**  
- The letters in a book  
- The keypad of a calculator

### Based on the supplied equipment, plan your process:

- If you must change the elements as you go along, use a different colour pencil to adjust your initial plan.

**Note:** You may use the space available on the next page as needed.

### Planning your process (continued):

- If you must change the elements as you go along, use a different colour pencil to adjust your initial plan.

Cr2	Development of a suitable plan of action	Planning of steps in the plan of action (manipulations, diagram of the assembly, etc.)	
		Selection of resources (materials, equipment, etc.)	
Cr3	Appropriate implementation of the plan of action	Observance of safety rules	
		Use of appropriate strategies and techniques	
		Adjustments during the implementation of the plan of action	



## **Data**

### **Note and organise**

Cr3	Appropriate implementation of the plan of action	Recording of data	
		Use appropriate types of representation (tables)	



## ***Difficulties and adjustments***

**Note what you experienced**

Difficulties encountered	Adjustments made
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Cr3	Appropriate implementation of the plan of action	Adjustments during the implementation of the plan of action
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## ***Working out explanations and concluding***

Are your hypotheses confirmed or refuted?

- |                                   |                                    |                                  |
|-----------------------------------|------------------------------------|----------------------------------|
| For the distant object            | <input type="checkbox"/> Confirmed | <input type="checkbox"/> Refuted |
| For the close object              | <input type="checkbox"/> Confirmed | <input type="checkbox"/> Refuted |
| For the object that is very close | <input type="checkbox"/> Confirmed | <input type="checkbox"/> Refuted |

Why? Explain your choice based on your results and observations.

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What do you take away from this process (what is the most important thing to remember?)

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If you could start your investigation over, explain what you would do differently and why.

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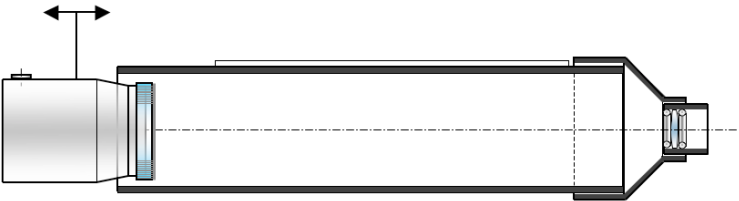
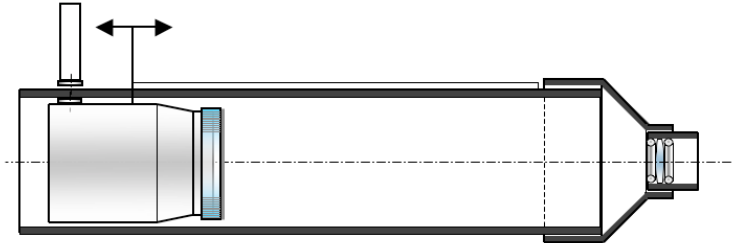
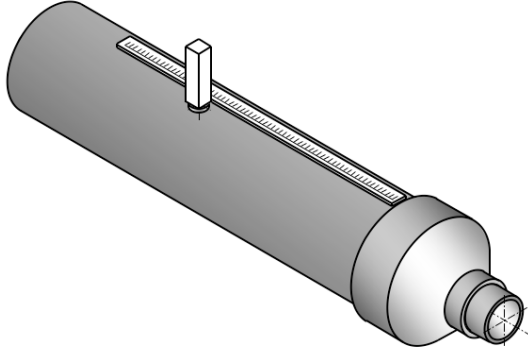
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Cr4	Development of relevant explanations, solutions or conclusions	Verification of consistency of the hypothesis with the analysis of the results.	
		Formulation of explanations or conclusions in accordance with the data collected and knowledge acquired	
		Proposal of improvements	
		Use of appropriate terminology, rules and conventions	

## Appendix 1 (User manual for the model of the eye)

<p>1. Introduce the screen completely into the tube in the direction indicated by the drawing.</p>	
<p>2. Press the magnet on the handle against the tube, being careful to align it with the magnet on the screen. <b>Note:</b> The screen should thus follow the movements of the handle.</p>	
<p>3. Slide the handle so as to bring its magnet against the graduation on the ruler.</p>	
<p>4. Press your face against the end of the tube opposite the lens, trying to prevent as much outside light as possible from entering.</p> <p>5. Point to a well-lit object that you want to observe.</p> <p>6. Slide the handle along the ruler until the image forms.</p>	