Testing Liquids for Starch  9-24-09

Today we are testing for starch. We are using iodine, which will turn a dark color if starch is present.

**Conclusion**

When we tested liquids for starch, our results showed conclusively that the only liquid with starch is cornstarch and water, milk, and corn oil do not contain starch. We think these results are conclusive because when we tested cornstarch, it turned black, but when we tested water, milk, and corn oil, they pretty much just stayed the same color as the iodine, and everyone agreed.

Some results were inconclusive. The tests that were inconclusive were the ones we did for corn syrup. We think these results are inconclusive because some of the class thinks that there might be a little bit of starch, but some of the class thought there was no starch in corn syrup.

I think that those inconclusive results were caused by people stirring their liquids more than 10 times trying to make their liquids change color to a black, blue, or purple. Or people put in too many drops of a substance.
2/23/10

In my investigation, I tried to figure out what would happen if I polluted our ecocolumn with acid rain. At first, our alfalfa and rye grass was bright green, but then the alfalfa turned yellow and droopy. The rye grass also turned yellow, however, unlike the alfalfa, the rye grass seeded before it died. My lichen and leaf compost decomposed and the lichen got moldy. I think if we had had isopods or crickets in the ecocolumns when we polluted them they would have died either because there were no direct affected or because their food source died they would die too.

In the aquarium, there were changes as well. At first, our elodea, duckweed, and algae were all green. But then, the elodea lost its leaves and unrooted itself from the bottom. And the algae turned grayish and sank to the bottom. The duckweed turned white and also sunk. The water was clean and transparent at first but became cloudy and started to evaporate. I think if the snails and cloud fish had been in our polluted ecocolumn, they would have died because they wouldn't have any thing to eat. Since the plants died, they also might die because of the lack of oxygen because the plants produce oxygen and if they are dead, they wouldn't be able to produce oxygen.

After I did this investigation,
I believe that some sulfuric dioxide is released from big factories, and sulfuric dioxide turned into acid rain. I think we should not have as many factories to avoid acid rain harming plants in the real ecosystem.
What effect does length have on the brightness of the bulb?

**Changed Variable:**
The length of the wire

**Controlled Variable:**
Lights off
Simple Circuit (D-cell, wires, bulb)

**Measured Variable:**
Brightness of the bulb

I predict length will not make a difference because if the other things are the same, I don't think the length will matter, it will just be like a normal circuit but smaller.

<table>
<thead>
<tr>
<th>Wire Length</th>
<th>Brightness</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 cm</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>8 cm</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>10 cm</td>
<td>13</td>
<td>13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trial 1</th>
<th>Trial 2</th>
<th>Trial 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>6</td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>13</td>
<td>6</td>
</tr>
</tbody>
</table>
G-18-10

**Conclusion**

I predicted that the length of the wire wouldn’t matter yet I was wrong. The short wire made the bulb much brighter than the long wire did. For example, the average for the short wire was 11 on the brightness meter while the long wire was 6 on the brightness meter. Therefore I conclude that the short wire makes the bulb brighter than the long wire.
Fourth Grade, Sample A—Food Chemistry Unit: Lena

- The basic structure of this conclusion is this frame: “When we tested __________, our results showed conclusively that __________. We think these results are conclusive because __________. Some results were inconclusive __________. I think that those inconclusive results were caused by __________.”

- Lena does a good job of using the frame to scaffold her conclusion. She also is able to add her own writing and thinking, moving beyond the possible constraints of the frame. Note, for example, how in the first paragraph, she contrasts the positive and negative test results: “because when we tested..., but when we tested . . .” She has learned how to use a “but clause” to set up a contrast. In the last paragraph, she also shows that she has developed an important scientific skill, recognizing that people need to conduct testing procedures carefully and consistently.

- The only question a scientist might have is about the inconclusive results. Is it enough for students to think that a certain nutrient is or is not present? What did the test results show that made students think the results were inconclusive?

Fourth Grade, Sample B—Ecosystems Unit: Violet

- Students have conducted investigations to determine the effect of different pollutants on their model ecosystems (their ecocolumns). In the first paragraph, they are to report what the plants in their terrarium ecocolumn looked like before students added the pollutant and then after they had been polluting for an extended period of time. Then they are to explain what they think would have happened if they had kept animals in their ecocolumn. In the second paragraph, they are to use the same structure to report about their aquarium ecocolumn. Finally, they are to explain how they think the pollutant could affect a real ecosystem and how the negative effects could be avoided. The students can use their data tables to help them organize and include all the necessary details for their conclusion.

- In the first paragraph, Violet reports about what she has observed about each kind of plant. She writes a particularly strong explanation of a cause-effect relationship between the animals and their environment in that she not only states that she thinks the isopods and crickets would have died, but she also explains two reasonable reasons why she thinks that would happen. Many students just say that they think the animals would die because the plants would be dead without explicitly making connections between what the plants provide for the animals. She includes even more detailed evidence in the second paragraph with an equally strong cause-effect explanation. In her final paragraph, she applies what she has learned from her investigation as well as the research she has done about acid rain to recommend a way of preventing pollution from that source.

- To improve the quality of the students’ conclusions, we would need to have them compare their polluted ecocolumn with the class ecocolumn that has not been polluted.
Fourth Grade, Sample C—Circuits and Pathways Unit: Rees

- This kind of conclusion, as noted earlier, is less complicated to write than those in many life science and earth science units in the elementary grades. Students need to answer the question, make a statement about the qualitative difference (for example, one is brighter and the other is less bright), then provide quantitative data to support their statement or claim. They also need to write a prediction that includes their reasoning.

- Rees writes a prediction in which she clearly explains her reasoning. The teacher has asked students to begin by referring to their prediction, which Rees does. Then she reports the qualitative evidence for both the short and long wires, which she backs up with quantitative data for both. In classes where students do not learn to use their data tables to structure their conclusions, students typically will include the data from only the longest or shortest wire. Rees then writes an accurate concluding statement.

- Students might not yet have discussed the concept of resistance. But if they have, it would be interesting for them to end their conclusion with their thinking about why the shorter wire makes the bulb shine more brightly. Rees had one idea before the investigation. How has her thinking changed? How does she think she could investigate her new idea? These are the kinds of questions that can make conclusions like this more reflective.