How Can Science Help Make Our Lives Better?
EQuIP Rubric for Science Evaluation

Unit Name: How can science help make our lives better?
Grade: High School
Date of Review: February 2019
Overall Rating (N, R, E/I, E): R
Category I: NGSS 3D Design Score (0, 1, 2, 3): 2
Category II: NGSS Instructional Supports Score (0, 1, 2, 3): 2
Category III: Monitoring NGSS Student Progress Score (0, 1, 2, 3): 1
Total Score (0–9): 5
Click here to see scoring guidelines

This review was conducted by the Science Peer Review Panel using the EQuIP Rubric for Science.

Category I Criteria Ratings		Category II Criteria Ratings		Category III Criteria Ratings	
A. Explaining Phenomena/Designing Solutions	Extensive	**A. Relevance and Authenticity**	Adequate	**A. Monitoring 3D Student Performances**	Adequate
B. Three Dimensions	Adequate	**B. Student Ideas**	Extensive	**B. Formative**	Inadequate
C. Integrating the Three Dimensions	Adequate	**C. Building Progressions**	Inadequate	**C. Scoring Guidance**	Inadequate
D. Unit Coherence	Extensive	**D. Scientific Accuracy**	Extensive	**D. Unbiased Tasks/Items**	Adequate
E. Multiple Science Domains	Adequate	**E. Differentiated Instruction**	Adequate	**E. Coherence Assessment System**	Adequate
F. Math and ELA	Adequate	**F. Teacher Support for Unit Coherence**	Extensive	**F. Opportunity to Learn**	Adequate
		G. Scaffolded Differentiation Over Time	Inadequate		

Summary Comments

Thank you very much for your commitment to students and their science education. Achieve is glad to partner with you in this continuous improvement process. It is clear that this unit was carefully written, and it includes many fantastic features. For example, the unit uses a video of children with Duchenne Muscular Dystrophy, who are close in age to students in the target grade band, to provide potential engagement. Students' questions about the phenomenon are used to drive the learning in the unit. Students develop and use models, construct explanations, obtain and communicate information and use their understanding of structure and function and variation and inheritance of traits to make sense of this phenomenon. In addition, students are asked to integrate the three dimensions several times throughout the unit.

The unit can be strengthened by providing specific rubrics and other means of providing meaningful feedback to students for each assessment. Including suggestions for how teachers can make adjustments in instruction based on student responses on formative and summative assessments will also strengthen the unit. Including specific explanations for how students will develop their use of the

Science and Engineering Practices (SEPs) and Crosscutting Concepts (CCCs) would provide clearer guidance for teachers.

The CCC of **Structure and Function** is highlighted throughout the unit. There are additional opportunities to make the use of CCCs more evident to students allowing students to use them in making sense of the phenomenon. There are opportunities to include elements from other CCC categories such as **Cause and Effect** and **Systems and System Models** more directly and prominently, in the unit. Overall, with a few key changes and additions, this unit has the potential to be a high quality NGSS unit.

Note that in the feedback below, black text is used for neutral comments of evidence the criterion was met and purple text is used as evidence that the criterion was not met.

Category I. NGSS 3D Design

Score: 2

I.A. Explaining Phenomena/Designing Solutions: Making sense of phenomena and/or designing solutions to a problem drive student learning.

i. Student questions and prior experiences related to the phenomenon or problem motivate sense-making and/or problem solving.
ii. The focus of the lesson is to support students in making sense of phenomena and/or designing solutions to problems.
iii. When engineering is a learning focus, it is integrated with developing disciplinary core ideas from physical, life, and/or earth and space sciences.

Rating for Criterion I.A Explaining Phenomena/Designing Solutions: Extensive

(None, Inadequate, Adequate, Extensive)

The reviewers found extensive evidence that learning is driven by students making sense of phenomena and/or designing solutions to a problem because students examine an anchoring phenomenon, Duchenne muscular dystrophy (DMD), and students regularly return to the phenomenon to add additional meaning to explain the cause of DMD.

Student learning is driven by making sense of phenomena throughout the unit. The collaborative activities and student activity sheets provide structured support for teachers to draw out student questions and use these questions to motivate student learning. Learning related to DCIs and CCCs is applied to develop a deeper understanding of DMD. Examples of this include:

- Students viewed a video and made observations about a phenomenon (DMD) to provide all students with a common understanding, experience, and window into this disorder. Students asked questions about the DMD video and began to wonder about their observations and what the cause might be. Students were asked to reflect on similar prior experiences. The Teacher's Guide provided direction about what to listen for at that time. Students developed a model of

their predictions. Student questions were collected and posted on a Driving Question Board. (Lesson 1)

- Students examined what is needed for muscles to function properly and they saw how this phenomenon relates to the overall phenomenon of DMD. In order to understand how Duchenne's Muscular Dystrophy affects those who have it, they had to first understand muscle anatomy, how muscles contract, and the proteins involved in the process. (Lessons 2 and 3)
- Students learned about DNA differences for those with DMD and those without. (Lesson 4)
- Students connected what was learned in a protein investigation to the phenomenon of DMD. (Lesson 5)
- Students gathered information on other related phenomena (Hemophilia, Huntington's, and Cystic Fibrosis) and made connections about these genetic disorders to the overall unit phenomenon of DMD. (Lesson 7)

Suggestions for Improvement
N/A

I.B. Three Dimensions: 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.

i. Provides opportunities to *develop and use* specific elements of the SEP(s).
ii. Provides opportunities to *develop and use* specific elements of the DCI(s).
iii. Provides opportunities to *develop and use* specific elements of the CCC(s).

Rating for Criterion I.B. Three Dimensions: Adequate

(None, Inadequate, Adequate, Extensive)

The reviewers found adequate evidence that the materials give students opportunities to build understanding of grade-appropriate elements of the three dimensions because students had extensive opportunities to use science and engineering practices and adequate opportunities with DCIs and CCCs.

Science and Engineering Practices (SEPs): Extensive

The reviewers found extensive evidence that students have the opportunity to use or develop the SEPs in this unit because students are engaged in SEPs to figure out phenomena in every lesson. Some SEPs, particularly some elements from the category of Obtaining, Evaluating and Communicating Information, are developed over the course of the unit.

The reviewers found the following SEP elements at the high school grade band to be repeated in multiple lessons:

Asking Questions and Defining Problems

In this unit, students "a*sk questions that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.*" Examples of this include:

- "Record five or more questions you have about how the kids in the video live, or what might be happening with them," after they watch a video of kids with DMD. (Lesson 1, Student Guide)
- "Suppose you are a developing a list of questions for a questionnaire at a genetic counselor's office. What are some questions you would ask the patients? (Lesson 9, Student Guide)
- "Have students identify more questions they need answered to understand how this system works" after they are introduced to CRISPR Cas9. (Lesson 12, Teacher guide)
- Students frequently are asked to consider what they are still wondering about; almost every lesson provides this opportunity for students to help identify the next steps in order to figure out what they are still wondering about.

In this unit, students *define a design problem that involves the development of a process or system with interacting components and criteria and ~~constraints~~ that may include social~~, technical, and/or environmental~~ considerations.* Examples of this include:

- "Do you think there should be rules or guidelines to determine who gets to use technologies that change the DNA or organisms? Why or why not?" and "What guidelines should scientists use to determine whether or not certain genetic manipulations should be done? What principles should scientists use to guide their actions?" (Lesson 10, Student Guide)
- "After watching the rest of the Jennifer Doudna TED Talk video, pretend you are on the board of scientists tasked with setting regulations on the use of CRISPR. What criteria would you need to set in order to feel confident that a potential use was ethical? Make sure your criteria are concrete and measurable. List potential criteria in the space below," and "After looking over the Principles for the Governance of Human Genome Editing, what would you add or change about your criteria from question 5? Would you add anything? Do you think these principles go far enough? Too far?" (Lesson 13, Student Guide)
- Students are asked to define the problem that CRISPR helps to solve. (Lesson 14, Student Guide)

Developing and Using Models

In this unit, students *develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system.* Examples of this include:

- Students gather information and developed a model to explain how muscles function and what is happening in the muscles of the boys with DMD. Then students compare their models through a class discussion. (Lesson 2, Teachers Guide)
- Students update their Storyboards from Lesson 2 after learning new information. (Lesson 3, Teachers Guide)
- Students develop a model to explain how you think people get DMD. Then compare models. After reading text, students revise their initial model. (Lesson 6, Student Guide #1 and Teachers Guide)
- Students develop a model to demonstrate an understanding of the structure and function of muscles, protein synthesis, mutations, and inheritance and how they explain the phenomenon of DMD when they are prompted to, "draw a model to explain how the boys in the video (and anyone with DMD) acquired it and how this relates to their physical symptoms." (Lesson 8, Student Guide)

- Students develop a model to explain how gene editing technology works when they are prompted to, "Research CRISPR and use a model to explain how it works including all relevant components, mechanisms and interactions." (Lesson 14, Student Guide)

In this unit, students *develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena, and move flexibly between model types based on merits and limitations* in developing an understanding of how muscles work in healthy individual and individuals with DMD. Examples of this include:

- Students develop an understanding of the structure and function of muscles in healthy individuals and individuals with DMD when they respond to the prompts "In the box below, draw a flow chart displaying the relationship between muscles, fascicles, muscle fibers, and myofibrils," and "Use this space to map your dystrophin analogy. Make sure to include sarcolemma (cell membrane), dystrophin, myofibril, and the relationship between structure and function." (Lesson 3, Student guide)
- Students evaluate their classmates' analogies and identified limitations of the models. (Lesson 3, Teachers Guide)
- Students develop multiple models to demonstrate understanding of protein synthesis when they are prompted to, "Work with the person next to you to draw a picture of how you think gene expression (or protein synthesis) works. Label the parts of your picture using words from the reading above," and "Work with a partner or alone to create another analogy about protein synthesis." (Lesson 4, Student Guide)

Constructing Explanations and Designing Solutions

In this unit, students *make a quantitative and/or qualitative claim regarding the relationship between dependent and independent variables.* An example of this is:

- Students answer the conclusion question: "What can we conclude about this investigation?" after completing an investigation into the function of the protein lactase when its structure is altered. (Lesson 5, Student Guide)

In this unit students *construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.* Examples of this include:

- Making Sense: Construct an explanation of: "What happens when DNA is mutated? Be sure to link DNA to proteins in your answer" after using a computer simulation. Then students answer "For people with DMD, how much can their DNA be different from a person who does not have DMD? Justify your answer with observations from the simulation." (Lesson 4, Student Guide)
- Students answer a summative assessment question, "Explain how someone acquires DMD." based on previous lessons developing models, using simulations, reading text, and class discussions. (Lesson 8, Student Guide)

In this unit students *apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.* Examples of this include:

- Why does DMD affect mostly boys? What type of inheritance pattern does DMD follow? Use evidence from the video and the case studies in your answer. (Lesson 7, Student Guide)

Obtaining, Evaluating, and Communicating Information

In this unit, students *critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.* Examples of this include:

- Students use information from text respond to the prompt, "Work with the person next to you to draw a picture of how you think gene expression (or protein synthesis) works. Label the parts of your picture using words from the reading above. (Lesson 4, Student Guide)
- Students read to answer the question, "How are traits inherited?" (Lesson 6, student guide)
- Students jigsaw and read about different Genetic Engineering Technologies. Students shared their information and discussed these technologies using a World Cafe Protocol. (Lesson 10, Teachers Guide)
- Students read a science journal article adapted for the classroom and answer questions about the evidence resulting from the investigation. (Lesson 11, Student Guide)
- Teachers are prompted to "Remind students that we have a World Cafe event planned to discuss with the community these new genetic technologies and the ethical concerns. In groups or individually, students will be researching case studies to propose to the World Cafe event coordinators." (Lesson 14, teacher guide, step 2)

In this unit, students c*ommunicate scientific and/or technical information or ideas (e.g. about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).* Examples of this include:

- Teachers are instructed to "Divide into groups so that each group will read about a specific type of GET *(*Genetic Engineering Technologies). The groups will be responsible for briefly explaining the technology introduced in their article*."* (Lesson 10, Teacher Guide, step 3)
- Students read and view information about gene editing and the ethics revolving around this technology. Students compare and contrast information about using CRISPR in mice vs. germline cells by developing their own Venn diagram. (Lesson 13, Student Guide)

Disciplinary Core Ideas (DCIs): Adequate

The reviewers found adequate evidence that students have the opportunity to use or develop DCIs in this unit because students gather and make sense of information related to several DCI elements at the high school level.

Students learn about specific DCI elements to aide in their understanding of DMD. Most, but not all of the elements that students learn are aligned with high school elements. There was evidence that students are building an understanding for most, but not all, of the DCI elements that were claimed in the front matter. The reviewers found evidence related to the following DCI elements:

LS1.A Structure and Function

All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins.

- "Work with the person next to you to draw a picture of how you think gene expression (or protein synthesis) works. Label the parts of your picture using words from the reading above." (Lesson 4, Student Guide)
- "After the class discussion, describe in your own words the process of gene expression (DNA → RNA → proteins)" (Lesson 4, Student Guide)
- "For people with Duchenne's muscular dystrophy, how must their DNA be different from a person who does not have DMD? Justify your answer with observations from this simulation." (Lesson 4, Student Guide)

Systems of specialized cells within organisms help them perform the essential functions of life.

- "What conclusions did your class draw about the differences between muscles with DMD and muscles without DMD?" (Lesson 2, Student Guide)
- "What do you notice is different in the sarcomere of a person with DMD compared to a person without DMD?" (Lesson 3, Student Guide)

LS3.A: Inheritance of Traits

Each chromosome consists of a single very long DNA molecule, and each gene on the chromosome is a particular segment of that DNA. The instructions for forming species' characteristics are carried in DNA. All cells in an organism have the same genetic content, but the genes used (expressed) by the cell may be regulated in different ways. Not all DNA codes for a protein; some segments of DNA are involved in regulatory or structural functions, and some have no as-yet known function.

- The reviewers found some of the evidence in the unit to be more closely aligned with the middle school element, "*Variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited." For example:*
  - "Why does DMD affect mostly boys? What type of inheritance pattern does DMD follow? Use evidence from the video and the case studies in your answer." (Lesson 7, Student Guide)
  - "Use the space below to draw your general model for how genetic disorders are inherited and expressed." (Lesson 9, Student Guide)

LS3.B: Variation of Traits

In sexual reproduction, chromosomes can sometimes swap sections during the process of meiosis (cell division), thereby creating new genetic combinations and thus more genetic variation. Although DNA replication is tightly regulated and remarkably accurate, errors do occur and result in mutations, which are also a source of genetic variation. Environmental factors can also cause mutations in genes, and viable mutations are inherited.

- "What happens when DNA is mutated? Be sure to link DNA to proteins in your answer." (Lesson 4, Student guide)

- "Summarize what you learned from the reading to answer the question 'What causes mutations?'" (Lesson 4, Student Guide)
- "After reading about how meiosis affects genetic mutation, students are prompted to respond to the question, 'How are traits inherited?'" (Lesson 6, Student Guide)
- Students consider the role of a genetic counselor and are asked to: "Use the space below to draw your general model for how genetic disorders are inherited and expressed." (Lesson 9, Student Guide)

ETS1.B: Developing Possible Solutions

When evaluating solutions it is important to take into account a range of constraints including cost, safety, reliability, and aesthetics and to consider social, cultural, and environmental impacts.

- "What guidelines should scientists use to determine whether or not certain genetic manipulations should be done? What principles should scientists use to guide their actions?" (Lesson 10, Student Guide)
- "Do you think there should be rules or guidelines to determine who gets to use technologies that change the DNA or organisms? Why or why not? What guidelines should scientists use to determine whether or not certain genetic manipulations should be done? What principles should scientists use to guide their actions?" (Lesson 10, Student Guide)
- "After watching the rest of the Jennifer Doudna TED Talk video, pretend you are on the board of scientists tasked with setting regulations on the use of CRISPR. What criteria would you need to set in order to feel confident that a potential use was ethical? Make sure your criteria are concrete and measurable. List potential criteria in the space below." (Lesson 13, Student Guide)
- "What ethical considerations should be addressed and are relevant to this case? Be sure to address the following ethical principles." (Lesson 14, Student Guide)
- "What impact could this technology have? Consider ecosystems (trees, Serengeti) humans/ society, evolution (Addie, Juncos, Antibiotic resistance)." (Lesson 14, Student Guide)

LS1.B: Growth and Development

The reviewers could not find sufficient evidence for the DCI element in PE HS-LS1-4: *In multicellular organisms individual cells grow and then divide via a process called mitosis, thereby allowing the organism to grow. The organism begins as a single cell (fertilized egg) that divides successively to produce many cells, with each parent cell passing identical genetic material (two variants of each chromosome pair) to both daughter cells. Cellular division and differentiation produce and maintain a complex organism, composed of systems of tissues and organs that work together to meet the needs of the whole organism. (LS1.B)*

- HS-LS1-4 is claimed in the unit front matter and lessons 12 and 13. However, there is no evidence that students use or develop their understanding of the growth and development of organisms.

LS3.B: Inheritance of Traits

The reviewers could not find sufficient evidence for the DCI in PE HS-LS3-3: *Environmental factors also affect expression of traits, and hence affect the probability of occurrences of traits in a population. Thus,*

the variation and distribution of traits observed depends on both genetic and environment factors. (LS3.B) The teacher guide in lessons 4, 7, 8 and 15 claim the performance expectation HS-LS3-3, however environmental factors effects on traits and the probability of occurrences of traits in a population is only eluded to once in the materials. This is not enough support for students to build towards an understanding of this element.

- "Mutations can happen for several reasons.
    A. DNA fails to copy accurately. Most of the mutations that we think of are "naturally-occurring." For example, when a cell divides, it makes a copy of its DNA — and sometimes the copy is not quite perfect. That small difference from the original DNA sequence is a mutation.
    B. Mutations can be caused by environmental factors such as Ultraviolet Radiation (UV), X-rays and smoking tobacco. Examples of diseases caused by environmental factors resulting in mutations would be skin and lung cancer.
    C. A mutation can be inherited if it exists in a sperm or egg cell. Examples of common inherited mutations cause Cystic Fibrosis, Huntington's and Hemophilia.
    Summarize what you learned from the reading to answer the question 'What causes mutations?'" (Lesson 4, Student Guide)
- Students use statistics and probability to analyze pedigrees and develop Punnett Squares for different genetic disorders (Lesson 7, Student Guide). HS-LS3-3 is called out in the teacher guide; however, environmental factors affecting the expression of traits is not addressed.
- "It's very rare for a girl to have DMD. Explain how a girl could have the symptoms of DMD using what you know about inheritance and random mutation." (Lesson 8, Student Guide)
- This evidence demonstrates that students are introduced to the idea of environmental factors causing mutations in lesson 4, but never gain a deeper understanding or apply that idea to DMD. The other lessons that HS-LS3-3 is claimed in the teacher guide lack evidence that students are using or developing an understanding of the role of environmental factors in the variation and distribution of traits.

Crosscutting Concepts (CCCs): Adequate

The reviewers found adequate evidence that students have the opportunity to use the CCCs in this unit because there is evidence of that students build towards elements of the CCC categories of Structure and Function and Cause and Effect at multiple points in the unit. The instructional materials support students in the use of these CCC elements, but do not support students in students developing deeper understandings.

Students use the CCC elements at the appropriate grade level in multiple lessons. Students applied their understanding of the CCC elements to their understanding of DMD, but the reviewers did not find evidence that the materials supported teacher in guiding students to develop deeper understandings of the CCC elements. Examples of this include:

Structure and Function

Investigating or designing new systems or structures requires a detailed examination of the properties of different materials, the structures of different components, and connections of components to reveal its function and/or solve a problem.

- "Make sure to provide the pieces that need to be in their analogy (shown on slide 13: Sarcolemma [cell membrane], Dystrophin, Myofibril, Relationship between structure and function)." (Lesson 3, Teacher Guide)
- Students are asked, "How does the structural change of the DMD protein affect its function?" (Lesson 4, Student Guide)
- Students plan and conduct and investigation to answer the question, "How does the structure of a protein play a role in its function?" (Lesson 5, Student Guide)
- Students respond to the prompt, "Dystrophin has a shape like a rod or stick that can connect to other structures. Cas9 is shaped like a claw. How do the structures of dystrophin and Cas9 help explain the function that each of these proteins plays in the cell?" (Lesson 15, Student Guide)

Cause and Effect

Cause-and-effect relationships can be suggested and predicted for complex natural and human-designed systems by examining what is known about smaller scale mechanisms within the system.

- Students use the simulation to record effects of changes in amino acids. Then students answer the following questions: "What happens when DNA is mutated?" and "For people with DMD, how much their DNA be different from a person who does not have DMD? Justify your answer with observations from the simulation." (Lesson 4, Student Guide)
- Students respond to the question, "Why does DMD affect mostly boys? What type of inheritance pattern does DMD follow? Use evidence from the video and the case studies in your answer." (Lesson 7, Student Guide)
- Use the space below to draw your general model for how genetic disorders are inherited and expressed. (Lesson 9, Student Guide)
- If we could repair or replace the DNA of the cell of a mouse embryo that had DMD, how could that keep a mouse from losing its muscle strength from the disease? As part of your answer, include what you know about the causes of DMD and how it affects muscles. (Lesson 15, Student Guide)

Suggestions for Improvement

SEPs

There are other opportunities to further develop other SEPs such as Planning and Conducting Investigations, Analyzing Data and Engaging in Argument from Evidence, but this is not necessary.

DCIs

- The reviewers suggest including DCI EST1.B (element 1: *When evaluating solutions it is important to take into account a range of constraints including cost, safety, reliability, and aesthetics and to consider social, cultural, and environmental impacts*) in the CRISPR bend of the

storyline for lessons 10–14, therefore identifying HS-ETS1-3 as a targeted performance expectation.

- The reviewers suggest either removing HS-LS1-4 and HS-LS3-3 from the front matter or addressing them more fully and with grade-appropriate elements.
- The reviewers found the LS3.B element *"In sexual reproduction, chromosomes can sometimes swap sections during the process of meiosis (cell division), thereby creating new genetic combinations and thus more genetic variation. Although DNA replication is tightly regulated and remarkably accurate, errors do occur and result in mutations, which are also a source of genetic variation. Environmental factors can also cause mutations in genes, and viable mutations are inherited. (LS3.B)*" to be only partially developed. Students have opportunities to develop and use their understanding of mutations as a source of variation. Students have opportunity to use, but not develop, an understanding of meiosis in Lesson 6, because students read a text and answer mostly recall questions, they are not figuring out the process of meiosis or how it relates to genetic variation and DMD. Because it is only mentioned once in a reading section, students are unlikely to develop or use an understanding of how environmental factors affect inheritance and variation. The unit would be strengthened by adding in opportunities for students to build this complete understanding.
- Consider including wording in lessons 6 and 9 that prompt students to use their understanding of the role of meiosis, mutations, and genetic variation in their explanation of inheritance patterns.
- Lesson 7 addresses patterns of inheritance, but this is better aligned to the MS element, "*In sexually reproducing organisms, each parent contributes half of the genes acquired (at random) by the offspring. Individuals have two of each chromosome and hence two alleles of each gene, one acquired from each parent. These versions may be identical or may differ from each other*." Consider either making this lesson optional for students who may need it or adding content to match the high school level element.

CCCs

Consider including opportunities for students to not only use their understanding of a Structure and Function element, but also develop a deeper understanding of these CCC elements. Also, students need to use Cause and Effect at the high school level, as detailed in the elements. The unit would be stronger if students were more explicitly using this CCC element so they knew they were using it.

I.C. Integrating the Three Dimensions: Student sense-making of phenomena and/or designing of solutions requires student performances that integrate elements of the SEPs, CCCs, and DCIs.

Rating for Criterion I.C. Integrating the Three Dimensions: Adequate

(None, Inadequate, Adequate, Extensive)

The reviewers found adequate evidence that student performances integrate elements of the three dimensions in service of figuring out phenomena and/or designing solutions to problems because, in

most lessons, students have at least one opportunity, often at the end, to make sense of the lesson using elements of all three dimensions. In addition, student sense-making of phenomena in the unit requires student performances that integrate elements of the SEPs, CCCs, and DCIs.

Students use the three dimensions to explain DMD and CRISPR/CAS:

- "Determine the variable your group is testing: presence (lactose + lactase), absence (lactose only) or altered protein (temperature or pH)? Write a scientific question you will test in this investigation." (Lesson 5, student guide)
- "What can we conclude about this investigation? Can we answer the question: What happens to a protein's role when it is present, absent or altered? How does the structure of a protein play a role in its function?" (Lesson 5, student guide)
- "Why does DMD affect mostly boys? What type of inheritance pattern does DMD follow? Use evidence from the video and the case studies in your answer." (Lesson 7, student guide)
- "What is the function of dystrophin in muscles? How does a mutation affect the function of dystrophin? Be sure to explain how different types of mutations cause different types of muscular dystrophy." (Lesson 8, student guide)
- Students are asked: "How does someone acquire (get) Duchenne Muscular Dystrophy? Is DMD inherited from a person's parents or do they get it from the environment? Explain." (Lesson 8, Student Guide, page 1)
- Students are asked, "Who is more likely to acquire DMD, boys or girls? Why is that? Could a person have a mutated gene for dystrophin but not have DMD? How?" (Lesson 8, Student Guide, page 2)
- Questions 3–6 also address how mutations affect cell functions. (Lesson 8, Student Guide, pages 3–6)
- "How is the CRISPR/CAS system being used in this case? Research CRISPR and use a model to explain how it works including all relevant components, mechanisms, and interactions." (Lesson 14, student guide)

Suggestions for Improvement

Include language for students to clearly identify the crosscutting concepts students are using in tasks that are intended to be three-dimensional. For instance, Question 18 in the lesson 4 student guide could be reworded to read, "Using your understanding of cause and effect, explain what happens when DNA is mutated."

I.D. Unit Coherence: Lessons fit together to target a set of performance expectations.

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.

ii. The lessons help students develop toward proficiency in a targeted set of performance expectations.

Rating for Criterion I.D. Unit Coherence: Extensive

(None, Inadequate, Adequate, Extensive)

The reviewers found extensive evidence that lessons fit together coherently to target a set of performance expectations because the lessons coherently build toward a set of performance expectations and guidance is provided to support students in developing questions to further their learning.

The lessons in the Genetic Unit help students develop toward proficiency in many of the high school genetics performance expectations. Each lesson builds on prior lessons by addressing questions raised in those lessons and cultivating new questions that build on what students figured out. Student questions drive each lesson to build an understanding of core ideas and concepts. Students revisit DMD multiple times throughout the unit.

- Students are introduced to DMD in lesson 1. In lessons 2–7 they review what they had learned in the previous lesson and students are asked to share ideas for what they need to figure out in order to better understand DMD. At the end of lessons 1–7, students are asked to apply their learning to DMD and think of questions they still need answered. Lessons 10–12 students use their questions about the use of technology to cure DMD to guide their "figuring out" of how CRISPR works and define the criteria for the use of genetic engineering technology. Throughout the unit student's questions are driving the learning and that learning is applied to better understand DMD.
- At the end of almost all lessons, students brainstorm questions or next steps that will further their discovery of the phenomenon.
- Students revisit the unit phenomenon multiple times, taking stock of how well they can explain the phenomenon creating key linkages across the unit.
- Each lesson begins with a Consensus Building Discussion to review and transition to the new lesson.
- Students use an Incremental Model Tracker to update and revise their ideas throughout the unit.

Suggestions for Improvement

N/A

I.E. Multiple Science Domains: When appropriate, links are made across the science domains of life science, physical science and Earth and space science.

i. Disciplinary core ideas from different disciplines are used together to explain phenomena.
ii. The usefulness of crosscutting concepts to make sense of phenomena or design solutions to problems across science domains is highlighted.

Rating for Criterion I.E. Multiple Science Domains: Adequate

(None, Inadequate, Adequate, Extensive)

The reviewers found adequate evidence that links are made across the science domains when appropriate because the unit only addresses performance expectations in one discipline (life science) but there are not obvious, missed connections either.

The genetics unit builds towards all high school performance expectations in LS3 - Heredity, as well as relevant performance expectations from LS1 - From Molecules to Organisms: Structures and Processes.

- Performance expectations addressed: HS-LS1-1, HS-LS1-4, HS-LS3-1, HS-LS3-2, HS-LS3-3
- Engineering, technology, and application of science PEs are used and developed in lessons 10, 13 and 14, but not claimed in the front matter or teacher guides.

Suggestions for Improvement

- It would be very helpful to clarify to students that the targeted Cause and Effect CCC element can be used to make sense of phenomena in many different contexts - not just with genetics.
- Consider including engineering performance expectations HS-ETS1-1 and HS-ETS1-3 as they are partially addressed in the CRISPR bend of the storyline, particularly lesson 14.

I.F. Math and ELA: Provides grade-appropriate connection(s) to the Common Core State Standards in Mathematics and/or English Language Arts & Literacy in History/Social Studies, Science and Technical Subjects.

Rating for Criterion I.F. Math and ELA: Adequate

(None, Inadequate, Adequate, Extensive)

The reviewers found adequate evidence that the materials provide grade-appropriate connections to mathematics, English language arts (ELA), history, social studies, or technical standards because students have many opportunities to read, write and discuss and these connections are identified in the Teacher's Guide.

The genetics unit is rated as adequate because it provides grade-appropriate connection(s) to the Common Core State Standards in English Language Arts & Literacy. There are not relevant connections to the Common Core State Standards in Mathematics.

- Relevant Common Core standards for reading, writing and math are listed at the end of the Teacher's Guide for each lesson.
- Students have multiple opportunities to read, write and discuss in this unit.
- Reading materials go beyond textbooks and include news articles, journal articles, infographics, websites of scientific entities
- One math practice is identified in Lesson 7, but no specific math standards are addressed.

Suggestions for Improvement

The unit could include more writing assignments that are varied in structure and purpose and are rigorous.

Overall Category I Score (0, 1, 2, 3): 2

Unit Scoring Guide – Category I
Criteria A–F
3: At least adequate evidence for all of the unit criteria in the category; extensive evidence for criteria A–C
2: At least some evidence for all unit criteria in Category I (A–F); adequate evidence for criteria A–C
1: Adequate evidence for some criteria in Category I, but inadequate/no evidence for at least one criterion A–C
0: Inadequate (or no) evidence to meet any criteria in Category I (A–F)

Category II. NGSS Instructional Supports

Score: 2

II.A. Relevance and Authenticity: Engages students in authentic and meaningful scenarios that reflect the practice of science and engineering as experienced in the real world.

i. Students experience phenomena or design problems as directly as possible (firsthand or through media representations).
ii. Includes suggestions for how to connect instruction to the students' home, neighborhood, community and/or culture as appropriate.
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.

Rating for Criterion II.A. Relevance and Authority: Adequate

(None, Inadequate, Adequate, Extensive)

The reviewers found adequate evidence that the materials engage students in authentic and meaningful scenarios that reflect the real world because students experience the phenomenon in as first-hand a manner as possible.

Students experience the symptoms of DMD and how they affect children through video. Students ideas and questions guide subsequent lessons.

- Students experience what DMD is through a video. Students research DMD to learn more. (Lesson 1)
- In Lesson 1 (phenomenon introduction) students are asked to develop questions and models using prior knowledge and information obtained from the video and research.
- In Lesson 1 students have opportunities to connect their questions to the targeted learning by prioritizing their questions.
- Teacher support includes prompting questions (for generating and prioritizing questions) and possible student responses.

Suggestions for Improvement

The reviewers suggest creating additional time and questions throughout the unit to connect this phenomenon to students' personal experiences with questions or journaling activities.

II.B. Student Ideas: 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.

Rating for Criterion II.B. Student Ideas: Extensive

(None, Inadequate, Adequate, Extensive)

The reviewers found extensive evidence that the materials provide students with opportunities to both share their ideas and thinking and respond to feedback on their ideas because the Teacher's Guide provides multiple strategies for different types of talk structure.

Students have opportunities to share ideas with each other. Students use models to reflect on how their thinking has changed over time.

- Every lesson begins with a "Consensus Building Discussion" in which students share what they figured out in the previous class.
- Every lesson ends with opportunities for students to share what they learned that day and ask questions.
- Students share and compare their thinking with classmates in Lesson 4 (analogies), Lesson 6 (initial models), Lesson 9 (questions to investigate) and Lesson 13 (ethical criteria).
- Students participate in the "World Cafe" protocol to share ideas in lessons 10 and 15.
- Multiple talk structures are used for students to receive information and feedback from peers and the teacher: Consensus Building Discussion, Building Understanding Discussion, World Cafe Discussion, Gallery Walk, Harvest Discussion
- Students have opportunities to show how their thinking has been revised after class discussions
- The Teacher's Guide contains a Discussion Strategies as well as Additional Guidance to further clarify the goal of the discussion.

Suggestions for Improvement

N/A

II.C. Building Progressions: Identifies and builds on students' prior learning in all three dimensions, including providing the following support to teachers:

i. Explicitly identifying prior student learning expected for all three dimensions
ii. Clearly explaining how the prior learning will be built upon.

Rating for Criterion II.C. Building Progressions: Inadequate

(None, Inadequate, Adequate, Extensive)

The reviewers found inadequate evidence that the materials identify and build on students' prior learning in all three dimensions because, although some supports are provided to teachers in the form of expected knowledge from previous grades and "Alternate Student Concepts" in each lesson, these

only address DCIs. The materials do not describe the level of proficiency that should be expected from students as a result of the unit.

The materials identify students prior learning in the DCIs but do not identify prior learning in SEPs and CCCs.

- Each lesson includes "Principles established in previous grades" which identifies expected DCI knowledge students should have.
- Each lesson includes "Alternative Student Concepts" which includes information about where students may struggle with the content or tasks or research-informed misconceptions about the DCIs.
- The front matter identifies "Targeted NGSS Performance Expectations."
- The teacher guide for each unit labels PEs as "Building Towards."

Suggestions for Improvement

Identify in the Teacher's Guides or front matter the expected level of understanding and experience with the SEPs and CCCs in addition to the DCIs, and ensure that the materials build on this experience. Ensuring that there is a match between the targeted performance expectations and the performance expectations covered in the lessons would strengthen the unit.

II.D. Scientific Accuracy: Uses scientifically accurate and grade-appropriate scientific information, phenomena, and representations to support students' three-dimensional learning.

Rating for Criterion II.D. Scientific Accuracy: Extensive

(None, Inadequate, Adequate, Extensive)

The reviewers found extensive evidence that the materials use scientifically accurate and grade appropriate scientific information because presented information is accurate and some supports are provided to teachers.

All science ideas are accurate and there is support for teachers to identify potential alternate conceptions held by students.

- Possible alternate student conceptions are documented in the "Alternative Student Concepts" section of the Teacher Guides which includes information about where students may struggle with the content or tasks or research-informed misconceptions
- Information is scientifically accurate.
- For each class discussion, teachers are given expected student responses and a goal for the discussion.

Suggestions for Improvement

N/A

II.E. Differentiated Instruction: Provides guidance for teachers to support differentiated instruction by including:

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.
ii. Extra support (e.g., phenomena, representations, tasks) for students who are struggling to meet the targeted expectations.
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.

Rating for Criterion II.E. Differentiated Instruction: Adequate

(None, Inadequate, Adequate, Extensive)

The reviewers found adequate evidence that the materials provide guidance for teachers to support differentiated instruction because general differentiation strategies are provided to support students with understanding the content. However, the unit does not provide alternative resources for students who need further accommodations.

Strategies are suggested to support students in reading and for English language learners.

- The Teacher's Guide provides a "Differentiation Strategies and Alternate Activities" call-out box to tell teachers how to use prompt questions to slow down or speed up instruction for their students (Lessons 2, 4, 7).
- Optional activities (Inheritance by Chance Lab Activity - Lesson 7) or resources (i.e. YouTube video - Lesson 4) are included to support students who need additional practice or different modality.
- When reading text, scaffolding strategies are provided to help students access the text.
- Alternative readings are not provided for struggling readers.

Suggestions for Improvement

Including adapted/annotated readings to support struggling readers or EL students would strengthen the unit.

II.F. Teacher Support for Unit Coherence: Supports teachers in facilitating coherent student learning experiences over time by:

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.).
ii. Providing strategies for ensuring student sense-making and/or problem-solving is linked to learning in all three dimensions.

Rating for Criterion II.F. Teacher Support for Unit Coherence: Extensive

(None, Inadequate, Adequate, Extensive)

The reviewers found extensive evidence that the materials support teachers in facilitating coherent student learning experiences over time because student questions drive the unit and supports are provided to teachers to help facilitate the questions and discussions.

Student questions in figuring out DMD drive the learning in the unit. Students apply what they have learned to the phenomenon and identify the next question that needs to be explored.

- Student questions about the phenomena are collected on a Driving Question Board.
- Each lesson begins with a Consensus Building Discussion to review previous lessons and re-orient students to new information to be learned in this lesson.
- The Teacher's Guide provides suggested prompts and "what to listen for" for each Consensus Building Discussion.
- Each lesson ends with students generating new questions or brainstorming next steps to answer the phenomenon.
- The Incremental Modeling Tracker is used to track students' learning.

Suggestions for Improvement
N/A

II.G. Scaffolded differentiation over time: 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.

Rating for Criterion II.G. Scaffolded Differentiation Over Time: Inadequate

(None, Inadequate, Adequate, Extensive)

The reviewers found inadequate evidence that the materials support teachers in helping students engage in the practices as needed and gradually adjusts supports over time because supports are not provided to build student proficiency in the SEPs.

While there is some escalation in the complexity of practices (Obtaining, Communicating and Evaluating Information) over time, the reviewers could not find any evidence to support teachers in understanding how the activities accomplished this escalation.

- The unit does not notify teachers of intentionality with how students engage with the SEPs over the course of the unit.
- The unit does not contain any supports for teachers to help students struggling with the SEPs.

Suggestions for Improvement

Consider providing information similar to "Differentiation Strategies and Alternate Activities" for the SEPs.

Overall Category II Score (0, 1, 2, 3): 2

Unit Scoring Guide – Category II
Criteria A-G: **3:** At least adequate evidence for all criteria in the category; extensive evidence for at least two criteria **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

Category III. Monitoring NGSS Student Progress

Score: 1

III.A. Monitoring 3D student performances: 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.

Rating for Criterion III.A. Monitoring 3D Student Performances: Adequate

(None, Inadequate, Adequate, Extensive)

The reviewers found adequate evidence that the materials elicit direct, observable evidence of students using practices with core ideas and crosscutting concepts to make sense of phenomena and/or design solutions because each lesson has at least one question or task that is identified for formative assessment and that requires using multiple dimensions together to sense-make. The task requires understanding and use of the dimensions. The task context is engaging, relevant, and accessible. For example:

- Answer the question and draw a model: How does someone acquire (get) Duchenne Muscular Dystrophy? Is DMD inherited from a person's parents or do they get it from the environment? Explain. (Lesson 8, student guide)
- Answer the question and draw a model: What is the function of dystrophin in muscles? How does a mutation affect the function of dystrophin? Be sure to explain how different types of mutations cause different types of muscular dystrophy. (Lesson 8, student guide)
- How is the CRISPR/CAS system being used in this case? Research CRISPR and use a model to explain how it works including all relevant components, mechanisms, and interactions. (Lesson 14, student guide)
- Students respond to the prompt, "Which of the following claims is true about proteins in cells." Students use evidence from their understanding of structure and function of proteins to complete the table. (Lesson 15)

Suggestions for Improvement

Include more frequent opportunities to assess students (including any production of observable student artifacts) using all three dimensions in their sense-making. One way to do this is to add more chances for students to apply the language from the CCCs in their explanations of the phenomenon.

III.B. Formative: Embeds formative assessment processes throughout that evaluate student learning to inform instruction.

Rating for Criterion III.B. Formative: Inadequate

(None, Inadequate, Adequate, Extensive)

The reviewers found inadequate evidence that the materials embed formative assessment processes throughout that evaluate student learning and inform instruction because, while formative assessment

opportunities are identified by the developers, there is little support for teachers to adjust instruction based on student responses.

Materials include many regular opportunities for formative assessment, with a large fraction called out specifically by the developer. Formative assessment opportunities are well timed and include clear connections to important learning experiences. Suggestions for formative assessment opportunities are provided at the beginning of most lessons, but scoring guidance, possible student responses and ways to adjust instruction are not included.

Additional evidence includes:

- An Assessment Overview document is provided that identifies a question or task in each lesson to use as formative assessment
- Teacher support for discussions in terms of what to listen for is provided in the Teacher Guide.
- There is no teacher support for written assessments (rubrics, exemplars, sample answers, etc.)
- Formative assessments do not include culturally or linguistically responsive strategies.

Suggestions for Improvement

Include teacher supports in the form of exemplar answers or rubrics for formative assessments. Consider including guidance for next steps based on formative responses.

III.C. Scoring guidance: 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.

Rating for Criterion III.C. Scoring Guidance: Inadequate

(None, Inadequate, Adequate, Extensive)

The reviewers found no evidence that the include aligned rubrics and scoring guidelines that help the teacher interpret student performance for all three all three dimensions because no scoring guides are provided.

The unit does not contain any rubrics or scoring guidelines for the formative or summative assessments, except for the answer key for Lesson 15.

- Lesson 15 is the only lesson that includes a teacher answer key for student responses.

Suggestions for Improvement

Provide rubrics or exemplar answers for the formative assessment items in each lesson and Lesson 8 (bend 1 assessment).

III.D. Unbiased tasks/items: Assesses student proficiency using methods, vocabulary, representations, and examples that are accessible and unbiased for all students.

Rating for Criterion III.D. Unbiased Task/Items: Adequate

(None, Inadequate, Adequate, Extensive)

The reviewers found adequate evidence that the materials assess student proficiency using accessible and unbiased methods, vocabulary, representations, and examples because the materials used appropriate text and vocabulary, were culturally neutral, and included multiple modalities.

Vocabulary (science and non-science) is grade level appropriate and the amount of text in tasks/items is grade appropriate. Representations or scenarios are culturally neutral.

- Text and vocabulary used in assessment items are at the appropriate grade-level
- Assessment items are culturally neutral; no items reference individuals or use student names
- Assessment items employ multiple modalities for students to show what they know: models, written explanations, discussions

Suggestions for Improvement

Consider allowing for student choice in answering some assessment items (written, verbal, alternative assessment)

III.E. Coherent Assessment system: Includes pre-, formative, summative, and self-assessment measures that assess three-dimensional learning.

Rating for Criterion III.E. Coherent Assessment System: Inadequate

(None, Inadequate, Adequate, Extensive)

The reviewers found inadequate evidence that the materials include pre-, formative, summative, and self-assessment measures that assess three-dimensional learning because of the lack of provided tools to measure student learning.

Materials include assessments that are sometimes designed to connect to learning goals and require students to apply appropriate elements of the three dimensions to make sense of the phenomenon. Most of the tasks are multi-dimensional with significant 3D tasks. However, there are no rubrics to measure students learning provided.

- The Assessment Overview document identifies a question or task in each lesson to use as formative assessment. However, this document does not provide guidance on how teachers may adjust instruction from feedback on these assessments.
- Assessment items employ multiple modalities for students to show what they know: models, written explanations, discussions.

Suggestions for Improvement

Include explanations for teachers about how students should respond to formative tasks, and what adjustments could be made to instruction if the desired responses are not given. Include rubrics for the use and development of the SEPs, DCIs and CCCs to guide teachers in measuring the expected outcomes.

III.F. Opportunity to learn: Provides multiple opportunities for students to demonstrate performance of practices connected with their understanding of disciplinary core ideas and crosscutting concepts and receive feedback

Rating for Criterion III.F. Opportunity to learn: Adequate

(None, Inadequate, Adequate, Extensive)

The reviewers found adequate evidence that the materials provide multiple opportunities for students to demonstrate performance of practices connected with their understanding of core ideas and crosscutting concepts because the unit structures ways for students to receive feedback on their ability to integrate practices with understandings.

There are at least two student performances that provide students with the opportunity to demonstrate understanding.

- Students have multiple formative and summative assessment opportunities to show learning. See I.C and III.A.
- Guidance for teacher feedback is only provided to guide discussions. There is no guidance for teachers to provide written feedback to students or for students to give written feedback to each other.

Suggestions for Improvement

Add guidance for teachers in providing feedback to students in multiple modalities. For example, teachers could provide feedback to students' written explanations and models.

Overall Category III Score (0, 1, 2, 3): 1

Unit Scoring Guide – Category III
Criteria A–F:
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

Overall Score

Category I: NGSS 3D Design Score (0, 1, 2, 3): 2
Category II: NGSS Instructional Supports Score (0, 1, 2, 3): 2
Category III: Monitoring NGSS Student Progress Score (0, 1, 2, 3): 1
Total Score: 5
Overall Score (E, E/I, R, N): Revision Needed (R)

Scoring Guides for Each Category
Unit Scoring Guide
Category I (Criteria A–F): **3:** At least adequate evidence for all of the unit criteria in the category; extensive evidence for criteria A–C **2:** At least some evidence for all unit criteria in Category I (A–F); adequate evidence for criteria A–C **1:** Adequate evidence for some criteria in Category I, but inadequate/no evidence for at least one criterion A–C **0:** Inadequate (or no) evidence to meet any criteria in Category I (A–F)
Category II (Criteria A-G): **3:** At least adequate evidence for all criteria in the category; extensive evidence for at least two criteria **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
Category III (Criteria A–F): **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

Overall Scoring Guide
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)*