

Light – Reflection and Refraction

Quick Study Guide

HOW TO USE THIS GUIDE

HIGHLIGHTED TEXT SHOWS IMPORTANT POINTS

- ★ MARKS HIGH-FOCUS TOPICS
- 📝 INDICATES EXAM TIPS
- ⚠️ SHOWS COMMON ERRORS
- 💡 GIVES QUICK TIPS

LIGHT REFLECTION

Mnemonic: "MIRROR SHOW"

- | | | | |
|---|--------------------------------|---|-------------------|
| M | Mirror types (plane/spherical) | S | Size of image |
| I | Image formation | H | Height relation |
| R | Real/Virtual images | O | Optical center |
| R | Ray diagrams | W | Work with formula |
| O | Objects distance | | |
| R | Reflection laws | | |

Remember As:

ANGLE WANGLE

- **A**: Angle of incidence
- **N**: Normal se measure
- **G**: Greater nahi hoga
- **L**: Light ka path
- **E**: Equal angles

Common Errors:

- Wrong angle measurement
- Incorrect ray drawing
- Missing normal line
- Formula sign confusion

MIRROR FORMULA

Mnemonic: "FOCUS MATHS"

- | | | | |
|---|---------------------|---|--------------------|
| F | Focus distance (f) | M | Mirror formula use |
| O | Object distance (u) | A | Always check units |
| C | Calculations easy | T | Take care of signs |
| U | Use proper signs | H | Height ratio check |
| S | Signs important | S | Solve step by step |

Quick Formula:

ONE BY ONE

$$1/f = 1/v + 1/u$$

"SIGN GAME"

- **A**: Real image: Positive v
- **V**: Virtual image: Negative v
- **O**: Object: Always -ve u
- **C**: Concave: +ve f
- **X**: Convex: -ve f

Remember As:

- Like Cricket Score:
- Positive = Above ground
- Negative = Below ground
- Zero = At ground

RAY DIAGRAMS

Mnemonic: "TEEN RAYS"

- | | | | |
|---|---------------|---|----------------------|
| T | Through focus | R | Ray parallel to axis |
| E | Exact center | A | Another through F |
| E | Equal angles | Y | Y-axis parallel |
| N | Normal draw | S | Straight through C |

Drawing Steps:

"LINE MASTER"

- **L**: Light rays draw
- **I**: Incident ray first
- **N**: Normal at point
- **E**: Equal angles mark
- **M**: Measure properly
- **A**: Arrows show
- **S**: Scale use
- **T**: Through focus
- **E**: Extend rays
- **R**: Real/Virtual check

SPHERICAL MIRRORS

Mnemonic: "GOLA TEAM"

- | | | | |
|---|------------------|---|-----------------------|
| G | Geometric center | T | Two types only |
| O | Optical center | E | Either concave/convex |
| A | Light bending | A | Aperture small |
| L | Axis principal | M | Mirror formula |

Uses Remember As:

DAILY LIFE

- | | |
|------------------|--------------------|
| • Concave: | • Convex: |
| • Dentist mirror | • Car side mirror |
| • Torch light | • Security mirrors |
| • Satellite dish | • Shop corners |

REFRACTION RULES

Mnemonic: "BREAK CODE"

- | | | | |
|---|----------------------|---|------------------|
| B | Bend at surface | C | Change speed |
| R | Ray direction change | O | Optical density |
| E | Enter new medium | D | Direction shift |
| A | Angle changes | E | Enter/Exit rules |
| K | Know the rules | | |

Remember As

PAANI MEIN PENCIL

- **P**: Path changes
- **A**: Angle changes
- **A**: Away/Towards
- **N**: Normal se measure
- **I**: Inside bending

Daily Examples:

1. Pool looks shallow
2. Coin in water
3. Straw in glass
4. Sky color blue

RAINBOW FORMATION

Mnemonic: "RANG BIRANGI"

- | | | | |
|---|-------------------|---|-------------------|
| R | Reflection inside | B | Bend of light |
| A | Angle specific | I | Inside reflection |
| N | Natural process | R | Red on top |
| G | Glass drops work | A | Angle 42° |
| | | N | Nature's show |
| | | G | VIBGYOR order |
| | | I | Important angles |

Colors Order:

VIBGYOR PAPA

- **V**: Violet bottom
- **I**: Indigo above
- **B**: Blue next
- **G**: Green middle
- **Y**: Yellow here
- **O**: Orange near
- **R**: Red on top



ATMOSPHERIC EFFECTS

Mnemonic: "BLUE SKY"

| | | | |
|---|-------------------|---|--------------------|
| B | Blue scattering | S | Scattering light |
| L | Light waves split | K | Knowledge of waves |
| U | Upper atmosphere | Y | Yellow sunset |
| E | Effects visible | | |

Remember As:

ROSHNI KA GAME

- *R*: Red least scatter
- *O*: Orange medium
- *S*: Scatter different
- *H*: Height matters
- *N*: Natural process
- *I*: Important concept

QUICK REVISION CHECKLIST

Before Exam:

- ✓ Mirror formulas
- ✓ Sign conventions
- ✓ Ray diagrams
- ✓ Refraction rules
- ✓ Rainbow formation
- ✓ Atmospheric effects
- ✓ Practical examples

Scoring Tips:

1. Draw neat diagrams
2. Show all steps
3. Use ruler for rays
4. Mark angles clearly
5. Write proper units

HIGH FOCUS AREAS

1. Light Reflection (5 marks)
2. Mirror Formula (5 marks)
3. Ray Diagrams (5 marks)
4. Refraction (4 marks)
5. Practical based (4 marks)

