Using Lab Notebooks in the Preschool and Elementary (and Virtual!) Classroom

324 students
Pre-K through 5th grade
NAIS Independent School
Seattle, WA

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Students document their thinking by drawing, dictating, and writing.
Lab notebooks reveal student **understanding** and guide teacher **instruction**.

Lab notebooks enhance student **investment**.
Lab notebooks help students **organize** their observations, data, and thinking.

Lab notebooks increase student use and understanding of **science vocabulary** and **concepts**.
Lab Notebooks Across the Ages

**PreK/K**
- Simple recording sheets
- Students mostly draw
- Teachers record student observations
- Store in 2-pocket folder

**1st-2nd grade**
- More detailed recording sheets
- Some pre-/post-assessment
- Students record more written observations
- Store in medical folder or 3-ring binder

**3rd-5th grade**
- Documentation expectations are posted
- Student-led recording and organization
- Split page or quadrule journal
Typical Class Structure:

- Introduce experiment
- Model recording strategies
- Students experiment
- Student and teacher recording
- Class discussion of results
Recording Sheet Formats

• Space for teacher or student writing with word prompts
• Oral or written questions to assess student understanding
• Model recording for students; allow for individual approach
Prompts facilitate ideas and thinking.

**Writing prompts:**
- I notice...
- I found out....
- I wonder...
- I observe...
- I predict...

**Discussion prompts:**
- Tell me more about....
- Why do you think that happened?
- What did you discover?
- Tell me about how you recorded this...

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**Bean Bridges**
Fold paper to test the following shapes. Record how many washers each bridge can hold. When you are finished, graph your results!

<table>
<thead>
<tr>
<th>Shape</th>
<th># of washers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>16</td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>

Which shape held the biggest load? Why do you think it was the strongest?

the three fold one becas
than were two pocets
Which shape held the smallest load? What do you think made it weak?

it was just flat
and nothing was on the sides
to keep it stable

**Salt and Water**

I notice or I predict:
- it will evaporate into the air in the classroom and then flow through the door and then outside.
Assess and document student understanding.

<table>
<thead>
<tr>
<th>Matter</th>
<th>Name: DECLAN</th>
<th>Name: DANNY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid</td>
<td><img src="image1" alt="Solid Diagram" /></td>
<td><img src="image2" alt="Solid Diagram" /></td>
</tr>
<tr>
<td>Liquid</td>
<td><img src="image1" alt="Liquid Diagram" /></td>
<td><img src="image2" alt="Liquid Diagram" /></td>
</tr>
<tr>
<td>Gas</td>
<td><img src="image1" alt="Gas Diagram" /></td>
<td><img src="image2" alt="Gas Diagram" /></td>
</tr>
</tbody>
</table>

**Declan's Observation:**

I notice **there are a lot of solids**

**Danny's Observation:**

I notice **I put sugar in solids because it is a whole bunch of pieces of little things.**
Class discussions facilitate recording

1st and 2nd graders discuss pillbug choice chamber behavior test

**Dark/Light**
Orla- Our pillbug was going from side to side. I think it was because it was seeing which side it liked more.
Olivia W- It mostly went back and forth, usually like 6-4. It was almost no difference. It was close to a tie.
Cas- When we tested light and dark, for some reason he mostly stayed in dark. So it was a bit boring. It stayed in the dark maybe because it is nocturnal.
Armaan- Our pillbug was mostly on the dark side. I think this is because the rolypolys are mostly underground so there's no sunlight.

**Wet/Dry**
Neel- We tested it and our pillbug stayed on the wet side for the whole time! It stayed on the far side of the chamber and it stayed there for the whole time and didn't move a single bit. I think it wanted to get water. Maybe it didn't have enough water stored in its body.
Orla- Ours stayed on the wet side because it was drinking. It was still so I think it was drinking.
Paxton- Ours in wet and dry, he/she was always in wet. I mean every single time for 5 minutes. Because it was resting its gills on it.
Lucas- Ours was on the water. It was moving around. I think it wanted to swim.
1. Choose 6 candies/colors to test with your partner.

2. Set up your chromatography strip with:
   - labels
   - names
   - the line.

3. Add one drop of water to each candy. Using the toothpick, spot the dye onto the paper. It will take several repetitions to apply enough of the color.

4. When you have completed all of your spots, bring your paper over to be stapled.

5. Place in salt water in jar and let rise until the solvent front is 2/3-3/4 of the way to the top.

6. While you are waiting, analyze your mystery dye chromatogram from yesterday. **Record** which dyes you think were mixed. Don't forget to include the **WHY!**
1. Model recording and organization strategies.

2. Use sentence starters to aid writing.

   In this experiment we...
   I thought it was interesting when...
   I noticed that....
   The _______ was different after _______ because...
   I think this happened because...

3. The word wall

   The **word wall** allows students to access science vocabulary independently and increases use and internalization of science terms.
Graphics

- technical drawings
- sketches (observations)
- diagrams
- notes and lists
- charts, tables, graphs
Lab Notebooks and Virtual Learning

- Provide recording sheets
- Model recording by video or during synchronous learning
- Class discussions during synchronous learning
- We used Padlet & Google Classroom as a platform for student posting
Scales

We are using scales this morning. We have done seven different balls.

- Glass Ball: 10
- Cork Ball: 2/3
- Steel Ball: 18/74
- Aluminum ball: 11
- Marble: 1/3
- Styrofoam: 2/3
- Hole ball: 18

Graph of Mass

<table>
<thead>
<tr>
<th>Ball</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Styrofoam</td>
<td>14</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>15</td>
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<tr>
<td>Marble</td>
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<td>20</td>
</tr>
<tr>
<td>Steel</td>
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<td>22</td>
<td>22</td>
<td>22</td>
<td>22</td>
<td>22</td>
<td>22</td>
</tr>
</tbody>
</table>

Ball Mass

We are trying to make a graph about the mass of the balls we tested. In the end the steel ball had the biggest mass.

- Cork
- Steel
- Marble
- Glass
- Aluminum

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