DEPARTMENT of EDUCATION
Louisiana Believes

#LATeacherLeaders

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Finding and Using Assessment Moments for Instructional Decision Making in Science K - 12

Session Goals

1. Highlight the role of unpacking and annotation in identifying and leveraging assessment moments.
2. Identify conceptual check-points within a sample lesson set.
3. Identify and analyze a critical task in a sample lesson.
4. Plan supports for facilitating student sense-making.

Let’s explore “assessment moments”

What are some examples of assessment moments in the science classroom?

When students speak	When students write	When students draw

Assessment moments tell us essential information about what students know and do not always have to be graded.

Planning Guide for Science Instruction

To assist teachers in planning with high-quality science curriculum, the Department has released a step-by-step Planning Guide for Science Instruction.

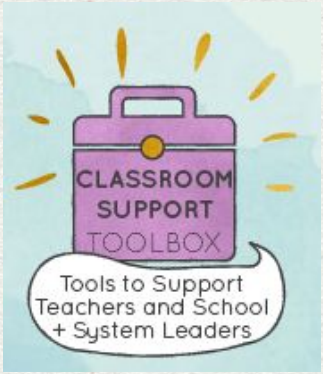
This resource includes guiding questions and protocols for each of the following:

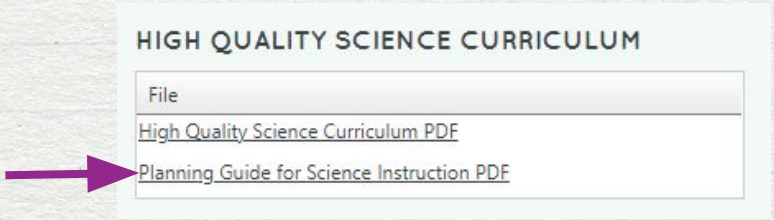
- Unit Unpacking
- Unit Launch Deep Dive
- Lesson Set Annotation
- Student Work Analysis

This session will focus on Step 3, **Lesson Set Annotation**.

Accessing the Planning Guide

[Louisiana Believes Website]





Planning Guide Introduction

Step 1: Unit Unpacking

- Unit Unpacking
- Unit Launch Deep Dive
- Lesson Set Annotation
- Student Work Analysis

Planning Guide for Science Instruction

Step 1: Unit Unpacking **Time Estimate: 60 to 90 minutes**

Question: As students engage with phenomena, how will they use the science and engineering practices, apply the crosscutting concepts, and develop understanding of the disciplinary core ideas?

Purpose: Team members analyze the unit performance expectation(s) to deepen understanding of what students should know and be able to do according to the Louisiana Student Standards for Science (LSSS).

Annotating Science Curriculum

What Does It Mean to Annotate?

- interacting with instructional materials
- showing your thinking while you read and study
- noting questions you need to answer
- marking ideas you want to revisit
- creating exemplar student responses
- identifying places where students may struggle

What Does Annotation Look Like:

- highlighting, underlining, or adding stars to emphasize important ideas
- writing questions or comments in the margins
- bracketing or circling content you want to revisit
- using ??? or !!! to indicate questions or critical ideas
- noting instructional strategies to implement
- indicating accommodations to meet the deeds of diverse learners

Step 2: Unit Launch Deep Dive

- Unit Unpacking
- Unit Launch Deep Dive
- Lesson Set Annotation
- Student Work Analysis

Planning Guide for Science Instruction

Step 2: Unit Launch Deep Dive **Time Estimate: 60 minutes**

Question: How will students engage in phenomenon-based instruction?

Purpose: Team members build an understanding of the unit launch experience by exploring the unit overview and the elements of the Anchoring Phenomenon Routine from the student perspective.

Step 2: Unit Launch Deep Dive

- Find the Step 2 in your planning guide.
- Spend a few minutes looking at this protocol and think about the following:

How does this component of the planning guide connect to identifying assessment moments and instructional decision making?

Planning Guide for Science Instruction

Step 2: Unit Launch Deep Dive **Time Estimate: 60 minutes**

Question: How will students engage in phenomenon-based instruction?

Purpose: Team members build an understanding of the unit launch experience by exploring the unit overview and the elements of the Anchoring Phenomenon Routine from the student perspective.

Lesson Set Annotation

Step 3: Lesson Set Annotation

- Unit Unpacking
- Unit Launch Deep Dive
- Lesson Set Annotation
- Student Work Analysis

Planning Guide for Science Instruction

Step 3: Lesson Set Annotation **Time Estimate: 60 minutes**

Question: How will students incrementally develop an understanding of the anchoring phenomenon and science concepts?

Purpose: Team members annotate sequences of lessons to determine where incremental sense-making occurs in the unit of study, in order to be able to make instructional decisions that best meet the intent of the standards and the needs of all students.

Step 3: Lesson Set Annotation

- Find the Step 3 in your planning guide.
- Spend a few minutes looking at this protocol and think about the following:

What do you notice in Lesson Set Annotation that connects to Formative Assessment?

Planning Guide for Science Instruction

Step 3: Lesson Set Annotation **Time Estimate: 60 minutes**

Question: How will students incrementally develop an understanding of the anchoring phenomenon and science concepts?

Purpose: Team members annotate sequences of lessons to determine where incremental sense-making occurs in the unit of study, in order to be able to make instructional decisions that best meet the intent of the standards and the needs of all students.

What is a “Lesson Set”?

- A “lesson set” is a group of lessons that:
  - utilizes investigations to build toward an important science concept
  - concludes with synthesizing information that helps to explain the anchor phenomenon
- Lesson sets are distinguished differently depending on curricula
- **NOTE:** The protocol for annotating a lesson set can also effectively be used to analyze a single lesson.
- Let’s take a look at a sample to see how a lesson set is organized in our sample materials.

Lesson 1 Context

UNIT STORYLINE

Why does a lot of hail, rain, or snow fall at some times and not others?

How students will engage with each of the phenomena

Lesson Question	Phenomena or Design Problem	What we do and figure out	How we represent it
LESSON 1 3 days **What causes this kind of precipitation event to occur?** Anchoring Phenomenon lesson type	 *Large, frozen pieces of water fall from the sky during storms at different locations on what appear to be relatively warm days. In one case, clouds can be seen moving into and out of the area where it happens.*	We observe three video clips of hail falling in different areas of the United States on different days. We develop a model to try to explain what causes this to occur. We develop questions for our Driving Question Board (DQB) about the mechanisms that cause different kinds of precipitation events. We brainstorm investigations we could do and sources of data that could help us figure out answers to our questions. We figure out these things: • Rain and wind accompany some hail events. • Some of the water that reaches the ground reached a low enough temperature to freeze, at some point, before it fell. • Clouds can be seen moving into and out of the area where it hailed. • Cloud movement in the sky, moving air (wind) at Earth's surface, and temperature may be related to why, where, and when different forms of precipitation fall. look fors	Models → large scale, longer time 

How does water get into the air?
why do some clouds produce storms & others don't?
How can ice fall even on a warm day?
How do clouds form?

Need to group ?s about hail together on DQB (see possible groupings)

⇩ Navigation to Next Lesson: Many of our questions were about hail. Explaining how it forms could also help explain other precipitation events. It looked like the hail fell in places where green stuff was growing, and we weren't sure how the water got cold enough to freeze and form hail. We wanted to know more about what the air was like on these days (and others) when it hailed. We also thought it would be useful to look at hail more closely, as it may provide some clues about how it formed.

Lesson 1 Context

Students have already

- explored resources that introduce the phenomenon and made observations
- asked questions related to the phenomenon
- shared experiences and initial explanations related to the phenomenon

Step 3: Lesson Set Annotation **Time Estimate: 60 minutes**

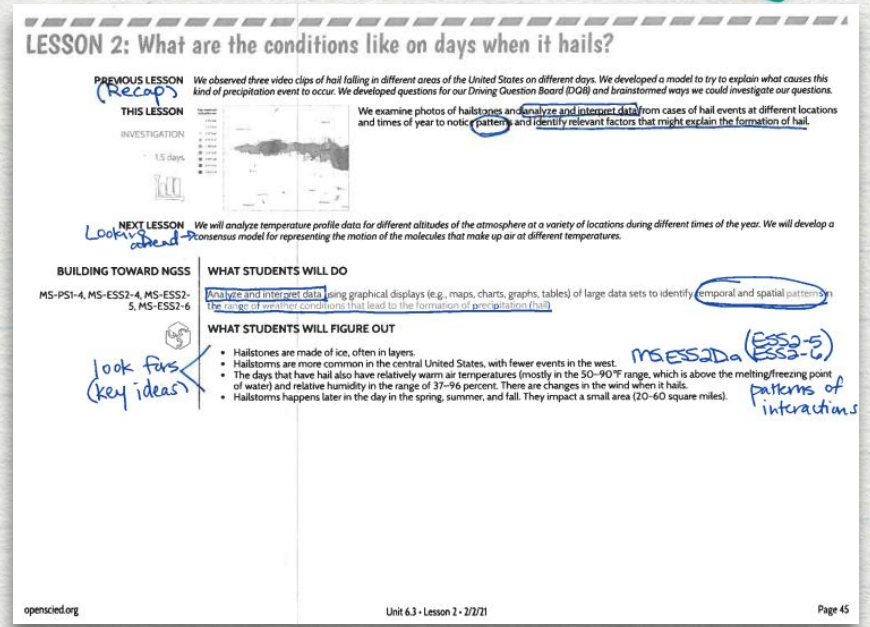
Question: How will students incrementally develop an understanding of the anchoring phenomenon and science concepts?

Purpose: Team members annotate sequences of lessons to determine where incremental sense-making occurs in the unit of study, to make instructional decisions that best meet the intent of the standards and the needs of all students.

Choose a lesson set from the current unit of study	Annotation Discussion Questions
Critically read the lesson-set performance expectation(s).	What Science and Engineering Practice(s) will students use?
	Where are the conceptual checkpoints for the Disciplinary Core Idea(s)?
	How will students apply the Crosscutting Concept(s)?
after the lessons set.	
	Note key understandings you will look for or listen for in each task.
	Identify places students may have competing ideas What strategies will you use to support student sense-making?

How will students incrementally build knowledge through the three dimensions?

- Examine the **Sample Annotated Lesson 2**
- Find examples of how students are incrementally building knowledge through the three dimensions.



LESSON 2: What are the conditions like on days when it hails?

PREVIOUS LESSON *We observed three video clips of hail falling in different areas of the United States on different days. We developed a model to try to explain what causes this kind of precipitation event to occur. We developed questions for our Driving Question Board (DQB) and brainstormed ways we could investigate our questions.*

THIS LESSON

INVESTIGATION

1.5 days

We examine photos of hailstones and analyze and interpret data from cases of hail events at different locations and times of year to notice patterns and identify relevant factors that might explain the formation of hail.

NEXT LESSON *We will analyze temperature profile data for different altitudes of the atmosphere at a variety of locations during different times of the year. We will develop a consensus model for representing the motion of the molecules that make up air at different temperatures.*

BUILDING TOWARD NGSS	WHAT STUDENTS WILL DO
MS-PS1-4, MS-ESS2-4, MS-ESS2-5, MS-ESS2-6	Analyze and interpret data using graphical displays (e.g., maps, charts, graphs, tables) of large data sets to identify temporal and spatial patterns in the range of weather conditions that lead to the formation of precipitation (hail).

WHAT STUDENTS WILL FIGURE OUT

- Hailstones are made of ice, often in layers.
- Hailstorms are more common in the central United States, with fewer events in the west.
- The days that have hail also have relatively warm air temperatures (mostly in the 50–90 °F range, which is above the melting/freezing point of water) and relative humidity in the range of 37–96 percent. There are changes in the wind when it hails.
- Hailstorms happens later in the day in the spring, summer, and fall. They impact a small area (20–60 square miles).

Step 3: Lesson Set Annotation **Time Estimate: 60 minutes**

Question: How will students incrementally develop an understanding of the anchoring phenomenon and science concepts?

Purpose: Team members annotate sequences of lessons to determine where incremental sense-making occurs in the unit of study, to make instructional decisions that best meet the intent of the standards and the needs of all students.

Choose a lesson set from the current unit of study	Annotation Discussion Questions
Critically read the lesson-set performance expectation(s).	What Science and Engineering Practice(s) will students use?
	Where are the conceptual checkpoints for the Disciplinary Core Idea(s)?
	How will students apply the Crosscutting Concept(s)?
Determine how student understanding will be assessed after the lessons set.	Identify 2-3 of the critical tasks in the lesson set. Create or review exemplar student responses.
	Note key understandings you will look for or listen for in each task.
	Identify places students may have competing ideas What strategies will you use to support student sense-making?

What tasks will best support instructional decision-making?

- Examine the Sample Critical Task
- **Why would this task be important in seeing if students have an understanding of the three dimensions?**

Examine a Critical Task

What opportunities were in the lesson plan that supported student sense-making of the task?

What might you add to provide support for your students?

Reflection

- Unit Unpacking
- Unit Launch Deep Dive
- Lesson Set Annotation
- Student Work Analysis

Step 4: Student Work Analysis **Time Estimate: 40 minutes**

Question: How do you use three-dimensional assessments to evaluate students' understanding?

Purpose: Team members establish norms for evaluating student work, analyze student work to formatively assess students' understanding, and from that analysis determine the implications for instructional practice and effectiveness.

How does Lesson Set Annotation set the stage for this next step?

For questions, email STEM@la.gov