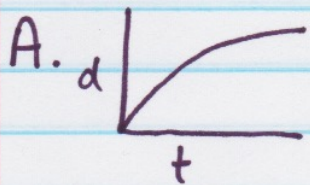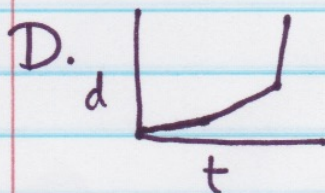# Forces & Motion Station/Poster Review
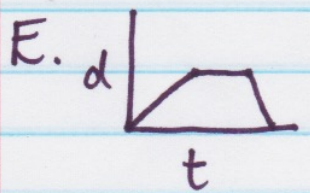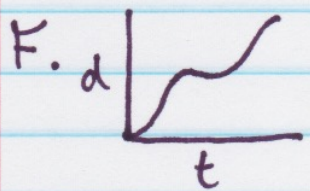## Key:

A. accelerating & then came to a stop. (Curve graphs mean accelerating in distance-time graphs; line stops, no more distance increase)
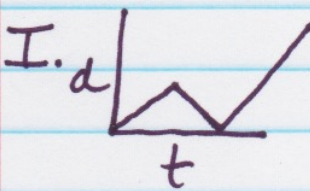
D. walked slowly, climbed a hill, walked across the top, ran farther down the other side. (Graph is increasing the distance from the starting point, ~~acceleration~~/ speed increasing)

E. walked a distance, stopped for a while, went quickly back to the starting position

F. gradually built speed, slowed down but didn't stop, and sped up again.

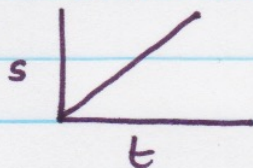**I.** walking a distance, went back to start quickly, ran a long distance

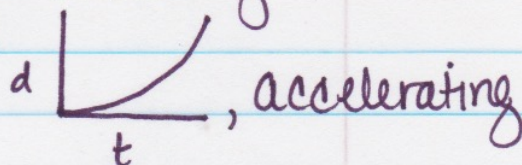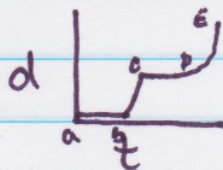K. ① Determine the speed of an object : distance (m) and time (sec)

$S = d/t$

② Which graph best represents the motion of an object initially at rest and accelerating uniformly? B.

③ Which graph best represents the motion of an object whose speed is increasing? What are they doing? A. , accelerating

L. The graph below represents the relationship btwn distance and time for an object in motion. Explain what is happening at each interval on the graph. Be sure to discuss speed, distance, and time.
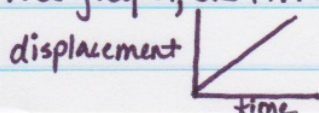
a-b) no mvmt; time increased, distance did not^
b-c) fast increase of speed & distance
c-d) no mvmt, stopped.
d-e) fast acceleration of speed

The graph below represents the motion of an object. According to the graph, as time increases, the velocity of the object...
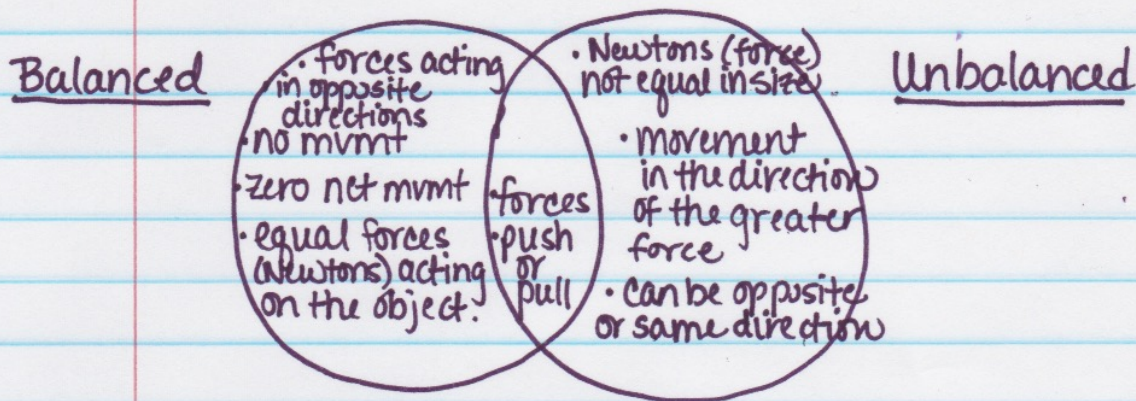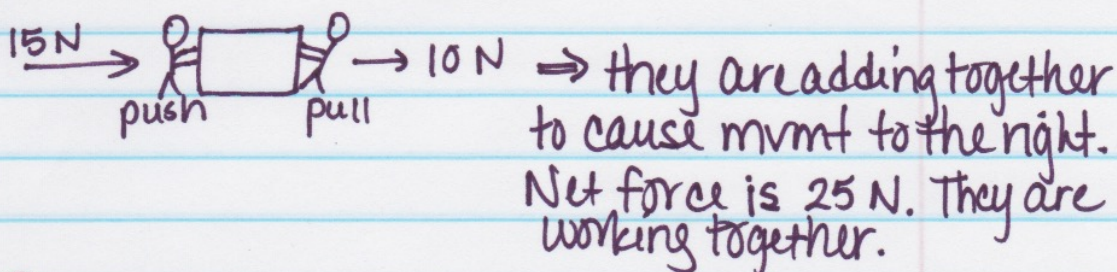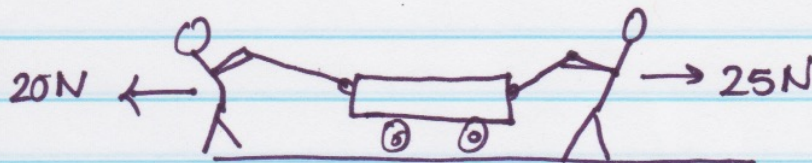
C. Remains the same.   * Velocity is speed with direction.

M. Create a Venn Diagram comparing & contrasting
Balanced & Unbalanced forces.

Balanced   Unbalanced

- forces acting in opposite directions
- no mvmt
- zero net mvmt
- equal forces (Newtons) acting on the object.

- forces push or pull

- Newtons (force) not equal in size.
- movement in the direction of the greater force
- can be opposite or same direction

N. ① Describe how the unbalanced forces are acting. What happens to the net force? Which direction does the object move?

15N → push □ pull → 10 N ⟹ they are adding together to cause mvmt to the right. Net force is 25 N. They are working together.

② Describe how the unbalanced forces are acting. What happens to the net force? Which direction does the object move?

20N ←   → 25N

The forces are working in opposition, so the mvmt will be towards the net force. You subtract when opposite/opposition forces. Net force is 5N to the right.

0. ① Explain motion in your own words. <u>Motion</u> is a change in the position of an object over time.

② Look up "reference point." Define. A <u>reference point</u> is used to see if something has moved. Ex: stop sign, tree, line in the road; it must be stationary (not moving)

③ What causes an object to move? A <u>force</u>! <u>All</u> motion is due to forces acting on objects.
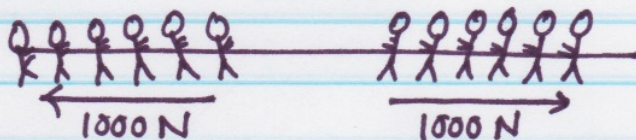
④ What is a force? A <u>push</u> or a <u>pull</u> on an object.

⑤ What is net force? The total combination of forces acting on an object. More than one force may act on an object at the same time.

⑥ What would happen if an unbalanced force acted on an object that's already moving (in motion?) It will <u>change</u> the speed or direction of the object. Ex: *Your little brother is riding his tricycle. You run up behind him and give him a push. Your force adds to the existing force causing him to speed up. *If you were to grab his handle bars and slow him down, then the unbalanced force would be taken away causing him to slow down.
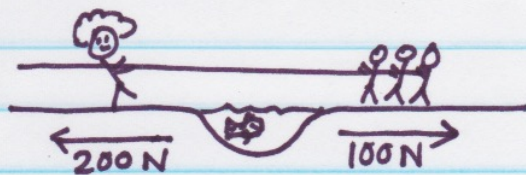
P. Write down the best answers:

1000 N   1000 N

① The forces shown are <u>pulling</u> forces.
② The forces shown are <u>opposite</u> forces.
③ The forces are <u>equal</u> (both 1000N's).
④ The forces <u>do</u> balance each other.
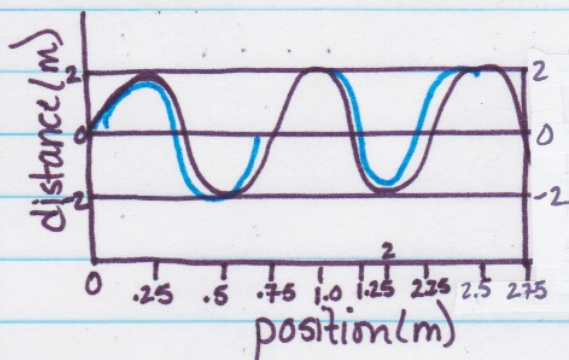⑤ The resultant force (net force) is <u>zero</u>.
⑥ There is <u>no</u> motion.

Q. Write down the best answers:

200 N   100 N

⑦ The forces shown are <u>pulling</u> forces.
⑧ The forces are <u>opposite</u>.
⑨ The forces are <u>not equal</u>.
⑩ The forces <u>do not balance</u> each other.
⑪ The stronger force is pulling to the <u>left</u>.
⑫ The weaker force is pulling to the <u>right</u>.
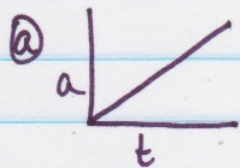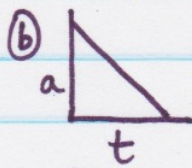⑬ Motion is to the <u>left</u>.

R. <u>Flashback Challenge</u>:

① Draw one cycle from the wave above. ✱
② How many cycles are in the graph? ⬚2.5⬚
③ Calculate the amplitude of the wave.
  <u>Amplitude</u> is the distance (in meters) from
  the resting point (0, zero) to the highest point
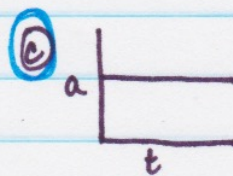 of the crest, or lowest point of the trough. ⬚2m⬚

S. ① What does the slope of an object accelerating
uniformly (at a constant rate) look like on an
acceleration vs. time graph? Draw each of these
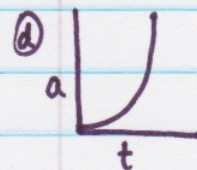to see what they look like.

ⓐ ↑ constant velocity (speed & direction)

ⓑ ↑ deceleration (slowing down)

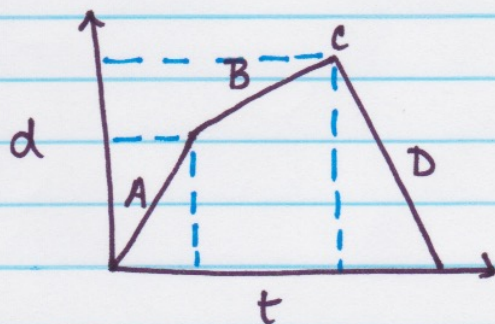ⓒ ↑ uniform acceleration (same speed)

ⓓ ↑ constant acceleration (speeding up)

"S" Continued:

② What is the meaning of the slope on a distance vs time graph? Slope represents the rate of Δ (change) of the graph. Higher/steeper the slope, faster the speed & distance. lower/less steep slope, slower the speed & distance covered.

C. Speed

T. Tom went for a jog. At the end of his road he bumped into a friend, and his pace slowed. When Tom left his friend, he walked quickly back home.
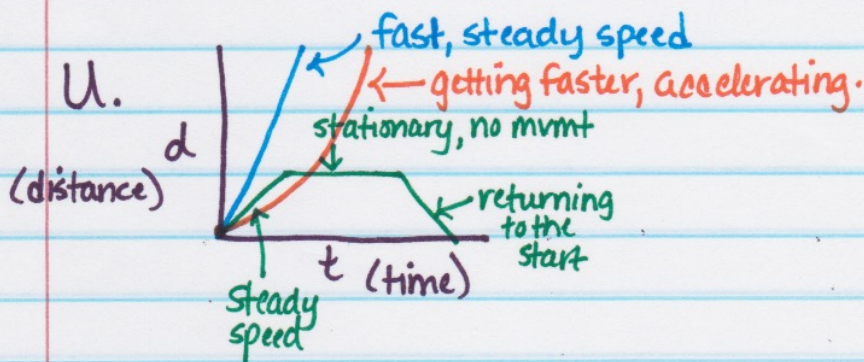

A. moving @ constant speed (fast speed)
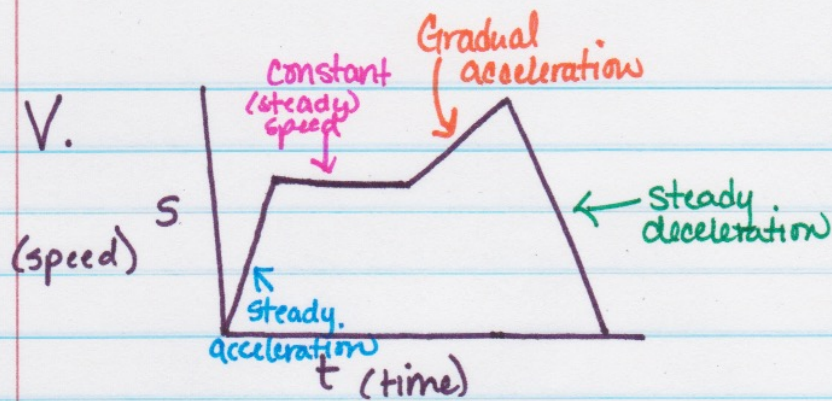
B. moving @ slower speed

C. Farthest distance he travels

D. Returning to the start.

U.

fast, steady speed
← getting faster, accelerating.
stationary, no mvmt
← returning to the start
Steady speed

(distance) d
t (time)

- The steeper the slope (+,-), the faster the motion.
- A horizontal line means the object isn't changing position. (at rest)
- A downward (-) sloping line means the object is returning to the start.

V.

(speed) s

Constant (steady) speed

Gradual acceleration

steady deceleration

Steady acceleration

t (time)

- The steeper the slope (+), the greater the acceleration.
- Horizontal line means the object is moving at a constant speed.
- Downward (-) slope means the object is slowing down.