

Images in a convex mirror

Task and equipment

Information for teachers

Additional Information

The students' unsuccessful attempts at capturing images formed by a convex mirror make this experiment especially interesting and motivating when they have no or only uncertain knowledge of image formation at a convex mirror. However, this experiment is also highly recommended to confirm or test the students' theoretical knowledge. Even in this situation, many students will attempt to intercept the mirror image against their better judgement.

Suggestions

In accordance with the instructions for conducting the experiment, the students will set certain object distances and examine the mirror images in each case (statically). If necessary, it is useful and above all methodically interesting to ask the students at the end of the experiment to observe the changes when the convex mirror is uniformly moved to the right or to the left along the optical bench.

Images in a convex mirror

Task and equipment

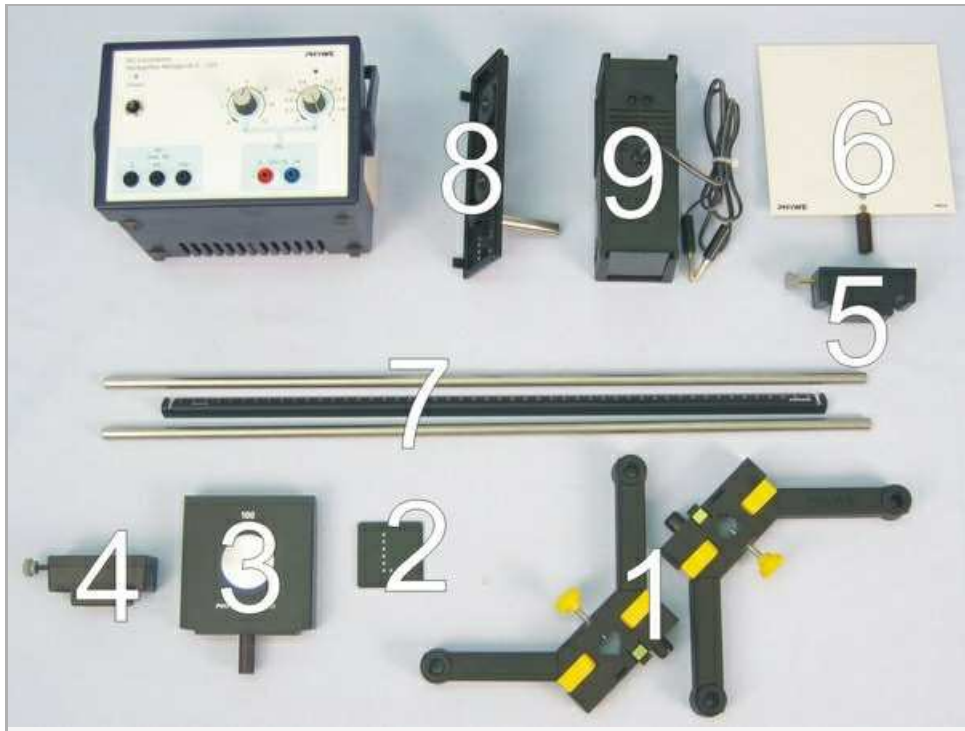
Task

What properties do images formed by a convex mirror have?

Determine the properties of the images formed by convex mirror for different object distances.



Equipment



Position No.	Material	Order No.	Quantity
1	Support base, variable	02001-00	1
2	Object -L-, glass bead	11609-00	1
3	Concave/convex mirror with rod	09821-00	1
4/5	Slide mount for optical bench	09822-00	2
6	Screen, white, 150x150mm	09826-00	1
7	Support rod, stainless steel, l = 600 mm, d = 10 mm	02037-00	2
7	Meter scale for optical bench	09800-00	1
8	Bottom with stem for light box	09802-10	1
9	Light box, halogen 12V/20 W	09801-00	1
	PHYWE power supply DC: 0...12 V, 2 A / AC: 6 V, 12 V, 5 A	13506-93	1

Set-up and procedure

Set-up

Using the two support rods and the variable support base assemble the optical bench and place the scale for the optical bench against the front support rod.



Fig. 1



Fig. 2

Place the bottom with stem under the light box.



Fig. 3



Fig. 4

Clamp it in the left part of the support base so that the lens end points away from the optical bench.



Fig. 5

Insert an opaque cover in front of the lens and the cover with the glass-bead-L into the slot at the other side of the light box.



Fig. 6

Complete the experimental setup by placing the convex mirror and the screen as shown in the picture. (The convex mirror is at a slight angle to the optical bench so that the light which is reflected by it can hit the screen located immediately adjacent to the optical bench).



Fig. 7

Procedure

Connect the light box to the power supply (12 V AC) and switch it on.

Student's Sheet

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Fig. 8

Attempt to capture the image formed by the convex mirror with the screen.

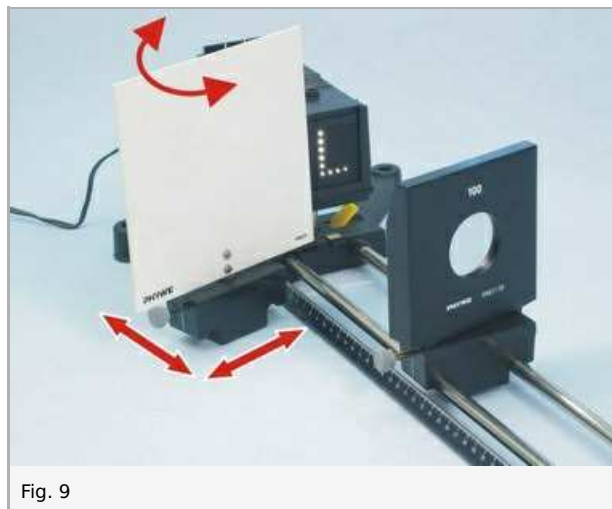


Fig. 9

What do you notice? Describe your observations in the report.

Now look toward the convex mirror from the direction of the screen.

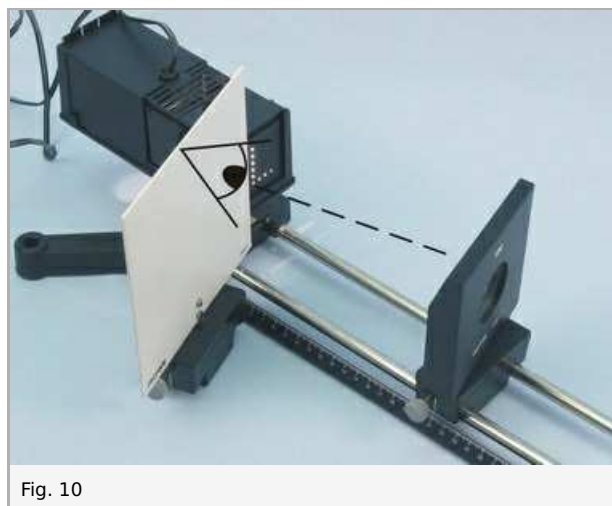


Fig. 10

What do you see? Describe your observations in the report.

Repeat this for different object distances. Describe your observations.
Switch off the power supply.

Report: Images in a convex mirror

Result - Observations 1

Image capture with the screen:
Describe your observations.

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Result - Observations 2

Image perception by looking at the mirror:
Describe your observations.

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Evaluation - Question 1

What are the properties of images at a convex mirror?

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Evaluation - Question 2

Where are the convex mirror's images located?

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Evaluation - Question 3

With convex mirrors one can enlarge one's field of vision. This is being used in real life.

- Consider what is meant by "enlarging the field of vision."
- Name some applications which you already know or think some up.

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