Science GRC Rubric

Consider the Following When Using These Rubrics

Gradebook Reporting Criteria (GRC) are based on the Colorado Academic Standards. GRCs are designed for reporting on student learning in student- and parent-friendly language. Most courses have four GRCs.

A student may receive a 3 or 4 at any point in time, provided that current work and performance of that student align with the descriptors at a Level 3 or 4.

The difference between Level 3 and Level 4 performance is generally based on student work that involves transfer, depth, and complexity.

When a student's performance falls between two performance level descriptors on the rubric, a teacher should seek input from colleagues and use professional judgment in making a determination of performance.

In order to assess if a student is achieving at the "Advanced Understanding Level – 4" of performance, it is necessary to provide opportunities for students to work at the highest level of performance. To accomplish this goal, teachers will need to adjust instruction and assessment practices.
For example, but not limited to:

- Grades K-5 - Use of the "Extensions" found in the "Interdisciplinary Extensions" section for each FOSS unit within each grade level. These should be incorporated into lesson plans as a Level 4 opportunity.
- Grades K-5 – Use of the "Elaborate: Extend the Learning" section for each Sangari unit within each grade level. These should be incorporated into lesson plans as a Level 4 opportunity.
- At the secondary level, near perfect performance on assessments must be paired with a consistent ability to complete additional Level 4 opportunities within coursework with success.
- At all grade levels, students should be given opportunities to extend their understanding to real world applications and problems. Examples of this are embedded in the Next Generation Science Standards http://www.nextgenscience.org/next-generation-science-standards through the "Connections to Engineering, Technology and Applications of Science" section. These should be incorporated into lesson plans as a Level 4 opportunity.
- Teacher created Level 4 opportunities.

Science GRC Rubric

SCIENCE

Crosscutting Concepts

Crosscutting concepts bridge disciplinary boundaries and unite core ideas throughout the fields of science and engineering. These concepts deepen students' understanding of the disciplinary core ideas, and develop a coherent and scientifically based view of the world. These concepts include:

- Patterns,
- Cause and Effect,
- Scale, Proportion, and Quantity,
- Systems and System Models,
- Energy and Matter,
- Structure and Function, and
- Stability and Change.

Advanced Understanding 4	Meets the Standard 3	Approaching 2	Does Not Meet 1
The student is able to: • **Evaluate** phenomenon through the appropriate concept in order to make reasonable and defensible predictions. • **Apply** concepts to create justifiable **explanations or analogies** to situations not directly taught in the classroom.	The student is able to: • **Analyze** phenomenon through the appropriate concept in order to **make reasonable and defensible predictions** or to **draw inferences** that show an understanding of the **connections** the concept has to the subject matter.	The student is able to: • **Summarize or demonstrate** an understanding of the concept. • **Explain** the concept showing an understanding of some of the connections to the subject matter currently being taught.	The student is able to: • **Identify, list, or define** the characteristics of the concept.

Scientific Practices

Students are able to apply the major practices that scientists employ as they investigate and build models and theories about the world. We use the term "practices" instead of a term such as "skills" to emphasize that engaging in scientific investigation requires not only skill

Science GRC Rubric

but also knowledge that is specific to each practice. These practices include:

- Asking Questions (for science) and Defining Problems (for engineering),
- Planning and Carrying Out Investigations,
- Analyzing and Interpreting Data,
- Using Mathematics and Computational Thinking,
- Constructing Explanations (for science) and Designing Solutions (for engineering),
- Engaging in Argument from Evidence, and
- Obtaining, Evaluating, and Communicating Information.

Advanced Understanding 4	Meets the Standard 3	Approaching 2	Does Not Meet 1
The student is able to: • Independently design and implement scientific practices to explore and develop explanations for natural phenomenon that display characteristics of the **next grade band descriptors*.** • Analyze and **critique** other's use of these practices to determine the validity of their findings.	The student is able to: • **Independently** design and implement scientific practices to explore and develop **explanations** for natural phenomenon. • **Analyze other's use of these practices** to determine the validity of their findings.	The student is able to: • **Design** and implement scientific practices **with support** that furthers the student's understanding of scientific core ideas.	The student is able to: • **Implement** scientific practices effectively with or without support.

***Grade level progressions are described in detail in the Next Generation Science Standards, under the "Disciplinary Core Idea Progressions." This document is referred to as "APPENDIX E – Progressions Within the Next Generation Science Standards."**
http://www.nextgenscience.org/next-generation-science-standards.

Disciplinary Core Ideas

This criterion describes the set of knowledge students will learn in order to prepare them with sufficient core knowledge so that they can later acquire additional information on their own. Specifically, a core idea should:

- Have broad importance across multiple sciences or engineering disciplines or be a key organizing principle of a single discipline,
- Provide a key tool for understanding or investigating more complex ideas and solving problems,
- Relate to the interests and life experiences of students or be connected to societal or personal concerns that require scientific or

Science GRC Rubric

technological knowledge,
- Be teachable and learnable over multiple grades at increasing levels of depth and sophistication. That is, the idea can be made accessible to younger students but is broad enough to sustain continued investigation over years.

Advanced Understanding 4	Meets the Standard 3	Approaching 2	Does Not Meet 1
The student is able to: • **Make connections** between different core ideas to **create or evaluate solutions** to real world problems, or uses the connections between core ideas to **justify a new hypothesis.** • Apply a **wide range** of vocabulary **fluently**, accurately, and appropriately. • Use **detailed** relevant facts to show understanding through accurate **and precise** descriptions, explanations and examples. The **depth** of content knowledge is consistent with the next grade band standards*	The student is able to: • Use core ideas to accurately explain natural phenomenon, and can **make reasonable predictions** about future events based upon this knowledge. • Use **appropriate content** vocabulary accurately. • Use **relevant** facts to **show understanding** through **accurate** descriptions, explanations and examples.	The student is able to: • S**ummarize** core ideas, and apply that knowledge **to accurately explain** observed phenomenon. • Use **some content** vocabulary **accurately and appropriately**. • Use **mostly relevant** facts and **usually shows understanding** through descriptions, explanations and examples though they may be **basic or superficial.**	The student is able to: • **Recognize** and **describe** the core ideas.

***Grade level progressions are described in detail in the Next Generation Science Standards, under the "Disciplinary Core Idea Progressions." This document is referred to as "APPENDIX E – Progressions Within the Next Generation Science Standards."**
http://www.nextgenscience.org/next-generation-science-standards.

Communication in the Discipline

Students need to be able to read and write in the context of science to be career and college ready. They must have the writing skills in order to articulate and defend claims, and to describe observed phenomenon and experiences. Students must also have the reading skills and vocabulary knowledge necessary to read and comprehend a variety of text because the majority of workforce and college reading will be complex informational text.

Advanced Understanding 4	Meets the Standard 3	Approaching 2	Does Not Meet 1

Science GRC Rubric

The student is able to: • Communicate in a way that is clear and coherent, and in which the development, organization and style are appropriate to the task, purpose and audience. • Present arguments on disciplinary content that are logical, focused and supported with sufficient and relevant data. Interpretation of the data makes insightful **connections to other content concepts or disciplines,** or **draws relevant conclusions to real world applications or problems.**	The student is able to: • Communicate in a way that is clear and coherent, and in which the development, organization and style are **appropriate** to **task, purpose and audience.** • Present arguments on disciplinary content that are logical, focused and **supported with sufficient and relevant evidence.** • Provide step by step procedures that are **precise** and **detailed** enough so that others can **replicate** them and (possibly] produce the same results.	The student is able to: • Communicate in a way that is **clear** and **coherent**, but the organization and style may not be appropriate to the task, purpose or audience. • Present arguments on disciplinary content which are **logical and focused**, but lack evidence that supports the argument. • Provide **step by step procedures** that lack detail needed for others to replicate.	The student is able to: • Communicate with some clarity but concepts may be **inaccurate** or inappropriate as related to the task, purpose or audience. • Present **arguments** on disciplinary content, which are **unfocused** or **unsupported** with evidence. • Communicate some **procedures** but **lack details** needed for others to replicate.