Class 6…Science - Ch – 13 Light shadow and Reflection…

II. Very short answer type questions.

A. Give two examples of the following.

1. Human-made sources of light — **Electric bulb and Candle**
2. Opaque materials — **Wood and Metal**
3. Objects that can form a shadow — **A chair and A book**
4. Irregular surfaces (with respect to reflection) — **Rough wall and Wooden surface**
5. Regular surfaces (with respect to reflection) — **Mirror and Still water**

B. Define the following terms.

1. **A natural source of light**

Ans: A natural source of light is something that produces its own light naturally, without the need for an external power source. Example: The sun.

2. **Transparent material**

Ans: A transparent material allows light to pass through it so that objects behind can be clearly seen. Example: Glass.

3. **Translucent material**

Ans: A translucent material allows some light to pass through but scatters it, making objects on the other side appear blurry. Example: Butter paper.

4. **Shadow**

Ans: A shadow is a dark area created when an opaque object blocks light from a light source.

5. **Diffused reflection**

Ans: Diffused reflection occurs when light strikes a rough surface, and the reflected rays scatter in many directions, leading to a blurry or diffused image.

6. Opaque material

Ans: An opaque material does not allow light to pass through it, and as a result, objects behind it cannot be seen. Example: Wood

III. Short answer type questions.

1. Classify the following as 'luminous' and 'non-luminous':

A table, a cup, a star in the night sky, candle flame, a cupboard, a book, water

Ans: **Non-luminous:** A table, a cup, a cupboard, a book, water

Luminous: A star in the night sky, candle flame

2. What are natural sources of light? Give two examples.

Ans: Natural sources of light are those that produce light naturally.

Example 2: A star Example 1: The Sun

3. If you want a wall, so that you can see clearly on the other side, what kind of material would you use to build it?

Ans: To see clearly through the wall, the material should be **transparent**, such as **glass**.

4. What property of light is demonstrated by formation of shadows and pinhole camera?

Ans: The **rectilinear propagation of light** is demonstrated by the formation of shadows and images in a pinhole camera.

5. **Write down any two characteristics of a shadow.**

a) A shadow is always formed in the opposite direction of the light source.

b) The size of a shadow depends on the distance between the light source and the object.

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IV. Long answer type questions.

1. **Can you see clearly through a transparent material? Give two examples of transparent materials. Describe an activity to determine whether a given material is transparent or not.**

Ans; Yes, you can see clearly through a transparent material because it allows light to pass through it without scattering, making objects on the other side visible.

Examples of Transparent Materials:

a) Glass b) Water

Activity to Determine if a Material is Transparent:

Objective: To check if a material is transparent.

Materials Required:

a) A piece of paper with a simple drawing (like a letter "A")
b) A transparent material (like a glass sheet)
c) An opaque material (like a book or cardboard)

Procedure:

a) Place the paper with the drawing (the letter "A") on a table.
b) Hold the transparent material (glass sheet) above the paper.
c) If you can clearly see the drawing of the letter "A" through the glass, it means the material is transparent.
d) Repeat the same procedure with an opaque material like a book or cardboard. If you cannot see the drawing through the material, then it is opaque.

Conclusion: If you can see through the material and clearly view the object on the other side, the material is transparent. If the material blocks the view, it is opaque. This simple activity helps determine whether a material is transparent, allowing light to pass through and making objects visible behind it.

2. Why is it that we cannot see a reflected image on a rough wall?

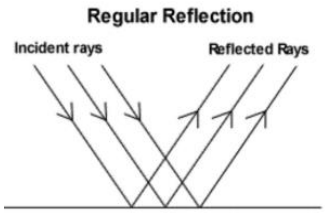
Ans: We cannot see a reflected image on a rough wall because of diffused reflection.

Explanation: When light strikes a smooth surface, such as a mirror, it reflects at a uniform angle, and the rays remain parallel. This produces a clear, distinct image because all the reflected light rays follow the same path. However, when light hits a rough surface, like a rough wall, the surface does not reflect the light uniformly. Instead, the light rays are scattered in many different directions. This scattering of light is called diffuse reflection. Since the reflected rays are scattered in various directions, they do not come together to form a clear, focused image. Instead, the reflected light is spread out, and we cannot see a sharp or distinct image as we would on a smooth surface.

Conclusion: A rough surface scatters the reflected light in many directions, preventing the formation of a clear, reflected image, unlike a smooth surface like a mirror that reflects light uniformly to form an image.

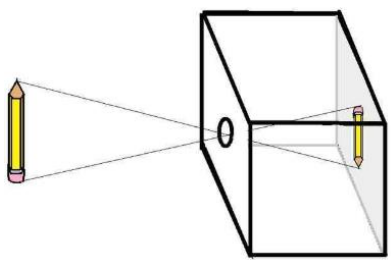
3. Draw a diagram to illustrate reflection of a parallel beam of light from a smooth surface.

Diagram:



4. Draw a diagram to show how an image is formed in a pinhole camera. Label all the parts of the pinhole camera.

Ans:



Labels:

* **Object:** The object outside the pinhole camera.
* **Camera Box:** The outer casing of the camera.
* **Pinhole:** The small hole that allows light to enter the camera.
* **Screen:** The surface where the inverted image is formed.
* **Light Rays:** Straight lines of light passing through the pinhole to form the image.