


Lesson Planning Guide

Part A
Develop Lesson Overview

Prepare lesson plan foundation:


- Select PEs/standards
- Connect to anchoring phenomenon
- Ask driving question
- Unpack PEs/standards
- Identify lesson topics and resources



Part B
Create Lesson Plan

Develop lesson plan:


- Lesson summary and learning goals
- Compile lesson logistics
- Select 5E(s) to guide instruction
- Complete lesson plan details



Part C
Lesson Instruction and Reflection

Review and revise lesson plan:

- Keep notes and modify lesson during instruction, as needed
- Review and revise lesson post-instruction



Key
Next Generation Science Standards (NGSS)
PE = Performance Expectation
SEP = Science and Engineering Practices
DCI = Disciplinary Core Ideas
CCC = Crosscutting Concepts
and
5Es = The 5E Instructional Model

Lesson Planning Guide

Develop Lesson Plans for Instruction

Steps in developing [NGSS](#)-/standards-aligned, phenomenon-based lessons that are guided by the [5Es instructional model](#):

1. Complete the Lesson Plan Overview (Part A) to guide development of lesson plans.
2. Use the Lesson Plan Template (Part B) to create detailed lesson plans.



Lesson Overview Template (Part A)

1.a Select grade level NGSS [Performance Expectations \(PEs\)](#) or [Topics](#), or district/state standards that support lesson-based student learning goals.

For NGSS, PE color coding reflects its 3-dimensional learning components. Search the [Evidence Statements](#) for details on what students should know and do.

1.b Identify a lesson-based [anchoring phenomenon](#) that builds towards understanding of the PEs/standards, and is engaging and relevant to students.

See more about [phenomena](#) and using [phenomena with NGSS](#).

1.c Ask a [Driving Question](#), which is authentic and student-focused, that relates to investigating the PEs/standards and phenomenon.

See more about [Driving Questions](#) and using [Driving Questions with NGSS](#).

1.d Unpack the 3-D learning components of the Performance Expectations/standards in the table below.

For NGSS guidance, see the [NGSS Topic Arrangements](#) and [NGSS DCI Arrangements](#). Use tools to **unpack** each PE separately.

Science and Engineering Practices (SEP) (skills)	Disciplinary Core Ideas (DCI) (content)	Crosscutting Concepts (CCC) (connections)

1.e Determine students' prior knowledge about the lesson concepts. (e.g., pre-test, class discussion, exit ticket, 1-minute report, KWL chart, survey, etc.)

--

1.f Identify Lesson Topics and Learning Goals: List main lesson concepts related to grade level PEs/standards that support student learning goals in figuring out the anchoring phenomenon; revise as needed.

--

1.g Select Lesson Resources: Identify resources to develop lessons that address the PEs/standards and investigate the anchoring phenomenon through a variety of sequenced activities; revise as needed (include title and URL).

--



Lesson Plan Template (Part B)

Lesson Plan Template (Part B)			
Grade and Subject		Instructional Time (min.)	
Lesson Title (Topic)			
Anchoring Phenomenon (copy from 1.b)			
Driving Question (copy from 1.c)			
Lesson Overview			
Lesson Summary (description)	Lesson Topics and Student Learning Goals (copy from 1.f)		



Lesson Resources Aligned with Standards		
Lesson Resource (copy from 1.g, sequenced with titles and links)	Resource Standards Alignment (copy from 1.d, standards notated, link optional)	
Teacher Preparation		
Student Misconceptions (potential student ideas that are problematic when engaging in the lesson)	Scientific Terminology (vocabulary named once students “figure out” concepts of lesson)	
Materials Preparation		
Student Needs (activity sheets, data packet, etc.)	Group Needs (lab equipment, group data packets, etc.)	Safety & Technology Needs (unsafe materials, websites cued, etc.)
Supporting Information		
References (links to cite sources of data, images, websites, etc.)	Background Reading (for teachers and/or students)	

Complete the 5E Instructional Model section(s) that are relevant to the lesson:

Engage: *Interest in a concept is generated and students' current understanding is assessed.*

ACTIVATE interest: Introduce anchoring phenomenon and driving question.

- Engages students in the concepts through a short activity or relevant discussion
- Connects students' past and present experiences
- Creates interest and generates curiosity
- Uncovers students' current knowledge and misconceptions
- Initiates students' investigation into the anchoring phenomenon based on an observation, problem, or question

Phenomenon-based Driving Questions (questions students are likely to ask about the lesson topic)

Lesson Activities (experiment, demonstration, video, visualization, reading, etc., coherently sequenced to help build understanding of PE/standard)

For each activity, provide details of the procedure including timing, teacher guidance, student prompts, strategies for discussions and differentiation, etc.

Formative Assessment (activity sheet, Venn diagram, summary, exit ticket, think-pair-share, etc. to check for understanding of lesson concepts)

Consensus Discussion (claims, evidence, and reasoning on what students figured out in this lesson)

New Questions and Next Steps (student-driven questions, ideas on what to investigate in the next lesson and how to investigate it, etc.)

AND/OR

Explore: *Students participate in activities to explore questions related to a concept.*

BUILD Knowledge: Learn the science behind concepts.

- Students explore the concepts with others to develop a common set of experiences
- Provides students with one or more actual experiences
- Offers opportunities for creative thinking and skills development
- Students make and record observations and ideas, make connections, and ask questions
- Students usually work in groups
- Teacher acts as coach or facilitator in student-led investigations

Phenomenon-based Driving Questions (questions students are likely to ask about the lesson topic)

Lesson Activities (experiment, demonstration, video, visualization, reading, etc., coherently sequenced to help build understanding of PE/standard)

For each activity, provide details of the procedure including timing, teacher guidance, student prompts, strategies for discussions and differentiation, etc.

Formative Assessment (activity sheet, Venn diagram, summary, exit ticket, think-pair-share, etc. to check for understanding of lesson concepts)

Consensus Discussion (claims, evidence, and reasoning on what students figured out in this lesson)

New Questions and Next Steps (student-driven questions, ideas on what to investigate in the next lesson and how to investigate it, etc.)

AND/OR

Explain: <i>Students construct their understanding of a concept and develop evidence-based explanations.</i> DEVELOP Concepts: Research information using real-world data.
<ul style="list-style-type: none">• Develops students' explanation for the concepts they have been exploring with teacher providing supporting guidance• Students describe their observations and come up with explanations• Students listen critically to each other's explanations• Students learn to apply and interpret evidence• Develops students' academic vocabulary by applying scientific terms once students have figured out the lesson concepts• Teacher guides students' reasoning, asks appropriate questions, and directs students to additional supporting resources
Phenomenon-based Driving Questions (questions students are likely to ask about the lesson topic)
Lesson Activities (experiment, demonstration, video, visualization, reading, etc., coherently sequenced to help build understanding of PE/standard) For each activity, provide details of the procedure including timing, teacher guidance, student prompts, strategies for discussions and differentiation, etc.
Formative Assessment (activity sheet, Venn diagram, summary, exit ticket, think-pair-share, etc. to check for understanding of lesson concepts)
Consensus Discussion (claims, evidence, and reasoning on what students figured out in this lesson)
New Questions and Next Steps (student-driven questions, ideas on what to investigate in the next lesson and how to investigate it, etc.)

AND/OR

Elaborate: <i>Students deepen and expand their understanding by applying their understanding in new contexts.</i>
APPLY Learning: Utilize information in new ways.
<ul style="list-style-type: none">• Extends students' understanding or applies what they have learned in a new setting• Students use the information they have gained to propose solutions and extend their learning to new situations• Teacher supports students in broadening their understanding and extend ideas to other situations so they can draw broader conclusions beyond their experiment or investigation
Phenomenon-based Driving Questions Extended/Applied in a New Context (questions students are likely to ask about the lesson topic)
Lesson Activities (experiment, demonstration, video, visualization, reading, etc., coherently sequenced to help build understanding of PE/standard) For each activity, provide details of the procedure including timing, teacher guidance, student prompts, strategies for discussions and differentiation, etc.
Formative Assessment (activity sheet, Venn diagram, summary, exit ticket, think-pair-share, etc. to check for understanding of lesson concepts)
Consensus Discussion (claims, evidence, and reasoning on what students figured out in this lesson)
New Questions and Next Steps (student-driven questions, ideas on what to investigate in the next lesson and how to investigate it, etc.)

AND/OR

Evaluate: <i>Students and teachers have opportunities to assess students' understanding of a concept.</i> DEMONSTRATE Ability: Write, illustrate, create, etc. artifacts that accurately describe knowledge gained.
<ul style="list-style-type: none">• Students have the opportunity to demonstrate understanding of skills and concepts, and evaluate their own progress• Teacher evaluates students' understanding and progress, as well as their own instructional practice, and may implement alternative assessment strategies• Enables adjustment of misconceptions, reinforces students' understanding of the PE concepts in greater depth
Phenomenon-based Driving Questions (questions about the lesson topic)
Skills Learning Performance (SEPs) Goals (assess student skills related to the lesson)
Formative Assessment (quiz, test, report, presentation, poster, video, model, etc. to demonstrate students' understanding about the PEs/standards)
Content Learning Performance (DCIs, CCCs) Goals (assess student mastery of lesson content)
Summative Assessment (quiz, test, report, presentation, poster, video, model, etc. to demonstrate students' understanding about the PEs/standards)



Step 4: Lesson Instruction and Reflection

Lesson Notes During Instruction

- What modifications (instruction, timing, etc.) were made or are needed for the lesson, activities, or resources?
- Which parts of the lesson, activities, or resources were or need to be changed?
- How effective (or ineffective) were the lesson, activities, or resources for student learning?

Review and Revise Post-Instruction

- Which parts of the lesson were a success?
- What were some challenges about the lesson?
- How could the lesson be changed or improved?