Language-Rich Inquiry Science with English Language Learners (LISELL)
Overarching goal is to develop a model of language-rich science inquiry and tools for assessing that model.

Focus is on middle school ELL students, their families and their science and ESOL teachers.
3 LISELL science inquiry practices: Coordinating Hypothesis, Observation & Evidence; Controlling Variables; Explaining Cause & Effect Relationships

2 LISELL academic language practices: Using General Academic Vocabulary in Context; Using the Academic Language of Science
These practices are important across content areas & learning contexts.

They are challenging but accessible for all middle schoolers & their families.

They are conducive to developing the skills of thinking, doing, talking, and writing scientifically.

They benefit all students but especially ELLs.

They are well aligned with the Next Generation Science Standards & Common Core Math & ELA.
Project Learning Contexts

- Middle school science classrooms
- Teacher PL workshops
- Family science & academic engagement workshops
- Teacher scoring sessions with project assessments
Our Goals for Teachers

- Reflect on the value of providing all their students, and especially their English learners, with increased opportunities to think, talk and write about science.

- Integrate the materials we are co-developing systematically into their regular teaching routines to support students’ learning in sustainable ways.

- Strengthen students’ fluency in communicating their ideas using both everyday language and the academic language of science.

- Support students’ in strategically making choices about how to use language in science for different communicative purposes.
Our Goals for this Session

Get your thoughtful feedback about our materials for enhancing opportunities for ELL students to learn and use:

- Science inquiry practices
- Academic language practices

Get your ideas about how to help teachers integrate these materials and practices to support all students, and especially ELL students, in becoming powerful science learners

Get your ideas about how our materials and practices can best be used in out-of-school contexts such as our bilingual family science workshops
Materials for Supporting LISELL Science Inquiry Practices
Lesson Starters

**LISELL**
Lesson Starters

Coordinating Hypothesis, Observation and Evidence

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**LISELL**
Lesson Starters

Explaining Cause and Effect Relationships
With a partner select one of the three inquiry practices and review the lesson starter materials

- What do you see as strengths and limitations in the current lesson starter format?

- What suggestions do you have for other approaches using lesson warm-ups or wrap-ups to promote thinking, talking and writing about science inquiry?
# Lab Notes Templates

## LISELL Lab Notes - Focus on Hypothesis, Observation & Evidence

**Lab Activity:**

<table>
<thead>
<tr>
<th>What is your Hypothesis about what will happen in your experiment? (Write it as an if/then statement)</th>
<th>What Observations should you make during your experiment? (What data should you collect? What should you measure?)</th>
<th>What would you count as Evidence to support or reject your hypothesis?</th>
</tr>
</thead>
</table>

**Use scientific language to describe how you can use your observations as evidence to support or reject your hypothesis.**

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## LISELL Lab Notes - Focus on Control of Variables

**Lab Activity:**

<table>
<thead>
<tr>
<th>What is the Independent Variable in your experiment? (What will you change to see what happens?)</th>
<th>What is the Dependent Variable in your experiment? (What will change as a result of what you do?)</th>
<th>What Constants or Controlled Variables will you need to keep the same during your experiment in order to have a fair test?</th>
</tr>
</thead>
</table>

**Use scientific language to describe how you will control the variables in your experiment:**

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Name: __________________ Period: ______ Date: ____________
### LISELL Lab Template – All Inquiry Practices

**Lab Activity:**

<table>
<thead>
<tr>
<th>1. Questioning</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>State the problem</strong></td>
<td><em>What do I want to find out? (Write in the form of a question)</em></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gather background knowledge</strong></td>
<td><em>What do I already know about the topic? (Write 3 things)</em></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>What is my Hypothesis about what will happen in my experiment?</strong></td>
<td>(Write it as an ifthen statement</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Planning</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Develop a plan for testing my hypothesis</strong></td>
<td>(Think about these questions, talk with a partner, write what I think)</td>
</tr>
<tr>
<td></td>
<td><em>What Observations should I make during my experiment? (What data should I collect? What should I measure?)</em></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**Full Inquiry Framework**
With a partner select one of the three inquiry practices and review the lab template materials

- What do you see as strengths and limitations in the current lab template format?

- What suggestions do you have for other ways to scaffold thinking, talking and writing in the context of science investigations?
Materials for Supporting LISELL Academic Language Practices
**Indicate** *(Indicar)*

(v) to show or point out; to state or express briefly

Darker colors on a physical map indicate mountains.

**Component** *(Componente)*

(n) a part of something

Murphy’s Law: After putting together a new bicycle, there will be extra components left over.
Feedback on General Academic Vocabulary

With a partner look at the pages that identify (in bold) the use of the general academic vocabulary in the Georgia Performance Standards (p. 11)

- How would you work with science teachers to consider the ways in which teaching general academic vocabulary is important to their teaching of science?

- What specific suggestions do you have for how general academic language could be used and supported in science classes?
Your principal has invited science classes at your school to make a plan for how to help middle school students eat healthier meals at school and get more exercise. Write a short letter to your principal, using scientific language, explaining your ideas about how things could be changed at your school so that students could eat healthier lunches and get more exercise.
Review the two page introduction outlining aspects of the academic language of science

With a partner select and review three of the lesson starters

- What do you see as strengths and limitations in the current lesson starter format for teaching about the academic language of science?

- What suggestions do you have for other approaches that could support teaching about the academic language of science?
Final Thoughts and Comments

- What is one thing that you got out of the conversations in this feedback session?
- What are your suggestions for next steps as we continue our materials development work with teachers and families?
- Thanks for all your feedback!!