

EQUIP Rubric for Lessons & Units: Science (Version 3.0)

Reviewer Name or ID: Emily Hie, Nichole Vanscay, Caitlin Morin Lesson/Unit Title: Forces & Motion - Lesson F4: Pendulum Swing

Grade: 3

Category I: **NGSS 3D Design (lessons and units):** *The lesson/unit is designed so students make sense of phenomena and/or design solutions to problems by engaging in student performances that integrate the three dimensions of the NGSS.*

Lesson and Unit Criteria	Specific evidence from materials and reviewer's reasoning	Evidence of Quality?	Suggestions for improvement
<p>Lessons and units designed for the NGSS include clear and compelling evidence of the following:</p> <p>A. <b>Explaining Phenomena/Designing Solutions:</b> Making sense of phenomena and/or designing solutions to a problem drive student learning.</p> <ul style="list-style-type: none"> <li>i. Student questions and prior experiences related to the phenomenon or problem motivate sense-making and/or problem solving.</li> <li>ii. The focus of the lesson is to support students in making sense of phenomena and/or designing solutions to problems.</li> <li>iii. When engineering is a learning focus, it is integrated with developing disciplinary core ideas from physical, life, and/or earth and space sciences.</li> </ul>	<p>Yes-phenomena present &amp; relates to prior lesson(s), gives probing q, students generate questions to students are sensemaking in this engineering is not included in this lesson, or throughout</p>	<p><input type="checkbox"/> None  <input type="checkbox"/> Inadequate  <input checked="" type="checkbox"/> Adequate  <input type="checkbox"/> Extensive</p>	<p>Include engineering, solution design</p>
<p>B. <b>Three Dimensions:</b> Builds understanding of multiple grade-appropriate elements of the science and engineering practices (SEPs), disciplinary core ideas (DCIs), and crosscutting concepts (CCCs) that are deliberately selected to aid student sense-making of phenomena and/or designing of solutions.</p> <ul style="list-style-type: none"> <li>i. Provides opportunities to develop and use specific elements of the SEP(s).                      Construct Explanator, Analyze Data, Develop models, Engage in Argument</li> <li>ii. Provides opportunities to develop and use specific elements of the DCI(s).</li> <li>iii. Provides opportunities to develop and use specific elements of the CCC(s).</li> </ul> <p>Evidence needs to be at the element level of the dimensions (see rubric introduction for a description of what is meant by "element")</p>	<p>Document evidence and reasoning, and evaluate whether or not there is sufficient evidence of quality for each dimension separately</p> <ul style="list-style-type: none"> <li>i. Plan/Conduct Investigations, Make Observations, Asking questions/Define problems</li> <li>ii. PS2.A: Forces &amp; Motion                      3-PS2-1                      3-PS2-2</li> <li>iii. Patterns                      Cause/Effect</li> </ul>	<p><input type="checkbox"/> None  <input type="checkbox"/> Inadequate  <input checked="" type="checkbox"/> Adequate  <input type="checkbox"/> Extensive</p> <p>(All 3 dimensions must be rated at least "adequate" to mark "adequate" overall)</p>	<p>Engineering                      ↓                      Solve a problem</p>

<p>C. <b>Integrating the Three Dimensions:</b> Student sense-making of phenomena and/or designing of solutions requires student performances that integrate elements of the SEPs, CCCs, and DCIs.</p>	<p>Yes- they combine DCI's, CCCs, SEPs to make sense of phenomena</p>	<p><input type="checkbox"/> None  <input type="checkbox"/> Inadequate  <input checked="" type="checkbox"/> Adequate  <input type="checkbox"/> Extensive</p>	
<p><b>Rating for Category I. NGSS 3D Design—lessons</b>  After carefully weighing the evidence, reasoning, and suggestions for improvement, rate the degree to which there is enough evidence to support a claim that the lesson meets these criteria.   <b>if you are evaluating an instructional unit rather than a single lesson, continue on to evaluate criteria D-F and rate Category I overall below.</b></p>	<p><b>Lesson Rating scale for Category I (Criteria A–C only):</b>  <b>3:</b> Extensive evidence to meet at least two criteria (and at least adequate evidence for the third)  <b>2:</b> Adequate evidence to meet all three criteria in the category  <b>1:</b> Adequate evidence to meet at least one criterion in the category, but insufficient evidence for at least one other criterion  <b>0:</b> Inadequate (or no) evidence to meet any of the criteria in the category</p>		<p><b>Circle Rating</b></p> <p>0 1 <b>2</b> 3</p> <p>After rating the lesson, read below for next steps</p>

**What's next if the lesson rating is less than a 2?**

If the rubric is being used to approve or vet resources and the lesson or unit does not score at least a "2" in **Category I: NGSS 3D Designed**, the review should stop and feedback should be provided to the lesson developer(s) to guide revisions. If the rubric is being used locally for revising and building lessons, professional judgment should guide whether to continue reviewing the lesson. Categories II and III may be time consuming to evaluate if Category I has not been met and the feedback may not be useful if significant revisions are needed in Category I, but evaluating these criteria in a group may support deeper and more common understanding of the criteria in these categories and more complete feedback to the lesson developer (if they are not in the room) so that Categories II and III are more likely to be met with fewer cycles of revision.

**What's next if the lesson rating is a 2 or 3?**

If you are evaluating a lesson that shows sufficient evidence of quality to warrant a rating of either a 2 or a 3 for Category I, proceed to Category II: NGSS Instructional Supports

**Category I: NGSS 3D Design (additional criteria for units only):**

If you are evaluating a lesson, it is not necessary to evaluate criteria D-F. Please enter your rating for a single lesson above (after C).

Unit Criteria	Specific evidence from materials and reviewers' reasoning	Evidence of Quality?	Suggestions for improvement
<p>A unit or longer lesson designed for the NGSS will also include clear and compelling evidence of the following:</p> <p>D. <b>Unit Coherence:</b> Lessons fit together to target a set of performance expectations.</p> <ul style="list-style-type: none"> <li>i. Each lesson builds on prior lessons by addressing questions raised in those lessons, cultivating new questions that build on what students figured out, or cultivating new questions from related phenomena, problems, and prior student experiences.</li> <li>ii. The lessons help students develop toward proficiency in a targeted set of performance expectations.</li> </ul>	<p>The content builds around DCI's, but are not dependent on student questioning, or what they found out</p> <p>Yes - grow in understanding of DCIs &amp; complexity of SEPs</p>	<p><input type="checkbox"/> None</p> <p><input type="checkbox"/> Inadequate</p> <p><input checked="" type="checkbox"/> Adequate</p> <p><input type="checkbox"/> Extensive</p>	<p>Openness to student ideas/question</p>
<p>E. <b>Multiple Science Domains:</b> When appropriate, links are made across the science domains of life science, physical science and Earth and space science.</p> <ul style="list-style-type: none"> <li>i. Disciplinary core ideas from different disciplines are used together to explain phenomena.</li> <li>ii. The usefulness of crosscutting concepts to make sense of phenomena or design solutions to problems across science domains is highlighted.</li> </ul>	<p>No stated connections w/ CCCs</p> <p>other science domains</p> <p>- Has potential, but does not explicitly state</p>	<p><input checked="" type="checkbox"/> None</p> <p><input type="checkbox"/> Inadequate</p> <p><input type="checkbox"/> Adequate</p> <p><input type="checkbox"/> Extensive</p>	<p>Include explicit connections to other domains (Earth/space, birds/migration etc)</p>
<p>F. <b>Math and ELA:</b> Provides grade-appropriate connection(s) to the Common Core State Standards in Mathematics and/or English Language Arts &amp; Literacy in History/Social Studies, Science and Technical Subjects.</p>	<p>- potential for connections - ELA - writing, speaking/listening</p> <p>- Does not explicitly state</p>	<p><input checked="" type="checkbox"/> None</p> <p><input type="checkbox"/> Inadequate</p> <p><input type="checkbox"/> Adequate</p> <p><input type="checkbox"/> Extensive</p>	<p>include explicit connection - measure, writing, speaking, listening, etc</p>
<p><b>Rating for Category I. NGSS 3D Designed—units</b></p> <p>After carefully weighing the evidence, reasoning, and suggestions for improvement, rate the degree to which the criteria are met across the unit.</p>	<p><b>Unit Rating Scale for Category I (Criteria A-F):</b></p> <ul style="list-style-type: none"> <li>3. At least adequate evidence for all of the unit criteria in the category; extensive evidence for criteria A-C</li> <li>2. At least some evidence for all unit criteria in Category I (A-F); adequate evidence for criteria A-C</li> <li>1. Adequate evidence for some criteria in Category I, but inadequate/no evidence for at least one criterion A-C</li> <li>0. Inadequate (or no) evidence to meet any criteria in Category I (A-F)</li> </ul>	<p><b>Circle Rating</b></p> <p>0 <b>1</b> 2 3</p>	<p><b>Circle Rating</b></p> <p>0 <b>1</b> 2 3</p>

If the rubric is being used to approve or vet resources and the unit does not score at least a "2" overall in Category I: NGSS 3D Design, the review should stop here and feedback should be provided to the unit developer(s) to guide revisions. If the rubric is being used locally for revising and building units, professional judgment should be used on whether or not to continue reviewing the unit. For example, a unit that is weak in one aspect of criterion A, but that the reviewers think is easy to fix, might warrant continued review to provide more complete feedback to the unit developer(s).

**Category II: NGSS Instructional Supports (lessons and units):** The lesson/unit supports three-dimensional teaching and learning for ALL students by placing the lesson in a sequence of learning for all three dimensions and providing support for teachers to engage all students.

Lesson and Unit Criteria	Specific evidence from materials and reviewers' reasoning	Evidence of Quality?	Suggestions for improvement
<p>Lessons and units designed for the NGSS include clear and compelling evidence of the following:</p> <p>A. <b>Relevance and Authenticity:</b> Engages students in authentic and meaningful scenarios that reflect the practice of science and engineering as experienced in the real world.</p> <ul style="list-style-type: none"> <li>i. Students experience phenomena or design problems as directly as possible (firsthand or through media representations).</li> <li>ii. Includes suggestions for how to connect instruction to the students' home, neighborhood, community and/or culture as appropriate.</li> <li>iii. Provides opportunities for students to connect their explanation of a phenomenon and/or their design solution to a problem to questions from their own experience.</li> </ul>	<p>Media-Videos            Have you ever been shocked...            Have you ever seen?            Includes some/limited suggestions for relating to students' home but could include more            YES</p>	<p><input type="checkbox"/> None  <input type="checkbox"/> Inadequate  <input checked="" type="checkbox"/> Adequate  <input type="checkbox"/> Extensive</p>	<p>More opp. for connection to home, culture</p>
<p>B. <b>Student Ideas:</b> Provides opportunities for students to express, clarify, justify, interpret, and represent their ideas and respond to peer and teacher feedback orally and/or in written form as appropriate.</p>	<p>MULTIPLE opportunities for students to share ideas, critique others', receive feedback, and make changes to thinking</p>	<p><input type="checkbox"/> None  <input type="checkbox"/> Inadequate  <input checked="" type="checkbox"/> Adequate  <input type="checkbox"/> Extensive</p>	
<p>C. <b>Building Progressions:</b> Identifies and builds on students' prior learning in all three dimensions, including providing the following support to teachers:</p> <ul style="list-style-type: none"> <li>i. Explicitly identifying prior student learning expected for all three dimensions</li> <li>ii. Clearly explaining how the prior learning will be built upon.</li> </ul>	<p>Yes, in each lesson - what they should have learned before - DCI's only - Not SEPs or CCCs Does not explicitly explain how the prior knowledge will be built upon</p>	<p><input type="checkbox"/> None  <input checked="" type="checkbox"/> Inadequate  <input type="checkbox"/> Adequate  <input type="checkbox"/> Extensive</p>	<p>include SEPs &amp; CCCs            Clearly show how prior knowledge could be built upon</p>

<p><b>D. Scientific Accuracy:</b> Uses scientifically accurate and grade-appropriate scientific information, phenomena, and representations to support students' three-dimensional learning.</p>	<p>Yes accurate &amp; appropriate</p> <p><input type="checkbox"/> None  <input type="checkbox"/> Inadequate  <input checked="" type="checkbox"/> Adequate  <input type="checkbox"/> Extensive</p>	
<p><b>E. Differentiated Instruction:</b> Provides guidance for teachers to support differentiated instruction by including:</p> <ul style="list-style-type: none"> <li>i. Appropriate reading, writing, listening, and/or speaking alternatives (e.g., translations, picture support, graphic organizers, etc.) for students who are English language learners, have special needs, or read well below the grade level.</li> <li>ii. Extra support (e.g., phenomena, representations, tasks) for students who are struggling to meet the targeted expectations.</li> <li>iii. Extensions for students with high interest or who have already met the performance expectations to develop deeper understanding of the practices, disciplinary core ideas, and crosscutting concepts.</li> </ul>	<p>Yes supports, checklists, media  making: sentence frames &amp; adapted forms for varying abilities  NO! - Not their</p> <p><input type="checkbox"/> None  <input checked="" type="checkbox"/> Inadequate  <input type="checkbox"/> Adequate  <input type="checkbox"/> Extensive</p>	<p>Include differentiated forms, ELL supports (sentence frames, vocab building), etc.</p>
<p><b>Rating for Category II: Instructional Supports—lessons</b>  After carefully weighing the evidence, reasoning, and suggestions for improvement, rate the degree to which the lesson met this category.</p> <p><b>If you are evaluating an instructional unit rather than a single lesson, continue on to evaluate criteria F–G and rate Category II overall below.</b></p>	<p><b>Lesson Rating scale for Category II (Criteria A-E only):</b></p> <p>3: At least adequate evidence for all criteria in the category; extensive evidence for at least one criterion</p> <p>2: Some evidence for all criteria in the category and adequate evidence for at least four criteria, including A</p> <p>1: Adequate evidence of quality for at least two criteria in the category</p> <p>0: Adequate evidence of quality for no more than one criterion in the category</p>	<p><b>Circle Rating</b></p> <p>0 1 2 3</p> <p style="text-align: center;">(1)</p>

**Category II: NGSS Instructional Supports (additional criteria for units only)**

*if you are evaluating a lesson, it is not necessary to evaluate criteria F-G. Please enter your rating for a lesson above (after E).*

Unit Criteria	Specific evidence from materials and reviewers' reasoning	Evidence of Quality?	Suggestions for improvement
<p>A unit or longer lesson designed for the NGSS will also include clear and compelling evidence of the following:</p> <p>F. <b>Teacher Support for Unit Coherence:</b> Supports teachers in facilitating coherent student learning experiences over time by:</p> <ul style="list-style-type: none"> <li>i. Providing strategies for linking student engagement across lessons (e.g. cultivating new student questions at the end of a lesson in a way that leads to future lessons, helping students connect related problems and phenomena across lessons, etc.).</li> <li>ii. Providing strategies for ensuring student sense-making and/or problem-solving is linked to learning in all three dimensions.</li> </ul>	<p>Referenced, but more as a footnote than as an integral part of the process</p> <p>Not clearly stated - often says "monitor groups" or "ask questions"</p>	<p><input type="checkbox"/> None</p> <p><input checked="" type="checkbox"/> Inadequate</p> <p><input type="checkbox"/> Adequate</p> <p><input type="checkbox"/> Extensive</p>	<p>Lessons led by questioning that matters in the next lesson</p> <p>Clearly state strategies for solving understanding (footnote or presentation w/ rubric)</p> <p>Engineering Problems solving solution</p>
<p>G. <b>Scaffolded differentiation over time:</b> Provides supports to help students engage in the practices as needed and gradually adjusts supports over time so that students are increasingly responsible for making sense of phenomena and/or designing solutions to problems.</p>	<p>To some extent, the demand increases throughout the unit in 2 cycles.</p> <p>They could have taken it further, giving students more responsibility</p>	<p><input type="checkbox"/> None</p> <p><input type="checkbox"/> Inadequate</p> <p><input checked="" type="checkbox"/> Adequate</p> <p><input type="checkbox"/> Extensive</p>	<p>Engineering Problems solving solution</p>
<p><b>Rating for Category II: NGSS Instructional Supports—units</b></p> <p>After carefully weighing the evidence, reasoning, and suggestions for improvement, rate the degree to which the criteria are met across the unit.</p>	<p><b>Unit rating scale for Category II (Criteria A-G):</b></p> <p>3: At least adequate evidence for all criteria in the category; extensive evidence for at least two criteria</p> <p>2: Some evidence for all criteria in the category and adequate evidence for at least five criteria, including A</p> <p>1: Adequate evidence for at least three criteria in the category</p> <p>0: Adequate evidence for no more than two criteria in the category</p>	<p><b>Circle Rating</b></p> <p>0 1 2 3</p> <p>(1)</p>	<p><b>Circle Rating</b></p> <p>0 1 2 3</p> <p>(1)</p>

**Category III: Monitoring NGSS Student Progress (lessons and units)** The lesson/unit supports monitoring student progress in all three dimensions of the NGSS as students make sense of phenomena and/or design solutions to problems.

Lesson and Unit Criteria Lessons and units designed for the NGSS include clear and compelling evidence of the following:	Specific evidence from materials and reviewers' reasoning	Evidence of Quality? <input type="checkbox"/> None <input type="checkbox"/> Inadequate <input checked="" type="checkbox"/> Adequate <input type="checkbox"/> Extensive	Suggestions for improvement
<p><b>A. Monitoring 3D student performances:</b> Elicits direct, observable evidence of three-dimensional learning; students are using practices with core ideas and crosscutting concepts to make sense of phenomena and/or to design solutions.</p>	<p>Yes - worksheets, building</p>	<p><input type="checkbox"/> None <input type="checkbox"/> Inadequate <input checked="" type="checkbox"/> Adequate <input type="checkbox"/> Extensive</p>	<p>More explanation with differentiated differentiated</p>
<p><b>B. Formative:</b> Embeds formative assessment processes throughout that evaluate student learning to inform instruction.</p>	<p>mentions, but is limited, provides no tools or guidance</p>	<p><input type="checkbox"/> None <input checked="" type="checkbox"/> Inadequate <input type="checkbox"/> Adequate <input type="checkbox"/> Extensive</p>	<p>tools for teachers to measure success formatively</p>
<p><b>C. Scoring guidance:</b> Includes aligned rubrics and scoring guidelines that provide guidance for interpreting student performance along the three dimensions to support teachers in (a) planning instruction and (b) providing ongoing feedback to students.</p>	<p>No rubrics or scoring guides</p>	<p><input checked="" type="checkbox"/> None <input type="checkbox"/> Inadequate <input type="checkbox"/> Adequate <input type="checkbox"/> Extensive</p>	
<p><b>D. Unbiased tasks/items:</b> Assesses student proficiency using methods, vocabulary, representations, and examples that are accessible and unbiased for all students.</p>	<p>None - No assessments</p>	<p><input checked="" type="checkbox"/> None <input type="checkbox"/> Inadequate <input type="checkbox"/> Adequate <input type="checkbox"/> Extensive</p>	
<p><b>Rating for Category III. Monitoring NGSS Student Progress -- lessons</b> After carefully weighing the evidence, reasoning, and suggestions for improvement, rate the degree to which the lesson met this category. <b>If you are evaluating an instructional unit rather than a single lesson, continue on to evaluate criteria E-F and rate Category III overall below.</b></p>	<p><b>Lesson Rating scale for Category III (Criteria A-D only):</b> 3: At least adequate evidence for all criteria in the category; extensive evidence for at least one criterion 2: Some evidence for all criteria in the category and adequate evidence for at least three criteria, including A 1: Adequate evidence for at least two criteria in the category 0: Adequate evidence for no more than one criterion in the category</p>	<p><b>Circle Rating</b> <b>0 1 2 3</b></p>	

**Category III: Monitoring NGSS Student Progress (additional criteria for units only)**

*If you are evaluating a lesson, it is not necessary to evaluate criteria E–F. Please enter your rating for a lesson above (after D).*

<b>Unit Criteria</b> A unit or longer lesson designed for the NGSS will also include clear and compelling evidence of the following:	<b>Specific evidence from materials and reviewers' reasoning</b>	<b>Evidence of Quality?</b>	<b>Suggestions for improvement</b>
E. <b>Coherent Assessment system:</b> Includes pre-, formative, summative, and self-assessment measures that assess three-dimensional learning.	No assessments	<input checked="" type="checkbox"/> None <input type="checkbox"/> Inadequate <input type="checkbox"/> Adequate <input type="checkbox"/> Extensive	
F. <b>Opportunity to learn:</b> Provides multiple opportunities for students to demonstrate performance of practices connected with their understanding of disciplinary core ideas and crosscutting concepts and receive feedback	- Yes- discussions, teacher feedback, peer feedback, producing work/products	<input type="checkbox"/> None <input type="checkbox"/> Inadequate <input checked="" type="checkbox"/> Adequate <input type="checkbox"/> Extensive	
<b>Rating for Category III: Monitoring NGSS Student Progress—units</b> After carefully weighing the evidence, reasoning, and suggestions for improvement, rate the degree to which the criteria are met across the unit.	<b>Unit Rating scale for Category III (Criteria A–F):</b> 3: At least adequate evidence for all criteria in the category; extensive evidence for at least one criterion 2: Some evidence for all criteria in the category and adequate evidence for at least five criteria, including A 1: Adequate evidence for at least three criteria in the category 0: Adequate evidence for no more than two criteria in the category		<b>Circle Rating</b> 0 1 2 3 (1)



### Category Ratings:

Transfer your team's ratings from each category to the following chart and add the scores together for the overall score:

Category ratings			Total Score
Category I: NGSS 3D Design	Category II: NGSS Instructional Supports	Category III: Monitoring NGSS Student Progress	
0 1 2 3 1	0 1 2 3 1	0 1 2 3 1	3

### Overall ratings:

The score total is an *approximate* guide for the rating. Reviewers should use the evidence of quality across categories to guide the final rating. In other words, the rating could differ from the total score recommendations if the reviewer has evidence to support this variation.

**E:** Example of high quality NGSS design—High quality design for the NGSS across all three categories of the rubric; a lesson or unit with this rating will still need adjustments for a specific classroom, but the support is there to make this possible; exemplifies most criteria across Categories I, II, & III of the rubric. (total score ~8–9)

**E/I:** Example of high quality NGSS design if Improved—Adequate design for the NGSS, but would benefit from some improvement in one or more categories; most criteria have at least adequate evidence (total score ~6–7)

**R:** Revision needed—Partially designed for the NGSS, but needs significant revision in one or more categories (total ~3–5)

**N:** Not ready to review—Not designed for the NGSS; does not meet criteria (total 0–2)

Circle the overall rating below:

E E/I R N

Overall Summary Comments: