**QUALITY PERFORMANCE ASSESSMENT PLAN**

**Task Title:** Accident Reconstruction

**Subject Area/Course:** Physical Science

**Grade Level:** 9th grade

**Abstract/Summary:** This accident reconstruction report asks students to use data supplied to analyze and make an informed decision on whether a guardrail company or the driver was at fault when a car crashed through the guardrail.

**Time Needed to Complete Task:** 2-3 days for the task 2-5 weeks for the unit

**Original Author:** Marge Pagliuca and Kyle Plante

|  |
| --- |
| **ALIGN: Instructional Goals***Please select competencies, work study practices, skills, and content that you will assess with this Performance Assessment Task.*  |
| **New Hampshire Competencies** Please write out the entire competency. We recommend no more than 2-3 competencies. We are looking to assess every aspect of the competency chosen. * **Math competencies**
* **Science competencies**
* **ELA competencies**
 |
| Cause and Effect Students will demonstrate the ability to investigate, explain, and evaluate potential causal relationships by using evidence to support claims and predictions about the mechanisms that drive those relationships.Energy and Matter: Students will demonstrate the ability to analyze evidence from a variety of sources (investigations, models) to predict, connect and/or evaluate the cycling of matter and flow of energy within and between systems in order to understand, describe, or predict possibilities and limitations of systems. |
| **New Hampshire Work Study Practices** Please write out the entire work study practice. We recommend no more than 1-2 work study practices. * **Work study practices**
 |
| CommunicationI can use various media to interpret, question, and express knowledge, information, ideas, feelings, and reasoning to create mutual understanding. *Graduating seniors will be able to demonstrate that they can:** *Communicate effectively using multiple modalities*
* *Interpret information using multiple senses*
* *Demonstrate ownership of the work*

 CollaborationI can work in diverse groups to achieve a common goal.*Graduating seniors will be able to demonstrate that they can:** *Contribute respectfully*
* *Listen and share resources and ideas*
* *Accept and fulfill roles*
* *Exercise flexibility and willingness to compromise*
 |
| **Other Goals** * **Standards, 21st century skills, and school-specific goals**
 |
| * S:PS3:11:1.8 Given information (graphs, data, diagrams), use the relationships between or among force, mass, velocity, momentum, acceleration to predict and explain the motion of objects.
* S:PS3:11:2.1 Interpret and apply the laws of motion to determine the effects of forces on the motion of objects.
* S:PS3:11:2.3 Apply the concepts of inertia, motion and momentum to predict and explain situations involving forces and motion, including stationary objects and collisions.
 |
| **Depth of Knowledge Alignment*** **What is the DOK of this task? Provide evidence.**
 |
| It is a DOK Level 3. Students use concepts to solve a non-routine problem, explain/connect ideas using supporting evidence, analyze and draw conclusions citing evidence. |
| **Essential Questions to Guide Learning and Inquiry** * What is the big idea and/or enduring understanding? Example: How are angles used in building a house?
* How does the essential question connect with the enduring understanding of the curriculum unit?
 |
| * What is the connection between or among force, mass, velocity, momentum, and acceleration?
* How can we use the calculation of mass, velocity, momentum, and acceleration to predict and explain the motion of objects?
 |
| **Students will know (content) . . .** * Bullet points
* Specify discreet content and key concepts that align to the competencies and standards (e.g., types of angles)
 | **Students will be able to (skills). . .** * Bullet points
* Specify process and skills that align to the competencies and standards
* Start with a verb (e.g., justify why an angle is classified the way it is)
 |
| * force,
* mass,
* velocity,
* momentum,
* acceleration
* Newton’s Laws
 | * Gather relevant data, observations, and information
* Perform calculations on data
* Make a claim
* Use data/evidence to support a claim
* Explain the connection between the data collected/calculations performed and the real-world scenario
 |
| **DESIGN: Performance Task and Evidence** *Please design a performance task that will provide evidence of the competencies, work study practices, skills, and content that are listed above.* |
| **Common performance task summary** This is a high level summary about what the students will be doing. It should be no more than 3-5 sentences or bullet points.  |
| This accident reconstruction report asks students to use data supplied to analyze and make an informed decision on whether a guardrail company or the driver was at fault when a car crashed through the guardrail. Students will first work in groups to analyze the problem and the information they have and the information they need. Then students will work individually to complete the necessary calculations and draw conclusions based on those calculations.  |
| **Key criteria for performance assessment** Please list the criteria used in the rubric. We recommend no more than 4-5 criteria. These criteria should come from the competencies, standards, work study practices, skills and/or content. |
| Data and calculations * identification of data
* calculations

Conclusions and Evidence * Claims
* Evidence
* Interpretation
 |
| **Possible Accommodations** What will teachers do in terms of instruction, curriculum and assessment to support the learning of SPED/ELL/other students in class? * Presentation accommodations
* Response accommodations
* Setting accommodations
* Timing and scheduling accommodations
 | **Resources/Texts/Scaffolding Materials** What’s included here depends on the task assignment. It is recommended that a variety of resources are provided that allow students to make choices to access the information needed to complete the assignment. |
| * Additional time
* Oral reading of instructions
* Computer as needed for responses
 | * Calculators as needed
* Graphing paper as needed
* Notes and internet as needed
 |
| **Teacher Guide**  |
| **Pre-requisites and Placement in the Curriculum**When in the year will this take place? What skills and concepts should be covered before the students perform this task? |
| * Solving for one variable equations
* Collecting data and evidence
 |
| **Possible Formative Assessments**How do I assess my students’ understanding about the performance requirements of the task (e.g., milestones, benchmarks, observations, dialogues, student reflection, quizzes)? How do I adjust my instruction accordingly? |
| Group Work and Data Collection Chart will serve as a Formative Assessment |
| **Teacher Instructions**To ensure the fidelity in implementation, this section includes:* Step-by-step procedures to implement task as designed
* Information on the time allotted for each step of the task
* Materials needed
 |
| * Unit will take 1-2 weeks with 2-3 class days for working in groups to analyze the problem, completing the calculations, and drafting and writing finalized versions of the conclusions.
* Teacher will need to plan lessons, reading materials or activities to explore forces of motion in preparation for the task.
* Students should be allowed to use any notes, formulas, or resources that they desire to complete the project. The only stipulation is that they must do and show their own work.
 |
| **Teaching/Learning Plan***To be completed by individual teacher, as learning plan may vary by teacher* The lesson plan is written as an outline that other teachers could understand and/or apply in their respective classroom (s). This generally outlines the scope and sequence of the lesson plans within the unit. It is recommended that the following are included: * The lesson plan includes how the goals will be addressed (what students know and can do
* The different steps and the specific instructions that correspond with each step of the process
* A timeline for each task
* Time or space for student reflection and feedback
 |
| This can be varied according to the time available and the unique needs of your classroom. It could exist within a two week unit or a five week unit. Here is a sample of a longer unit from the Ohio State Department of Education. <http://ims.ode.state.oh.us/ode/ims/lessons/content/csc_lp_s03_bd_l09_i22_02.pdf> |