

Kinematics Presentation and Report Rubric

Task

Students present a labelled model or report on kinematics. This work shows they understand motion. Motion involves displacement, velocity, acceleration and time. Students apply these ideas to real or made-up motion scenarios.

Curriculum alignment

Students are assessed on describing motion using displacement, velocity, acceleration and time ([Topic](#)). The rubric checks these skills: defining displacement, velocity and acceleration in words and with numbers ([Outcome](#)); telling scalar and vector quantities apart ([Outcome](#)); explaining uniform and uniformly accelerated motion using words, numbers and graphs ([Outcome](#)); interpreting two-dimensional motion using vector components ([Outcome](#)); and interpreting the motion of one object relative to another using relative velocity.

Rubric

Criterion	Beginning	Developing	Proficient	Exemplary
Definitions and Concepts	Defines displacement, velocity or acceleration with significant omissions or errors; confuses scalar and vector quantities.	Defines most terms correctly but with minor gaps; shows partial understanding of scalar versus vector distinction.	Defines displacement, velocity and acceleration accurately; correctly identifies scalar and vector quantities and explains the distinction.	Provides precise definitions with clear examples; explains how scalar and vector quantities differ in real motion contexts.
Quantitative Analysis	Calculations are missing, incorrect or lack supporting work; units are absent or inconsistent.	Calculations are mostly correct with minor errors; units are present but occasionally inconsistent; work is partially shown.	Calculations are correct with clear working; units are consistent and appropriate throughout; algebraic steps are shown.	Calculations are correct and efficient; units are justified; work demonstrates understanding of underlying physics principles.
Representation and Labelling	Model or diagram is unclear, incomplete or poorly labelled; graphs or vectors are missing or inaccurate.	Model or diagram is present with most components labelled; graphs or vectors are included but lack clarity or completeness.	Model or diagram is clear and fully labelled; graphs and vectors are accurate and appropriately scaled; all key features identified.	Model or diagram is clear, detailed and precisely labelled; graphs and vectors are accurate, well-scaled and annotated; enhances understanding.

Application to Motion Scenarios	Applies concepts inconsistently; explanations lack connection to kinematics principles; motion type is misidentified.	Applies concepts with partial success; explanations show some connection to kinematics; motion type is identified but analysis is incomplete.	Applies concepts correctly to uniform and uniformly accelerated motion; explanations clearly connect data to kinematics principles.	Applies concepts to complex scenarios; explains motion with reference to displacement, velocity and acceleration relationships; interprets two-dimensional motion using vector components and describes the motion of one object relative to another.
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Scoring

Give each criterion a level: Beginning (1 point), Developing (2 points), Proficient (3 points), or Exemplary (4 points). Add up the four scores. A total of 4 to 8 points shows beginning skill. A total of 9 to 11 points shows developing skill. A total of 12 to 14 points shows proficiency. A total of 15 to 16 points shows exemplary work. Students study kinematics by looking at changes in position and velocity of objects and systems.

Notes for the teacher

- **Consistency in quantitative work:** Require students to show all algebraic steps and state units at each stage. Deduct points only once for a unit error that propagates through multiple calculations, not for each occurrence.
- **Labelling standards:** Insist that all axes, vectors, displacement markers and time intervals carry labels with appropriate units. A clear legend or key should accompany any vector diagram.
- **Scalar versus vector distinction:** Accept either written explanation or colour-coded/symbol-coded diagrams that distinguish the two. The method matters less than the accuracy of the classification.
- **Two-dimensional motion:** For students addressing two-dimensional scenarios, require explicit resolution of motion into horizontal and vertical components. If the task does not require two-dimensional analysis, do not penalize its absence; mark only on what the student attempted.