TRICKOF THE LIGHT

TEACHER GUIDE



Here's a suggested schedule for this kit! The activities should be completed in order, but you can choose when the lessons take place over time. Required times are estimated.

PLANNING

ACTIVITY INFORMATION	SECTION (S)	TIME REQUIRED	DAY/ LESSON
ACTIVITY I: WINDOW WONDER Build an odd window and a strange room to learn how perspective affects perception. Time required: 45 min	🛛 Window Wonder	45 minutes	Day 1
ACTIVITY 2: ROOM FOR PERSPECTIVE	The Role of Perspective	45 minutes	Day 2
seen, using an Ames Room you build as an example.] The Ames Room	60 minutes	Day 3
	Shine a Light on Lenses	45 minutes	Day 4
ACTIVITY 3: LENSES AND REFRACTION Look through lenses to understand refraction and angles of light. Time required: 3 h 30 min	Concave Lenses	60 minutes	Day 5
	Convex Lene		Day 6

Full schedule available with purchase • An overview of lenses is provided, including what they do and why. The two main types of lenses are covered in more detail in the proceeding sections.

• The following vocabulary terms are defined in this section: lens and refraction.

MULTIPLE AGES AND ABILITIES:

A "Math Moment" is included to show the student how the refractive index is calculated for a material. There is no assessment related to this information, so you can have them skip it if you like.

We have intentionally not asked the student to draw detailed ray diagrams for the lens and mirror examples in Activities 2 and 3. We feel these are not necessary for most students and would be likely to make the student frustrated with the concept. However, you might elect to dig deeper into ray tracing and angles if your student is especially interested in geometry. With that in mind, here are some sample ray diagrams for lenses and mirrors you can discuss with your student and work from. We suggest coming back to them after completing Activity 2 (for the lens diagrams) and Activity 3 (for the mirror diagrams).



- Your student will do a hands-on exploration of the concave mirror.
- Examples of concave mirrors are provided.
- The vocabulary term concave mirror is defined.

🖗 THINK ABOUT IT!

Question 1: What does a concave mirror do to the light that hits it? Explain how you know.

Answer: It makes an image that is larger than the reflected object. **How to Help:**

• The image may be real or virtual, depending on whether it is placed between the focal point and the mirror.



Concave mirror Real Image



Concave mirror Virtual image

2 Question 2: What are some examples of ways you have used concave mirrors in daily life?

Answer: Answers will vary.

How to Help: Check that your student provides examples of mirrors with inward curvature.

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CONVEX MIRRORS

PREPARATION AND SUPERVISION

Your student will do a hands-on exploration of the convex mirror.

The vocabulary term convex mirror is defined.

Examples of convex mirrors are provided.

THINK ABOUT IT!

• Question 1: What does a convex mirror do to the light that hits it? Explain how you know.

Answer: It makes an image that is smaller than the actual object. This should have happened during the exploration; if not, try it again with different variables such as changing the distance and/or angle.

How to Help: It is also a virtual image – the light rays do not converge outside of the observer's eyes.

Question 2: What are some examples of ways you have used convex mirrors in daily life?

Answer: Answers will vary.

How to Help: Check that your student provides examples of mirrors with outward curvature.



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Kit	SU-TRIKLT
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