# Data Work Sheet

## Equipment

- Optics Kit
- Polaroid
- Stressed plastics and Birefringence crystal
- Overhead sheets and clear tapes
- Flash light

## Procedure

### [Part.1] Linear Polarization (Absorption)

1. Align the polarizer and the analyzer as shown and describe your observation in the box.
2. Rotate the analyzer as shown and describe your observation.
3. Insert another polarizer in the middle and describe your observation.

![Diagram of polarizer and analyzer](attachment:diagram.png)

### [Part.2] Polarization due to Reflection

Test the following light sources to see if they are polarized.

<table>
<thead>
<tr>
<th>Light Source</th>
<th>(Polarized or Un-polarized)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluorescent Light</td>
<td>(Polarized or Un-polarized)</td>
</tr>
<tr>
<td>Light source (Optics kit)</td>
<td>(Polarized or Un-polarized)</td>
</tr>
<tr>
<td>Flashlight</td>
<td>(Polarized or Un-polarized)</td>
</tr>
<tr>
<td>Reflected Flashlight</td>
<td>(Polarized or Un-polarized)</td>
</tr>
</tbody>
</table>
9. Set up the optics kit as shown above.
10. Using a single Polaroid to check the polarization of the reflected light. You will need to move your head down near the table to observe the faint reflected beam and rotate the Polaroid.
11. Slowly rotate the optics table to increase the incident angle while monitoring the polarization of the reflected beam through Polaroid. Find the incident angle at which the reflected beam is fully polarized. This angle is called Brewster’s angle. At the Brewster’s angle the reflected light is completely polarized.

Brewster’s angle of Lucite: \( \theta_{\text{Brewster}} = \underline{\text{__________}} \)

[Part.3] Birefringence

1. Make a birefringence pattern on a transparent sheet using clear tapes.
2. Place the prepared pattern prepared above between two Polaroid films on top of overhead projector.
3. Slowly rotate the top Polaroid 360 degrees and describe your observation.
4. Place a birefringence crystal between two Polaroid films on top of overhead projector and slowly rotate the top Polaroid film.
5. Describe your observation.