

TSOKOS READING ACTIVITY

Lsn 2-1A, Kinematic Quantities

1. **Essential idea:**

- a. Motion may be described and analysed by the use of graphs and equations.

2. **Nature of science:**

- a. Observations: The ideas of motion are fundamental to many areas of physics, providing a link to the consideration of forces and their implication. The kinematic equations for uniform acceleration were developed through careful observations of the natural world.

3. **Understandings:**

- a. Distance and displacement
b. Speed and velocity
c. Graphs describing motion

4. **Applications and skills:**

- a. Determining instantaneous and average values for velocity and speed
b. Sketching and interpreting motion graphs

5. **International-mindedness:**

- a. International cooperation is needed for tracking shipping, land-based transport, aircraft and objects in space

6. **Utilization:**

- a. Biomechanics (see Sports, exercise and health science SL sub-topic 4.3)

7. **Guidance:**

- a. Calculations will be restricted to those neglecting air resistance

8. **Data booklet reference:**

a. $s = \frac{(v+u)t}{2}$

9. **Aims:**

- a. Aim 2: much of the development of classical physics has been built on the advances in kinematics
b. Aim 6: experiments, including use of data logging, could include (but are not limited to):
determination of g , estimating speed using travel timetables, analysing projectile motion, and investigating motion through a fluid

10. Read section 2-1, pages 35-37 in your textbook.

11. Answer the following questions:

a. Define *uniform motion*.

b. What are differences between *velocity*, *speed*, *average velocity* and *average speed*.

c. What is the difference between *distance* and *displacement*.

d. What are two pre-conditions for the equation $s = s_i + vt$?

e. Explain how different observers belonging to different frames of reference can give differing but equally valid descriptions of motion.

12. Answers may be typed or neatly printed. Drawings may be freehand, but try to make use of the 'Shapes' or 'Insert Clipart' functions of MS Word. If you submit this assignment electronically, the filename must be in the following format, "LastnameFirstinitialPerXReadActX-X".