**Principles of Physics Term 1 Review**

1. What is the average speed of the object at 1 minute?

Distance 5

(m) 4

3

2

1

15 30 45 60

Time (sec)

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1. Is the object at a constant speed or accelerating? You may need to explain why.
2. Where is the object the slowest? Where is it the fastest?
3. Give 2 conversion factors for 2.54 cm.
4. What device is best used to measure the length of a pencil? How about the width of a river?
5. What do the following prefixes mean?
   1. Kilo, Mega, centi, milli
6. You walk around the track (400m) 3 times and it takes you 25 min. What is your average speed?
7. You walk half north 10 blocks, east 5 blocks, then south 10 blocks. What is your distance? What is your displacement?
8. What would the horizontal line on a Distance vs. Time graph mean?

Distance 5

(m) 4

3

2

1

15 30 45 60

Time (sec)

1. A river has a southern current of 10 m/s and a motor boat is traveling north at 2 m/s. What is the boat’s relative motion?
2. A car traveling at 25 m/s comes to a stop in 12 seconds. What is its acceleration?
3. A car leaves a stop sign and 10 seconds later it is traveling 30m/s. What is its acceleration?
4. How is Newton’s 1st law stated? Second law? Third law?
5. Give two opposing forces that are stated in Newton’s 1st law?
6. What force is applied from a 10kg object accelerating at 9.8 m/s/s?
7. You push a wall with a force of 120N. By Newton’s 3rd law, what is the wall pushing back with?
8. Referring to the Dragster Activity on the front board, what did the first graph show? What did the second graph show?
9. How can you throw a 100 m/hr baseball from the back of a moving truck? How can you throw a -40mi/hr fastball from a moving truck?
10. Why does a satellite move in space without any engine propulsion?
11. How can a blind person tell if a car is accelerating?
12. What are the base units for length, mass, time and temperature?

++Check out <http://2ndfave.wikispaces.com> for the solutions to these questions++

**Principles of Physics Term 1 Review KEY**

1. What is the average speed of the object at 1 minute?

Distance 5

(m) 4

3

2

1

15 30 45 60

Time (sec)

|  |  |  |  |  |
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S = d/t = 3 sec/60 sec = 0.05 m/sec

1. Is the object at a constant speed or accelerating? You may need to explain why.

It’s accelerating since the speed changes, gets greater.

1. Where is the object the slowest? Where is it the fastest?

Slowest below 15 sec, fastest above 60 sec

1. Give 2 conversion factors for 2.54 cm.

2.54 cm = 1 inch = 25.4mm = .254m

1. What device is best used to measure the length of a pencil? How about the width of a river?

Pencil – ruler, River – meter stick

1. What do the following prefixes mean?
   1. Kilo(1000), Mega(1,000,000), centi(1/100), milli(1/1000)
2. You walk around the track (400m) 3 times and it takes you 25 min. What is your average speed?

S = d/t = 1200m/25min = 48 m/min

1. You walk half north 10 blocks, east 5 blocks, then south 10 blocks. What is your distance? What is your displacement? Distance =10+5+10 = 25blocks. Displacement = 5 blocks

Distance does not change, so object is not moving.

1. What would the horizontal line on a Distance vs. Time graph mean?

Distance 5

(m) 4

3

2

1

15 30 45 60

Time (sec)

1. A river has a southern current of 10 m/s and a motor boat is traveling north at 2 m/s. What is the boat’s relative motion?

10 m/s – 2 m/s = 8 m/s

1. A car traveling at 25 m/s comes to a stop in 12 seconds. What is its acceleration?

a = (V1-V2)/t = (0-25)/12 = 2.08 m/s2

1. A car leaves a stop sign and 10 seconds later it is traveling 30m/s. What is its acceleration?

a = (V1-V2)/t = (30-0)/10 = 3.0 m/s2

1. How is Newton’s 1st law stated? Second law? Third law?

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1st law: A body in motion stays in motion Unless acted upon by

A body at rest stays at rest an outside force.

2nd Law: Force = mass x acceleration (F=ma)

3rd Law: For every action there is an equal but opposite reaction.

1. Give two opposing forces that are stated in Newton’s 1st law?
   1. Friciton b. Gravity if the object is thrown upward
2. What force is applied from a 10kg object accelerating at 9.8 m/s/s?

F = ma = 10 kg x 9.8 m/s2 = 98.0 N

1. You push a wall with a force of 120N. By Newton’s 3rd law, what is the wall pushing back with?

120 N….equal but opposite

1. Referring to the Dragster Activity on the front board, what did the first graph show? What did the second graph show?

First graph was an upward curve. It graphed distance vs time – speed graph

Second graph was a straight angled line. It graphed speed vs time – acceleration graph.

1. How can you throw a 100 m/hr baseball from the back of a moving truck? How can you throw a -40mi/hr fastball from a moving truck?

Throw at 50 mi/hr out the front of a truck moving at 50 mi/hr (50 + 50 =100 mi/hr)

Throw at 10 mi/hr out the back of a truck moving at 50 mi/hr (-10+50 = 40 mi/hr)

1. Why does a satellite move in space without any engine propulsion?

It is a body in motion with no opposing force. There is little to no friction in space.

1. How can a blind person tell if a car is accelerating?

Your body opposes the direction of gravity:

* Speeding forward – body sinks backward into the seat.
* Slowing down – body moves toward the front of the car

1. What are the base units for length, mass, time and temperature?

Length – meter

Mass – Kilogram

Time – second

Temperature – Celsius or Kelvin

**For 2 bonus points on the test, write in the name of the**

**newly elected governor of Pennsylvania at the top of your test**.