Kinematic Equations 2

Objectives:
- Use all four kinematic equations interchangeably.

- For a given problem, write down given information and unknown information, and from this, select and solve the correct kinematic equation.

Name	**Equation**
Definition of Acceleration	$v_f = v_i + a \cdot \Delta t$
The King of Kinematic Equations	$\Delta x = v_i \cdot \Delta t + \frac{1}{2} a (\Delta t)^2$
The Average Velocity Formula	$\Delta x = \left(\frac{v_i + v_f}{2} \right) \Delta t$
No-Time Equation	$v_f^2 = v_i^2 + 2a \cdot \Delta x$

- In this quiz, problems are only stated in very clear terms, in which each quantity is given simply.

Part C: Introducing the 4 Kinematic Equations

Thus far, we only know how to calculate distance if something moves at a *constant velocity*. However, most interesting things do not move at a constant velocity, they accelerate. There are 4 equations.

Kinematics The study of how things *move*.
4 kinematic equations These are four important equations that demonstrate how things *move* in physics.
Condition for the kinematic equations You can use the kinematic equations when ever anything is moving with a *constant acceleration*. If acceleration is changing, you CANNOT use the kinematic equations.

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C.1 The study of motion is called _____.

C.2 Which kinematic equation have we already studied?

C.3 True or false: If my acceleration is changing, I can use the No-Time Equation.

C.4 True or false: If my acceleration is not changing, I can use The Other Average Velocity Formula.

Formula 1

I had an initial velocity of 8 m/s and now have a final velocity of 20 m/s. I have an acceleration of 4 m/s^2. How much time did it take?

Looking For	Formula	
Already Know		
Answer in a complete sentence *with unit*:		

I had an initial velocity of 2 m/s and a final velocity of 23 m/s. I have an acceleration of 3m/s^2. How much time did it take?

Looking For	Formula	
Already Know		
Answer in a complete sentence *with unit*:		

Formula 2

When I travel with an acceleration of 5 m/s^2 for a time of 3 s, I travel a displacement of 69 m. What was my initial velocity?

Looking For	Formula	
Already Know		
Answer in a complete sentence *with unit*:		

When I travel with an acceleration of 7 m/s^2 for a time of 4 s, I travel a displacement of 104 m. What was my initial velocity?

Looking For	Formula	
Already Know		
Answer in a complete sentence *with unit*:		

I began with an initial velocity of 3 m/s and traveled for a time of 6 seconds. I eventually traveled a displacement of 126 m. What was my acceleration?

Looking For	Formula	
Already Know		
Answer in a complete sentence *with unit*:		

I began with an initial velocity of 16 m/s and traveled for a time of 2 seconds. I eventually traveled a displacement of 50 m. What was my acceleration?

Looking For	Formula	
Already Know		
Answer in a complete sentence *with unit*:		

Formula 3:

I begin with an initial velocity of 3 m/s and travel a displacement of 49 m in a time of 7 seconds. What is my final velocity?

Looking For	Formula	
Already Know		
Answer in a complete sentence *with unit*:		

I begin with an initial velocity of 5 m/s and travel a displacement of 88 m in a time of 8 s. What is my final velocity?

Looking For	Formula	
Already Know		
Answer in a complete sentence *with unit*:		

I travel a displacement of 90 m in a time of 5 seconds and end with a final velocity of 23 m/s. What was my initial velocity?

Looking For	Formula	
Already Know		
Answer in a complete sentence *with unit*:		

I travel a displacement of 15 m in a time of 3 s and end with a final velocity of 9 m/s. What was my initial velocity?

Looking For	Formula	
Already Know		
Answer in a complete sentence *with unit*:		

Formula 4: