

Class 7 - Science

Curiosity

Light: Shadows and Reflections

CBSE NOTES

Light: Shadows and Reflections - Mastery Worksheet

Strengthen your foundation with key concepts and basic applications.



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Solve the following questions. Write your answers in the space provided.

1. Explain the differences between luminous and non-luminous objects with relevant examples. How do these classifications relate to the characteristics of the Moon and other celestial bodies?

Hint: Identify characteristics that define each category and provide celestial examples.



Solve the following questions. Write your answers in the space provided.

2. Describe the process through which shadows are formed. Include an experiment that demonstrates the factors affecting the size and shape of shadows.

Hint: Consider what changes might affect a shadow's characteristics and conduct observations.



Solve the following questions. Write your answers in the space provided.

3. Compare the methods of light propagation through transparent, translucent, and opaque materials. Design an experiment to categorize different materials based on their light transmission.

Hint: Create a table to facilitate the classification and compare results of your observations.

4. What is the significance of light traveling in a straight line? Conduct an experiment to validate this principle using everyday objects.

Hint: Think about how aligning objects impacts the results you observe.



Solve the following questions. Write your answers in the space provided.

5. Investigate the reflection of light. How do mirrors utilize the properties of light reflection differently from other surfaces? Provide relevant examples.

Hint: Consider how angle and surface texture impact light reflection.



Solve the following questions. Write your answers in the space provided.

6. Explore how a pinhole camera functions. Explain the theory behind the formation of images and the importance of light behavior in this device.

Hint: Think about how the pinhole size might affect the quality of the image produced.



Solve the following questions. Write your answers in the space provided.

7. Discuss the impact of artificial lights like LEDs on natural environments. How does light pollution affect nocturnal species such as fireflies?

Hint: Explore the relationship between habitat disturbances and light exposure.



Solve the following questions. Write your answers in the space provided.

8. Analyze the phenomenon of lateral inversion observed in mirrors. What does this imply about image formation? Conduct an experiment to visualize this impact.

Hint: Consider how changing your position relative to the mirror affects your observation.

9. Examine the applications of light reflection in everyday technologies. Compare the roles of mirrors in periscopes and kaleidoscopes.

Hint: Think about how mirror placement changes the outcome in both devices.



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Solve the following questions. Write your answers in the space provided.

10. What conclusions can be drawn about the nature of light based on the activities and experiments discussed in this chapter? Relate your conclusions to practical applications.

Hint: Reflect on the experiments you've conducted and how they relate to real-world applications.



Check your answers with the solutions below.

1. Explain the differences between luminous and non-luminous objects with relevant examples. How do these classifications relate to the characteristics of the Moon and other celestial bodies?

Solution: Luminous objects emit their own light (e.g., Sun, fireflies), whereas non-luminous objects reflect light (e.g., Moon). The Moon does not emit light; it reflects sunlight. This distinction helps to understand celestial appearances.

2. Describe the process through which shadows are formed. Include an experiment that demonstrates the factors affecting the size and shape of shadows.

Solution: Shadows form when an opaque object blocks light. Factors include distance from the light source and object size. An experiment includes using a light source and various objects to observe shadow variations.

3. Compare the methods of light propagation through transparent, translucent, and opaque materials. Design an experiment to categorize different materials based on their light transmission.

Solution: Light travels through transparent materials completely, partially through translucent, and not at all through opaque. An experiment could involve a torch and various materials to measure light transmission.

4. What is the significance of light traveling in a straight line? Conduct an experiment to validate this principle using everyday objects.

Solution: Light travels in a straight line unless it interacts with an object. An experiment with matchboxes and a torch can illustrate this principle effectively.



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Check your answers with the solutions below.

5. Investigate the reflection of light. How do mirrors utilize the properties of light reflection differently from other surfaces? Provide relevant examples.

Solution: Mirrors reflect light at equal angles (law of reflection). Other surfaces may diffuse light. Examples include investigating reflections in a plane mirror versus a rough surface.

6. Explore how a pinhole camera functions. Explain the theory behind the formation of images and the importance of light behavior in this device.

Solution: A pinhole camera projects an image upside down through a small opening. The behavior of light traveling in straight lines is crucial for image formation.

7. Discuss the impact of artificial lights like LEDs on natural environments. How does light pollution affect nocturnal species such as fireflies?

Solution: LEDs reduce energy consumption but may contribute to light pollution, affecting species that rely on natural light patterns for communication (e.g., fireflies).

8. Analyze the phenomenon of lateral inversion observed in mirrors. What does this imply about image formation? Conduct an experiment to visualize this impact.

Solution: Lateral inversion means the left side of an object appears on the right in the mirror, which is due to how light reflects. An experiment with observing an object in a mirror can illustrate this.



Check your answers with the solutions below.

9. Examine the applications of light reflection in everyday technologies. Compare the roles of mirrors in periscopes and kaleidoscopes.

Solution: Mirrors redirect light in distinct ways. Periscopes use angles for visibility over obstacles, while kaleidoscopes create symmetrical patterns through multiple reflections.

10. What conclusions can be drawn about the nature of light based on the activities and experiments discussed in this chapter? Relate your conclusions to practical applications.

Solution: Light behaves predictably in straight lines and reflects off surfaces, crucial for many technologies, including cameras and optical instruments. These principles apply in fields ranging from photography to medical imaging.



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