Mr. Scharff
Physical Science

Name _____
May 11, 2015 Pd. ____

ShSht. Exam Review

The pages that follow contain the many of the shortsheets that we completed collaboratively in class. I have given you these again to review and practice. Since, we completed all of these exclusively in class, you should have all of the answers in your science notebook in the shortsheet section to check as you complete any of the ones provided below. In addition to completion of these, you should know and understand all of your pregame questions given in class each day, and you should know and understand all or your previous quiz questions. Any that you missed, I hope your corrected previously for partial points, but if not, you need to correct them know for understanding prior to the final examination. In addition, review the "I can statements" in your notebook for clarification.
Good luck! If you need any help stop by and ask.

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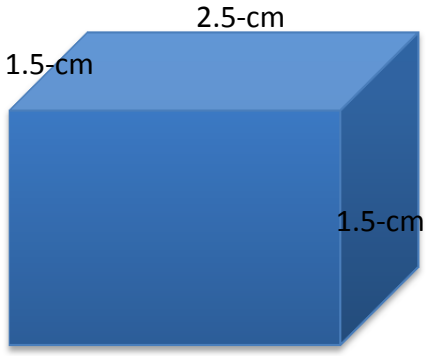
ShSht. Density Mathematics I



Calculate the density of the 17.2-g object to the left. For all problems round to the nearest 0.1. You must show all mathematical calculations.

1. What is the density formula?

_____

2. What is the objects' mass?

_____

3. What is the objects volume?

_____

4. What is the objects density?

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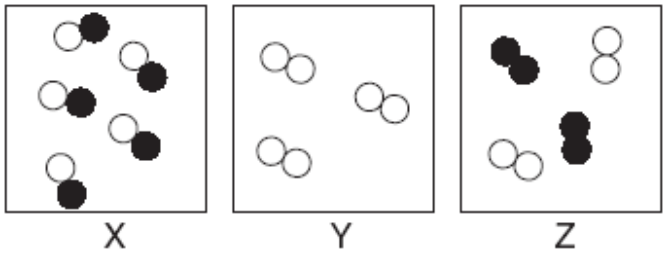
ShSht. Particle Diagrams Visit



Key
Atom of element A = ○
Atom of element B = ●

Answer the questions using the diagram to the left.

1. Which letter(s) represent an example of a pure substance?

2. Which letter(s) represent an example of a mixture?

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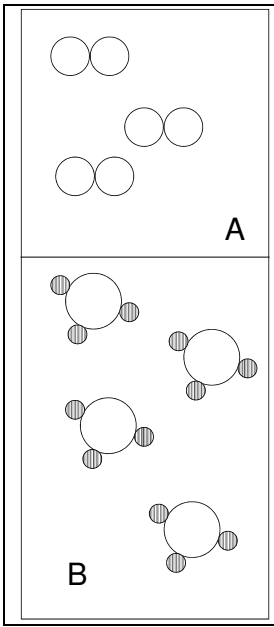
ShSht. Particle Diagrams ReVisit



Choose all terms that apply to each particle diagram: atom, element, compound, mixture, molecule, pure substance. And describe the state of matter of each substance.

Diagram A:

Diagram B:

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ShSht. Nuclear Decay – Check

Directions. Examine the following radioactive decay equations. Identify which radioactive particle is involved, circle it, and complete the equation and. Use the provided Periodic Table on the reverse side.

1. Particle: _____ $^{239}_{94}Pu \rightarrow {}^{4}_{2}He + $ _____

2. Particle: _____ $^{42}_{19}K \rightarrow {}^{0}_{-1}e + $ _____

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ShSht. Nuclear Decay – Double Check

Directions. Examine the following radioactive decay equations. Identify which radioactive particle is involved, circle it, and complete the equation and. Use the provided Periodic Table on the reverse side.

1. Particle: _____ $^{235}_{92}U \rightarrow$ _____ $+ {}^{231}_{90}Th$

2. Particle: _____ $^{6}_{3}Li \rightarrow {}^{4}_{2}He + $ _____

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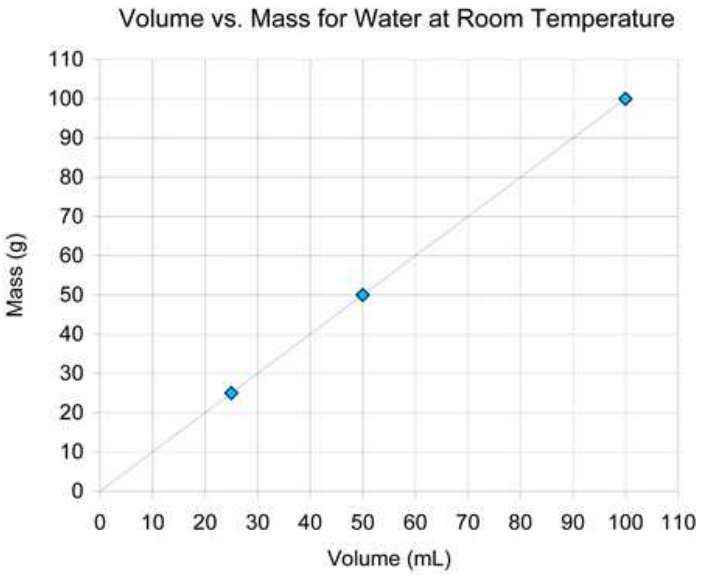
ShSht. Density Graph I



1. According to the graph, if you were to measure out 75-ml of this substance, what would be its mass?

2. According to the graph, what volume of water would you need, to have a mass of 40-g?

3. What is the density of water of 90-ml of water?

4. Based on your density calculation above, manipulate the density formula, to determine how much water is needed for a mass of 37.39-g?

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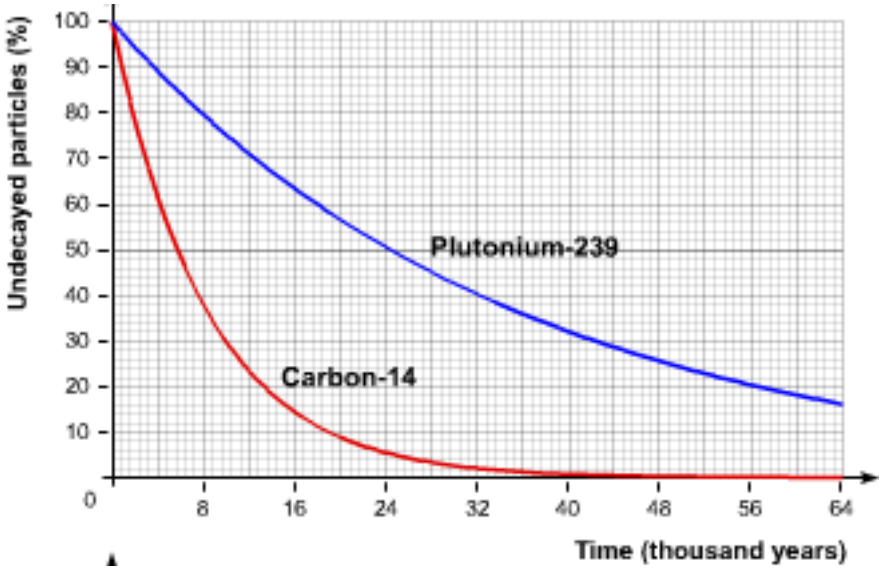
ShSht. Half-life Graph I



1. What is half-life?

2. How much Plutonium-239 is left after 24,000 yrs?

3. What is the half-life of Plutonium-239?

4. What is the half-life of Carbon-14?

5. How long will it take for Carbon-14 to complete 2 half-lives?

6. How much of the initial quantity of Carbon-14 is still remaining after 24,000 years?

7. Write an alpha particle decay reaction for Plutonium-239.

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ShSht. Half-life Graph II

187
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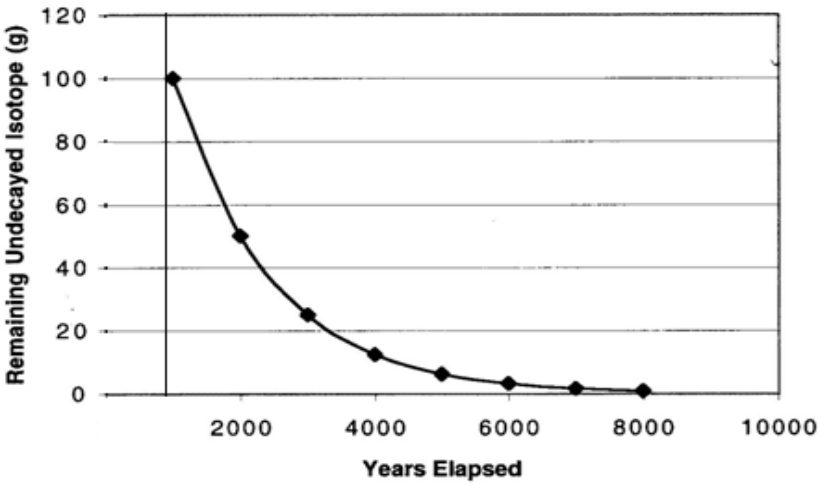
Radioisotope #1: Summerium



1. What is half-life?
2. How much Summerium is left after 3,000 yrs?
3. What is the half-life of Summerium?
4. How long will it take for Summerium to complete 3 half-lives?
5. How much Summerium did this sample start with?
6. Write a beta decay equation for Summerium.

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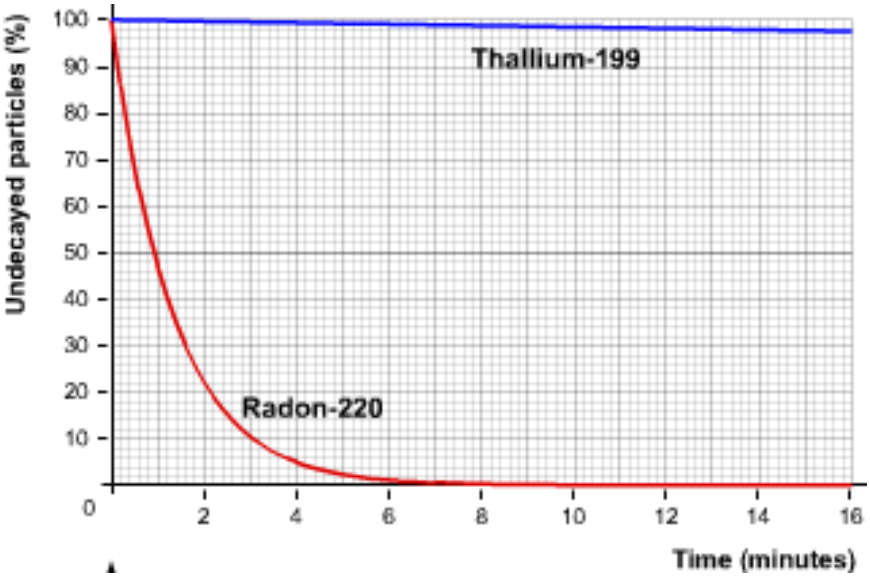
ShSht. Half-life Graph III



1. What is half-life?
2. How much Thallium is left after 16minutes?
3. What is the half-life of Radon-220?
4. After 6 minutes, about how many half-lives has Radon-220 gone through?
5. How long does it take for 90% of Radon-220 to decay?
6. Lets' say that Radon-22o has a half-life of 30 seconds. How long would it take for Radon-220 to decay for 4 half-lives?
7. Write an alpha particle decay reaction for Radon-220.

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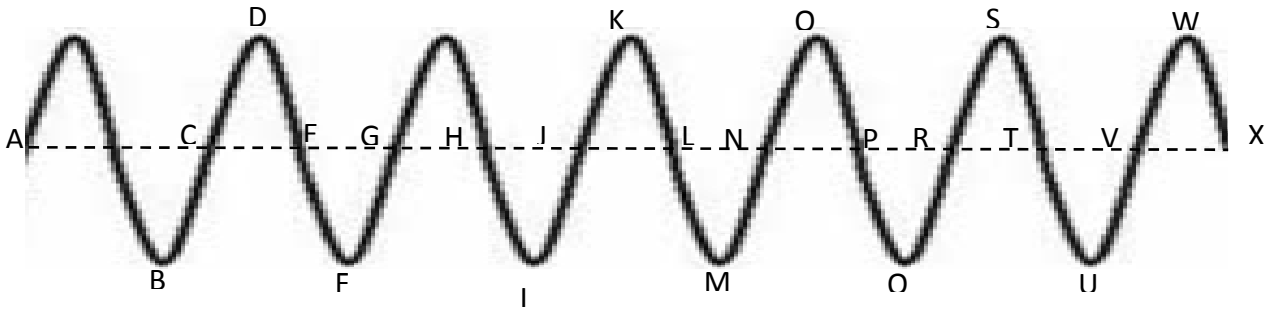
Shsht. Wave Diagram I – student

Directions. Use the wave diagram to answer the following questions.



1. What type of wave is depicted in the illustration above? _____
2. List all of the wavelengths and their associated letters. For example, you would write A-X for one wavelength that could be measured from letter A to letter X.

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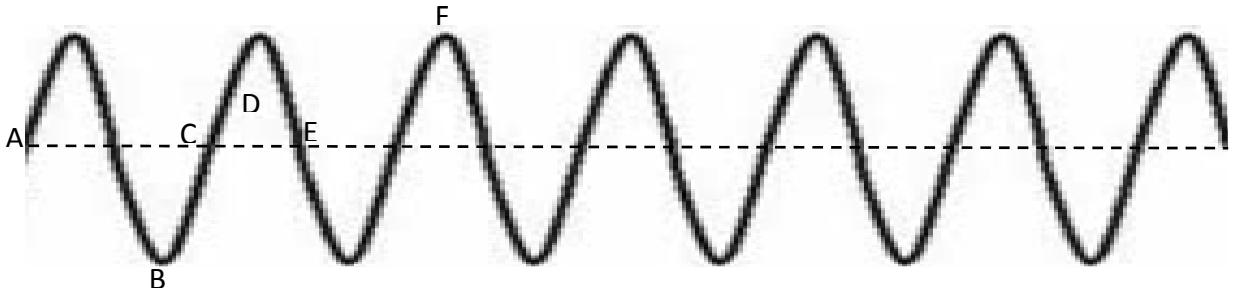
Shsht. Wave Diagram II – student

Directions. Use the wave diagram to answer the following questions.



1. What type of wave is depicted in the illustration above? _____
2. Label the lettered parts of the wave.
3. Draw a sound wave below it.
4. A to C would represent how many waves? ____

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Shsht. Wave Diagram III – student

Directions. Use the wave diagram below to answer the following questions.

1. Underline the compression(s).
2. Circle the rarefaction(s).
3. Square one wave length.
4. Superimpose a transverse wave over the wave train below.
5. Draw a sound wave the same length as the wave below, but louder, above the wave diagram.
6. If it took 30 seconds for a wave in this series to pass by you, what is the period of these waves?

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State of Ohio GLI

- *PS 9.21. Demonstrate that motion is a measurable quantity that depends on the observer's frame of reference and describe the object's motion in terms of position, velocity, acceleration and time.*

Shsht. Frame of Reference I

Directions. Examine each picture to determine a) if they illustrate movement b) if yes provide 2 frames of reference.

	
a.	a.
b.	b.

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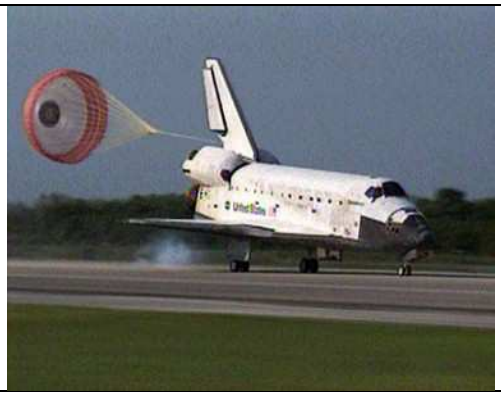
State of Ohio GLI

- *PS 9.21. Demonstrate that motion is a measurable quantity that depends on the observer's frame of reference and describe the object's motion in terms of position, velocity, acceleration and time.*

Shsht. Frame of Reference II

Directions. Examine each picture to determine a) if they illustrate movement b) if yes provide 2 frames of reference.

	
a.	a.
b.	b.

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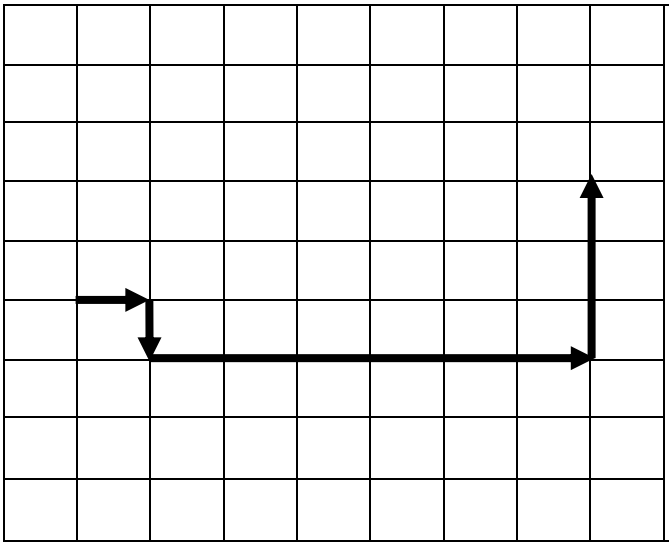
Science Expectations (I can statements)

- *demonstrate that motion is a measurable quantity that depends on the observer's frame of reference and describe the object's motion in terms of position, velocity, acceleration and time.*

Directions. Below is a grid with the path taken by an individual. Label the start of the path taken with 'S' and end of the path taken 'F'. Draw a dotted line to indicate the displacement. Answer the questions adjacent to each path illustration.

SHSHT. DISPLACEMENT I – STUDENT



1. Grid to the left is composed of squares 50.5-m on each side.

a. What is the distance covered by the individual?

b. What is the displacement of the individual?

c. If it took the individual 28.6 seconds to cover this distance, what was her speed?

d. How long would it have taken her to walk the displacement line?

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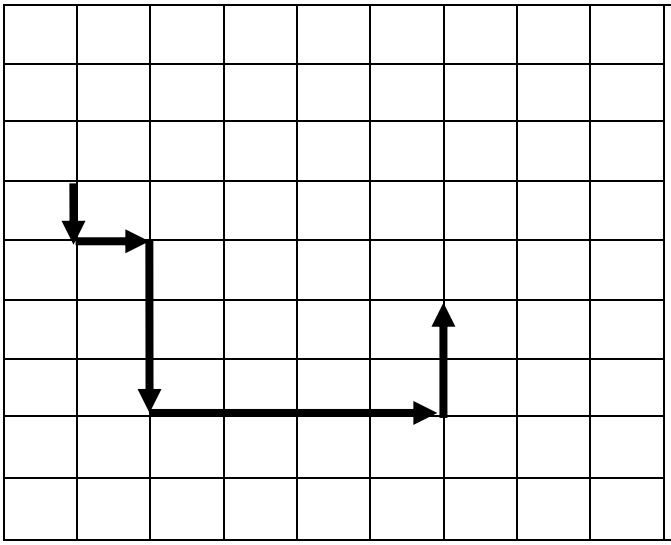
Directions. Below is a grid with the path taken by an individual. Label the start of the path taken with 'S' and end of the path taken 'F'. Draw a dotted line to indicate the displacement. Answer the questions adjacent to each path illustration.

SHSHT. DISPLACEMENT II – STUDENT



1. Grid to the left is composed of squares 50.5-m on each side.

a. What is the distance covered by the individual?

b. What is the displacement of the individual?

c. If it took the individual 47.2 seconds to cover this distance, what was her speed?

d. How long would it have taken her to walk the displacement line?

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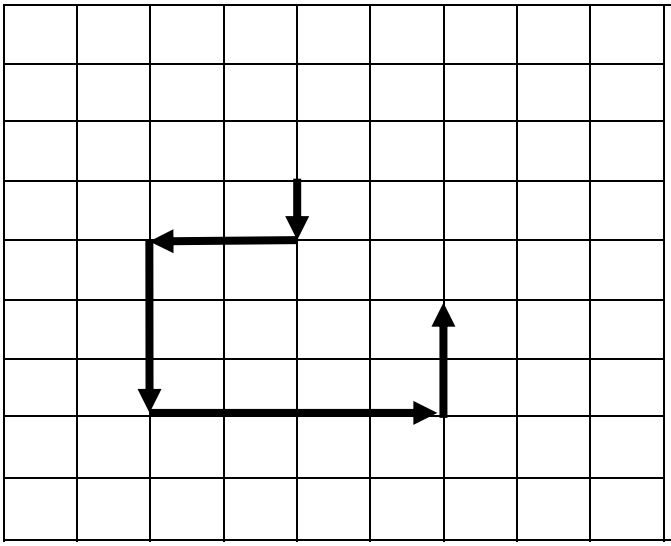
Science Expectations (I can statements)

- *demonstrate that motion is a measurable quantity that depends on the observer's frame of reference and describe the object's motion in terms of position, velocity, acceleration and time.*

Directions. Below is a grid with the path taken by an individual. Label the start of the path taken with 'S' and end of the path taken 'F'. Draw a dotted line to indicate the displacement. Answer the questions adjacent to each path illustration.

SHSHT. DISPLACEMENT III – STUDENT



1. Grid to the left is composed of squares 50.5-m on each side.

a. What is the distance covered by the individual?

b. What is the displacement of the individual?

c. If it took the individual 31.27 seconds to cover this distance, what was her speed?

d. How long would it have taken her to walk the displacement line?

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State of Ohio Science Indicator

- *demonstrate that motion is a measurable quantity that depends on the observer's frame of reference and describe the object's motion in terms of position, velocity, acceleration and time.*

Short Sheet: Acceleration I - Student

Directions. Solve the following problems showing all work and units. Box the unknown value and underline and label the known values.

1. A motorcycle when the stoplight turns green, reaches a speed of 7.0 m/s toward the next intersection in 3.5s. What is the motorcycles acceleration?	2. After 5 blocks, the motorcycle must stop for a second red light. It takes the motorcycle 5.0 seconds to slow down. What is the motorcycles acceleration?	3. After reaching a speed of 1.5 m/s a bicycle rider pedals hard for 8.0 seconds to a speed of 2.0m/s over a bridge. What it the bicycles acceleration?

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State of Ohio Science Indicator

- *demonstrate that motion is a measurable quantity that depends on the observer's frame of reference and describe the object's motion in terms of position, velocity, acceleration and time.*

Short Sheet: Acceleration II – Student

Directions. Solve the following problems showing all work and units. Box the unknown value and underline and label the known values.

1. Javhon tries to dribble past Mr. Scharff with a ball traveling 1.97-m/s. But as Javon moves around Mr. Scharff, Mr. Scharff stops the ball from moving forward by him in 0.162-s. What is the balls acceleration due to Mr. Scharff?	2. Ethan takes a penalty shot. As Mr. Scharff leaps to make the save, the ball hits the crossbar 0.841-s later, traveling at 12.87-m/s. What is the acceleration of the Ethan's kick?	3. Madi is on the last leg of her swimming event. She is traveling at 2.89-m/s but speeds up to 3.14-m/s in 0.156-s over 2 meters. What was Madi's swimming acceleration?

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State of Ohio Science Indicator

- *demonstrate that motion is a measurable quantity that depends on the observer's frame of reference and describe the object's motion in terms of position, velocity, acceleration and time.*

Short Sheet: Acceleration III Algebraic Manipulations - Student

Directions. Solve the following problems showing all work, significant figures and units. Box the unknown value and underline and label the known values.

1. Rachel's motorcycle when the stoplight turns green, reaches a speed of 7.0 m/s forward due to an acceleration rate of 2.0-m/s^2. How long did it take for Rachel to accelerate?	2. Julien's school bus must stop for a red light. The school bus accelerates at -1.36m/s^2 for 6.265-s before reaching the light. How fast was Julien's bus traveling prior to accelerating?

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Science Expectations (I can… statements)

- *demonstrate that motion is a measurable quantity that depends on the observer's frame of reference and describe the object's motion in terms of position, velocity, acceleration and time.*
- *demonstrate that any object does not accelerate (remains at rest or maintains a constant speed and direction of motion) unless an unbalanced (net) force acts on it.*

ShSht. Force A – student

Directions. *Highlight the numerical information given and describe each based on the units present. You must show all work, significant figures, and units. Underline your final answer.*

A 6.772-kg object leaves the starting line and reaches a top speed of 4.579-m/s

on a 100-m track and in 10.2-seconds before coming to a stop in 6.790-seconds.

a. What is the objects acceleration to reach its' top speed?	b. What is the force generated by the object at 10.2-s into its path?

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Science Expectations (I can… statements)

- *demonstrate that motion is a measurable quantity that depends on the observer's frame of reference and describe the object's motion in terms of position, velocity, acceleration and time.*
- *demonstrate that any object does not accelerate (remains at rest or maintains a constant speed and direction of motion) unless an unbalanced (net) force acts on it.*

ShSht. Force B – student

Directions. *Underline the numerical information given and describe each based on the units present. You must show all work and units. Underline your final answer.*

A 54.9-kg object is at rest and then reaches a speed of 6.73-m/s in a short distance covering in 1.97 seconds. The object then travels for 13.78-m at that velocity down the hill.

a. What is the objects acceleration?	b. What is the force generated by the object down the hill?

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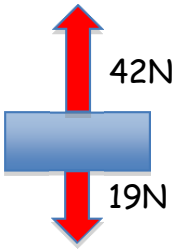
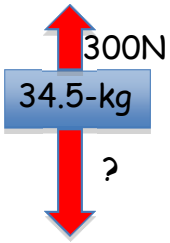
ShSht. Force Diagram I

Directions. Determine the net force, and then if the object will move, circle the force vector that is resulting in the movement. You must show all work, units and significant figures.





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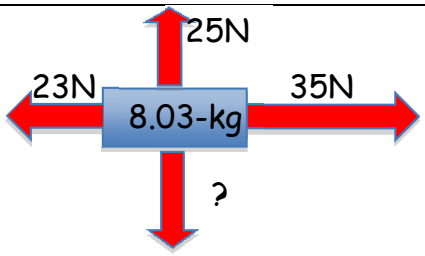
Date _____

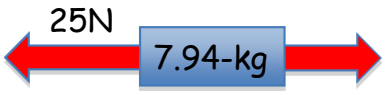
ShSht. Force Diagram II

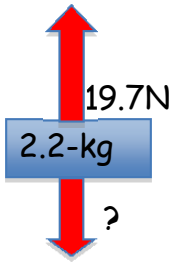
Directions. Determine the net force, and then if the object will move, circle the force vector that is resulting in the movement. You must show all work and units.



How much force is necessary to keep the box stationary?

Could this object move to the right with an acceleration of 13.81-m/s²?





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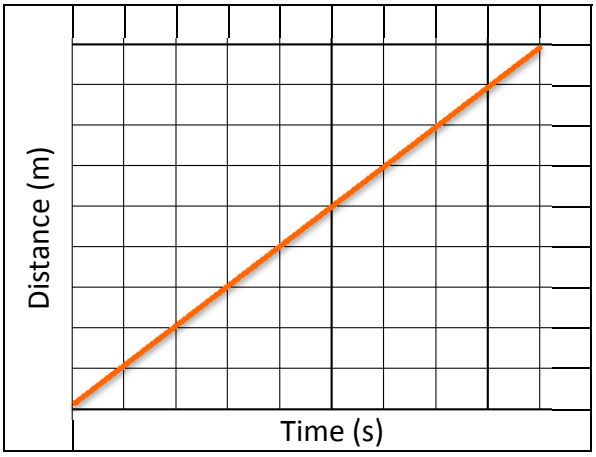
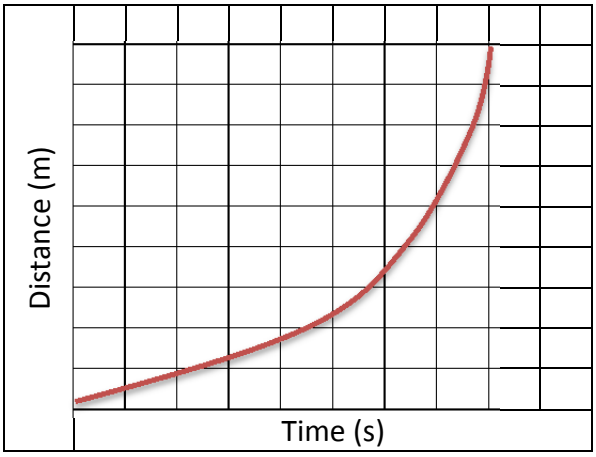
ShSht. Motion Graphs I: Distance v. Time



Graph A

1. Is the slope positive, negative, or zero?
2. Is the slope of this line constant or changing?
3. Is the speed of this increasing, decreasing, or constant?



Graph B

1. Is the slope positive, negative, or zero?
2. Is the slope of this line constant or changing?
3. Is the speed of this increasing, decreasing, or constant?

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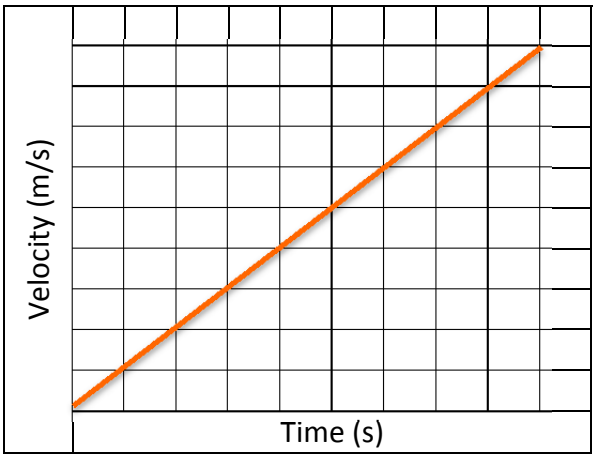
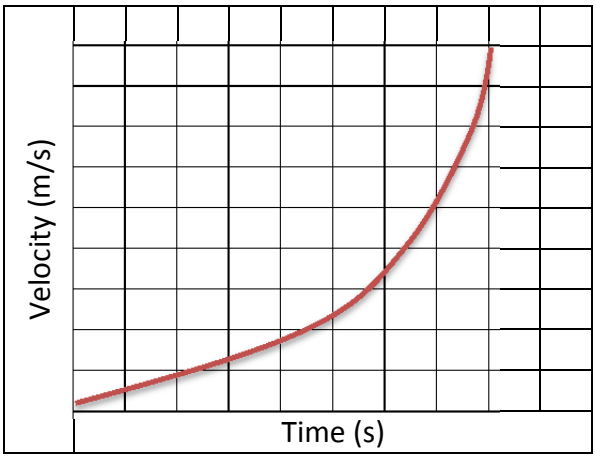
ShSht. Motion Graphs II: Velocity v. Time



Graph A

1. Is the slope positive, negative, or zero?
2. Is the slope of this line constant or changing?
3. Is the speed of this increasing, decreasing, or constant?
4. Is the object accelerating?



Graph B

1. Is the slope positive, negative, or zero?
2. Is the slope of this line constant or changing?
3. Is the speed of this increasing, decreasing, or constant?
4. Is the object accelerating?

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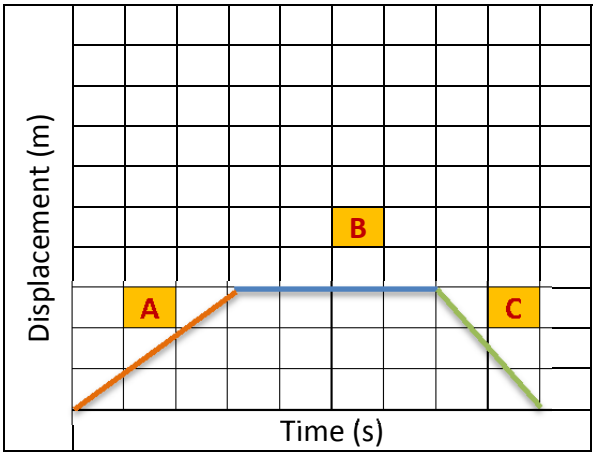
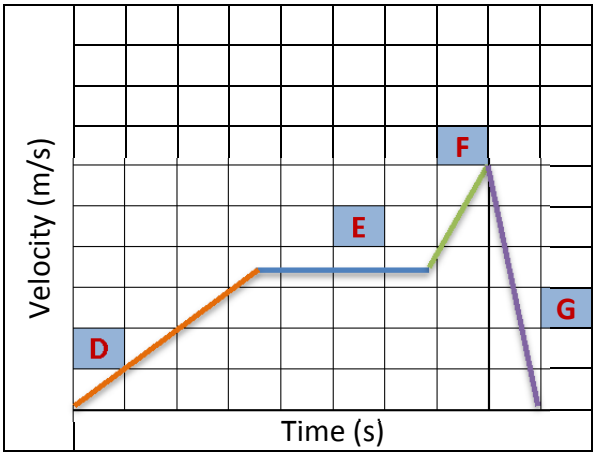
ShSht. Motion Graphs III: Displacement v. Time and Velocity v. Time





Graph A

1. Is the slope positive, negative, or zero?

A. _____ B. _____ C. _____

2. How far did the object travel? _____

3. What does the slope tell you? _____

4. What is the objects displacement?

Graph B

1. Is the slope positive, negative, or zero?

D. _____ E. _____ F. _____ G. _____

2. Is the speed of this increasing, decreasing, or constant?

D. _____ E. _____ F. _____ G. _____

3. Connect a graph line indicating the object stopped.

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Science Expectations (I can statements)

- *explain how an object's kinetic energy depends on its mass and its speed (KE = ½ mv²).*
- *demonstrate that near Earth's surface, an object's gravitational potential energy depends upon its weight (mg where m is the object's mass and g is the acceleration due to gravity) and height (h) above a reference surface (PE=mgh).*

ShSht. Kinetic Energy, Potential Energy I - student

Directions. Underline the numerical information given and describe each based on the units present. You must show all work and units. Underline your final answer.

A 62.22-kg object leaves the starting line and reaches a top speed of 7.79-m/s on a 600-m incline in 9.80-seconds before coming to a stop in 20.98-s resting 97.6-m above its starting position.

a. What is the maximum kinetic energy reached by the object going up the incline?	b. What is the potential energy due to gravity stored in the object from its relocation ?

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Science Expectations (I can statements)

- *explain how an object's kinetic energy depends on its mass and its speed (KE = ½ mv²).*
- *demonstrate that near Earth's surface, an object's gravitational potential energy depends upon its weight (mg where m is the object's mass and g is the acceleration due to gravity) and height (h) above a reference surface (PE=mgh).*

ShSht. Kinetic Energy, Potential Energy II - student

Directions. Underline the numerical information given and describe each based on the units present. You must show all work and units. Underline your final answer.

A 62.3-kg diver on the 10-m board preforms a 2½ back layout dive and hits the water 2.7 seconds after leaving the board.

a. What is the diver's potential energy due to gravity just prior to jumping off of the diving board?	b. What is the kinetic energy reached by the diver?

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Science Expectations (I can …)

- *explain how an object's kinetic energy depends on its mass and its speed (KE = ½ mv²).*
- *demonstrate that near Earth's surface, an object's gravitational potential energy depends upon its weight (mg where m is the object's mass and g is the acceleration due to gravity) and height (h) above a reference surface (PE=mgh).*

ShSht. Potential and Kinetic Energy Plus – student

Directions. *Highlight the numerical information given and describe each based on the units present. You must show all work, significant figures, and units. Underline your final answer. Answer a – d in class, and the remaining questions for practice as homework.*

A 83.26-kg high jumper ties the state record on his third jump at 2.223-m before falling 0.3367-s and landing on the mat.

a. As he clears the bar, what is his acceleration toward the mat?	b. What is his average speed as he hits the mat?
c. As he clears the bar what is his potential energy due to gravity?	d. What is his kinetic energy just as he hits the mat?

e. What is his weight?	f. What is his force is generated as he impacts the mat?
g. What is his momentum as he hits the mat?	h. Is energy conserved in this high jump?