NEW

10th class

# PHYSICAL SCIENCE

# MODEL LESSON PLAN

**M.SRINIVASA RAO, SA(PS)   AGKMHS  GUDIVADA PH: 9848143855**

# MODEL LESSON PLAN

**CLASS: 10**       **SUBJECT: PS**       **Name of the Teacher: M.SRINIVASA RAO**       **Name of the School: A.G.K.M.H.School,Gudivada**

| Name of the Lesson/Unit | Topic | No.of Periods Required | Timeline for teaching | | Any specific information |
|---|---|---|---|---|---|
| | | | From | To | |
| **Refraction of Light at Curved Surfaces (Chapter-4)** | Refraction of light at a curved surface | 1 | xx/xx/xxxx | xx/xx/xxxx | |
| | Examples and Solutions | 1 | xx/xx/xxxx | xx/xx/xxxx | |
| | Lenses | 1 | xx/xx/xxxx | xx/xx/xxxx | |
| | The behaviour of certain light rays when they are incident on a lens | 1 | xx/xx/xxxx | xx/xx/xxxx | |
| | Ray diagrams of the convex lens | 2 | xx/xx/xxxx | xx/xx/xxxx | |
| | Determination of focal length of bi-convex lens using UV method | 1 | xx/xx/xxxx | xx/xx/xxxx | |
| | Len's formula, Solved problems | 1 | xx/xx/xxxx | xx/xx/xxxx | |
| | Focal length of a convex lens is increased when it is kept in water Lens maker's formula Problems-Solutions | 1 | xx/xx/xxxx | xx/xx/xxxx | |

**Prior Concept/Skills:**
1. Write the laws of refraction of light.
2. What is the cause of refraction?
3. What is normal to the refracting surface?

| Learning Outcomes: | No. of Periods |
|---|---|
| 1. Classifies lenses based on properties and characteristics. | 1 |
| 2. To seek answers to queries on their own of any ray passing through the optic centre is undeviated. | 1 |
| 3. Draws labelled diagrams, flow charts, concepts maps of bi-convex lens ray diagrams | 1 |
| 4.  Analyses and interprets data and figure of object distance and image distance of convex lens. | 1 |
| 5. Applying scientific concepts in daily life of lenses | 1 |
| 6. Uses scientific convention to represent units of various quantities, symbols,formulae and equations of sign convention in optics, SI units | |
| 7. Handles tools and laboratory apparatus properly, measures physical quantities using appropriate apparatus, instruments and devices of finding the focal length of lens by UV method. | 1 |
| 8. Analyses and interprets figures of ray diagrams. | 1 |
| 9. Calculates using the data of focal length of a lens. | 1 |
| 10. Relates processes and phenomena with causes and effects 'On what factors does the focal length of the lens depend? | 1 |

11. Draws conclusion of focal length of convex lens and surroundings
12. Plans and conducts investigations and experiments to arrive at and verify the fact of the focal length of a convex lens is increased when it is kept in water

| TEACHING LEARNING PROCESS |
|---|

**Induction/Introduction:**
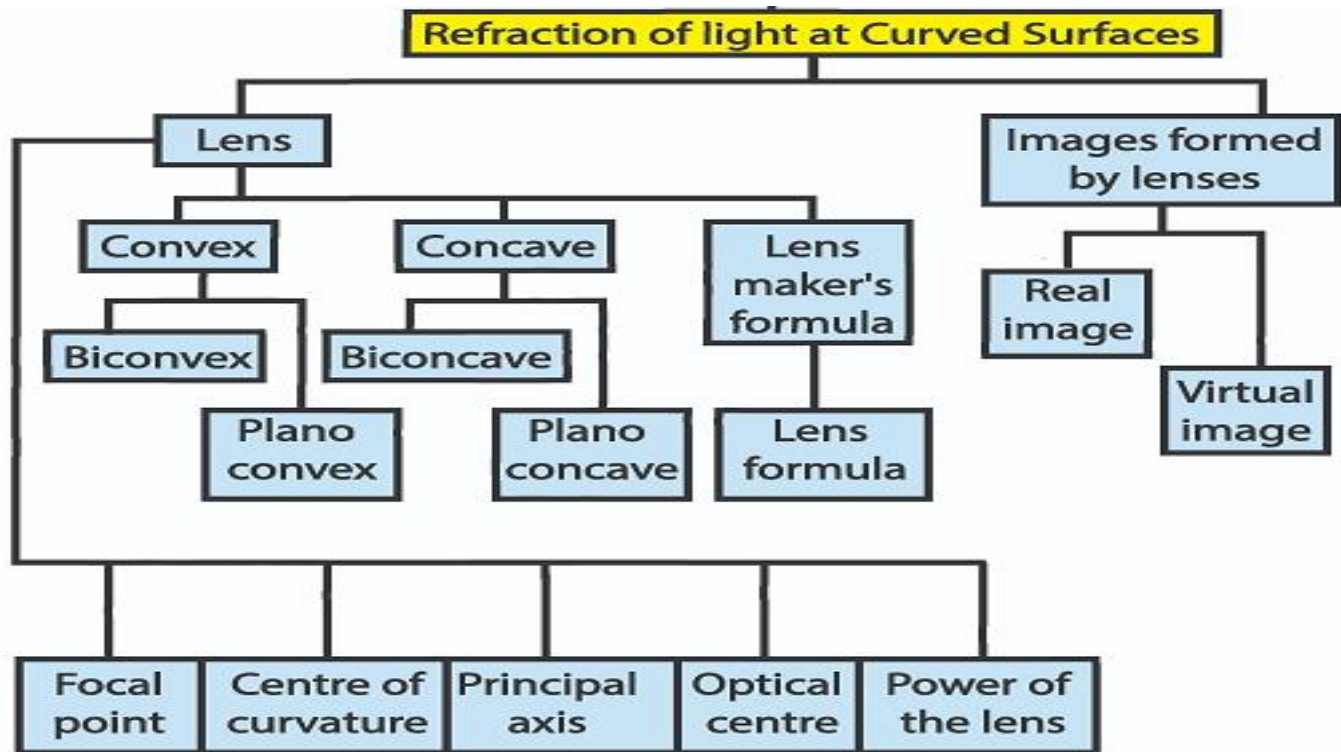


**Experience and Reflection:**
1. Students will know what kind of lenses to use for which occasion in their daily life.
2. Students learn the characteristics of images formed by lenses through drawing of ray diagrams.
3. Students will understand ray diagrams in order to find the focal length of the lens.

| Explicit Teaching/Teacher Modelling (I Do) | Group Work (We Do) | Independent Work (You Do) | Notes for: |
|---|---|---|---|
| 1. Discussion and conduct an activity on refraction of light with help of a black sketch, thick paper sheet, transparent glass tumbler. | 1. Students conduct the activity and observed the characteristics of the arrow mark without water and with water in the glass tumbler. | 1. Students write the differences between real and virtual image? | 1. When a real image is formed? |

| | | | |
|---|---|---|---|
| 2. Discussion and explain the refraction of light at curved surfaces with ray diagrams. | 2. What happens to ray that is incident on a curved surface separating the two media? – Group discussion | 2. Students draw the normal to the curved surfaces. | 2. What is the radius of curvature of the plane surface? |
| 3. Explain the textual examples | 3. Students solved the problems | 3. Students complete the homework. | 3. $\frac{n2}{v} - \frac{n1}{u} = \frac{n2-n1}{R}$ Explain the terms in it? |
| 4. Discussion and demonstration of types of lenses | 4. Students identify the types of lenses. | 4. Students draw the different types of lenses. | 4. What is a lens? |
| 5. Explain the terminology used in the lenses. | 5. Students identify the principle axis, centre of curvatures, radii of curvature, focal lengths, focal points. | 5. Students give reasons, why R= 2f for all lenses. | 5. Define the focal point of lens? |
| 6. Discussion and Explain the behaviour of certain light rays when they are incident on a lens. | 6. Group discussion on rules to draw ray diagrams for image formation by lenses | 6. Students explain in which cases a ray of light undeviated and deviated. | 6. Write the symbols of convex and concave lenses. |
| 7. Discussion and Explain the ray diagrams of the convex lens. | 7. Students draw the ray diagrams of convex lens when object kept at different positions | 7. Students write the characteristics of images formed by a convex lens. | 7. What are the rules to draw ray diagram of convex lens? |
| 8. Discussion and explain the ray diagrams of the concave lens. | 8. Students draws the ray diagrams of concave lens when object kept at different positions | 8. Students solved the problems on the focal length of a concave lens. | 8. Is concave lens diverging or converging? |
| 9. Conduct experiment of determination of focal length of bi-convex lens using UV method. | 9. Students arrange the apparatus in a proper way and express the procedure of the experiment. | 9. Students complete the homework. | 9. What are the materials required to find the focal length of a convex lens in UV method? |
| 10. Explain lens formula and its Problems. | 10. Students solved the problems on lens formula | 10. Collect the information of uses of lenses in our day to day life situations. | 10. Write a lens formula? |
| 11. Discussion and conduct an activity on the focal length of a convex lens is increased when it is kept in water. | 11. Students conduct an activity | 11. On what factors does the focal length of the lens depend? | 11. Why an air bubble in water behaves like a diverging lens? |

| **Check For Understanding Questions** | **TLM's (Digital+Print)** |
|---|---|
| **1. Factual:**<br>  1. Are the laws of refraction valid for curved surfaces?<br>  2. What is the purpose of drawing ray diagrams for lenses?<br>  3. Why are real images inverted?<br><br>**2. Open Ended/Critical Thinking:**<br>  1. Why is there no refraction at the circular surface?<br>  2. Why there are only two cases of the formation of images in the concave lens?<br>  3. Is focal length always positive?<br><br>**3. Student Practice Questions & Activities:**<br>  1. How do you find the focal length of a lens experimentally?<br>  2. The focal length of a converging lens is 20cm. An object is 60cm from the lens. Where will the image be formed and what kind of image is it?<br>  3. How do you verify experimentally that the focal length of a convex lens is increased when it is kept in water?<br>  4. Your friend is not able to distinguish between concave and convex lenses. Ask two suitable questions to understand the differences between the lenses. | 1. Used prepared Quiz paper.<br><br>2. Utilized digital classroom.<br><br>3. Provide video link QR codes, DIKSHA App.<br><br>4. YouTube video's link |

**Assessment:**
1. Distinguish between Convex lens and Concave lens
2. Draw ray diagrams for the Convex lens following positions and explain the nature and position the of image.
   1) Object at infinity     2) Object is placed at beyond 2F2     3) Object is placed at 2F2
   4) Object is placed between F2 and 2F2     5) Object is placed at F2
   6) Object is placed between F2 and optic centre
3. Write the rules to draw ray diagrams for image formation by lenses.
4. A double convex lens has two surfaces of equal radii 'R' and refractive index n = 1.5, find the focal length?


SIGNATURE OF THE TEACHER                     SIGNATURE OF THE HEADMASTER


VISITING OFFICER WITH REMARKS