

Making Motion Matter – 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; gathers evidence to support arguments)		
Problem Solving (analyzes a situation to identify the problem to be solved; develops and applies multiple strategies to solve a problem)		
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)		
Academic Integrity (includes the ideas of others and the complexities of the debate, issue, or problem)		
FOUNDATIONAL SKILLS	Student's Self-Assessment	Instructor's Score
Writing Across the Curriculum (writes clearly, coherently using standard writing conventions; writes in a variety of forms for various audiences, purposes)		
Research Across the Curriculum (synthesizes and organizes information effectively)		
SCIENCE STANDARDS	Student's Self-Assessment	Instructor's Score
Nature of Science: Scientific Ways of Learning and Thinking (exercises cognitive skills in science; demonstrates collaborative, safe practices; effectively communicates scientific info)		
Foundational Skills: Scientific Applications of Mathematics (understands relationships between algebra, geometry, and trigonometry)		
Foundational Skills: Scientific Applications of Communication (demonstrates appropriate writing practices for science)		
Physics (understands the fundamental concepts of kinematics)		

**See reverse for
comments.**

Score	College Readiness Level
42-48	Exceeding College Ready
35-41	College Ready
18-34	Approaching College Ready
0-17	Initiating College Ready

Total Score: _____

Grade: _____

See Scoring Guide for grade conversion chart.

Making Motion Matter – 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 their misconceptions as well as considering their reasoning and arguments. Student attempts to answer questions informally posed by the instructor.

Evidence for Scoring: Student discusses her or his ideas about the motion displayed in the graphs and poses questions to the instructor or a classmate.

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

College Ready Description: Student integrates new information into his or her arguments when his or her 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 presented against what they think.

Evidence for Scoring: Student is open to changing his or her views when unable to refute 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 his or her opinions. Student should be able to explain his or her reasoning in a step-by-step manner, citing sound logic at each step.

Evidence for Scoring: Rather than jumping from one argument to the next without making clear connections, the student states his or her arguments in a logical manner.

C. Problem solving

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

College Ready Description: Student recognizes the situation he or she is 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 examines the position vs. time graphs and finds that the slope of the line is equal to the velocity of the object.

2. Develop and apply multiple strategies to solve a problem.

College Ready Description: Student will look at the problem from multiple angles to see which approach will work best.

Evidence for Scoring: Student might use the concept of calculus or they might try to act out the motion for a particular graph.

D. Academic Behaviors**1. Self-monitor learning needs and seek assistance when needed.**

College Ready Description: Student keeps a mindful eye on his or her integration of knowledge as it progresses and is able to ask fellow students and the instructor for help.

Evidence for Scoring: Student is comfortable admitting he or she does not know an answer and is willing to re-examine the material to relearn.

3. Strive for accuracy and precision.

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

Evidence for Scoring: Student will not simply move on to the next question once he or she finds an answer, but instead will make sure the response is correct and well-reasoned by checking alternative answers and testing the limits of the chosen response.

4. Persevere to complete and master tasks.

College Ready Description: Student does not give up when present with a situation which they do not know how to solve but rather attempts to start with things they do know.

Evidence for Scoring: If a student does not know how to deal with a particular graph, they will look at their personal experiences and try to recreate the motion until they understand it.

E. Work Habits**1. Work independently.**

College Ready Description: Student can work through the problems by themselves.

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

2. Work collaboratively.

College Ready Description: Student actively and equally works with others on the problem at hand. Student recognizes different people have different skills and knowledge and tries to use the best everyone has for the betterment of the group.

Evidence for Scoring: One student does not do all the work while the other students just sit passively.

F. Academic Integrity

3. Include the ideas of others and the complexities of the debate, issue, or problem.

College Ready Description: Student integrates the discussion they had on the previous sections of this activity into the latter ones.

Evidence for Scoring: In the third section, student draws on their discussion from the first section.

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 is able to use technical definitions in their explanations.

Evidence for Scoring: Student correctly uses the word “acceleration” in their writing. Student can write a short story consistent with their grade level.

2. Write in a variety of forms for various audiences and purposes.

College Ready Description: Student demonstrates an understanding of writing style as related to audience and purpose.

Evidence for Scoring: Student writes technically in their notebook as well as in more creative way in their short story.

C. Research Across the Curriculum

5. Synthesize and organize information effectively.

College Ready Description: Student brings together knowledge they learned from previous discussions as well as the data and information they obtain in this particular activity. Student recognizes that the information they learned in the past and the information they are currently learning are related.

Evidence for Scoring: Student recognizes that the steeper the position vs. time graph is, the faster the object is moving.

SCIENCE STANDARDS

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

A.2. Cognitive skills in science.

College Ready Description: Student uses creativity and insight to recognize and describe patterns in natural phenomena.

Evidence for Scoring: Student describes the motion of an object using the information in the graphs and generates a plausible real-world scenario for the motion described in Activity 4.

C.1. Collaborative and safe working practices.

College Ready Description: Student collaborates on joint projects.

Evidence for Scoring: All group members equally participate, and one does not do all the work while the others sit and do nothing.

E.1, 2. Effective communication of scientific information.

College Ready Description: Student uses several modes of expression to describe or characterize natural patterns and phenomena. These models of expression include narrative, numerical, graphical, pictorial, symbolic, and kinesthetic. Student uses essential vocabulary of the discipline being studied.

Evidence for Scoring: Student provides clear explanation of velocity to their classmate correctly using words and phrases like the time rate of change of position. Student can explain the main points of the activity in the short story.

II. Foundation Skills: Scientific Applications of Mathematics**C.2. Understand 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.

Evidence for Scoring: Student can take the slope of the position vs. time graphs and infer what the speed of the object is.

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 is able to say in words what it means for an object to be speeding up (accelerating).

VIII. Physics**C.1. Forces and motion.**

College Ready Description: Student understands the fundamental concepts of kinematics.

Evidence for Scoring: Student can correctly differentiate between position, velocity and acceleration. Student is able to find velocity and acceleration from a position vs. time graph.

Making Motion Matter – 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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College Ready (3): Shows proficiency in all of the performance expectations

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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
48	100		39	89		30	80		21	73
47	99.5		38	87		29	79.5		20	72
46	99		37	86		28	79		19	71
45	98		36	85		27	78.5		18	70
44	97		35	84.5		26	78		17	68
43	96		34	84		25	77		16	66
42	95		33	83		24	76		15	64
41	93		32	82		23	75		14	62
40	91		31	81		22	74		13	60