2015 Alabama Course of Study: Science
Lesson/Instructional Materials Prescreen Design

The Lesson/Instructional Materials Prescreen Design is adapted from Achieve, Inc.'s NGSS Lesson Screener to be sued as a guide to take a quick look at lessons and/or instructional materials as a first step in determining if lessons/instructional materials truly fit the standards. The prescreen design is a good tool to use when designing science lessons as a learning team/community to determine the quality of the lesson.

The directions for using the lesson/instructional materials prescreen design assume an understanding of *A Framework for K—12 Science Education* and the *2015 Alabama Course of Study: Science*, including how the science standards are different from the 2005 science standards.

The Lesson/Instructional Materials Prescreen Design is not sufficient to fully vet resources as completely designed to meet the standards in the *2015 Alabama Course of Study: Science*. Achieve has created the *EQuIP Rubric for Science* to evaluate NGSS design for lessons and units and the *Primary Evaluation of Essential Criteria (PEEC)* for evaluating full curricula or instructional materials programs. These tools may be adapted to be used for Alabama's science standards.

How to Use Prescreen Design

There are six criteria. A set of response forms is included for each category on the following pages. Evidence for each criterion must be identified and documented. In addition, criterion-based feedback and suggestions for improvement should be given to help improve the lesson.

Users of the prescreen design may

- Individually record criterion-based evidence
- Individually make suggestions for improvement in comments section, and
- Collaboratively discuss finding with team members before checking one of the boxes under the *"Evidence"* column. A rating of "Strong Evidence" means that the lesson meets the criterion.

Working as a group will not only result in a better lesson, but can also bring the group to a common and deeper understanding of designing lessons for the science standards. When developing a lesson, groups may focus on a specific criterion or on all criteria (A-F).

Features of a Quality Lesson Design for Instruction and Assessment

Shifts Based on *A Framework for K-12 Science Education*

A. **Explaining Phenomena or Designing Solutions:** The lesson focuses on supporting students to make sense of a phenomenon or design solutions to a problem.

B. **Three Dimensions:** The lesson helps students develop and use multiple grade-appropriate elements of the science and engineering practices (SEPs), disciplinary core ideas (DCIs) and crosscutting concepts (CCCs), which are deliberately selected to aid student sense-making of phenomena or designing of solutions.

C. **Integrating the Three Dimensions for Instruction and Assessment:** The lesson requires student performances that integrate the elements of the SEPs, CCCs, and DCIs to make sense of phenomena or design solutions to problems, and the lesson elicits student artifacts that show direct, observable evidence of three-dimensional learning.

Features of Quality Design

D. **Relevance and Authenticity:** The lesson motivates student sense-making or problem-solving by taking advantage of student questions and prior experiences in the context of the students' home, neighborhood, and community as appropriate.

E. **Student Ideas:** The lesson provides opportunities for students to express, clarify, justify, interpret, and represent their ideas (i.e., making thinking visible) and to respond to peer and teacher feedback.

F. **Building on Students' Prior Knowledge:** The lesson identifies and builds on students' prior learning in all three dimensions in a way that is explicit to both the teacher and the students.

Criterion A. Explaining Phenomena or Designing Solutions

The lesson focuses on supporting students to make sense of a phenomenon or design solutions to a problem.

1. **Learn about the importance of explaining phenomena and designing solutions** in lessons at the NextGenScience website. Then use the table below to help gather evidence that either student problem-solving or sense-making of phenomena drives the lesson.
2. **Record evidence** about how explaining phenomena or designing solutions to problems are represented in the lesson. Describe in the response form how this evidence is or is not a strong enough indicator to meet the criterion. Include detailed suggestions for improvement.
3. If you are working in a group, **compare lists of evidence and reasoning and come to consensus** about whether this lesson met Criterion A.

Designed Lesson will look *less* like this				**Designed Lesson will look *more* like this**
	No Evidence	Some Evidence	Strong Evidence	
Explaining phenomena and designing solutions are not a part of student learning or are presented separately from "learning time" (i.e., used only as a "hook" or engagement tool; used only for enrichment or reward after learning; only loosely connected to a DCI).	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	The purpose and focus of the lesson are to support students in making sense of phenomena and/or designing solutions to problems. The entire lesson drives toward this goal.
The focus is only on getting the "right" answer to explain the phenomenon	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	Student sense-making of phenomena or designing of solutions is used as a window into student understanding of all three dimensions of the standards.
A different, new, or unrelated phenomenon is used to start every lesson.	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	Lessons work together in a coherent storyline to help students make sense of phenomena.
Teachers tell students about an interesting phenomenon or problem in the world.	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	Students get direct (preferably firsthand, or through media representations) experience with a phenomenon or problem that is relevant to them and is developmentally appropriate.
Phenomena are brought into the lesson after students develop the science ideas so students can apply what they learned.	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	The development of science ideas is anchored in explaining phenomena or designing solutions to problems.
Comments:				

Criterion B. Three Dimensions

The lesson helps students develop and use multiple grade-appropriate elements of the science and engineering practices (SEPs), disciplinary core ideas (DCIs), and crosscutting concepts (CCCs), which are deliberately selected to aid student sense-making of phenomena or designing of solutions.

1. **Document evidence of specific grade-banded elements (DCIs, CCCs, and SEPs) of each dimension—including what evidence was in the lesson, where it occurs, and why it should be considered to be evidence.** To be considered as evidence it should be clear how the student learning will develop or apply a specific element in a way that distinguishes it from other grade bands. Use the table below to help gather evidence about how each dimension is used in this lesson.
2. **Record specifically where you find each dimension** in the lesson. Describe in the response form how this evidence is or is not a strong enough indicator to meet the criterion. Include detailed suggestions for improvement.
3. If you are working in a group, **compare lists of evidence and reasoning and come to consensus** about whether this lesson met Criterion B.

Designed Lesson will look *less* like this				**Designed Lesson will look *more* like this**
	No Evidence	Some Evidence	Strong Evidence	
A single practice element shows up in the lesson.	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	The lesson helps students use multiple (e.g., 2-4) practice elements as appropriate in their learning.
The lesson focuses on colloquial definitions of the practice or crosscutting concept names (e.g., “asking questions”, “cause and effect”) rather than on grade-appropriate learning goals. Contact ALSDE science specialist for copies of grade band endpoints.	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	Specific grade-appropriate elements of SEPs and CCCs are acquired, improved, or used by students to help explain phenomena or solve problems during the lesson.
The SEPs and CCCs can be inferred by the teacher (not necessarily the students) from the lesson materials.	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	Students explicitly use the SEP and CCC elements to make sense of the phenomenon or to solve a problem.
Engineering lessons focus on trial and error activities that don’t require science or engineering knowledge.	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	Engineering lessons require students to acquire and use elements of DCIs from physical, life, or Earth and space sciences together with elements of DCIs from engineering design to solve design problems.
Comments:				

Criterion C. Integrating the Three Dimensions for Instruction and Assessment

The lesson requires student performances that integrate the elements of the SEPs, CCCs, and DCIs to make sense of phenomena or design solutions to problems, and the lesson elicits student artifacts that show direct, observable evidence of three-dimensional learning.

1. **Document evidence of specific grade-banded elements (DCIs, CCCs, and SEPs) of each dimension—including what evidence was in the lesson, where it occurs, and why it should be considered evidence. Use your evaluation of the lesson for criterion B (three dimensions)** to examine the lesson for places that students use the three dimensions together to explain a phenomenon or design a solution to a problem. Use the table below to help gather evidence about three-dimensional learning and assessment in the lesson.
2. **Record evidence** about how the three dimensions are integrated for instruction and assessment purposes. Describe in the response form how this evidence is or is not a strong enough indicator to meet the criterion. Include detailed suggestions for improvement.
3. If you are working in a group, **compare lists of evidence and reasoning and come to consensus** about whether this lesson met Criterion C.

Designed Lesson will look *less* like this				**Designed Lesson will look *more* like this**
	No Evidence	Some Evidence	Strong Evidence	
Students learn the three dimensions in isolation from each other (e.g., a separate lesson or activity on science methods followed by a later lesson on science knowledge).	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	• The lesson is designed to build student proficiency in at least one grade-appropriate element from each of the three dimensions. • The three dimensions intentionally work together to help students explain a phenomenon or design solutions to a problem. • All three dimensions are necessary for sense-making and problem-solving.
Teachers assume that correct answers indicate student proficiency without the student providing evidence or reasoning.	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	Teachers deliberately seek out student artifacts that show direct, observable evidence of learning, building toward all three dimensions of the standards at a grade-appropriate level.
Teachers measure only one dimension at a time (e.g., separate items for measuring SEPs, DCIs, and CCCs).	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	Teachers use tasks that ask students to explain phenomena or design solutions to problems, and that reveal the level of student proficiency in all three dimensions.
Comments:				

Criterion D. Relevance and Authenticity

The lesson motivates student sense-making or problem-solving by taking advantage of student questions and prior experiences in the context of the students' home, neighborhood, and community as appropriate.

1. **Learn about the importance of making lessons relevant and authentic for all students at the** NSTA@NGSS site**.** Once you are comfortable with ideas for making lessons relevant and authentic for all students, examine the lesson through the "lens" of student engagement, and for clear evidence that the lesson supports connections to students' lives. Use the table below to help gather evidence about the relevance and authenticity of the lesson for students.
2. **Record evidence** about how the lesson is relevant to students and motivates their learning. Describe in the response form how this evidence is or is not a strong enough indicator to meet the criterion. Include detailed suggestions for improvement.
3. If you are working in a group, **compare lists of evidence and reasoning and come to consensus** about whether this lesson met Criterion D.

Designed Lesson will look *less* like this				**Designed Lesson will look *more* like this**
	No Evidence	Some Evidence	Strong Evidence	
The lesson teaches a topic adults think is important.	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	The lesson motivates students sense-making or problem-solving.
The lesson focuses on examples that some of students in the class understand.	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	The lesson provides support to teachers for making connections to the lives of every student in the class.
Driving questions are given to students.	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	Student questions, prior experiences, and diverse backgrounds related to the phenomenon or problem are used to drive the lesson and the sense-making or problem-solving.
The lesson tells the students what they will be learning.				The lesson provides support to teachers or students for connecting students own questions to the targeted materials.
Comments:				

Criterion E. Student Ideas

The lesson provides opportunities for students to express, clarify, justify interpret, and represent their ideas (i.e., making thinking visible) and to respond to peer and teacher feedback.

1. **Examine the lesson for opportunities for *all* students to communicate their ideas** and for the depth to which student ideas are made visible. Use the table below to help gather evidence about how each dimension is used in this lesson.
2. **Record evidence** about how student ideas are elicited form ALL students during the lesson. Describe in the response form how this evidence is or is not a strong enough indicator to meet the criterion. Include detailed suggestions for improvement.
3. If you are working in a group, **compare lists of evidence and reasoning and come to consensus** about whether this lesson met Criterion E.

Designed Lesson will look *less* like this				**Designed Lesson will look *more* like this**
	No Evidence	Some Evidence	Strong Evidence	
The teacher is the central figure in classroom discussions.	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	• Classroom discourse focuses on explicitly expressing and clarifying student reasoning. • Students have opportunities to share ideas and feedback with each other directly.
Student artifacts only show answers.	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	Student artifacts include elaborations (which may be written, oral, pictorial, and kinesthetic) of reasoning behind their answers, and show how students' thinking has changed over time.
The teacher's guide focuses on what to tell the students.	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	The lesson provides supports to teachers for eliciting student ideas.
Comments:				

Criterion F. Building on Students' Prior Knowledge

The lesson identifies and builds on students' prior learning in all three dimensions in a way that is explicit to both the teacher and students.

1. **Learn about the expected learning progressions of each of the three dimensions.** Once you are familiar with the learning progressions, use the table below to help gather evidence about how the lesson builds on students' prior learning in each of the three dimensions.
2. **Record evidence** about how the lesson builds on students' prior learning. Describe in the response form how this evidence is or is not a strong enough indicator to meet the criterion. Include detailed suggestions for improvement.
3. If you are working in a group, **compare lists of evidence and reasoning and come to consensus** about whether this lesson met Criterion F.

Designed Lesson will look *less* like this				**Designed Lesson will look *more* like this**
	No Evidence	Some Evidence	Strong Evidence	
The lesson content builds on students' prior learning but only for DCIs.	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	The lesson content builds on students' prior learning in all three dimensions.
The lesson does not include support to teachers for identifying students' prior learning.	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	The lesson provides explicit support to teachers for identifying students' prior learning and accommodating different entry points, and describes how the lesson will build on the prior learning.
The lesson assumes that students are starting from scratch in their understanding.	☐=0 Evidence	☐=1 Evidence	☐=2 Evidence	The lesson explicitly works together with students' foundational knowledge and practice from prior grade levels.
Comments:				

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Final Summary

Reviewer Name or ID: _____ **Lesson/Unit Title:** _____

Subject/Grade: _____

Overall Prescreening Summary:

(Reminder: The purpose of the prescreen is to give a quick look at a lesson, not to fully vet resources. For full evaluations of materials for Alabama, please refer to an adapted version of Achieve's EQuIP Rubric or Primary Evaluation of Essential Criteria [PEEC] for full evaluations.)