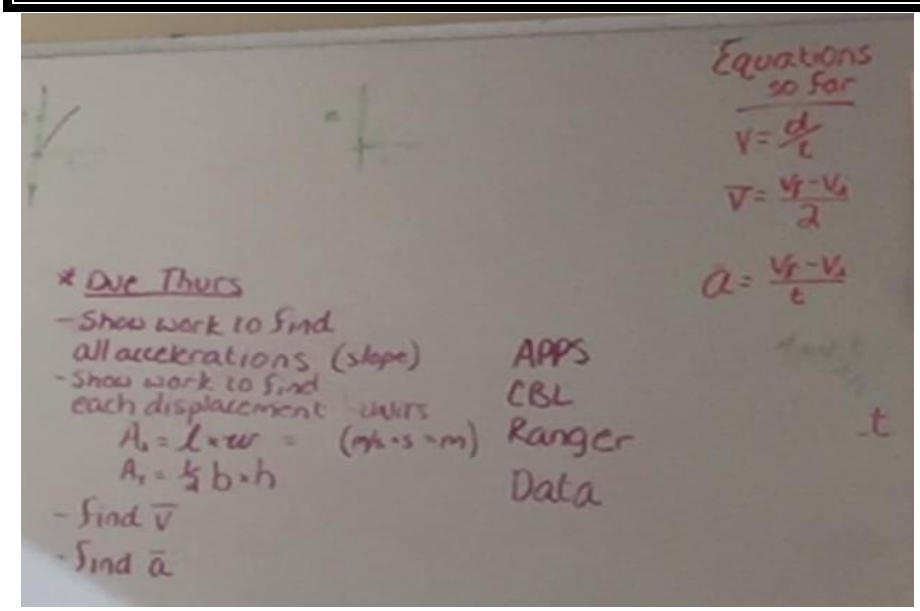
Weekly Planner: All science week of 1.20.20

Objectives for the week: Chm.1.1.1 Analyze the structure of atoms, isotopes, and ions.
Phys 1.1.1 Analyze the nature of motion

Day	Honors Physics	Honors Chemistry
Mon	*Darkness cannot drive out darkness; only light can do that. Hate cannot drive out hate; only love can do that.* ~Dr. Martin Luther King	
Tues	-Warm up -Problems practice *HW= use 4 ½ pages to make a COMPLETE and labeled diagram of each problem, show equations, and show all work/units to solve. Do test corrections! Answers below.	Notes: Atomic theory and structure. -isotopes, ions *HW= *FINISH all of atomic structure packet. 4 pages total or 2 pages front and back of each!, do test corrections! Answers below.
Wed	https://www.flippity.net/rp.asp?k=1hrW3RJgPDIk1mGPZyKP10koTQWO07kmaYUYJhv732Jo **NEW TEAMS!!** **-Team graphing** **-Motion detectors** *HW= Large graph, solve for EVERYTHING and show work/units.	https://www.flippity.net/rp.asp?k=11g1RyW9o--73dJLCQP676DNvTyf8gRrhHwepdxl_yiU NEW TEAMS!! Socraevic method **-Team presentations** **-NOTES: Average isotopic mass** ***HW= worksheets pgs. 26-28, 11.**
Thurs	Graph matching *HW= Pg 15-18 # 8, 12, 14, 20, 27, 28, 29, 32, 36, 37, 46. Make a labeled diagram (including sketch of graph)	**Go over HW** **Notes: radioactivity** **Lab?** **HW= finish Pg 34** **Study for test!!**

	for each and solve with all work and UNITS!	
Friday	TEST- KINEMATICS IN ONE DIMENSION POSTPONED UNTIL MONDAY	TEST- CH4 POSTPONED FOR MONDAY LAB DUE! ISOTOPES!



Warm up activities! *HW= SHOW ALL WORK

to do all of them (graphs 1-4 including Carl Lewis).

Monday 1.20.20- https://evansccca.weebly.com/

Darkness cannot drive out darkness; only light can do that. Hate cannot drive out hate; only love can do that.

~Dr. Martin Luther King

Tuesday 1.21.20- https://evansccca.weebly.com/

PHYZ Warm up: TURN OFF cell phone and put in the bin

A bicyclist steadily speeds up from rest to 10m/s.

Determine the initial speed, average speed and final speed during the time interval.

s_i =

$\bar{s}$ =

s_f =

CHEM Warm up: 1.21.2020

Turn OFF your cell phone and put in bin ☺

Conversion Factors:

3 bops = 5 yips

20 nerds = 8 cams

2 cams = 1 bleep

2 nerds = 3 tongs

1 bop = 5 cams

1) How many bops are in 22.5 cams?

Wednesday 1.22.20-

https://evansccca.weebly.com/

PHYZ Warm up:

Turn OFF your cell phone and put in bin ☺

A bicyclist, initially traveling at 1 m/s, begins pedaling and gaining speed steadily for 5.0 seconds during which she accelerates at $0.5 m/s^2$.

What is her final velocity?

What is her average velocity during the 5 seconds?

CHEM Warm up:

Turn OFF your cell phone and put in bin ☺

If you do an experiment that finds the density of copper to be 9.52 g/cm^3. What is your % error?

Metal	Specific Heat $\frac{J}{g^\circ C}$	Density (g/cm^3)	Melting Point (°C)
Aluminum	0.897	2.702	660
Copper	0.385	8.92	1083
Gold	0.129	19.31	1064

Thursday 1.23.20-

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PHYZ Warm up: Turn OFF your cell phone and put in bin ☺ From Wednesday's problem, how far did she go?	CHEM Warm up: Turn OFF your cell phone and put in bin ☺ 1.What is the a.m.u unit based on? 2.What is a group on the periodic table? 3.What is a period?

Friday 1.24.19-

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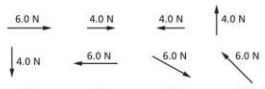
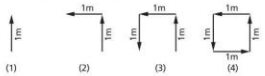
PHYZ Warm up: Turn OFF your cell phone and put in bin ☺ Pick the most difficult problem from the homework and solve using work and UNITS on this paper.	CHEM Warm up: Turn OFF your cell phone and put in bin ☺ **Write the chemical symbol for an element with 8 protons 9 neutrons and 10 electrons.**



ANSWER: (4)

7. Which vector diagram represents the greatest magnitude of displacement for an object?



ANSWER: (2)

PART A: Pages 15–16

8. A car travels 90. meters due north in 15 seconds. Then the car turns around and travels 40. meters due south in 5.0 seconds. What is the magnitude of the average velocity of the car during this 20-second interval?

ANSWER: (1) 2.5 m/s

9. A skater increases her speed uniformly from 2.0 meters per second to 7.0 meters per second over a distance of 12 meters. The magnitude of her acceleration as she travels this 12 meters is

ANSWER: (1) 1.9 m/s²

10. In a 4.0-kilometer race, a runner completes the first kilometer in 5.9 minutes, the second kilometer in 6.2 minutes, the third kilometer in 6.3 minutes, and the final kilometer in 6.0 minutes. The average speed of the runner for the race is approximately

ANSWER: (1) 0.16 km/min

11. A golf ball is hit with an initial velocity of 15 meters per second at an angle of 35 degrees above the horizontal. What is the vertical component of the golf ball's initial velocity?

ANSWER: (1) 8.6 m/s

12. The speed of a wagon increases from 2.5 meters per second to 9.0 meters per second in 3.0 seconds as it accelerates uniformly down a hill. What is the magnitude of the acceleration of the wagon during this 3.0-second interval?

ANSWER: (2) 2.2 m/s²

13. An object with an initial speed of 4.0 meters per second accelerates uniformly at 2.0 meters per second2 in the direction of its motion for a distance of 5.0 meters. What is the final speed of the object?

ANSWER: (1) 6.0 m/s

14. An astronaut drops a hammer from 2.0 meters above the surface of the moon. If the acceleration due to gravity on the moon is 1.62 meters per second², how long will it take for the hammer to fall to the moon's surface?

ANSWER: (3) 1.6 s

15. The average speed of a runner in a 400.-meter race is 8.0 meters per second. How long did it take the runner to complete the race?

ANSWER: (2) 50. s

16. Which statement about the movement of an object with zero acceleration is true?

ANSWER: (4) The object may be in motion.

17. An object travels for 8.00 seconds with an average speed of 160. meters per second. The distance traveled by the object is

ANSWER: (3) 1280 m

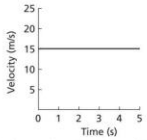
18. An object is displaced 12 meters to the right and then 16 meters upward. The magnitude of the resultant displacement is

ANSWER: (3) 20 m

19. An object moves a distance of 10 meters in 5 seconds. The average speed of the object is

ANSWER: (2) 2.0 m/s

20. The graph following represents the relationship between velocity and time for an object moving in a straight line.



What is the acceleration of the object?

ANSWER: (1) 0 m/s²

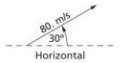
21. Acceleration is a vector quantity that represents the time-rate of change in

ANSWER: (2) velocity

22. A moving body must undergo a change of

ANSWER: (3) position

23. What is the magnitude of the vertical component of the velocity vector shown below?



ANSWER: (4) 40. m/s

24. The maximum number of components that a single force may be resolved into is

ANSWER: (4) unlimited

25. Which quantity has both magnitude and direction?

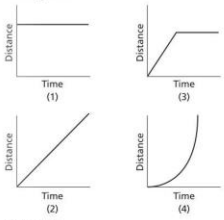
ANSWER: (4) velocity

26. If a man walks 17 meters east then 17 meters south, the magnitude of the man's displacement is

ANSWER: (2) 24 m

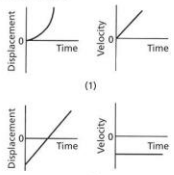
PART B-1: Pages 16–18

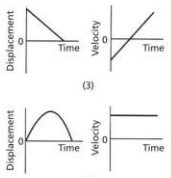
27. Which graph best represents the motion of a block accelerating uniformly down an inclined plane?



ANSWER: (4)

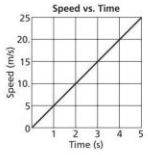
28. Which pair of graphs represents the same motion of an object?





ANSWER: (1)

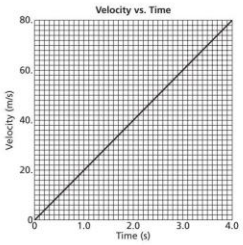
29. The graph below represents the relationship between speed and time for an object moving along a straight line.



What is the total distance traveled by the object during the first 4 seconds?

ANSWER: (3) 40 m

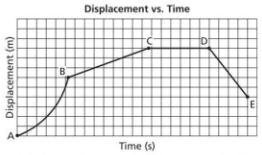
30. The graph below shows the velocity of a race car moving along a straight line as a function of time.



What is the magnitude of the displacement of the car from $t = 2.0$ seconds to $t = 4$ seconds?

ANSWER: (3) 120 m

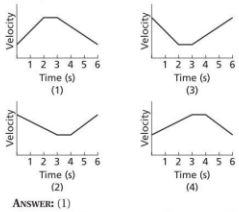
31. The displacement-time graph below represents the motion of a cart initially moving forward along a straight line.



During which interval is the cart moving forward at constant speed?

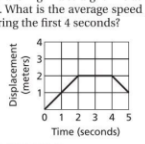
ANSWER: (2) BC

32. Which graph best represents the relationship between velocity and time for an object that accelerates uniformly for 2 seconds, then moves at a constant velocity for 1 second, and finally decelerates for 3 seconds?



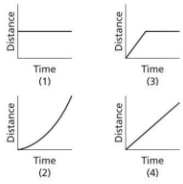
ANSWER: (1)

33. The graph below represents the motion of an object traveling in a straight line as a function of time. What is the average speed of the object during the first 4 seconds?



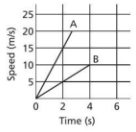
ANSWER: (3) 0.5 m/s

34. Which graph represents an object moving at a constant speed for the entire time interval?



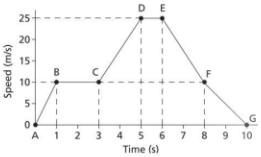
ANSWER: (4)

35. The graph shows the relationship between speed and time for two objects, *A* and *B*. Compared with the acceleration of object *B*, the acceleration of object *A* is



ANSWER: (3) three times as great

Base your answers to questions 36 through 41 on the graph below, which represents the relationship between speed and time for an object in motion along a straight line.



36. What is the acceleration of the object during the time interval $t = 3$ s to $t = 5$ s?

ANSWER: (2) 7.5 m/s²

37. What is the average speed of the object during the time interval $t = 6$ s to $t = 8$ s

ANSWER: (4) 17.5 m/s

38. What is the total distance traveled by the object during the first 3 seconds?

ANSWER: (3) 25 m

39. During which interval is the object's acceleration the greatest?

ANSWER: (1) AB

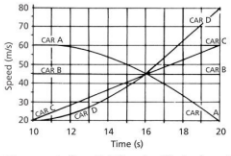
40. During the interval $t = 8$ s to $t = 10$ s, the speed of the object is

ANSWER: (3) decreasing

41. What is the maximum speed reached by the object during the 10 seconds of travel?

ANSWER: (2) 25 m/s

Base your answers to questions 42 through 46 on the accompanying graph, which represents the motions of four cars on a straight road.



42. The speed of car *C* at time $t = 20$ s is closest to

ANSWER: (1) 60 m/s

43. Which car has zero acceleration?

ANSWER: (2) *B*

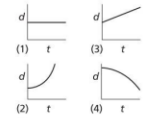
44. Which car is decelerating?

ANSWER: (1) *A*

45. Which car moves the greatest distance in the time interval $t = 10$ s to $t = 16$ s?

ANSWER: (1) *A*

46. Which graph best represents the relationship between distance and time for car *C*?



ANSWER: (2)

PART A: Pages 20–21

47. The diagram below shows a worker using a rope to pull a cart.

The worker's pull on the handle of the cart can best be described as a force having

ANSWER: (3) both magnitude and direction

48. Which is a vector quantity?

ANSWER: (4) force

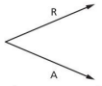
49. A 5.0-newton force and a 7.0-newton force act concurrently on a point. As the angle between the forces is increased from 0° to 180°, the magnitude of the resultant of the two forces changes from

ANSWER: (3) 12.0 N to 2.0 N

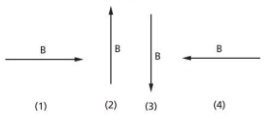
50. A 5.0-newton force could have perpendicular components of

ANSWER: (3) 3.0 N and 4.0 N

51. Forces **A** and **B** have a resultant **R**. Force **A** and resultant **R** are represented in the following diagram.



Which vector best represents force B?



ANSWER: (2)

52. Two 10.0-newton forces act concurrently on a point at an angle of 180° to each other. The magnitude of the resultant of the two forces is

ANSWER: (1) 0.00 N

53. A force of 3 newtons and a force of 5 newtons act concurrently to produce a resultant of 8 newtons. The angle between the forces may be

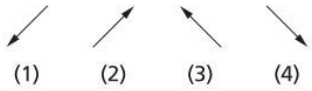
ANSWER: (1) 0°

54. A table exerts a 2.0-newton force on a book lying on the table. The force exerted by the book on the table is

ANSWER: (2) 2.0 N

55. The diagram represents two concurrent forces acting on a point.

Which vector best represents their resultant?



ANSWER: (4)

56. The resultant of two forces acting on the same point at the same time will be greatest when the angle between the forces is

ANSWER: (1) 0°

57. What is the magnitude of the vector sum of the two concurrent forces represented in the diagram?

ANSWER: (2) 2.5 N

58. The resultant of two concurrent forces is minimum when the angle between them is

ANSWER: (4) 180°

59. As the angle between two concurrent forces of 10 newtons and 12 newtons changes from 180° to 0°, the magnitude of their resultant changes from

ANSWER: (2) 2.0 N to 22

60. Two concurrent forces act at right angles to each other. If one of the forces is 40 newtons and the resultant of the two forces is 50 newtons, the magnitude of the other force must be

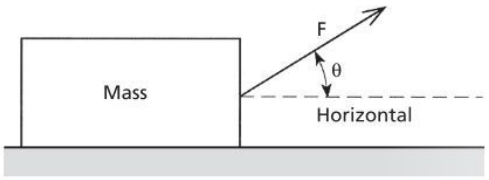
ANSWER: (3) 30 N

61. If two 10.-newton concurrent forces have a resultant of zero, the angle between the forces must be

ANSWER: (4) 180°

PART B-1: Pages 21–22

62. The diagram below shows a force of magnitude F applied to a mass at angle θ relative to a horizontal frictionless surface.



As the angle is increased, the horizontal acceleration of the mass

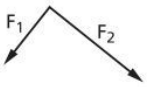
ANSWER: (1) decreases

63. The diagram below represents a 5.0-newton force and a 12-newton force acting on point P.

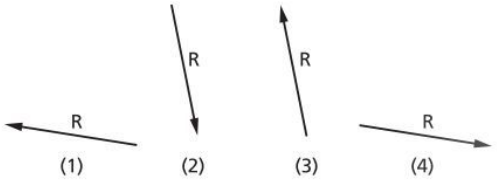
The resultant of the two forces has a magnitude of

ANSWER: (4) 13 N

64. The vector diagram below represents two forces, $\mathbf{F_1}$ and $\mathbf{F_2}$, simultaneously acting on an object.

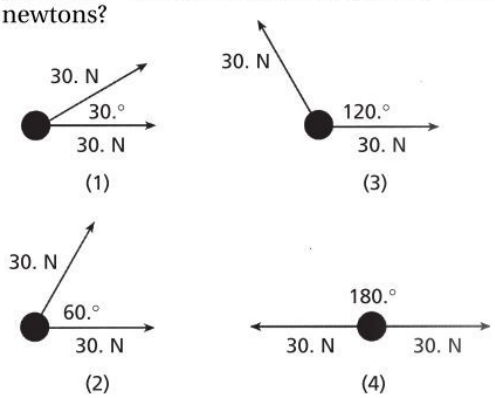


Which vector best represents the resultant of the two forces?



ANSWER: (2)

65. Two 30.-newton forces act concurrently on an object. In which diagram would the forces produce a resultant with a magnitude of 30. newtons?



ANSWER: (3)

ZIPGRADE ANSWERS from 1.17.2020

Phyz

#	Answer
1	E
2	A
3	B
4	C
5	C
6	A
7	AC
8	C
9	C
10	A
11	D
12	C
13	C
14	A
15	B
16	D
17	B
18	D
19	B
20	C

Chem

#	Answer
1	D
2	B
3	E
4	B
5	A
6	C
7	E
8	A
9	D
10	C
11	D
12	A
13	D
14	D
15	A
16	C
17	B
18	A
19	C
20	B
21	A
22	B
23	C
24	B
25	D
26	C
27	A
28	B
29	A
30	A

GRAPHS OF MOTION COMPARED

Fill each grid space with an appropriately concise answer.

	displacement–time	velocity–time	acceleration-time
"*y*" intercept	initial displacement	initial velocity	initial acceleration
slope of tangent	instantaneous velocity	instantaneous acceleration	–
positive slope	motion in positive direction	acceleration in positive direction	–
negative slope	motion in negative direction	acceleration in negative direction	–
zero slope	not moving	not accelerating	–
straight	constant velocity	constant acceleration	–
curved	changing velocity	changing acceleration	–
area under curve	–	[change in] displacement	[change in] velocity
curves coincide	objects have same displacement	objects have same velocity	objects have same acceleration
stopped when…	horizontal	crosses *t*-axis	area = – (initial velocity)
uniform acceleration	parabolic	straight	horizontal

Calculate Atomic Mass Given the data in the table, calculate the atomic mass of unkown Element X. Then, identify the unkown element, which is used medically to treat some mental disorders.

1 Analyze the Problem

Calculate the atomic mass and use the periodic table to confirm.

Known

^{6}X: mass = 6.015 amu
abundance = 7.59% = 0.0759
^{7}X: mass = 7.016 amu
abundance = 92.41% = 0.9241

Unkown

atomic mass of X = ? amu

element X = ?

Isotope Abundance for Element X		
Isotope	Mass (amu)	Percent Abundance
^{6}X	6.015	7.59%
^{7}X	7.016	92.41%

2 Solve for the Unknown

^{6}X: mass contribution = (mass)(percent abundance) — **Calculate ^{6}X's contribution.**
mass contribution = (6.015 amu)(0.0759) = 0.4565 amu — **Substitute mass = 6.015 amu and abundance = 0.0759.**
^{7}X: mass contribution = (mass)(percent abundance) — **Calculate ^{7}X's contribution.**
mass contribution = (7.016 amu)(0.9241) = 6.483 amu — **Substitute mass = 7.016 amu and abundance = 0.9241.**
atomic mass of X = (0.4565 amu + 6.483 amu) = **6.939 amu** — **Total the mass contributions to find the atomic mass.**
The **element** with a mass 6.939 amu is **lithium (Li)**. — **Identify the element using the periodic table.**

Physics motion class practice:

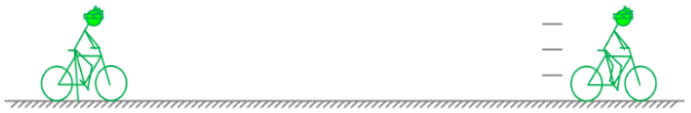
A bicyclist steadily speeds up from rest to 10m/s.

Determine the initial speed, average speed and final speed during the time interval.

s_i =

$\bar{s}$ =

s_f =



A student releases a marble from the top of a 180cm ramp. The marble increases speed steadily and reaches the bottom of the ramp with a speed of 140cm/s. Determine all unknowns and answer the following question.

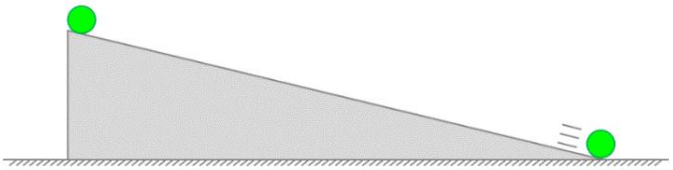
s_i =

$\bar{s}$ =

s_f =

d =

t =



How long did the marble take to reach the bottom of the ramp?

A bicyclist, initially at rest, begins pedaling and gaining speed steadily for 5.9s during which she covers 37m.

What was her final speed?

An engineer is designing a runway. She knows that a plane, starting at rest, needs to reach a speed of 200mph at take-off. If the plane can reach this take-off speed in 70s, how far will the plane travel before take-off. Assume the plane increases speed steadily.

How far does the plane need to travel during take-off (in given units)?

ft

Could the plane take off on a 10000ft long runway?

GRAPHS OF MOTION COMPARED

Fill each grid space with an appropriately concise answer.

	displacement–time	velocity–time	acceleration-time
"y" intercept	initial displacement	initial velocity	initial acceleration
slope of tangent	instantaneous velocity	instantaneous acceleration	–
positive slope	motion in positive direction	acceleration in positive direction	–
negative slope	motion in negative direction	acceleration in negative direction	–
zero slope	not moving	not accelerating	–
straight	constant velocity	constant acceleration	–
curved	changing velocity	changing acceleration	–
area under curve	–	[change in] displacement	[change in] velocity
curves coincide	objects have same displacement	objects have same velocity	objects have same acceleration
stopped when…	horizontal	crosses t-axis	area = – (initial velocity)
uniform acceleration	parabolic	straight	horizontal

PHYSICS speed problems: *Always make a model/diagram/graph of your problem. Then show all work and units to solve!! Use a separate sheet of paper.

1	A bicyclist steadily speeds up from rest to 10m/s. Determine the initial speed, average speed and final speed during the time interval.
2	A student releases a marble from the top of a 180cm ramp. The marble increases speed steadily and reaches the bottom of the ramp with a speed of 140cm/s. Determine all unknowns and answer the following question. s_i = $\bar{s}$ = s_f = d = t = How long did the marble take to reach the bottom of the ramp?

3	A bicyclist, initially at rest, begins pedaling and gaining speed steadily for 5.9s during which she covers 37m. What was her final speed?
4	An engineer is designing a runway. She knows that a plane, starting at rest, needs to reach a speed of 200mph at take-off. If the plane can reach this take-off speed in 70s, how far will the plane travel before take-off. Assume the plane increases speed steadily. How far does the plane need to travel during take-off (in given units)? [ ] ft Could the plane take off on a 10000ft long runway?
5	A car moving at 22 m/s to the right skids to a stop in 4.0 seconds. a) What is the average velocity? b) In which direction is the velocity vector in this problem? c) In which direction is the acceleration vector in this problem?