

**Reversing Arrows Setup**

- Set up the hook as shown below before class begins on a table at the front of the class (get everyone to gather around when you do the hook)
- The “paper with arrows” is the last page of this lesson plan
- Tape the paper to the wall or tape a meter stick to a table and then attach the paper to that
- The glass jar has NO water in it to begin

**Reversing Arrows Procedure**

- get predictions from students as to what will happen to the image of the arrows and write the predictions on the board
- get people to vote on which one they think will happen
- slowly pour water into the jar until the first arrow is covered only – at this point that arrow will be “reversed” to the other one – the point of stopping is so that everyone knows what to water for when you fill up the rest of the way
- pour the rest of the water in and watch the arrow do it’s thing!

| <b>Student Activity/Expectation</b>  | <b>Teaching Notes</b>   |
|--|---|
| <p><i>(issue: I think many students may have already seen this...)</i></p> <ul style="list-style-type: none"> <li>• Provide predictions about the image of the arrows</li> </ul> <p><b>Expected predictions:</b> <i>(nothing happens, gets bigger, smaller, changes direction, no idea)</i></p> <ul style="list-style-type: none"> <li>• show participation through listening and providing predictions</li> </ul> | <p><b>Q:</b> What will happen when I pour this water in?<br/> <b>A:</b> <i>arrows will reverse (don’t say this)</i></p>   |
| <p><b>Debrief</b></p> <ul style="list-style-type: none"> <li>• stay standing</li> <li>• make possible suggestions <b>why</b> this happened</li> <li>• student engagement shown through suggestions, eye contact and body language</li> </ul>   | <p><b>Q:</b> Why did this result occur?<br/> <b>A:</b> <i>refraction of light causes this to occur – refraction is the bending of light as it passes from one material to another because it changes speed</i></p> <ul style="list-style-type: none"> <li>• students will be able to explain this after this unit!</li> </ul> |

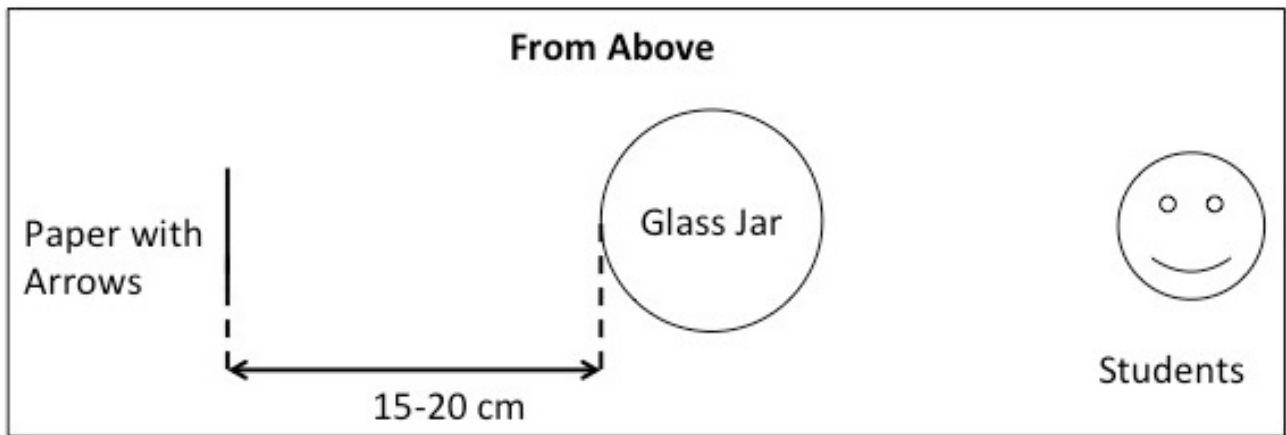


Diagram 1: Hook setup (Top View)

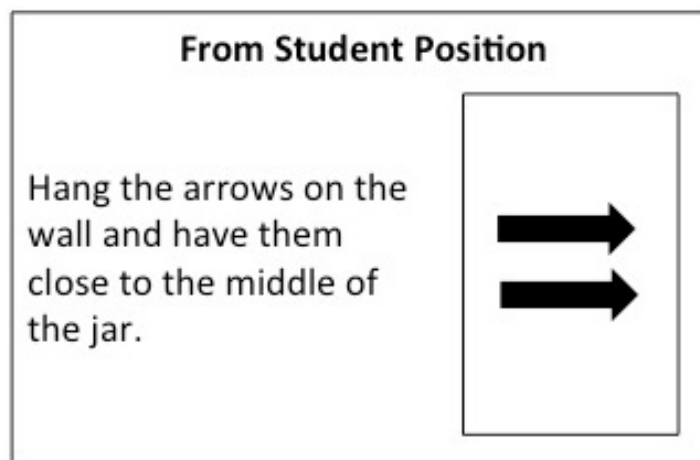


Diagram 2: Hook setup (front/student view)

