

Mathematics: The Language of Science – Scoring Sheet

Student Name: _____

Place a score (1-4) in each row corresponding to the student's college readiness level.

Exceeding College Ready (4): Substantially exceeds the performance expectations**College Ready (3):** Shows proficiency in all of the performance expectations**Approaching College Ready (2):** Meets only some of the performance expectations**Initiating College Ready (1):** Does not yet meet the performance expectations

KEY COGNITIVE SKILLS	Student's Self-Assessment	Instructor's Score
Intellectual Curiosity (engages in scholarly inquiry and dialogue; accepts constructive criticism and revises personal views when valid evidence warrants)		
Reasoning (considers arguments and conclusions of self and others; constructs well-reasoned arguments to explain phenomena, validate conjectures, or support positions)		
Problem Solving (analyzes a situation to identify the problem to be solved)		
Academic Behaviors (self-monitors learning needs and seeks assistance when needed; strives for accuracy and precision; perseveres to complete and master tasks)		
Work Habits (works independently; works collaboratively)		
FOUNDATIONAL SKILLS	Student's Self-Assessment	Instructor's Score
Writing Across the Curriculum (writes clearly and coherently using standard writing conventions)		
MATHEMATICS STANDARDS	Student's Self-Assessment	Instructor's Score
Algebraic Reasoning (recognizes algebraic properties and concepts and uses them to solve equations, inequalities, and systems of equations)		
Functions (understands and analyzes features of a function)		
Communication and Representation (communicates mathematical ideas using symbols, diagrams, graphs, and words)		
Connections (connects mathematics to the study of other disciplines)		
SCIENCE STANDARDS	Student's Self-Assessment	Instructor's Score
Nature of Science: Scientific Ways of Learning and Thinking (demonstrates collaborative and safe working practices)		
Foundational Skills: Scientific Applications of Mathematics (uses exponents, scientific notation, and algebraic symbols and formulae; understands relationships among geometry, algebra, and trigonometry; understands logarithmic notation)		
Foundational Skills: Scientific Applications of Communication (demonstrates appropriate writing practices for science)		

See reverse for
comments.

Score	College Readiness Level
46-52	Exceeding College Ready
38-45	College Ready
20-37	Approaching College Ready
0-19	Initiating College Ready

Total Score: _____

Grade: _____

See Scoring Guide for grade
conversion chart.

Mathematics: The Language of Science – Scoring Guide

Note: The letters and numbers of the skills below refer to their designation in the College and Career Readiness Standards.

KEY COGNITIVE SKILLS

A. Intellectual Curiosity

1. Engage in scholarly inquiry and dialogue.

College Ready Description: Student engages fellow classmates in discussion correcting misconceptions of their classmates as well as considering the arguments of their classmates' reasoning.

Evidence for Scoring: Student attempts to answer questions informally posed by the instructor.

2. Accept constructive criticism and revise personal views when valid evidence warrants.

College Ready Description: Student integrates new information into their arguments when their thought processes are incorrect or incomplete.

Evidence for Scoring: When a classmate correctly and logically explains why the student is incorrect, the student is open to change.

B. Reasoning

1. Consider arguments and conclusions of self and others.

College Ready Description: Student listens attentively to fellow classmates' arguments, weighing what is present to what they think.

Evidence for Scoring: Student is open to changing their views when they are unable to refute their classmates' views and logic.

2. Construct well-reasoned arguments to explain phenomena, validate conjectures, or support positions.

College Ready Description: Student uses logical responses to support their opinions. Student explains their reasoning in a step-by-step manner, citing sound logic at each step.

Evidence for Scoring: Student does not jump from one topic to the next but rather keeps their arguments in a linear manner.

C. Problem solving

1. Analyze a situation to identify a problem to be solved.

College Ready Description: Student recognizes the situation they are trying to logically argue and identifies key areas of the problem as well as discarding content that does not play a role.

Evidence for Scoring: Student identifies what is the order of operations for simplifying an algebraic expression.

D. Academic Behaviors

1. Self-monitor learning needs and seek assistance when needed.

College Ready Description: Student keeps a mindful eye on their integration of the knowledge as they progress and are able to ask questions of fellow students and the instructor for help. Student is comfortable admitting they do not know the answer and is willing to recover the material to relearn.

Evidence for Scoring: Student asks for help when they do not know something.

3. Strive for accuracy and precision.

College Ready Description: Student is not satisfied with incomplete arguments and tries to reason out the logical arguments in a complete and full manner. Student approaches problems in a step-by-step manner to make sure they do not miss any key steps.

Evidence for Scoring: Student will not only ask the questions they are supposed to answer but will go above and beyond by posing “what if” questions of themselves.

4. Persevere to complete and master tasks.

College Ready Description: Student does not give up when presented with a situation which they do not know how to solve but rather attempts to start with things they do know. Student attempts a different approach when a previous approach does not work out.

Evidence for Scoring: If a student does not know how to deal with logarithms with powers, they will look at logarithms and powers separately and figure out how to combine them.

E. Work habits

1. Work independently.

College Ready Description: Student works through the problems by themselves.

Evidence for Scoring: Student does not wait until the group work to start thinking about the scenarios.

2. Work collaboratively.

College Ready Description: Student actively and equally works with others on the problem at hand.

Evidence for Scoring: Student recognizes different people have different skills and knowledge and tries to use the best everyone has for the betterment of the group.

FOUNDATIONAL SKILLS

B. Writing Across the Curriculum

1. Write clearly and coherently using standard writing conventions.

College Ready Description: Student explains in writing what they observe in the data graphs and can clearly convey consequences of their observations. Student uses technical definitions in their explanations.

Evidence for Scoring: Student correctly describes the strategy of linearizing functions through substitution of variables in their writing.

MATHEMATICS STANDARDS

II. Algebraic Reasoning

C.1. Solving equations, inequalities, and systems of equations.

College Ready Description: Student recognizes and uses algebraic properties, concepts, procedures, and algorithms to solve equations, inequalities, and systems of linear equations.

Evidence for Scoring: Student performs basic algebraic manipulations to solve these problems. Student can solve the equations in Activity 2c.

VII. Functions

B.1, 2. Analysis of functions.

College Ready Description: Student understands and analyzes features of a function and algebraically constructs and analyzes new functions.

Evidence for Scoring: Student transforms one function into another through substitution of variables and relates functions to graphical representations.

IX. Communication and Representation

C.1. Presentation and representation of mathematical work.

College Ready Description: Student communicates mathematical ideas, reasoning, and their implications using symbols, diagrams, graphs, and words.

Evidence for Scoring: Student sketches functions and motivates specific variable substitutions that result in linear graphs.

X. Connections

A.2. Connections among the strands of mathematics.

College Ready Description: Student connects mathematics to the study of other disciplines.

Evidence for Scoring: Student describes an example from a specific branch of science in which mathematical transformations are used.

SCIENCE STANDARDS

I. Nature of Science: Scientific Ways of Thinking and Learning

C.1. Collaborative and safe working practices.

College Ready Description: Student collaborates on joint projects.

Evidence for Scoring: Student actively participates in the discussions with their fellow classmates as well as with their instructor. Student does not sit and listen the whole time but rather actively listens and talks.

II. Foundation Skills: Scientific Applications of Mathematics

A.2, 5. Basic mathematics conventions.

College Ready Description: Student uses exponents and scientific notation. Student simplifies algebraic expressions.

Evidence for Scoring: Student can rearrange equations to solve for useful quantities. Student solves for the unknown quantities in Activity 2c.

B.1. Mathematics as a symbolic language.

College Ready Description: Student carries out formal operations using standard algebraic symbols and formulae.

Evidence for Scoring: Student carries out variable substitution to linearize functions presented in the activity.

C.2, 3. Understanding relationships among geometry, algebra, and trigonometry.

College Ready Description: Student understands that a curve drawn on a defined set of axes is fully equivalent to a set of algebraic equations. Student understands basic trigonometric principles, including definitions of terms such as sine, cosine, tangent, cotangent, and their relationship to triangles.

Evidence for Scoring: Student can read, interpret and create graphs that correlate to mathematical equations and algebraic functions. Student recognizes basic trigonometric functions.

F.3. Scientific measurement.

College Ready Description: Student understands and uses logarithmic notation (base 10).

Evidence for Scoring: Student is able to sketch functions involving logarithmic notation and perform appropriate variable substitution to linearize such functions.

III. Foundation Skills: Scientific Applications of Communication

A.1. Scientific writing.

College Ready Description: Student uses correct applications of writing practices in scientific communication.

Evidence for Scoring: Student accurately completes the packet of graphs.

Mathematics: The Language of Science – Scoring Instructions

Place a score (1-4) in each row of the scoring sheet corresponding to the student's college readiness level.

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Initiating College Ready (1): Does not yet meet the performance expectations

Suggested Grade Conversion:

This chart reflects equal weight given to each skill. As key cognitive skills, foundational skills, and discipline content knowledge are all important elements of college readiness, we recommend this grading approach. However, you may certainly choose to implement different weights to particular scales and assign a grade at your discretion.

Score	Grade		Score	Grade		Score	Grade		Score	Grade
52	100		42	88		32	80		22	72
51	99.5		41	87		31	79		21	71
50	99		40	86		30	78		20	70
49	98		39	85		29	77		19	68
48	97		38	84.5		28	76		18	66
47	96		37	84		27	75.5		17	64
46	95		36	83.5		26	75		16	62
45	94		35	83		25	74.5		15	60
44	92		34	82		24	74			
43	90		33	81		23	73			