Overall Expectations:

SIV.01 demonstrate scientific investigation skills (related to both inquiry and research) in the four areas of skills (initiating and planning, performing and recording, analysing and interpreting, and communicating);

KIV.01 analyse technologies that apply concepts related to kinematics, and assess the technologies' social and environmental impact;

KIV.02 investigate, in qualitative and quantitative terms, uniform and non-uniform linear motion, and solve related problems;

KIV.03 demonstrate an understanding of uniform and non-uniform linear motion, in one and two dimensions.

Specific Expectations:

SI1.01 formulate relevant scientific questions about observed relationships, ideas, problems, or issues, make informed predictions, and/or formulate educated hypotheses to focus inquiries or research;

SI1.03 identify and locate a variety of print and electronic sources that enable them to address research topics fully and appropriately;

SI1.06 compile accurate data from laboratory and other sources, and organize and record the data, using appropriate formats, including tables, flow charts, graphs, and/or diagrams;

SI1.07 select, organize, and record relevant information on research topics from a variety of appropriate sources, including electronic, print, and/or human sources, using suitable formats and an accepted form of academic documentation;

SI1.09 analyse the information gathered from research sources for logic, accuracy, reliability, adequacy, and bias;

SI1.11 communicate ideas, plans, procedures, results, and conclusions orally, in writing, and/or in electronic presentations, using appropriate language and a variety of formats (e.g., data tables, laboratory reports, presentations, debates, simulations, models);

KI1.01 analyse, on the basis of research, a technology that applies concepts related to kinematics; (e.g., devices used to measure speed in sports; rocket accelerators; motion-detecting sensors for security systems; speedometers in automobiles) [IP, PR, AI, C];

KI1.02 assess the impact on society and the environment of a technology that applies concepts related to kinematics (e.g., photo radar helps prevent vehicular accidents and reduces fuel consumption associated with excessive speeding) [AI, C];

KI2.01 use appropriate terminology related to kinematics, including, but not limited to: *time*, *distance*, *position*, *displacement*, *speed*, *velocity*, and *acceleration* [C];

KI2.04 conduct an inquiry into the uniform and non-uniform linear motion of an object (e.g., use probeware to record the motion of a cart moving at a constant velocity or a constant acceleration; view a computer simulation of an object attaining terminal velocity; observe video of a bouncing ball or a skydiver; observe the motion of a balloon with a small mass suspended from it) [AI, C];

KI2.05 solve problems involving distance, position, and displacement (e.g., find total displacement using a scale vector diagram and vector components, and compare it to total distance travelled) [AI, C];

KI2.06 plan and conduct an inquiry into the motion of objects in one dimension, using vector diagrams and uniform acceleration equations [IP, PR, C];

KI2.07 solve problems involving uniform and non-uniform linear motion in one and two dimensions, using graphical analysis and algebraic equations [AI, C];

KI3.01 distinguish between the terms constant, instantaneous, and average with reference to speed, velocity, and acceleration, and provide examples to illustrate each term;

KI3.02 distinguish between, and provide examples of, scalar and vector quantities as they relate to the description of uniform and non-uniform linear motion (e.g., time, distance, position, velocity, acceleration).