

### Pre-Post Test for LCD

Name \_\_\_\_\_

Teacher \_\_\_\_\_

Date \_\_\_\_\_

Class \_\_\_\_\_

Check one:

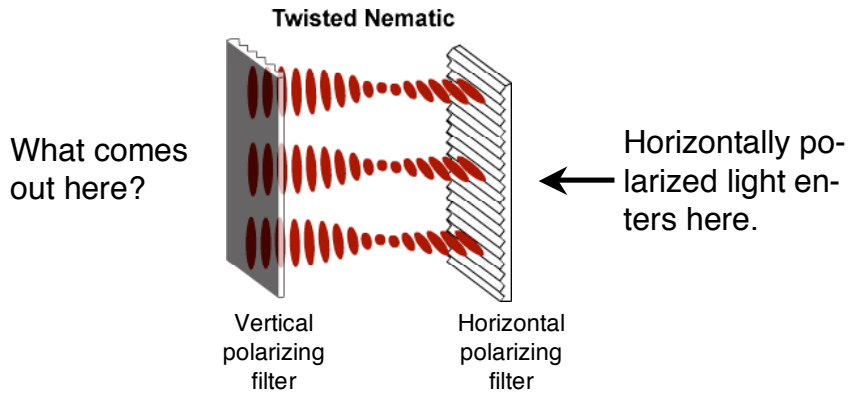
Pretest

Posttest

1) Compare a liquid, a liquid crystal, and a solid to each other.

<b>Response includes...</b>	
Liquid molecules stay close together but can slide past one another; in solids molecules always maintain their orientation and stay in the same position with respect to one another. The molecules of a liquid crystal can be arranged as they are in a crystal yet be able to move around to different positions, as in liquids.	2
Liquid crystals have properties of solid and liquid. (doesn't elaborate). Isn't molecular in explanation.	1
Other—defines states of matter	0

2) Layers of liquid crystals can form interesting patterns where the orientation of one layer is slightly twisted from the previous layer. These layers of liquid crystals can have an affect on polarized light. Suppose we place a third polarizer at 45 degrees to the two polarizers below. Do you expect to see any light transmitted? Explain.



<b>Response includes...</b>	
Yes you could see light but it depends on how the 45 degree polarizer is oriented relative to the other polarizers. If the liquid crystals twisted the light to line up with the polarizer, all the light would be transmitted. If the light was twisted to be perpendicular to the polarizer, the light will be stopped.	2
Yes you could see light but it depends on where you put the 45 degree polarizing filter. (Doesn't elaborate on why this is important.)	1
Other	0

3) When an electric field is applied to the liquid crystals in the diagram above, less light will make it through the vertical polarizing filter. Explain why.

<b>Response includes...</b>	
As the voltage increases across the liquid crystals, the crystals line up with the electric field and no longer rotate the light. Less light comes out because the filter only allows vertical light through it and the light coming through is horizontal. So the horizontal light cannot be emitted through the vertical filter.	2
Electric field realigns the crystals (but doesn't include explanation of how it then changes the light's orientation.)	1

Electric field will affect crystal (not affect light); no explanation	.5
Other	0

4) An LCD TV or monitor creates images using points of light called pixels. A typical LCD monitor is 1024 pixels wide and 768 pixels tall. Someone brings in her TV screen and explains to a technician that all the people in her TV show appear green. What might be wrong with the TV monitor? Choose all that are correct.

- a. The voltage for red and blue pixels is too high.
- b. The voltage for red and blue pixels is too low.
- c. The voltage for green is too high.
- d. The voltage for green pixels is too low.
- e. There are more green pixels than red and blue.
- f. Only green pixels are being charged at all.

Two points for answering plus one point for each correct answer for a total of four points: correct answers are A and D	4
Otherwise 2 points for answering, 1 point for each correct answer, minus one point for each incorrect answer.	0-3 points