

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

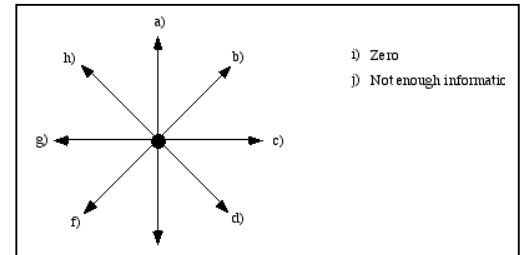
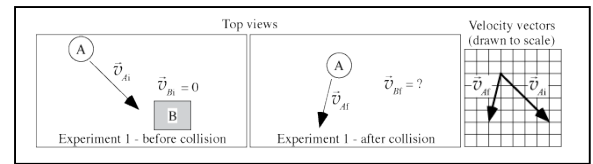
Object A:

Block B:

Explain.

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

Explain.



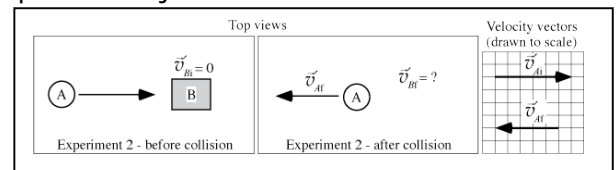
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A:

Block B:

Explain.



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

Explain.

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

Explain.

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**Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

Object A: 777

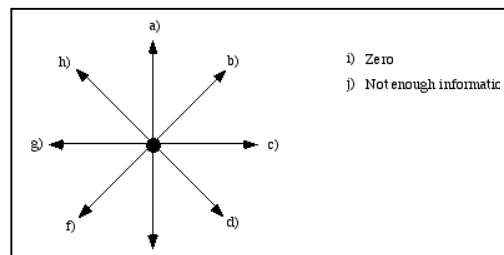
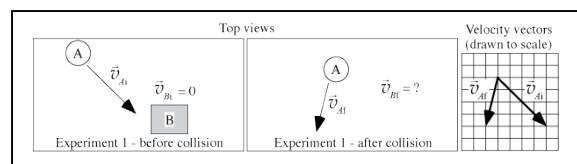
Block B: 777

Explain. 777

**Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

777

Explain. 777



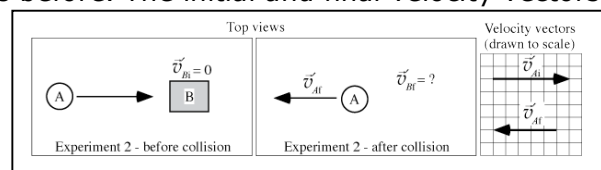
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Object A: 777

Block B: 777

Explain. 777



**Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

777

Explain. 777

**Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

777

Explain. 777

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Object A: *G*

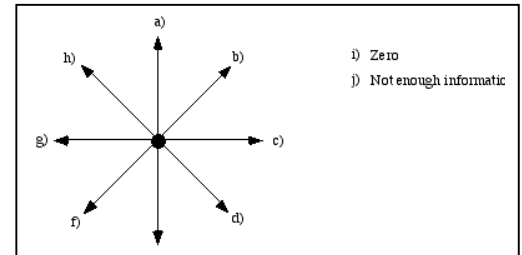
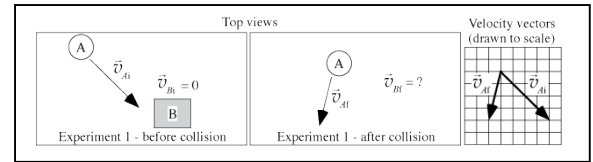
Block B: *C*

Explain. *guess*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*Not enough information*

Explain. *reword the question, equal to what vector, the final or the change vector.*



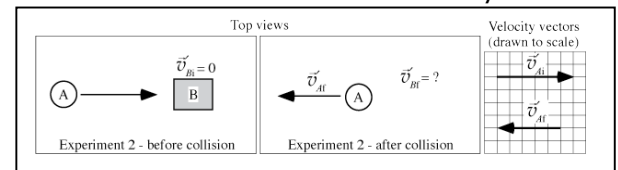
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *simple collision.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*less than*

Explain. *same as before but I am going to say that you are talking about the change vector. Mass looks more for b so less.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *all the of the velocity vector is accounted for in the second experiment. and the first has to be greater than zero*

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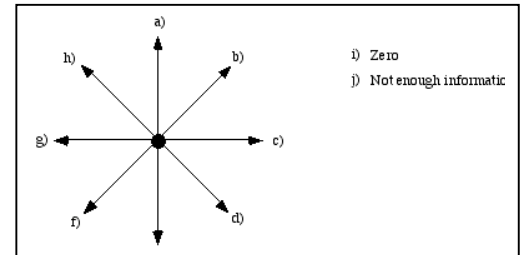
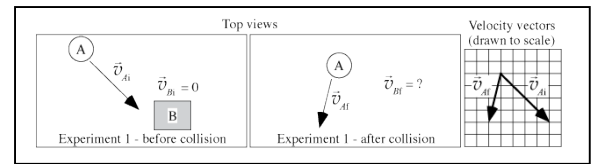
Object A: *F*

Block B: *F*

Explain.

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*less than*

Explain.



i) Zero

j) Not enough information

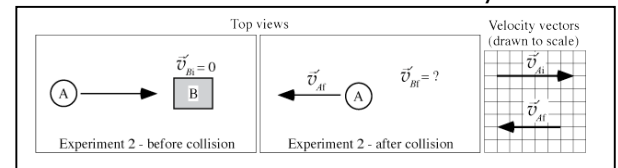
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *C*

Block B: *E*

Explain. *The*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*Not enough information*

Explain. *KE*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *Work*

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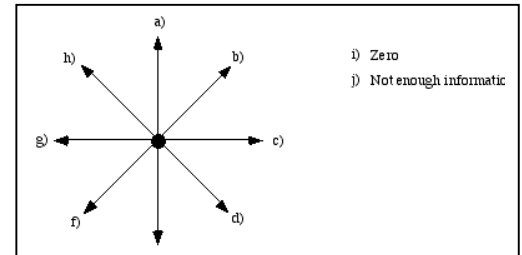
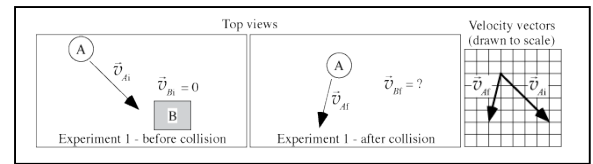
Object A: *E*

Block B: *D*

Explain. *because i think it is that way*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*less than*

Explain. *thats just the way it is*



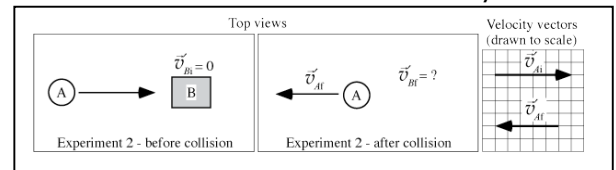
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Object A: *E*

Block B: *G*

Explain. *because i said so*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*less than*

Explain. *thats what i think*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 = Final speed of block B in experiment 2 > 0*

Explain. *i like that answer*

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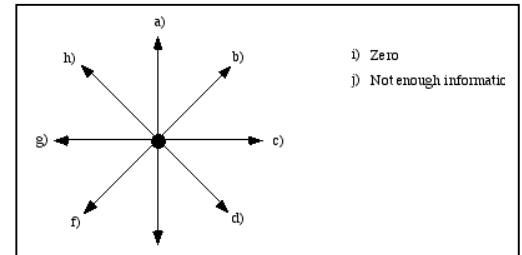
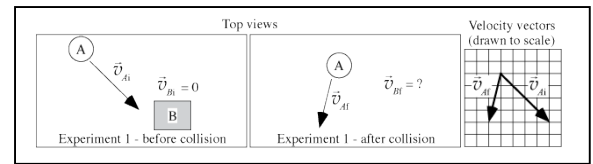
Object A: *D*

Block B: *D*

Explain. *initial  $v$  was 0, conservation of momentum*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*less than*

Explain. *b weighs more*



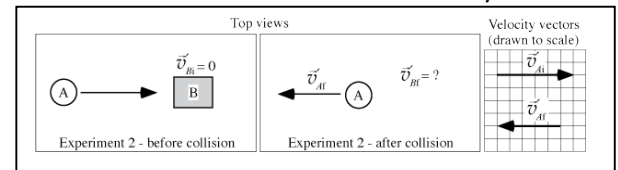
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *C*

Block B: *C*

Explain. *the dot diagram shows change*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*less than*

Explain. *the dot diagram would only be 1 unit, which is less than a's units*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *length of vectors in dot diagram*

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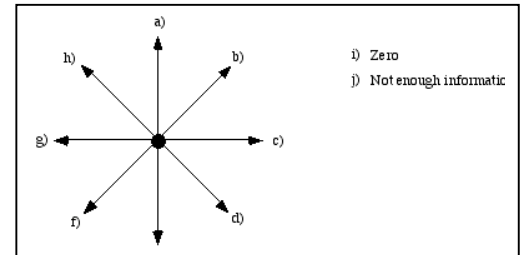
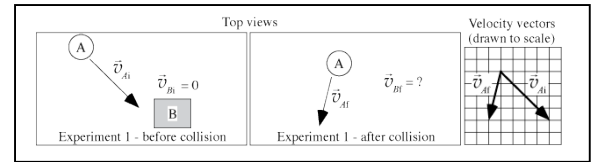
Object A: C

Block B: G

Explain. *A: I subtracted its initial velocity vector from its final velocity vector. B's velocity vector would undergo the opposite change in velocity*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *B weighs more thus it doesn't move that much after A hits it*



i) Zero  
j) Not enough information

A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

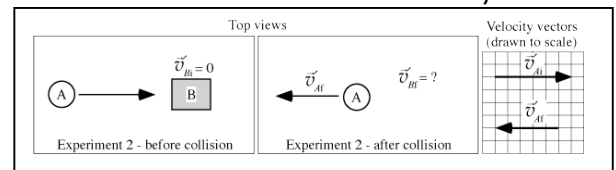
Object A: G

Block B: C

Explain. *A: Vector  $\vec{v}_f$  minus  $\vec{v}_i$  goes in the direction of g. B: it would be in the direction of A's  $\vec{v}_i$*

- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *it weighs less than B. B is harder to get going*

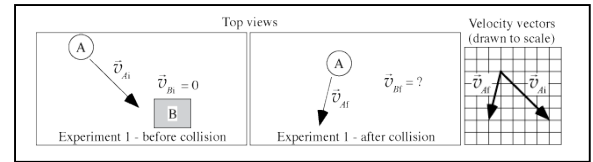


- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 = Final speed of block B in experiment 2 > 0*

Explain. *B has a final velocity in both so it's greater than zero and the box was hit with the same mass going the same speed in both situations so its speed should undergo the same changes*

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**Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

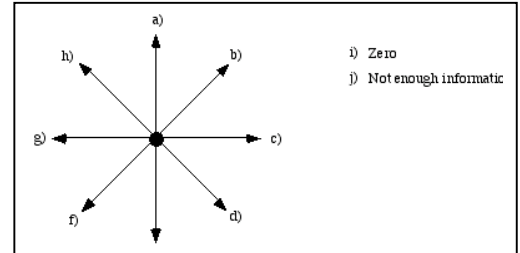
Object A: G

Block B: C

Explain. *Since momentum must be conserved the y component of A is the same so it can only move left. To counteract the left movement of block A block B must move in the exact opposite direction.*

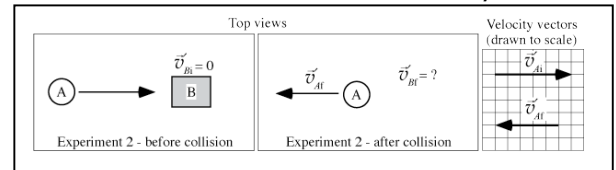
**Q6.** Is the magnitude of the change in velocity of object A greater than, less than, or equal to that of block B?  
*equal to*

Explain. *The change in x velocity of block A is 5. To counteract this block B must have a velocity of 5 as well, but and both blocks have the same y change so they must be moving at the same speeds*



i) Zero  
j) Not enough information

A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.



**Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: A

Block B: C

Explain. *Since this is a linear system and block A reverts on itself its velocity change must be the opposite of its initial. Block B by conservation of momentum must move backwards.*

**Q10.** Is the magnitude of the change in velocity of object A greater than, less than, or equal to that of block B?  
*greater than*

Explain. *Block A changes from a positive velocity to a negative velocity while B simply picks up a little speed because it is massive.*

**Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 > 0*

Explain. *The x component of velocity change is the biggest predictor of velocity in both situations. Since the change in such velocity is basically double that of experiment 1 in experiment 2, experiment 2 must have a velocity change for B that is twice A.*



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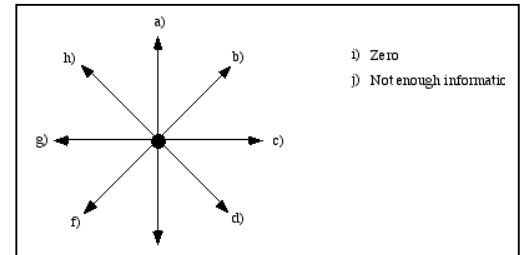
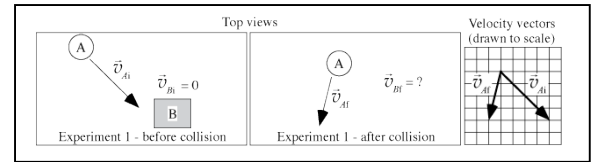
Object A: *E*

Block B: *I (zero)*

Explain. *I used vector addition for vector A. I didnt really know how to find vector b.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *Block B is 6 times as large as A. It will not change position nearly as much as A.*



i) Zero  
j) Not enough informatic

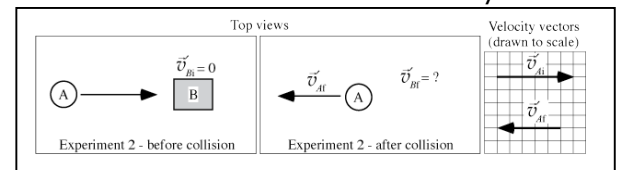
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *C*

Block B: *C*

Explain. *I just used arrow addition and subtracted the first arrow from the second.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*less than*

Explain. *Block A only moves 1 square to the right where as block b moves 3 from rest.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 > 0*

Explain. *The change vector is longer on exp.1 than on exp.2 for b.*

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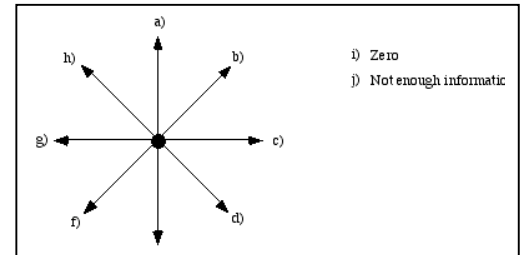
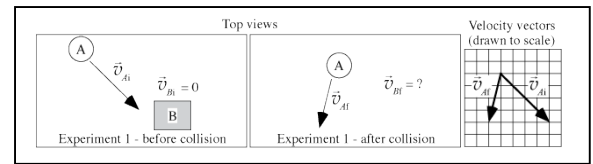
Object A: *G*

Block B: *C*

Explain. *momentum is conserved*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain. *momentum is conserved*



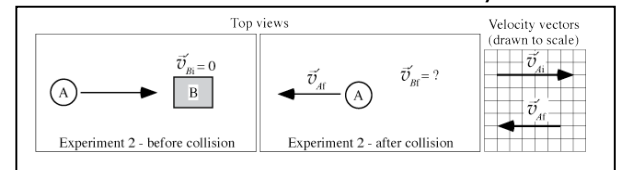
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *momentum is conserved*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain. *equal and opposite*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *momentum is conserved*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

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Object A: *D*

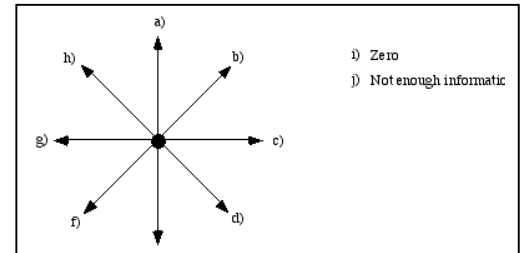
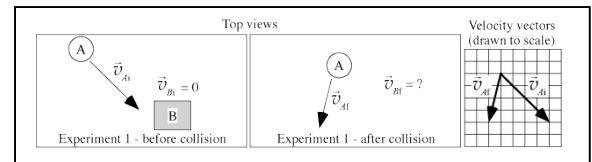
Block B: *C*

Explain. *vector subtraction to find change in vectors.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*Not enough information*

Explain. *The only thing we know is that momentum is conserved and block B has a mass 6 times greater than A. we do not know they're actual direction or velocity and therefore cannot determine whether the change in one is greater than the other.*



- i) Zero  
j) Not enough information

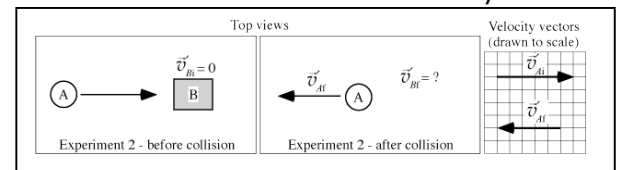
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *vector subtraction again. easy because all is linear*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*greater than*

Explain. *because A has one sixth of the mass of block B, it will need to keep a large velocity in any direction in order conserve momentum*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *the block will move faster in experiment 2 because the collision is more direct,  $\sin(90^\circ) = 1$  as opposed to a smaller multiplier with an angle between 0 and 90 degrees. The block in exp. 1 still moves though and therefore the third choice is the best*

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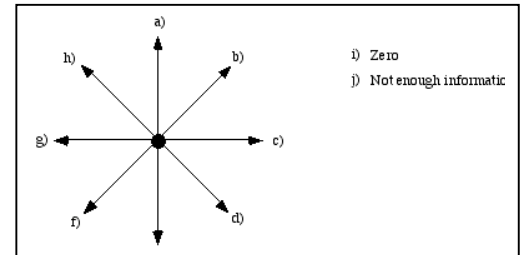
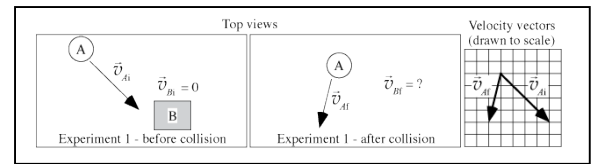
Object A: *D*

Block B: *E*

Explain. *Momentum*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*less than*

Explain. *Energy*



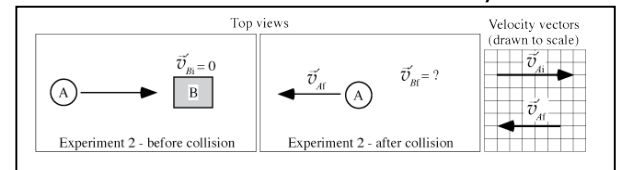
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *D*

Block B: *H*

Explain. *Gravity*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*less than*

Explain. *velocity*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 = 0*

Explain. *force*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

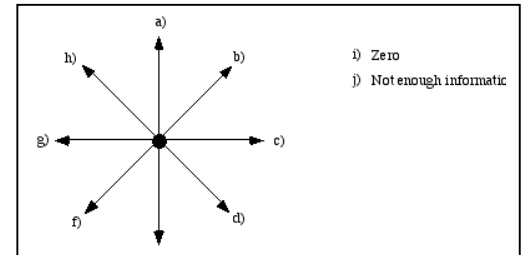
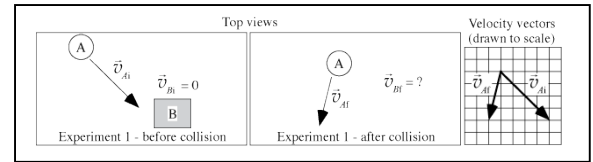
Block B: *C*

Explain. *A is found just by drawing the change in velocity vector.*

*B goes to the right just because of how A bounces off of B.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

Explain. *Through conservation of momentum the change in velocity of A and B will be equal.*



A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *A was found just because the change in velocity vector goes to the left. Block B goes to the left due to the conservation of momentum.*

- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

Explain. *Conservation of momentum*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *A hits B straight on in experiment 2 so its speed will be greater than experiment 1.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

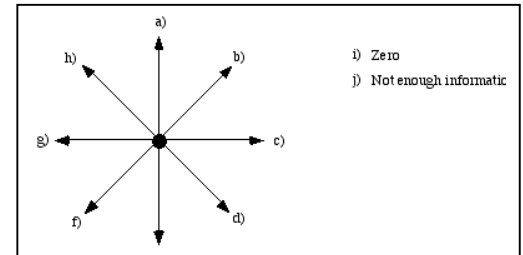
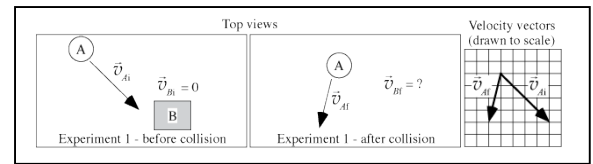
Object A: *G*

Block B: *C*

Explain. *your looking for  $x$  in  $x+Vi=Vf$  that direction would have to to the left for  $vi$  to go to  $vf$*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*equal to*

Explain. *conservation of momentum. change in kinetic energy equals work. energy is conserved, no work done.*



- i) Zero  
j) Not enough informatic

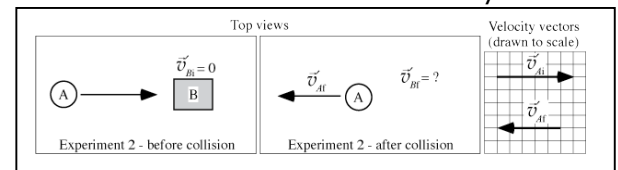
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *the object a going from right to left, making acceleration to the left. object b s going from rest to right. making it to the right.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*Not enough information*

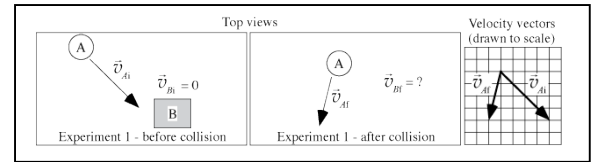
Explain. *because the ball bounced off, and you dont know the mass of b*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *A has greater change in velocity in ex 2 than one. but in one, still exerts a force of B, moving the block.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )



- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

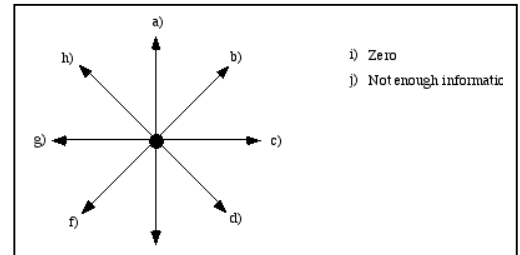
Object A: *H*

Block B: *D*

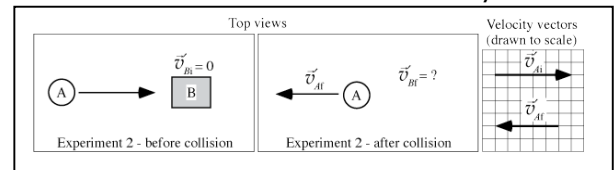
Explain. *opposite and equal*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*less than*

Explain. *B has a larger mass, and more inertia*



A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.



- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *B*

Block B: *C*

Explain. *equal and opposite reaction. conservation of p*

- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *A has less mass and less inertia.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *Exp 1 was at an angle, creating lower net force in that direction*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

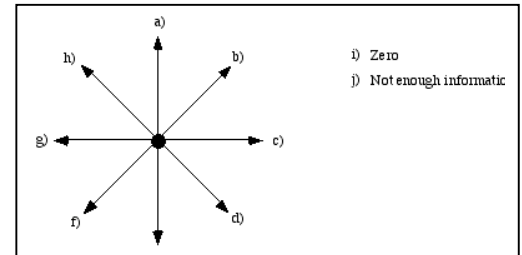
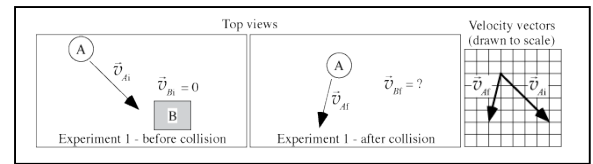
Object A: *G*

Block B: *C*

Explain. *Only the X component of velocity changed; A's changed to the right so equal->opposite B's changed to the left*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

Explain. *Mass of B is greater*



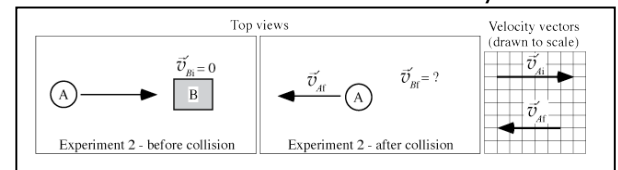
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *Once again all motion seems to be happening in the i-hat direction*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*Not enough information*

Explain. *does block B have the same mass as before? if so change in velocity is smaller for B than A*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *count the lil blocks in the picture*



Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

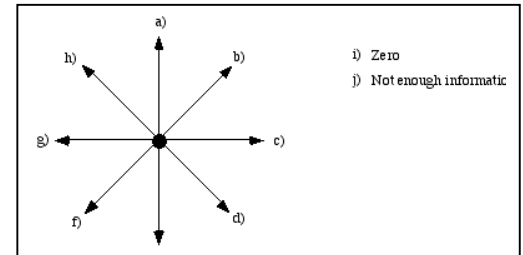
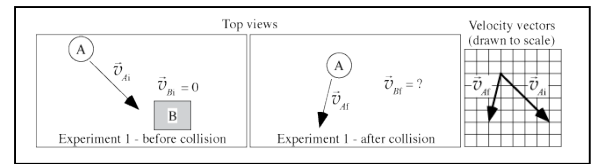
Block B: *B*

Explain. *For the first one I used vector addition.*

*For the second one I used the conservation of momentum.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain. *conservation of momentum*



- i) Zero  
j) Not enough information

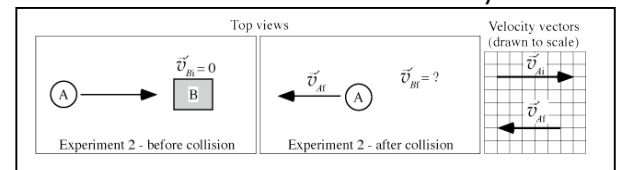
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *conservation of momentum*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*greater than*

Explain. *A changes direction entirely while maintaining the same magnitude*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *These are all conservation of momentum questions*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

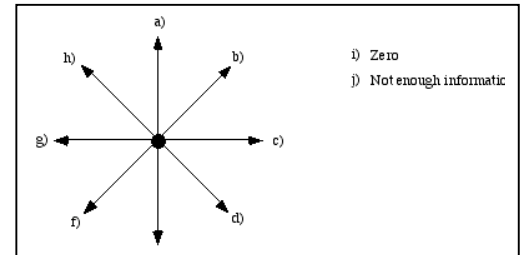
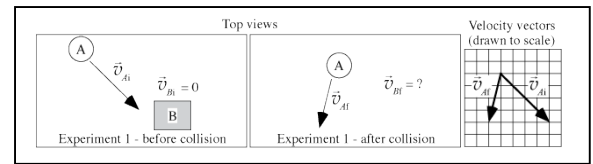
Object A: *B*

Block B: *D*

Explain. *because of the direction*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*less than*

Explain. *its clear*



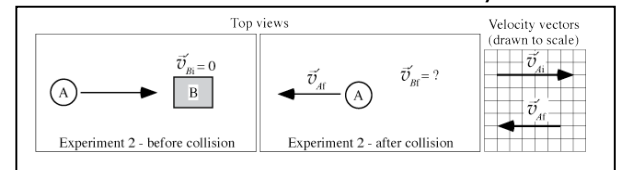
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *F*

Block B: *C*

Explain. *due to the conservation of momentum*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain. *conservation of momentum*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *momentum is directly proportional to mass*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

Object A: 999

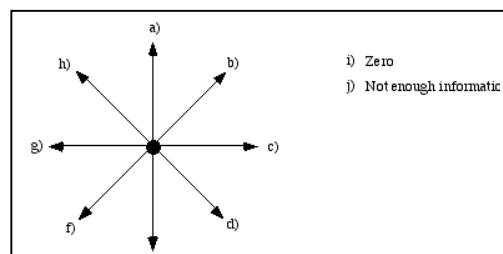
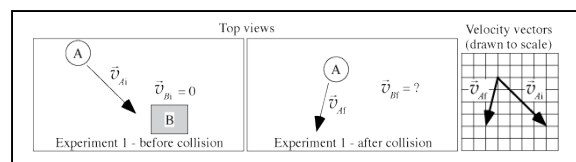
Block B: 999

Explain.

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

999

Explain.



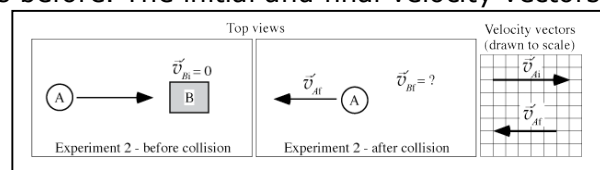
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: 999

Block B: 999

Explain.



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

999

Explain.

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

999

Explain.

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

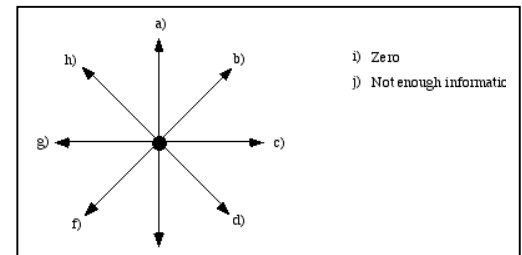
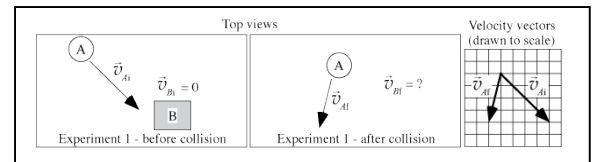
Object A: *H*

Block B: *D*

Explain. *for A, velocity is decreased and to the left. for B the object moves in the direction it was hit.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*equal to*

Explain. *conservation of momentum*



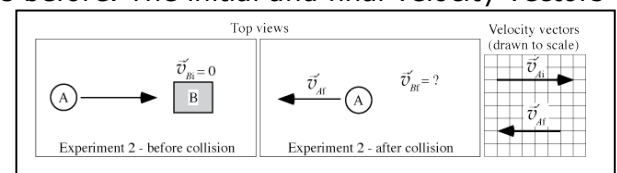
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *object A goes in the opposite direction that it initially was going so that is the way in which its change in velocity goes. For block B, its change in velocity is obviously in the direction it goes after the collision (since it was hit in that direction)*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*equal to*

Explain. *conservation of momentum. EXCELSIOR!!!!!!*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 = 0*

Explain. *Because the second block got hit by a more direct force causing a greater velocity. I'm super, super serial.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

Object A: *E*

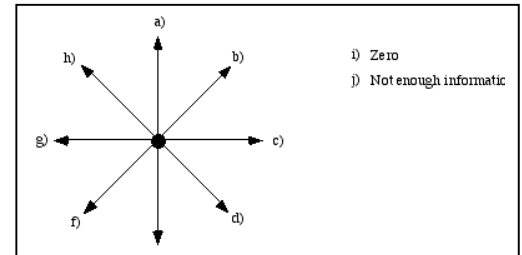
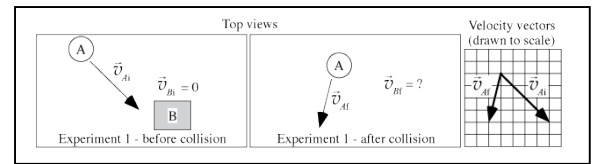
Block B: *E*

Explain. *vector*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*greater than*

Explain. *velocity*



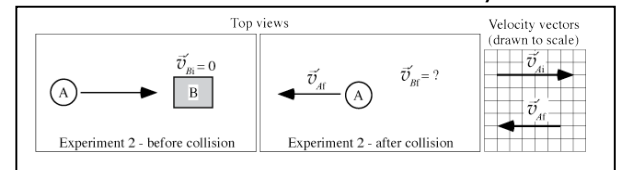
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *D*

Block B: *G*

Explain. *acceleration*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*greater than*

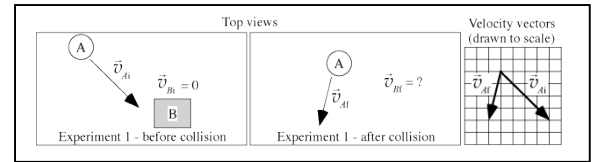
Explain. *reason*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 > 0*

Explain. *because*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )



- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

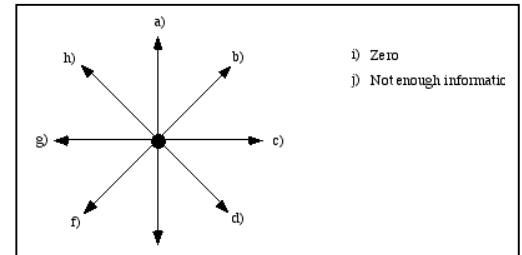
Object A: *D*

Block B: *H*

Explain. *the vectors correspond to the direction of the force being applied to the block.*

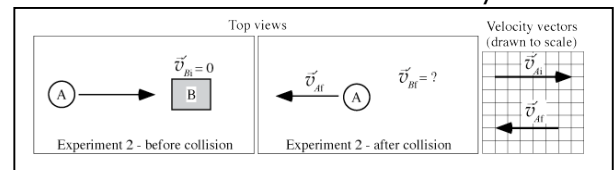
- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain. *it must be equal because when you apply a force on something, it applies the same force back.*



i) Zero  
j) Not enough information

A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.



- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *C*

Block B: *C*

Explain. *block a hits block b and it bounces off. the block b will go towards the right with a slight forward vector and block a will go to the left with a large vector.*

- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *it has to be greater because the mass must be different for the change in velocity to be that drastic.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 = Final speed of block B in experiment 2 > 0*

Explain. *the final speed of block B is equal in both experiments because in experiment 1 the block is still and block a is reflected to the left, and in experiment 2, block b must be going toward the right to send block a toward the left.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

Object A: *E*

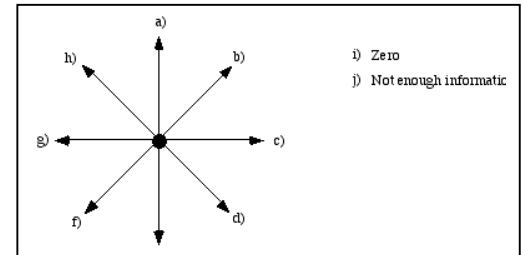
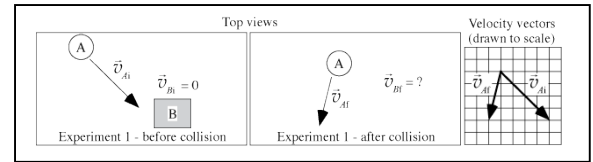
Block B: *D*

Explain. *I suck*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*Not enough information*

Explain. *I suck a lot*



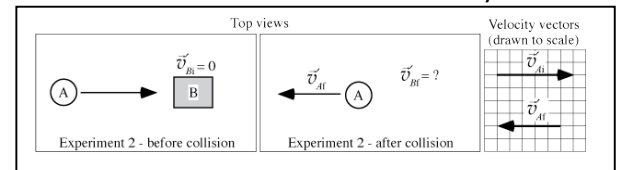
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *B*

Block B: *C*

Explain. *No really, I really suck*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*Not enough information*

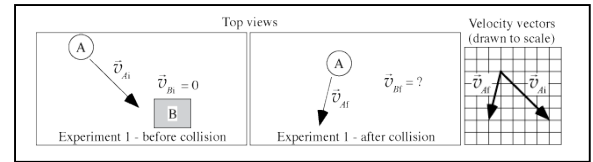
Explain. *ok ok fine u win, but i still suck*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 = 0*

Explain. *GG*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )



- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

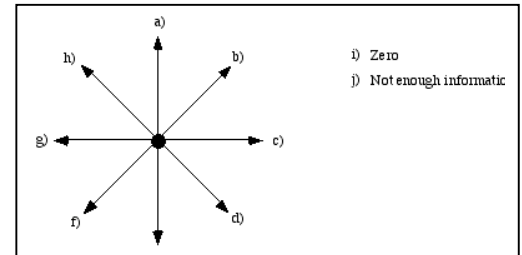
Object A: *G*

Block B: *D*

Explain. *The change in velocity for object A can be determined through vector subtraction. The direction of B can be found through the conservation of momentum.*

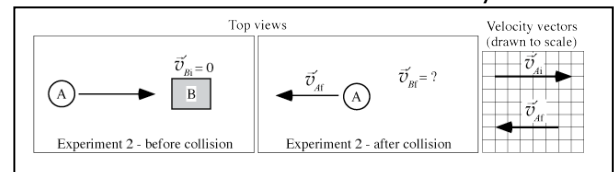
- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *The final velocity is in a different direction than the initial, while the final velocity of B didn't have to change direction.*



- i) Zero  
j) Not enough information

A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.



- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *Vector subtraction and conservation of momentum.*

- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *The final velocity of B will be small due to the conservation of momentum.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 > 0*

Explain. *Conservation of momentum tells me that since the magnitude of the change in velocity in experiment 1 is less than 2, B will have a greater final velocity in the first experiment.*



Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

**Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

Object A: 777

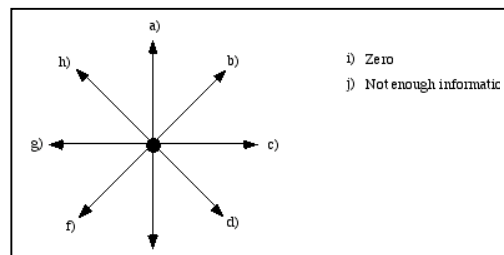
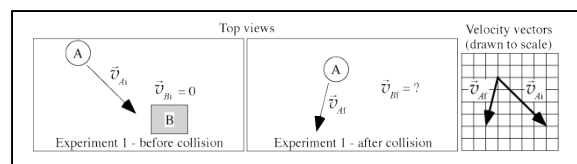
Block B: 777

Explain. 777

**Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

777

Explain. 777



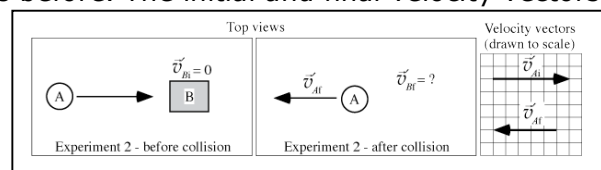
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

**Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: 777

Block B: 777

Explain. 777



**Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

777

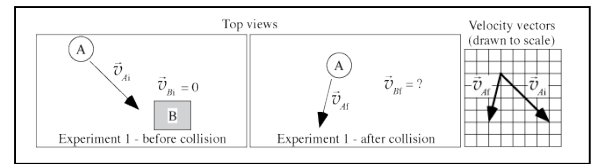
Explain. 777

**Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

777

Explain. 777

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )



- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

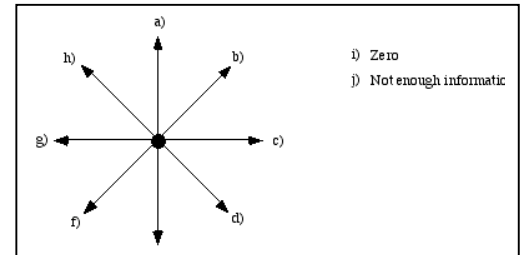
Object A: *G*

Block B: *C*

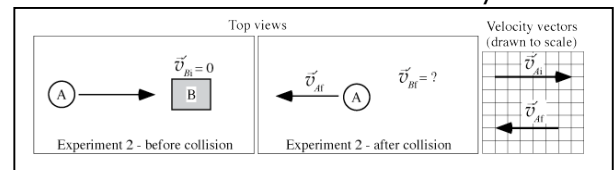
Explain. *In the absence of external forces on a system change in momentum of one will be equal and opposite the other.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*less than*

Explain. *In the absence of external forces on a system change in momentum of one will be equal and opposite the other and block B has greater mass so less velocity.*



A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.



- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *In the absence of external forces on a system change in momentum of one will be equal and opposite the other.*

- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *In the absence of external forces on a system change in momentum of one will be equal and opposite the other B has more mass.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *The magnitude of the change in velocity vector is larger in experiment 2 thus more change in momentum and more velocity and the final speed of block B was always greater than zero.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

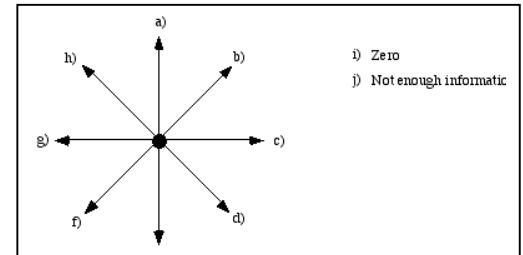
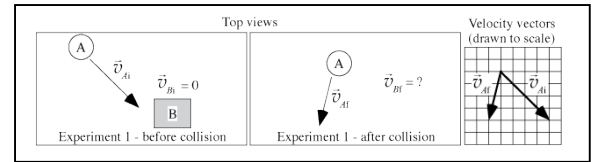
Object A: C

Block B: C

Explain. *ball A is simply  $V_f - V_i$ , and we can see by vector addition that it is to the right. Block B should have the same Impulse, or change in momentum as did the ball A.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain. *conservation of momentum*



A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

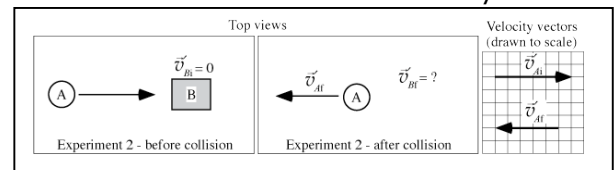
Object A: G

Block B: C

Explain. *Object A is simply vector subtraction  $V_f - V_i$ , and block B's change in V would be simply whatever it's  $V_f$  is because it has no  $V_i$ . Newton's third gives us the direction of impulse*

- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain. *Conservation of momentum, and Newton's third*



- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *Because in experiment 2 all the force of impact is directed down the x axis.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

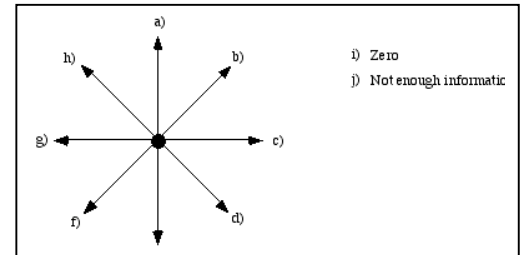
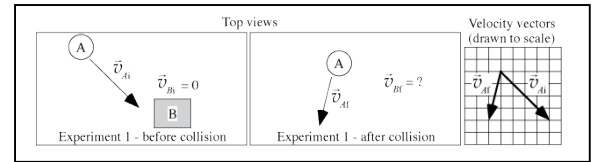
Object A: *G*

Block B: *C*

Explain. *A changed directions so it went to the left and B started moving to the right*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *A completely changes directions, B just starts from rest*



i) Zero  
j) Not enough information

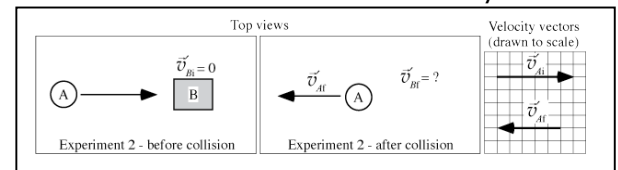
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *same as the first part*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*greater than*

Explain. *same as first part*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 > 0*

Explain.

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

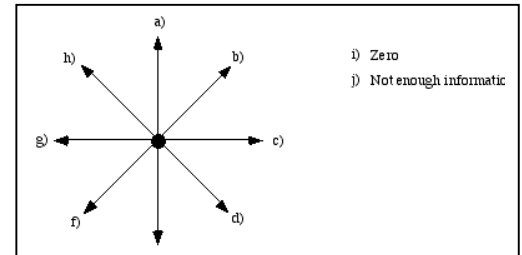
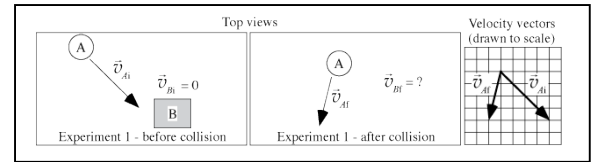
Object A: *F*

Block B: *Not enough information*

Explain. *For A, the change in direction is the difference of the velocity vectors, for B it is unknown if A had enough force to move B.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*less than*

Explain. *It is unknown if B moved at all, but it is more likely that A moved more as it changed directions all together.*



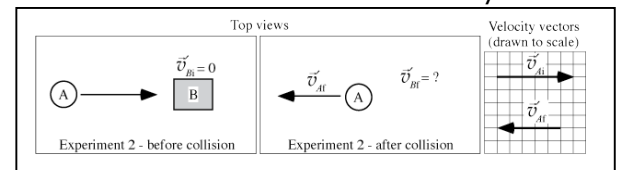
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *Not enough information*

Explain. *A moved in a the opposite direction in a straight path, it is still unknown if B moved or not.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *B would hardly move even if A hit it hard enough to move, but A moved in the opposite direction, meaning its velocity changed as much as possible.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *I believe that since A came in on a straight path in #2 that it would move B more than it would in #1. There is not enough info. to determine if B in 1 is equal to zero or not, but i believe that B moved in 2, and therefore it is highly possible that B is >0 in 1.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

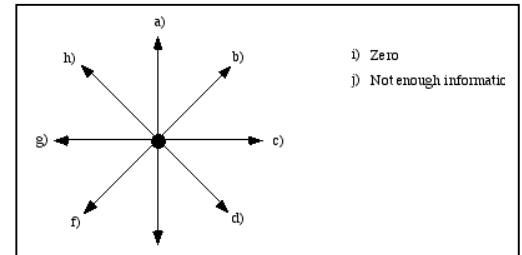
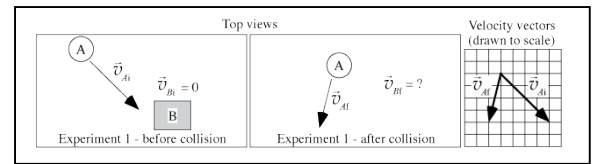
Object A: *A*

Block B: *B*

Explain. *dont know*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*less than*

Explain. *dont know*



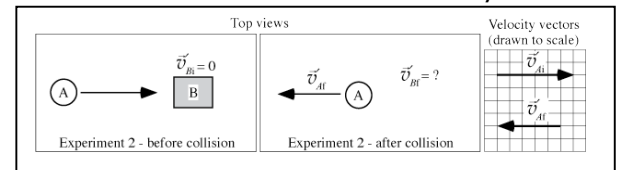
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *C*

Block B: *B*

Explain. *dont know*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*less than*

Explain. *dont know*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 = Final speed of block B in experiment 2 > 0*

Explain. *dont know*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

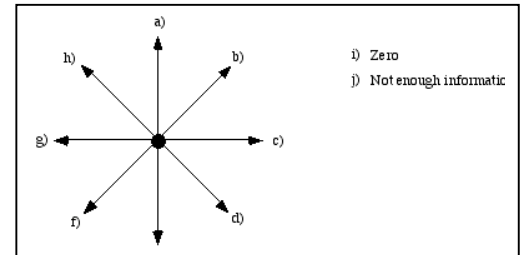
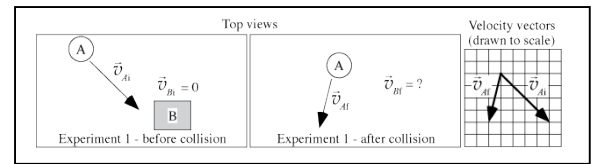
Object A: *G*

Block B: *C*

Explain. *Change only in the x component of velocity vector.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *Mass of block B is six times greater than a*



- i) Zero  
j) Not enough information

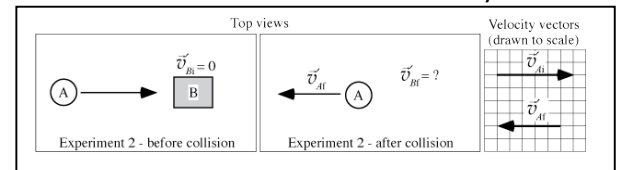
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *change in x componanat only Va is not quite 2Va so the remainder must be in opposite direction for Vb*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *Block b is much greater in mass so it's velocity changes much less*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *both experiments involve a change in speed >0 but experimet 2 involves a greater change in speed than experiment 1 based on conservation of momentum*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

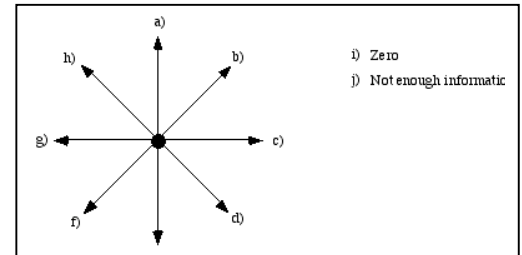
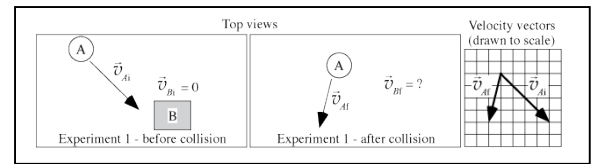
Object A: *D*

Block B: *H*

Explain. *The change in velocity is equal to the velocity vectors subtracted from each other*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

Explain. *They are equal since you are taking the difference between the two vectors.*



- i) Zero  
j) Not enough information

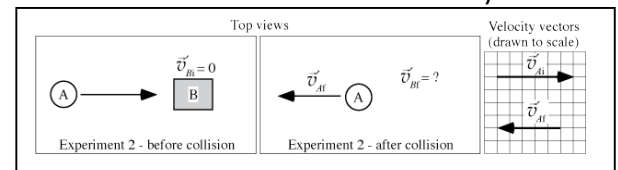
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *The difference between the velocity vectors are taken.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*equal to*

Explain. *You are taking the difference between the two vectors each time.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 = 0*

Explain. *The change in velocity is equal to zero for block 2 since they are the same magnitude but opposite directions. The final speed of block one is there for greater.*



Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

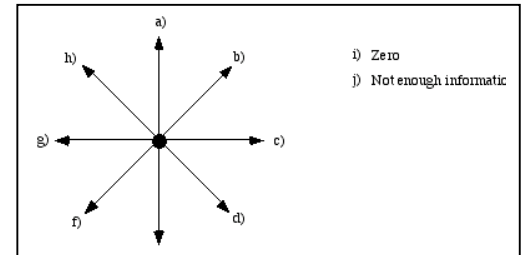
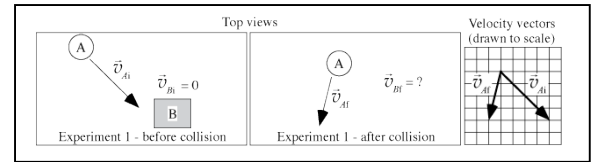
Object A: *G*

Block B: *C*

Explain. *vector addition to find final velocity vector*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*less than*

Explain. *because momentum must be conserved*



- i) Zero  
j) Not enough information

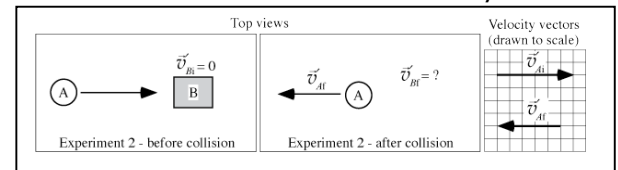
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *vector addition and conservation of momentum*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *because it had to double back and return at almost same velocity*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *both final speeds are greater than zero but experiment one has the collision coming at an angle versus a straight on collision and the straight on collision will give a larger velocity*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

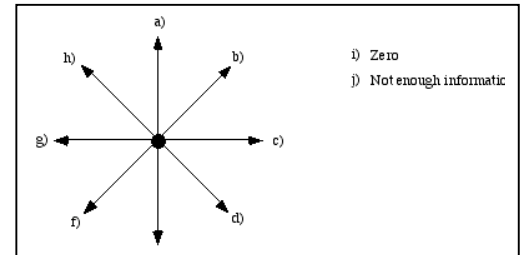
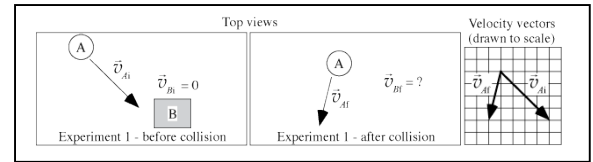
Object A: *A*

Block B: *G*

Explain. *A is the prettiest letter in the alphabet that i can see so i picked it*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

Explain. *derka derka derka jihad*



i) Zero  
j) Not enough information

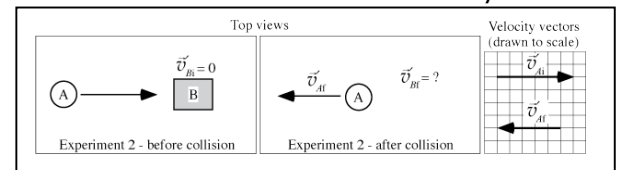
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *E*

Block B: *B*

Explain. *ALALALALAL. i think i like it i really think i like it.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*equal to*

Explain. *curtis is going to be very lazy over the break.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *Curtis Edwards the third student ID 810 69 1888 is going to the beach to get his hair done up.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

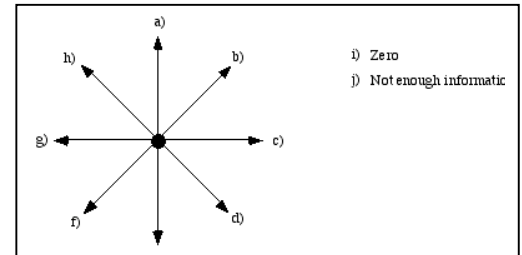
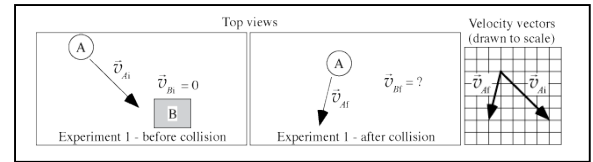
Object A: *H*

Block B: *H*

Explain. *hte change in velocity equals  $v_f - v_i$ . since block b wasnt moving and object a transferred velocity to the block, block b would be moving in the change in velocity of object a*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *because block b is so heavy it is cancelled out by the wieght. and in oredr for object a to change directions like that it has a greater change in velocity then block b*



- i) Zero  
j) Not enough informatic

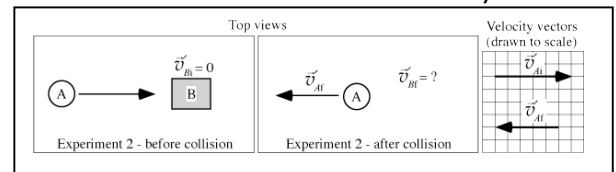
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *since the change in velocity equals  $v_f - v_i$  you can find out what the magnitude and direction of the vector is going. object a is going toward the left while blk b is going toward the right.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *because it has to cancel out the 6 block going the oppisite way and then add 5 more onto that*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *because it was hit striaght on*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

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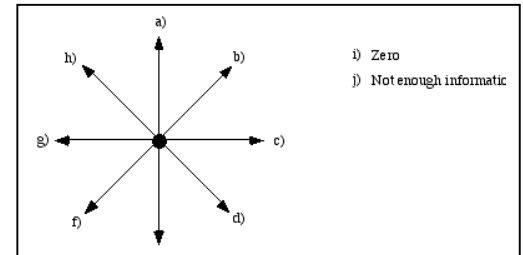
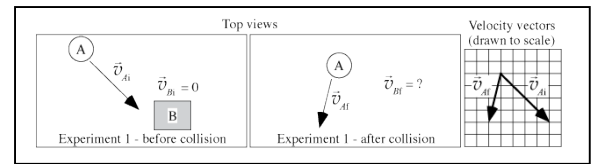
Object A: *E*

Block B: *D*

Explain. *Those look like the right velocities*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain. *They are the same length*



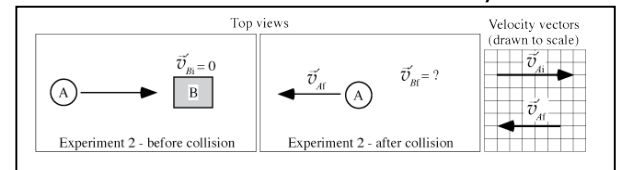
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *F*

Block B: *D*

Explain.



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*equal to*

Explain.

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 = 0*

Explain. *this is the right one*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

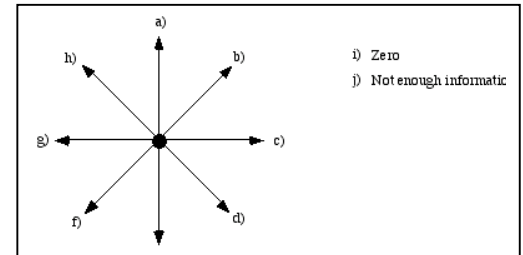
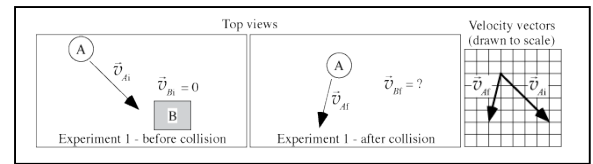
Object A: *H*

Block B: *E*

Explain. *change = final - initial. (so 5 mag and 5 mag)*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain. *P<sub>x</sub> and P<sub>y</sub> are conserved after the collision.*



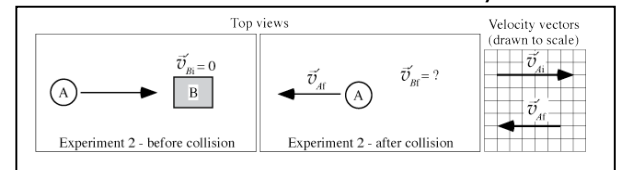
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *change = final - initial*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *b is more massive*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 = 0*

Explain. *see above*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

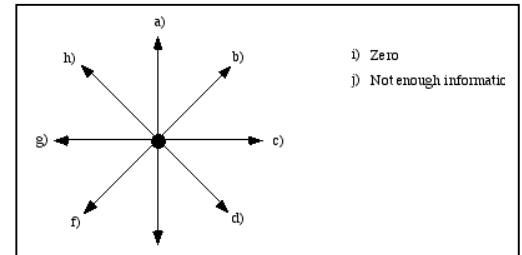
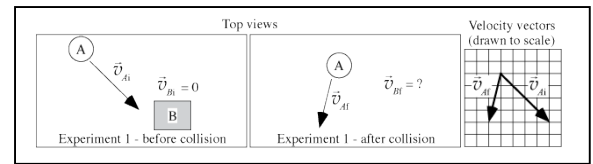
Object A: *H*

Block B: *C*

Explain. *Just an educated guess.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *Block B is heavier.*



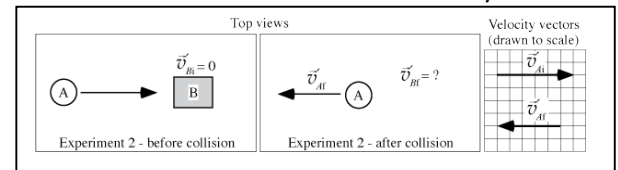
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *A*

Block B: *C*

Explain. *Just how they change.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *Again, block b is heavier.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *In the experiment twom, more force is applied by block a in one direction.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

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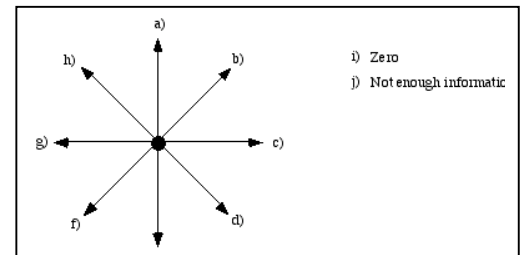
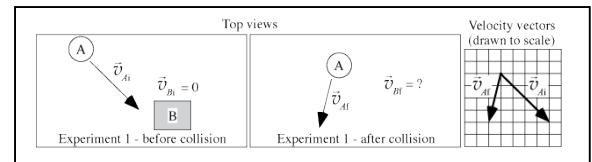
Object A: *E*

Block B: *F*

Explain. *It's how i see it working*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *The magnitude would have to be greater*



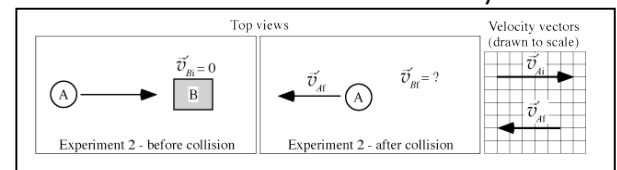
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *F*

Explain. *It's how I see it*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*less than*

Explain. *It would need to be less than*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 = 0*

Explain. *Because the final velocity of b in experiment 1 would need to be less than experiment 2*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

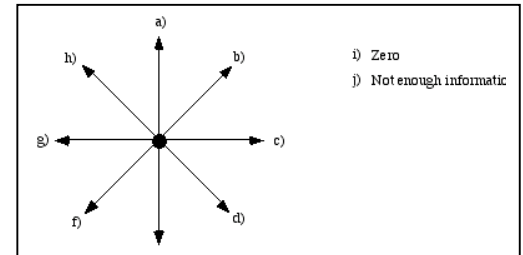
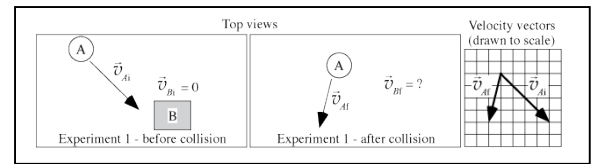
Object A: *G*

Block B: *C*

Explain. *Because mass A is six times greater than that of block B, it causes block B to move to the right.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*equal to*

Explain. *conservation of energy*



- i) Zero  
j) Not enough information

A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

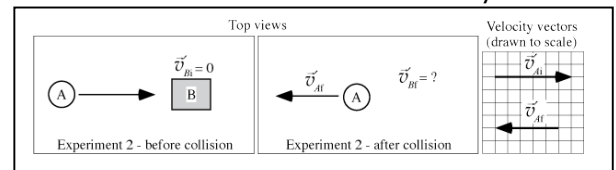
Object A: *I (zero)*

Block B: *I (zero)*

Explain. *Because the vectors are equal and opposite, the overall change is zero. According to the conservation of energy, the change in block B needs to be zero because no energy is lost to it.*

- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*equal to*

Explain. *They are both zero. block A has magnitudes that are equal and opposite so the change is zero. Block B does not move so its velocity is also zero.*



- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 = 0*

Explain. *I just know that for experiment 2, Block B has a final velocity of zero because it did not move. Experiment exhibits Block B moving toward the positive x-axis. Therefore, the final speed of block B in experiment 1 must be greater than the final speed of block B in experiment 2, which is equal to zero.*



Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

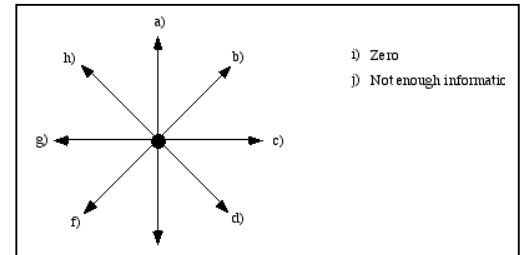
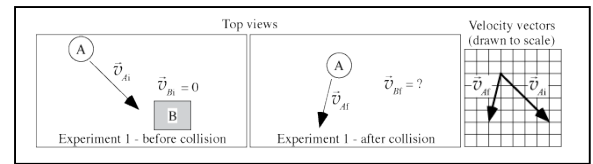
Object A: *I (zero)*

Block B: *F*

Explain. *Since there is no velocity in the first one, there is no acceleration in this case. For the second one, since the direction shows the velocity after the collision, that is the direction of the change in velocity.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *Because its initial velocity is zero, so it would have a larger change in velocity.*



- i) Zero  
j) Not enough information

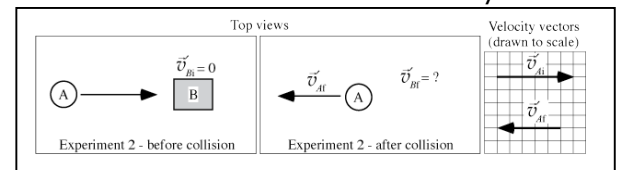
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *C*

Block B: *I (zero)*

Explain. *Block B has no displacement, so the change in velocity is zero and since block A is traveling towards the right, the velocity is to the right.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *Block B is not moving at all, but Block A has a velocity, so it is obviously greater.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 > 0*

Explain. *There has to be some force involved above zero for these collisions to occur.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

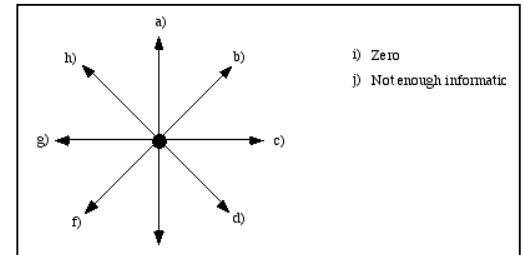
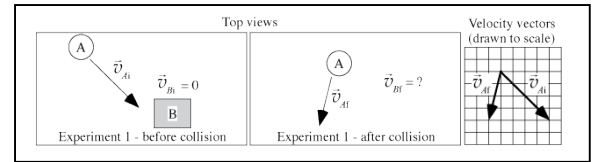
Object A: *G*

Block B: *C*

Explain. *Vector addition for object A led to getting "G", and assuming block B is moving to the right after the collision after being at rest to start.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain. *Conservation of momentum/energy*



- i) Zero  
j) Not enough information

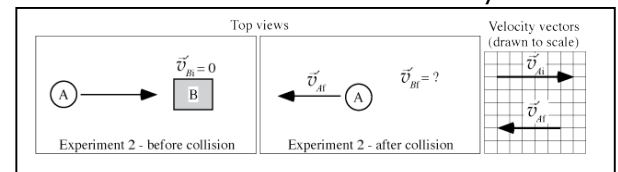
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *object first going to right then to left, so the change is to the final direction. Block starting at rest and then assuming moving to right after collision.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain. *Conservation of momentum/energy*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 > 0*

Explain. *A:  $m_1v_1 + m_2v_2 = M_1V_1 + M_2V_2 \rightarrow 4mv + 6(0mv) = -1Mv + 6Mv$*

*B:  $m_1v_1 + m_2v_2 = M_1V_1 + M_2V_2 \rightarrow 6mv + 6(0mv) = -5Mv + 6Mv$*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

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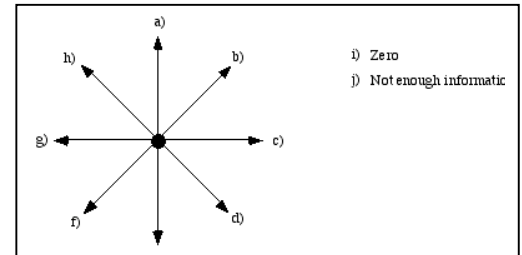
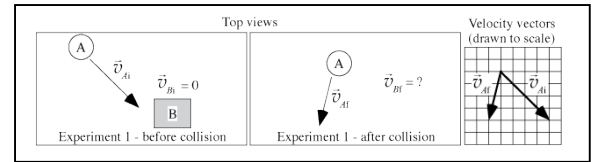
Object A: *H*

Block B: *C*

Explain. *tip to tail vector addition*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *block B has a greater mass, so it takes more force to move it*



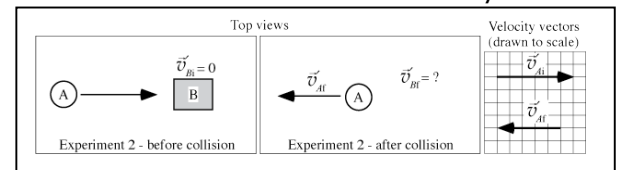
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *tip to tail vector addition*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*999*

Explain. *block B has a greater mass,*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 = 0*

Explain. *x components of the change in  $V_a = 2$*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

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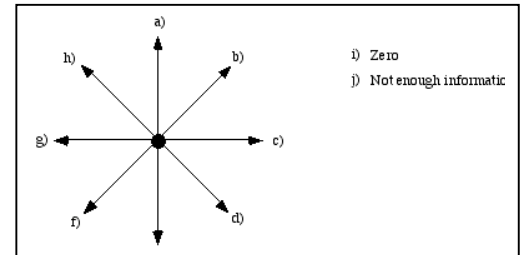
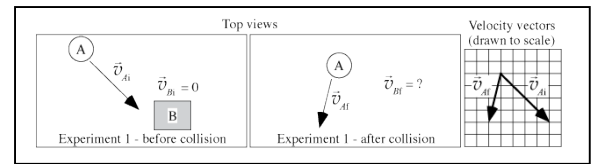
Object A: *E*

Block B: *D*

Explain. *force*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*less than*

Explain. *force*



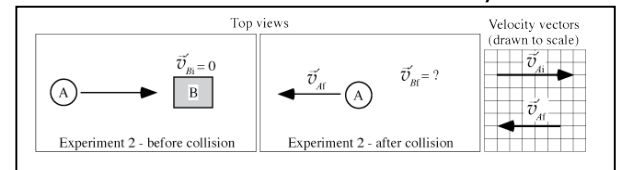
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *F*

Block B: *C*

Explain. *force*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

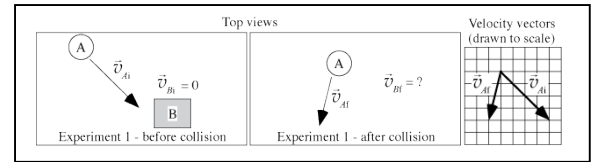
Explain. *force*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *force*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )



- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

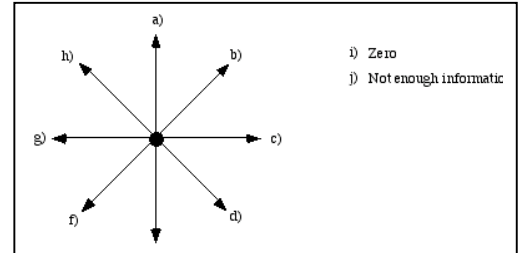
Object A: *H*

Block B: *Not enough information*

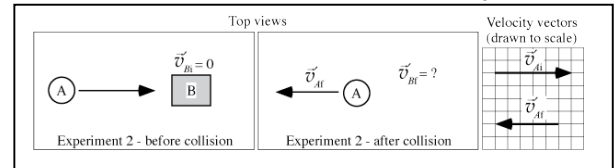
Explain. *vector addition*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *6x the mass will move slower than 1x after collision*



A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.



- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *basic collisions, force is transferred to each object*

- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *the final is slightly less than initial for A so B must be moving slightly to the right*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *all motion is horizontal in 2, but some will be leeched off from 1, leaving both velocities greater than zero*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

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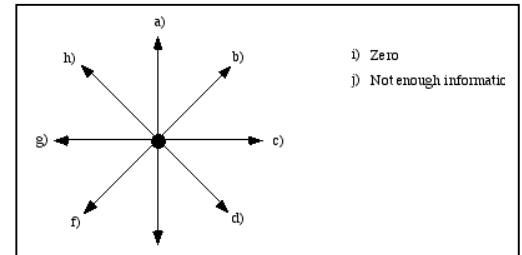
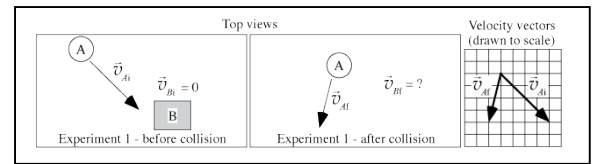
Object A: *B*

Block B: *F*

Explain. *cause i am numero uno*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *a' moving faster*



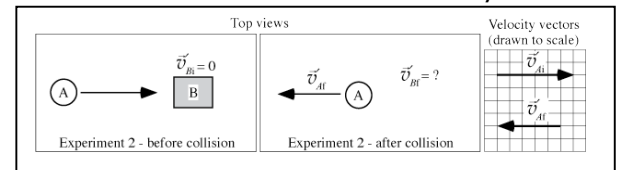
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *B*

Block B: *F*

Explain. *cause i say so*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*less than*

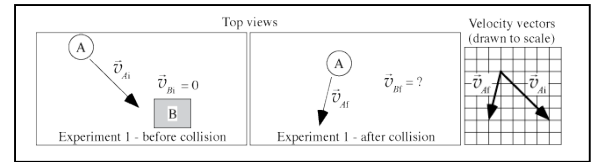
Explain. *see attached*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 > 0*

Explain. *1 is more direct*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )



**Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

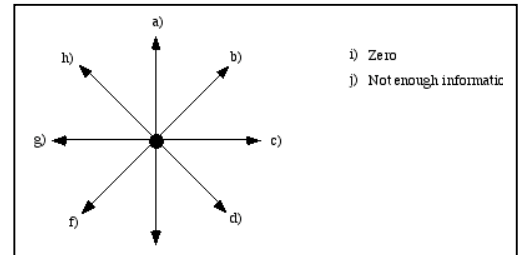
Block B: *D*

Explain. *for A - velocity vector addition*

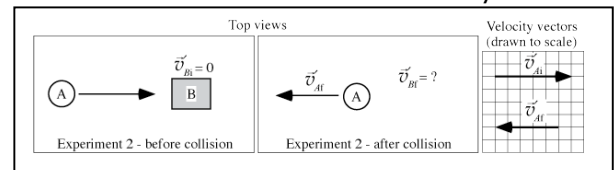
*for B - initial value is zero, so change = direction of A initial.*

**Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *A has less mass so its change in velocity must be higher to reflect an equal change in energy as seen in B*



A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.



**Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *for A - vector addition. was going L, changed to going R. net change is to the right.*

*for B- initially stationary, so final V will be in direction of V initial of A.*

**Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *A has a smaller mass, therefore its change in velocity must be greater to reflect an equal amount of energy change that B would.*

**Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *for experiment 2, the initial velocity of A is greater than in experiment 1, therefore more energy will be transferred to B, resulting in a higher final speed for B.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

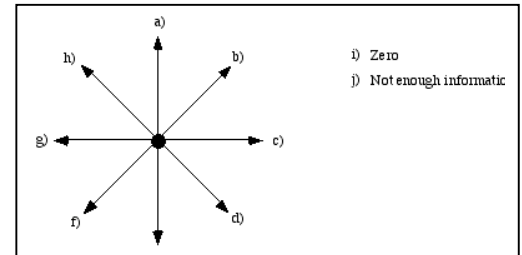
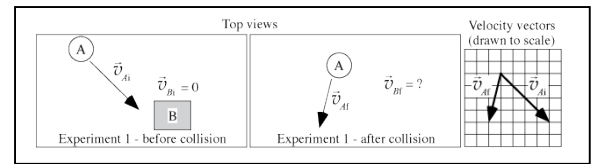
Object A: *G*

Block B: *C*

Explain. *because i guessed*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*equal to*

Explain. *newtons third law*



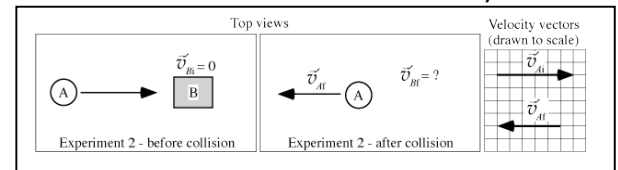
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *looks good*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*equal to*

Explain. *third law*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *looks good*



Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

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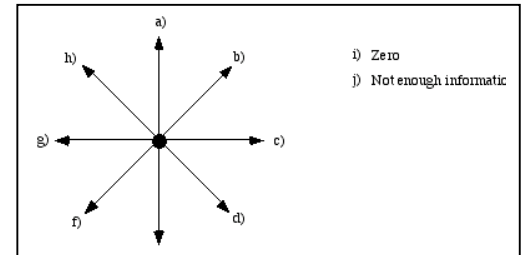
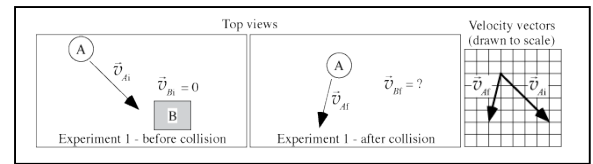
Object A: *D*

Block B: *E*

Explain. *bonkers*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain. *yar*



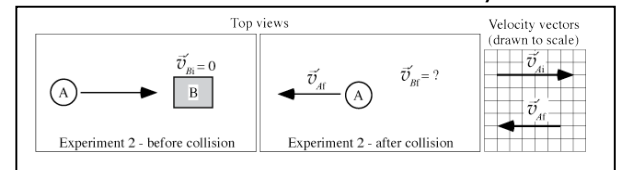
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *C*

Block B: *F*

Explain. *yar*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*less than*

Explain. *tar*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 = 0*

Explain. *gar*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

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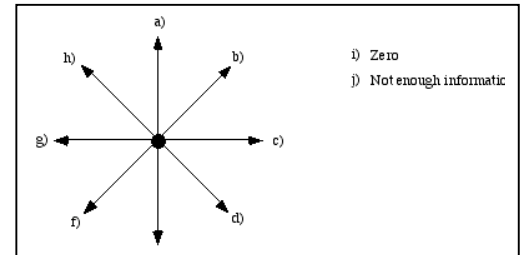
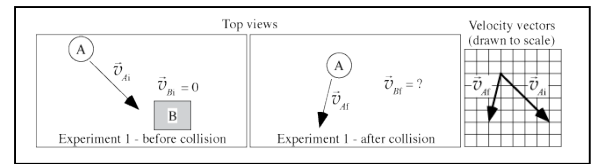
Object A: *D*

Block B: *C*

Explain.  $f=ma$

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain.  $f=ma$



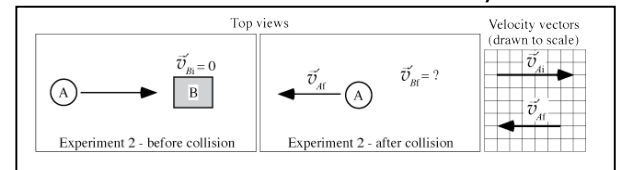
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *H*

Block B: *F*

Explain.  $f=ma$



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*less than*

Explain.  $f=ma$

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain.  $p=mv$

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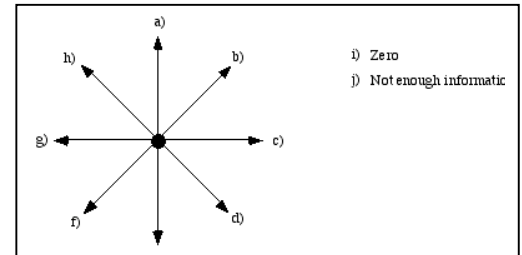
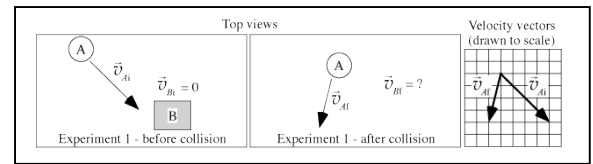
Object A: *C*

Block B: *D*

Explain. *vector addition*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*less than*

Explain. *A slowed down but b sped up.*



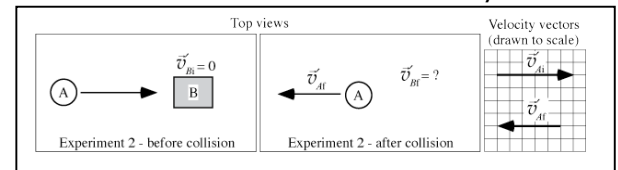
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *vector addition*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *again b sped up and a slowed down*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 > 0*

Explain. *momentum was conserved so because a was going faster in experiment 1 b had to be going faster at the end of the experiment. In experiment 2 b had to compensate less. Or something. Argh.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

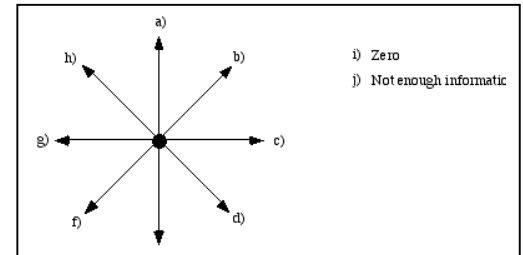
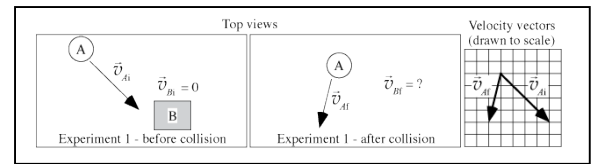
Object A: G

Block B: C

Explain. *conservation of momentum. A initial and final have the same y component so the changes in the blocks are purely lateral. A changes to the left so to conserve momentum B must change to the right*

- Q6.** Is the magnitude of the change in velocity of object A greater than, less than, or equal to that of block B?  
*greater than*

Explain. *B has a greater mass, so since momentum is  $mv$ , and b would need a final value of 3 to the right, for a mass of just 1m, but it has 6 times the mass, the velocity would be  $3/6$ , or  $1/2$  to conserve momentum*



- i) Zero  
j) Not enough information

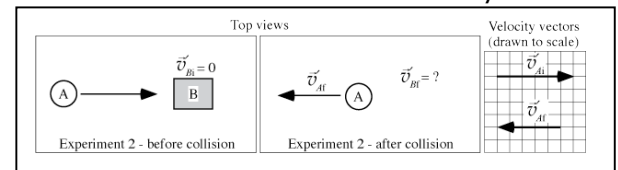
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: G

Block B: C

Explain. *A changes to the right so B must change to the left to conserve momentum*



- Q10.** Is the magnitude of the change in velocity of object A greater than, less than, or equal to that of block B?  
*greater than*

Explain.  *$mvi = 6$  so  $mv$  b must equal 11 to the right, but b is 6 times as massive, so that's just under two, so A is greater*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *the change in momentum was less in A than in B, but was still always greater than zero. masses are constant so these differences are reflected in the velocities*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

Object A: G

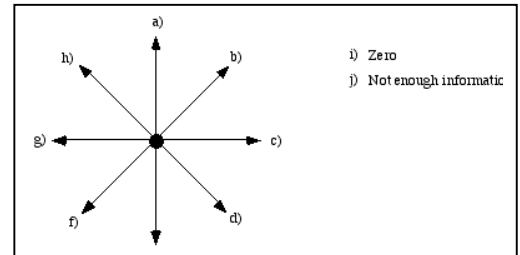
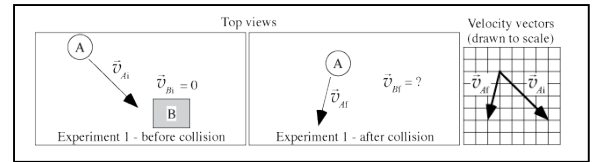
Block B: C

Explain. *For object A, the change in velocity can be found using the displacement vector between the initial and final velocities. For object B, the change in velocity must point to the right because the velocity vector of A decreased in its y- component.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*greater than*

Explain. *The change in momentum for both objects will be equal, but since object B has a much greater mass, it will have less of a change in velocity.*



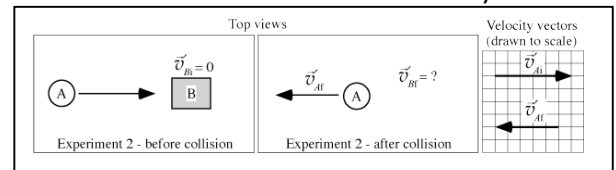
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: G

Block B: C

Explain. *For object A, the change in velocity and momentum is clearly to the right because the object ends up moving to the left. For block B, some of the momentum of A will be transferred to it to cause it to move to the right.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*greater than*

Explain. *The change in A's velocity must be much greater because the change in velocity vector has to account for a change in direction and a relatively high final velocity in the opposite direction, whereas block B just has a small change in velocity to the right.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *There is only a horizontal velocity component of A in experiment*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

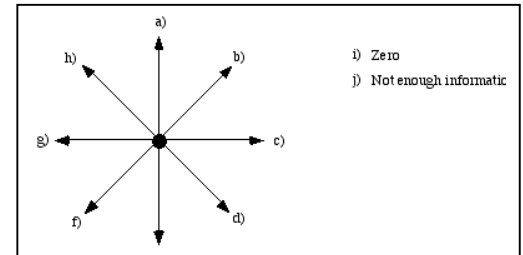
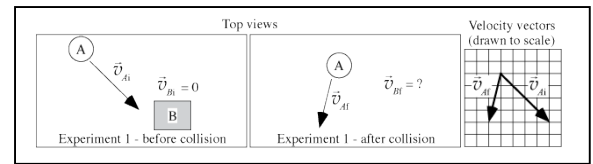
Object A: *G*

Block B: *C*

Explain. *by vector addition, the change of velocity is the direction of *G*. Since the block is being pushed from rest, down on a flat surface, then its change in velocity must be parallel to the surface*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *The change in velocity is greater on A because it has less mass*



i) Zero  
j) Not enough information

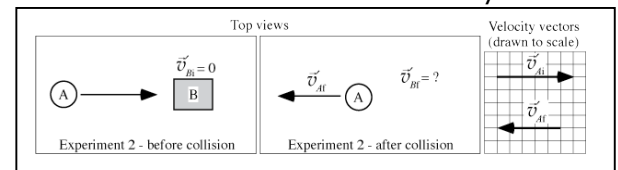
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *The change of velocity must be straight back, by vector addition, the change of velocity in B is straight forward because it starts at rest and the only force on it is straight forward, not counting gravity/normal force*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *Because object is still a smaller mass than object B*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *in experiment 1, object B is struck at an angle, which reduces the amount of force and energy transferred from object A, whereas in experiment 2, object B is struck head on by object A.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

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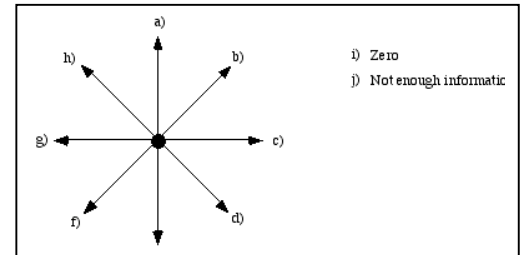
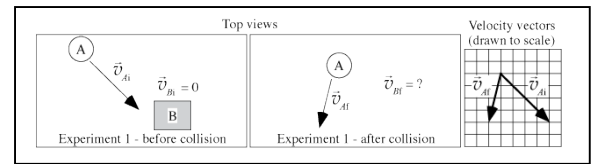
Object A: *C*

Block B: *C*

Explain. *Looking at the vectors and from common sense.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*less than*

Explain. *Conservation of energy (kinetic).*



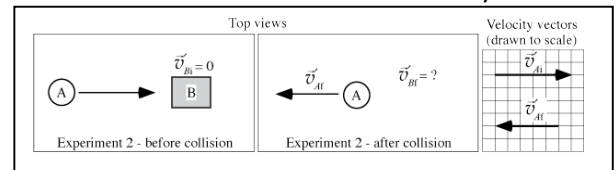
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *Common sense.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *The weight of B will make it slower than A.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *One is hit by A at an angle and the other is hit straight on.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

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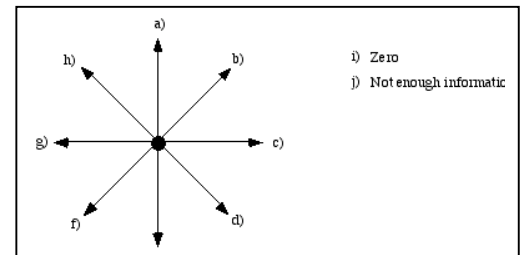
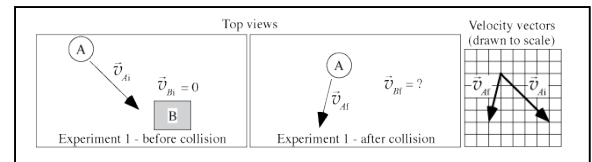
Object A: *G*

Block B: *C*

Explain. *change in velocity is  $V_{\text{final}}$  minus  $V_{\text{initial}}$ .*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain. *i used the law of conservation of momentum*



i) Zero  
j) Not enough information

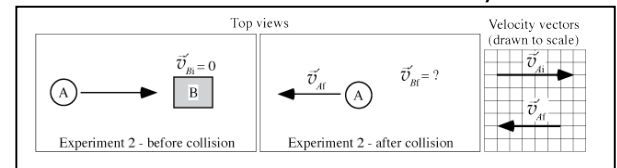
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *change in velocity formulas*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *law of conservation of momentum*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 = Final speed of block B in experiment 2 > 0*

Explain. *law of conservation of momentum*



Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

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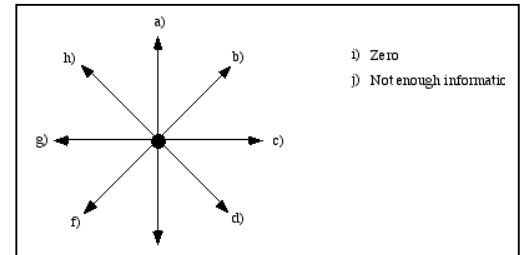
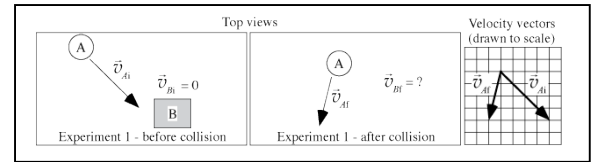
Object A: *G*

Block B: *D*

Explain. *obj. A was just vf - vi, and block B with no initial v, will go at a 90 deg angle from A*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *A is going in the positive x direction and changes to neg. x direction, totaling more change than B*



- i) Zero  
j) Not enough information

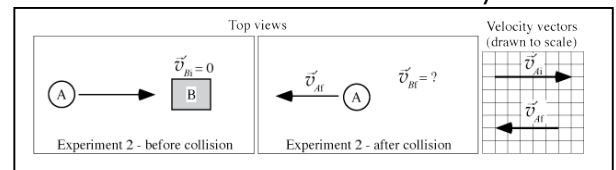
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *no y change, so in x, they will hit and go in opposite directions*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain.

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *well, I kinda guessed*

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Object A: *G*

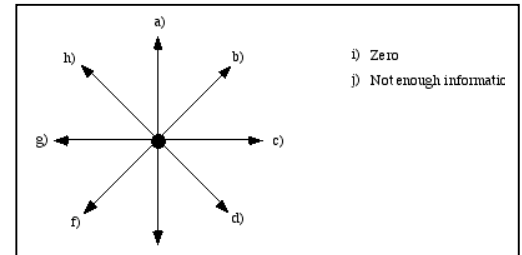
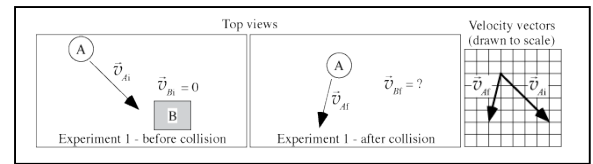
Block B: *C*

Explain.  $v_f - v_i = \Delta v$

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*greater than*

Explain. *less mass*



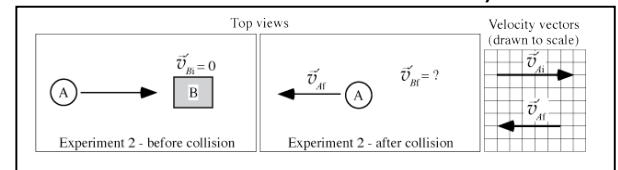
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain.  $v_f - v_i = \Delta v$



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*greater than*

Explain. *less mass*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *gghtwew erew*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

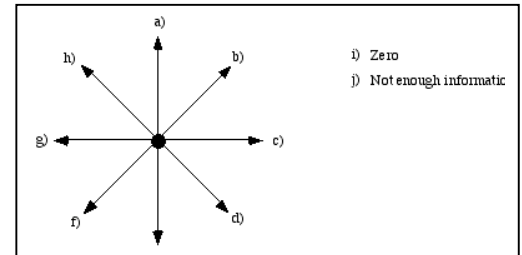
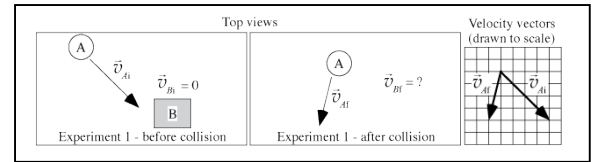
Object A: *G*

Block B: *D*

Explain. *A went from down and to the right to down and to the left while block B just went from rest to down and to the right*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *A changed more*



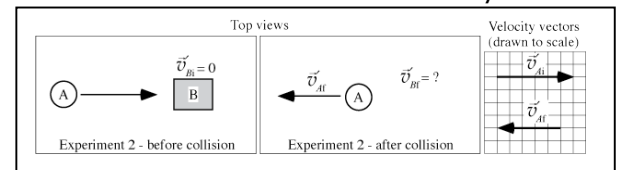
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *C*

Block B: *C*

Explain. *Both had velocity to the right*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *It changed direction rather than moving from a stop*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 = 0*

Explain. *Final of B must be greater*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

Object A: *H*

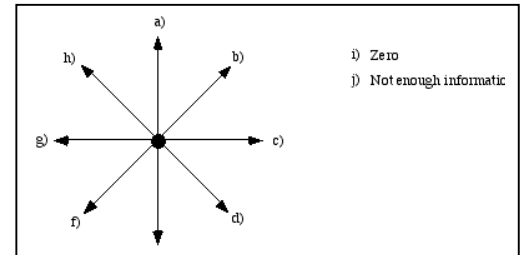
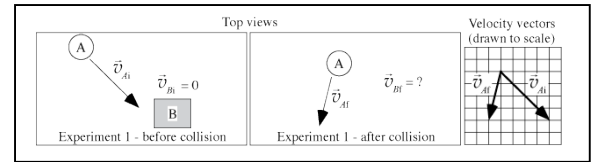
Block B: *D*

Explain. *The final velocity of A is smaller and at a smaller angle, so the change of velocity must be in the opposite direction of the initial velocity. Since B is initially at rest, its change in velocity must be in the same general direction as the velocity of A.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*greater than*

Explain. *Since the two objects act on each other, the force they have on each other must be the same so  $F=ma$  should be the same for both. Since A is smaller, it must have a greater acceleration, meaning it has a greater change in velocity.*



- i) Zero  
j) Not enough information

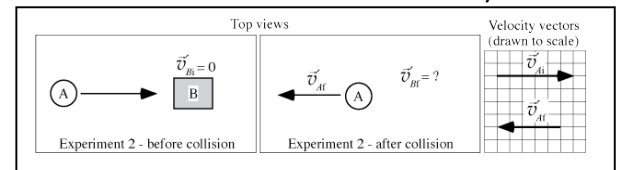
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *Final velocity minus initial velocity of a would result in a vector to the left. B would move in the direction of the force that is acting on it.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*greater than*

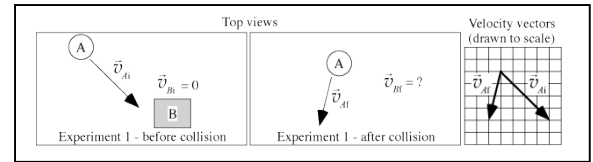
Explain. *A has a smaller mass and so it must have a greater acceleration so its change in velocity must be greater.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*999*

Explain.

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )



- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

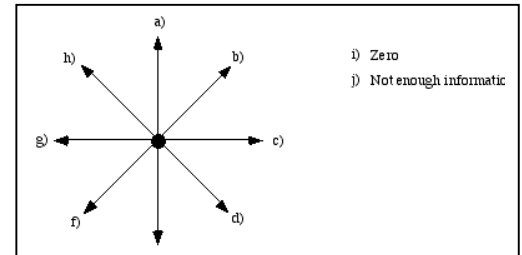
Object A: *G*

Block B: *D*

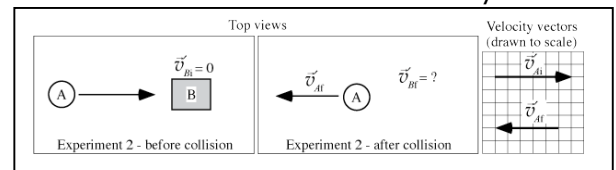
Explain. *The tip to tail for block a gives you the direction and then using intuition tells that block b moves in that directions.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*less than*

Explain. *The change in velocity for A is less than block b because block b starts from rest.*



A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.



- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *A*

Block B: *D*

Explain. *Tip to tail for block a and since b doesnt move at intially then moves so d is the vector*

- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*less than*

Explain. *Since block b is at rest, the change is greater for b*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *you have to take in account the x and y components of the veocity and since all the velocit is in the x component in part 2, part 2 is greater than part 1.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

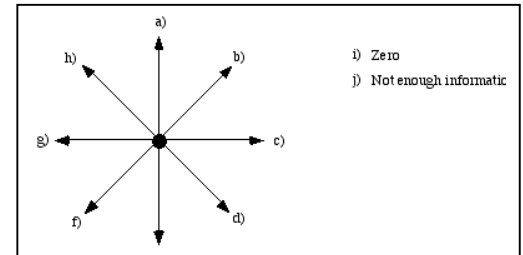
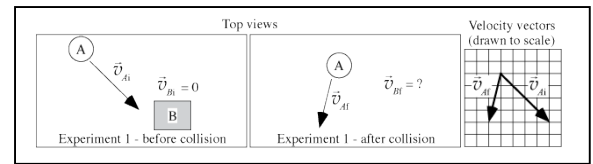
Object A: *D*

Block B: *D*

Explain. *using vector addition*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*less than*

Explain. *because block b was initially at rest, so any change in velocity for it is more important*



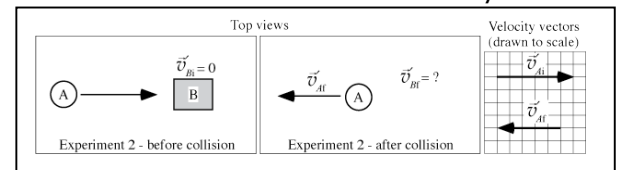
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *C*

Block B: *C*

Explain. *vector addition*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *due to conservation of momentum*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 > 0*

Explain. *intuition?*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

Object A: *E*

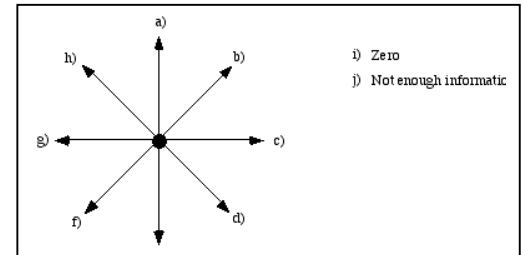
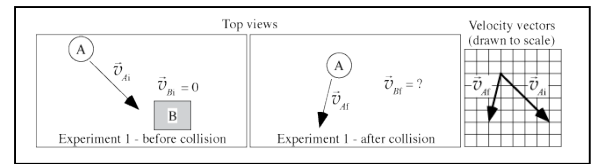
Block B: *D*

Explain. *Momentum*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*equal to*

Explain. *To conserve Momentum*



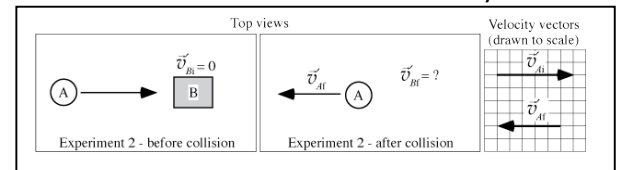
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *D*

Block B: *D*

Explain. *Because of linear momentum*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*equal to*

Explain. *To make momentum equal*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 = 0*

Explain. *Because of conservation of momentum*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

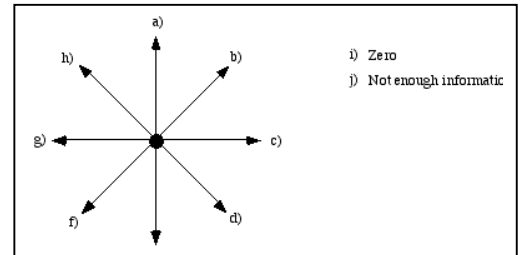
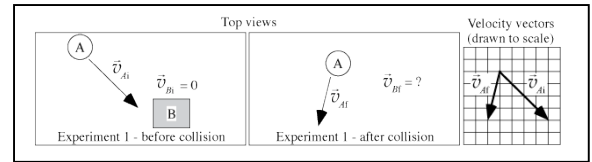
Object A: *G*

Block B: *C*

Explain. *the  $dV$  vector is to the left so *g* is a good choice for *a*. block *b* is the opposite.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *block B is six times greater mass so will require a larger force to move the same velocity; same force leads to object A with a greater velocity*



- i) Zero  
j) Not enough information

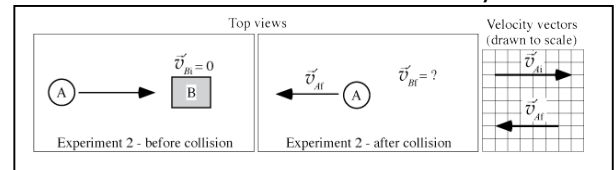
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *like before the object bounces back so the change of velocity vector is to the left while the block moves right*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*Not enough information*

Explain. *not sure because if object A bounced off with nearly the same magnitude while block B could have bounced off with greater or less velocity*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *change of velocity magnitude is greater in 2 and gives block b a positive speed*



Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

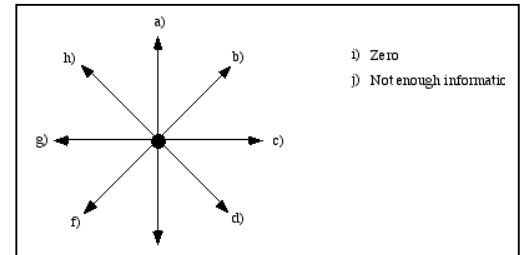
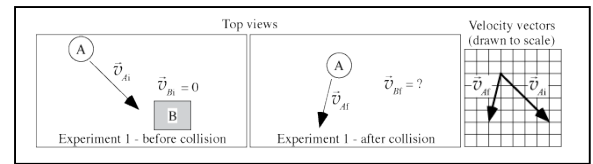
Object A: *G*

Block B: *D*

Explain. *For A, i used  $v_f - v_i$  vectors, and for B i assumed that the block would be moved in about the same direction as  $a_i$ .*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*less than*

Explain. *Object A is moving initially and object b is not. A is deflected by b and b does not move much due to its mass.*



i) Zero  
j) Not enough information

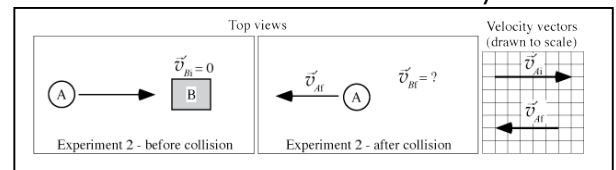
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *A*

Block B: *C*

Explain. *A is initially moving to the right and moving to the left at the end. assuming b moves, it will move the same direction as a initial.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *i am assuming that object b does not move much due to the large velocity of a after impact.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *block b is struck at an angle in expt. 1 and does not recieve all of a's force, block b in expt. 2 is struck dead on and recieves all the force possible from a.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

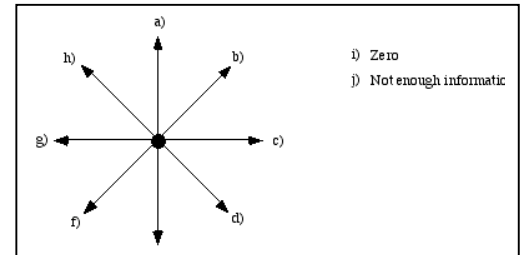
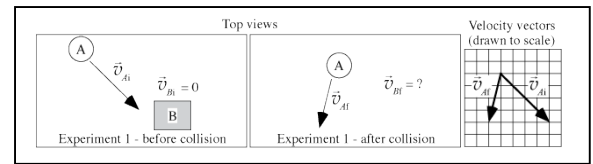
Object A: *G*

Block B: *D*

Explain.

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain.



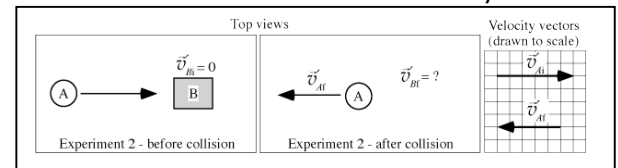
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain.



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

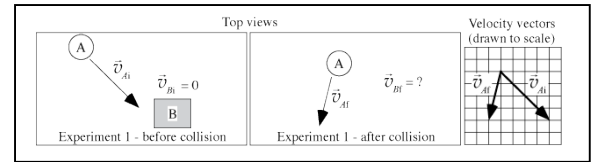
Explain.

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain.

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )



**Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

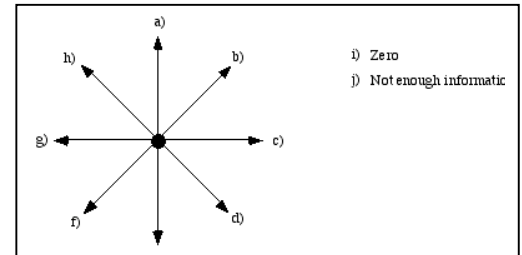
Object A: *G*

Block B: *D*

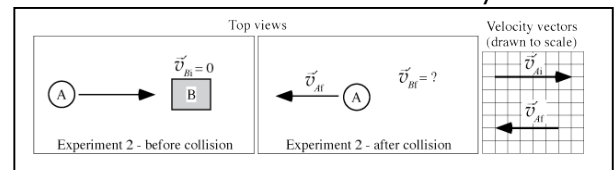
Explain. *the final velocity vectors are in between the initial and final velocity vectors*

**Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*less than*

Explain. *since block b is six times the mass of a, the change in b is greater than a*



A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.



**Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *since object a moves from far right to pretty far left, the change is to the left...block b, will move to the right to conserve momentum*

**Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *object a will have a greater change because it is of less mass and therefore will have a greater change in velocity*

**Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *the picture is obscured and i cant see the picture for experiment 1*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

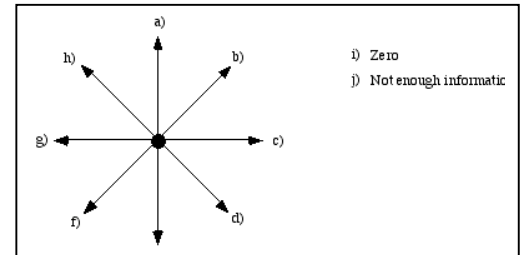
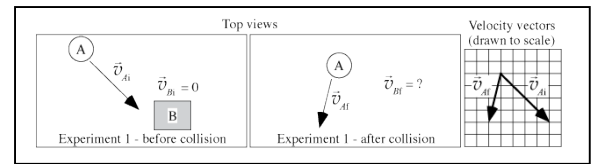
Object A: *I (zero)*

Block B: *C*

Explain. *Object A did not change, and B were to change it move along the surface away from the collision with A.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*less than*

Explain. *Block A had no change in Velocity, so even a tiny change in B would make B greater.*



- i) Zero  
j) Not enough information

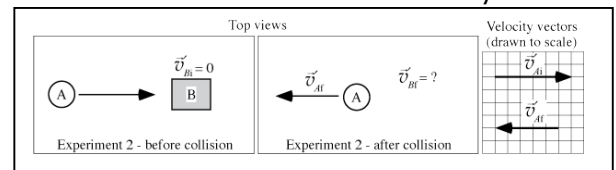
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *Object A change direction from west to east, its change is easterly. Object B did take some of object A's energy and because it was at rest it could have only moved east.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *object A reversed direction almost with the same magnitude, object B took only a small portion of A's energy, with its larger mass and small amount of energy its likely object B moved very little.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 = Final speed of block B in experiment 2 > 0*

Explain. *The velocity vectors are of the same magnitude and speed is not dependent on direction.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

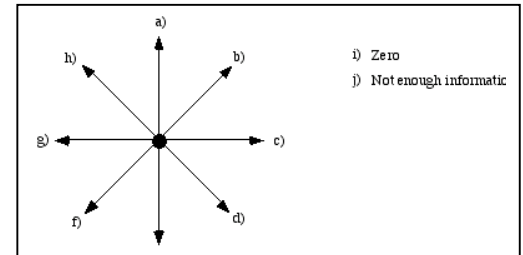
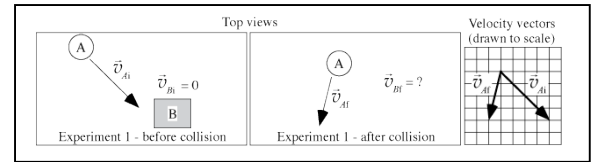
Object A: C

Block B: D

Explain. *The change is velocity is final minus initial*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *since b is heavier, it would not have move much*



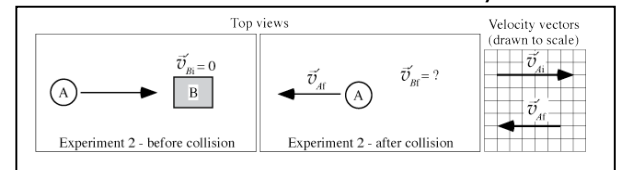
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: C

Block B: C

Explain. *since they are moving horizontally, they should have the same direction*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *with a bounding off with the almost the same speed, the energy didn't transfer much from a to b.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 > 0*

Explain. *it should be 1 greater because the change is velocity of a is greater in 1, which means more energy is transfer. And, even though b is heavy...it would still move a little..*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

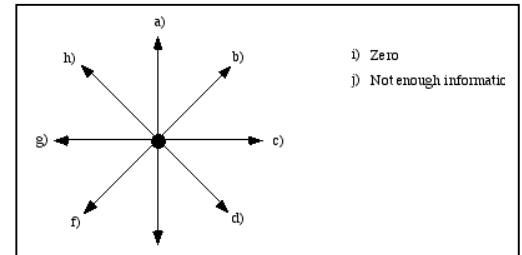
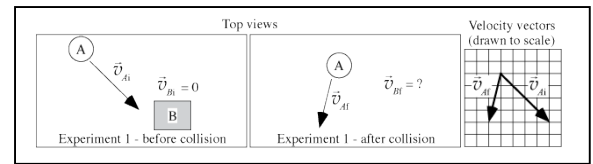
Object A: *G*

Block B: *C*

Explain. *object A moves off in one direction while object B moves in the opposite direction.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain. *they both move off at the same velocity*



- i) Zero  
j) Not enough information

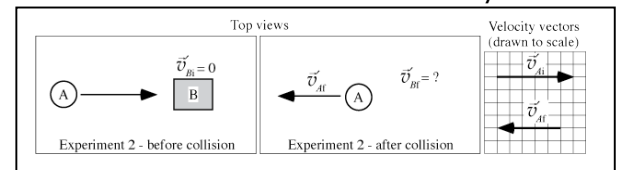
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *The two objects move in opposite direction after colliding.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *Object B was not moving while object A was giving it more momentum.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *Block B is being hit at an angle in experiment 1 and perfectly horizontal in experiment 2. This gives it more velocity.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

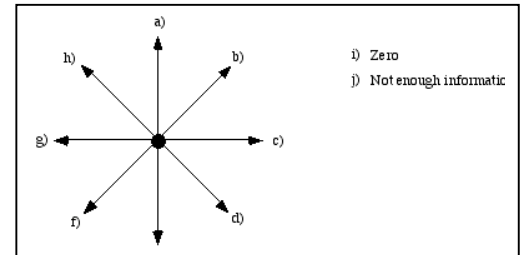
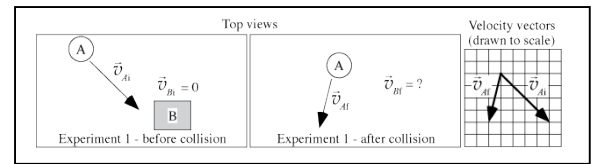
Object A: *G*

Block B: *C*

Explain.  $V_f - V_i$

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *Masses are different*



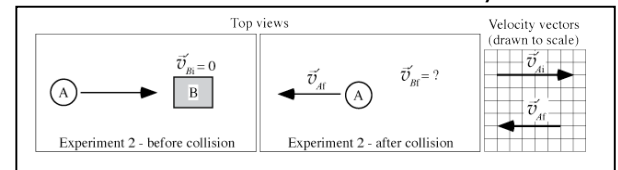
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain.  $V_f - V_i$



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *Masses are different*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *larger impulse on block B, therefore its speed is greater then in second experiment*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

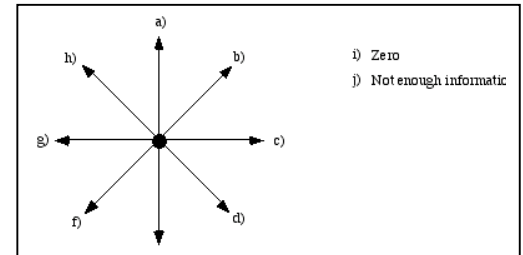
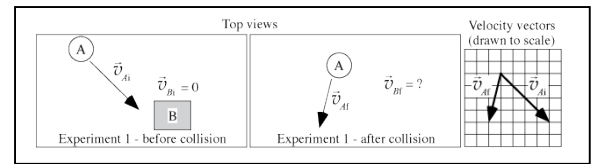
Object A: *G*

Block B: *C*

Explain. *conservation of momentum*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain. *conservation of momentum*



i) Zero  
j) Not enough information

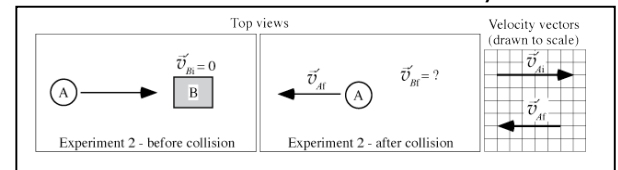
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *conservation of momentum*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*equal to*

Explain. *conservation of momentum*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *the direction and magnitude of the x-axis velocities*





Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

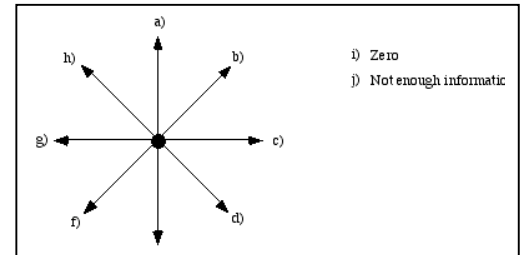
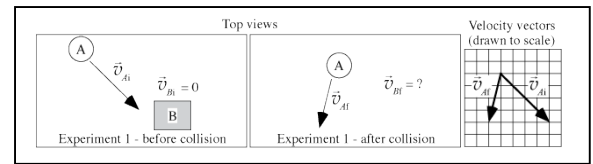
Object A: *C*

Block B: *D*

Explain. *because*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain. *not sure*



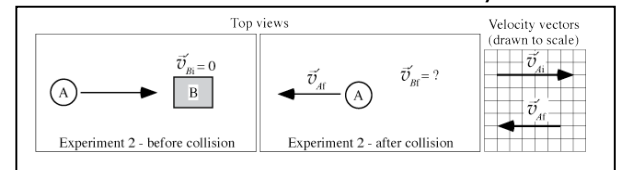
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *C*

Block B: *G*

Explain. *little confused*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*equal to*

Explain. *not sure*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 = 0*

Explain.

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

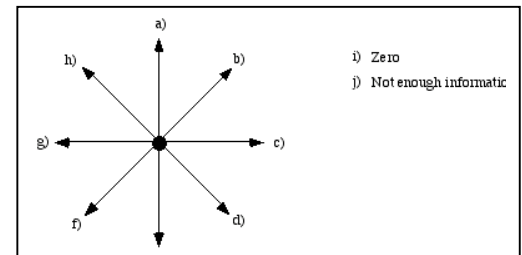
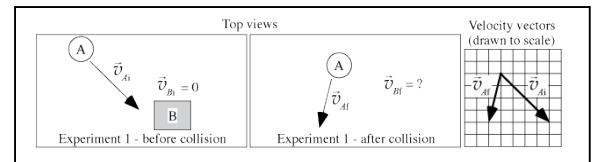
Object A: *F*

Block B: *C*

Explain. *Just the way it bounces*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *Block b weighs more than ball A*



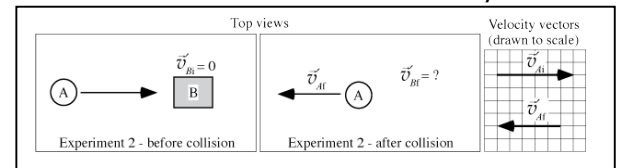
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *The block is not moving so he ball bounces back at it and the block moves to the right*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *The block doesnt move as well as the ball.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *The ball is going faster in two so it will move the block more.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

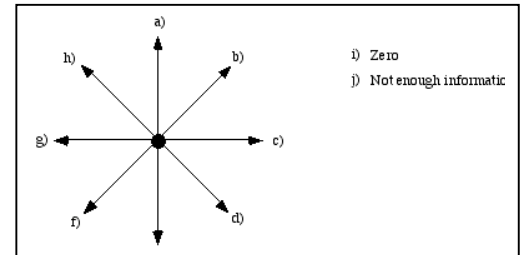
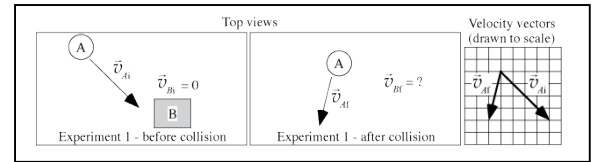
Object A: *D*

Block B: *C*

Explain. *The mass of a is bigger than the mass of b*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *Because A has more mass than B*



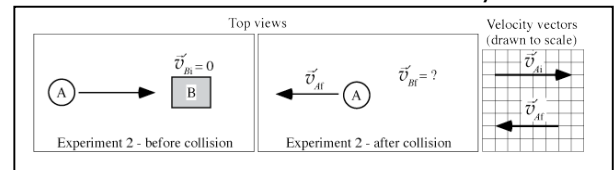
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *F*

Block B: *E*

Explain. *B is smaller than a*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *B is smaller than A*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *The speed of A will be greater*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

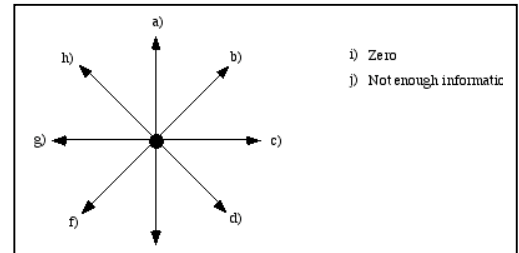
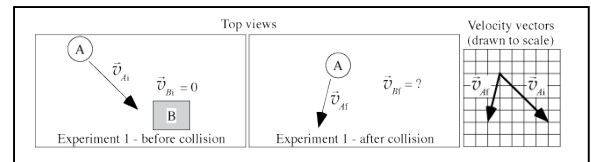
Block B: *C*

Explain. *The y component of velocity of object A is the same before and after so it only changes in the x component.  $x_{af} - x_{ai}$  is to the left. B is initially at rest and then moves to the right (it has no y component since A takes care of that).*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*greater than*

Explain. *Vchange of A is five units whereas the Vchange of B is one to make the total four.*



- i) Zero  
j) Not enough information

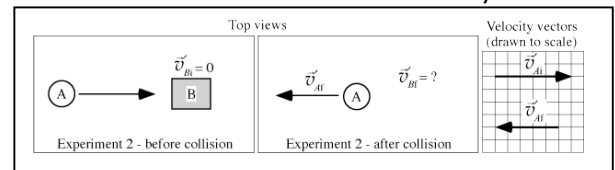
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *Final minus initial of A points directly to the left whereas B moves solely to the right after collision. There are no y components.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*greater than*

Explain. *VChange of a is about 11 units whereas B is 5.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *Vchange of experiment one is one unit; Vchange of experiment two is five units.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

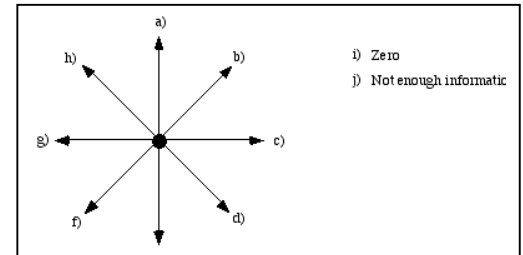
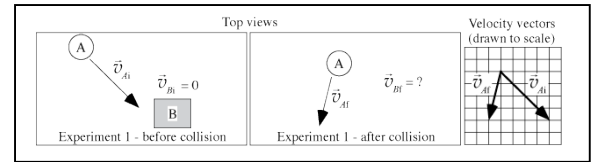
Object A: *G*

Block B: *C*

Explain. *Object A only changes velocity in the x direction. The velocity in the y direction remains the same. Therefore, to conserve momentum B must move right.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*less than*

Explain. *Block B has a greater mass than block A. Momentum is conserved, so block B must move slower than block A.*



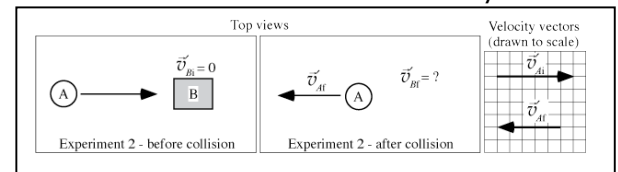
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *To conserve momentum, object B must move to the right. Vector subtraction will yield a velocity to the left for object A.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *Block B is larger than block A. Therefore, to conserve momentum block B must move slower than block A.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *The systems can both be considered in only the x direction. For this the x velocity changes larger for experiment 2 than for experiment 1, therefore there is more momentum in experiment 2 and the velocity of Block B must be larger to account for this.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

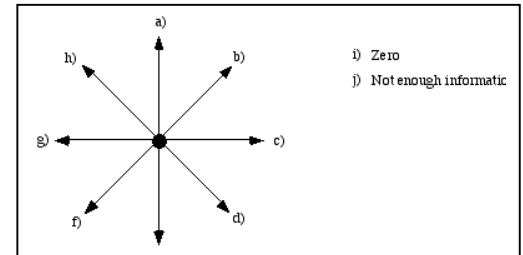
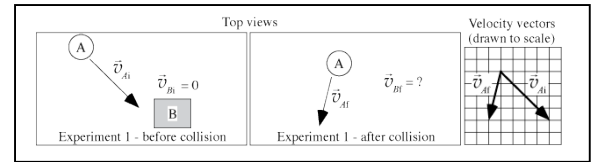
Object A: *G*

Block B: *C*

Explain. *a final has a negative momentum*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *a final is negative so b must be larger*



A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

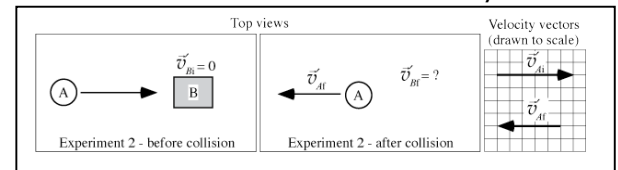
Block B: *C*

Explain. *a changes from r to l*

*b changes from rest to right*

- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *a is almost the same magnitude but in the negative position*



- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *b has to counter a higher momentum in part 2*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

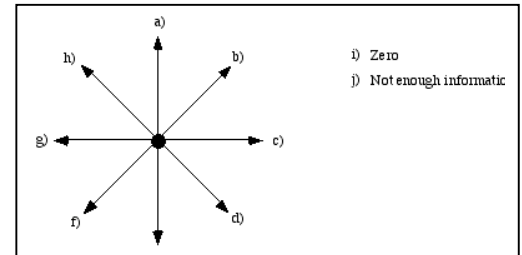
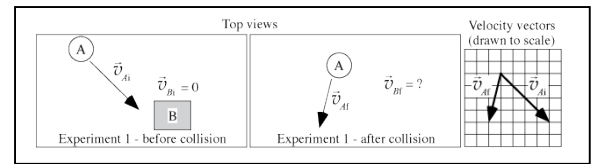
Object A: *G*

Block B: *C*

Explain. *i treated them like displacement vectors. Figured that the momentum had to stay reasonably constant.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

Explain. *object b is so much heavier*



i) Zero  
j) Not enough information

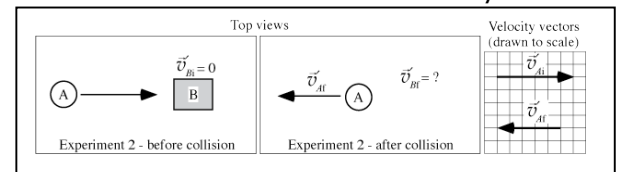
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *same as earlier. B starts moving right, and a starts moving left. I just chose the displacement vector joining the 2 points of the vectors placed start to start*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*greater than*

Explain. *b is so much heavier than a*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *A moves to the left a lot faster after the second collision than after the first, so that extra energy to change the velocity so much must have come from block b*



Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

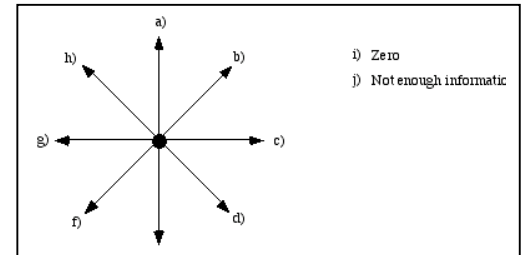
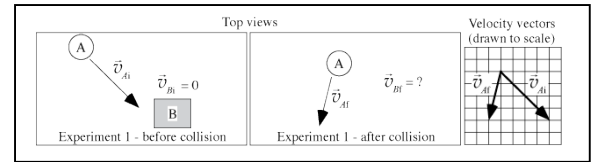
Object A: *F*

Block B: *D*

Explain. *A bounces off and goes back in the opposite direction making the change in V vector to the left. B goes off to the right to keep momentum conserved*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *since we have to conserve momentum A must be traveling faster than B to keep the equilibrium.*



- i) Zero  
j) Not enough information

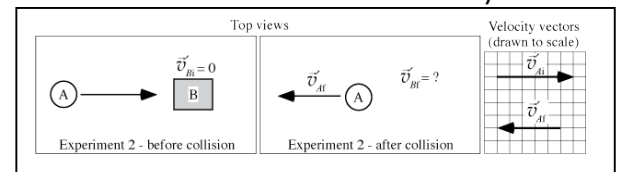
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *a bounces straight back so its delta V is straight left, B starts moving to the right so its delta V is right.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

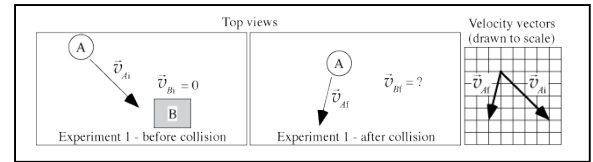
Explain. *A is much larger b/c it has an initial value, while B accelerates from rest.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 > 0*

Explain. *A has a smaller final V in experiment 1 which means that B absorbed more of its energy propelling it faster.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )



- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

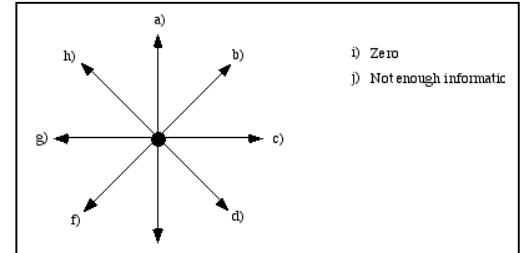
Object A: C

Block B: C

Explain. *Because object A hits block B at an angle, we can use Cosine to find the impulse direction.*

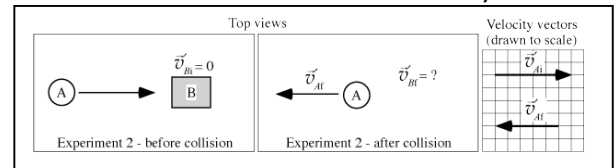
- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal* to that of block B?  
*less than*

Explain. *Because object has to completely stop and change direction, as object B just goes in one direction. Therefore, it would be less than.*



- i) Zero  
j) Not enough information

A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.



- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: G

Block B: G

Explain. *Because it goes in the left direction, it has to have a velocity change in the left direction.*

- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal* to that of block B?  
*greater than*

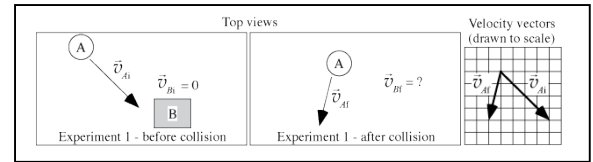
Explain. *Because object A has to completely stop and then change direction, it has to have a greater change in velocity.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *Because of the angle, the energy transfer has to be less because of less impact.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )



- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

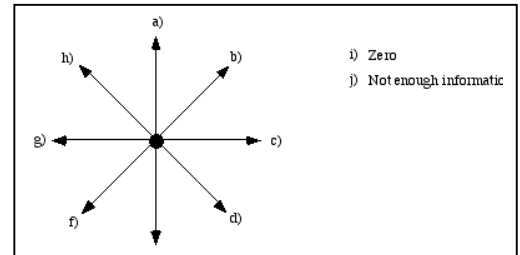
Object A: *H*

Block B: *C*

Explain. *The change in velocity is equal to the final velocity - the initial velocity*

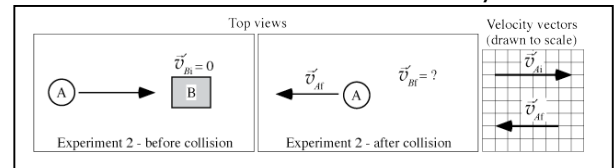
- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *Object A has an initial velocity, while object b does not. Therefore the mag in the change of velocity vector of a must be larger than b.*



i) Zero  
j) Not enough information

A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.



- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *The change in velocity vectors is equal to the initial vector - the final vector*

- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

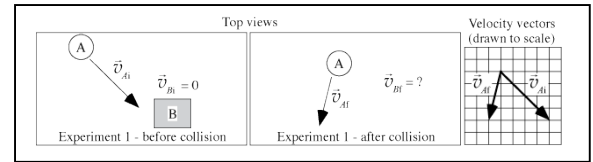
Explain. *The initial velocity of A is greater than B therefore the*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain.

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )



- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

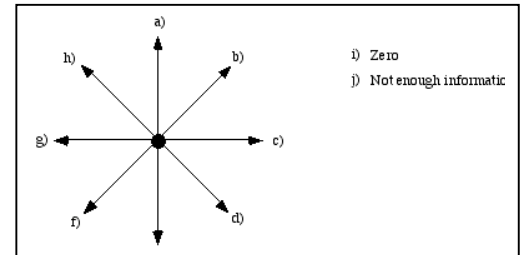
Object A: *G*

Block B: *C*

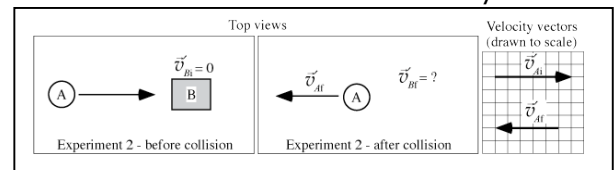
Explain. *Only the x velocity of A changes, so only the X velocity of B will change, and it will change in such a way to conserve momentum.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *The momentum change will be the same, but because B has a higher mass, its velocity will change less.*



A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.



- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *Sames as previous page.*

- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *Same as previous page.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *Change in frickin momentum!*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

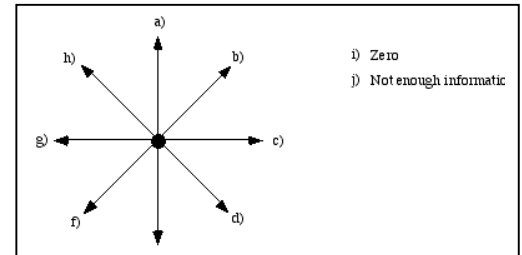
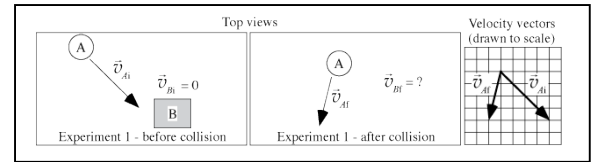
Object A: *F*

Block B: *D*

Explain. *Principles of vector subtraction and addition*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*less than*

Explain. *The final velocity of B is longer than the delta vector between the initial and final velocities of A*



- i) Zero  
j) Not enough information

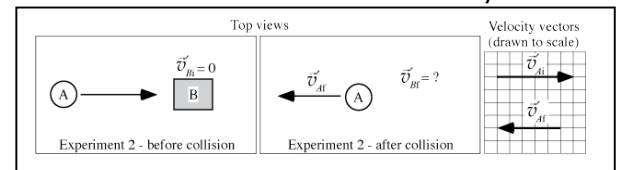
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *B must move to the right, A's change in velocity vector must be its initial plus its final.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *A must change direction*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 = Final speed of block B in experiment 2 > 0*

Explain. *The velocity vectors are approximately the same length.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

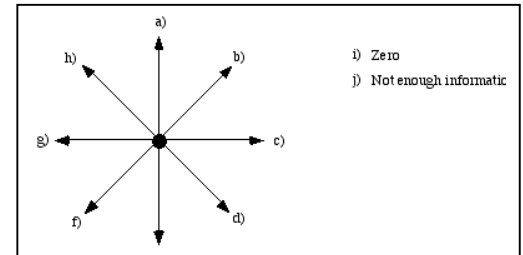
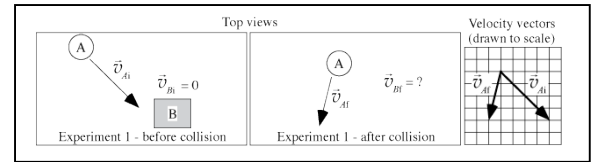
Object A: *F*

Block B: *D*

Explain. *We know the change in A by looking at the pictures and we can find B by knowing that A<sub>final</sub> and B<sub>final</sub> will be 90 degrees from each other*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *Object A changes direction so the change in velocity is going to be quite large while the change in velocity is B<sub>final</sub> since B<sub>initial</sub> isn't moving.*



- i) Zero  
j) Not enough information

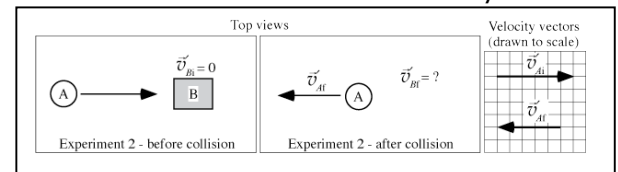
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *No angles so we know the changes are going to be g or c and we can look at how the two objects would interact.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *This is the same reasoning as it was in the previous similar problem, The fact that A changes direction gives it the greater change*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *In experiment one, block A hits B at an angle so not all of its energy will transfer. Since block A has the same initial for both we know experiment 2 will leave block B with greater Velocity.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

Object A: *A*

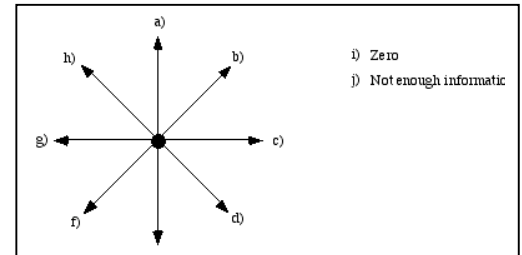
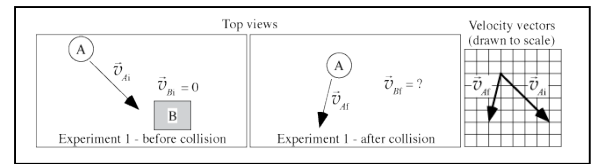
Block B: *B*

Explain. *because A comes before B*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*Not enough information*

Explain. *not enough information*



i) Zero  
j) Not enough information

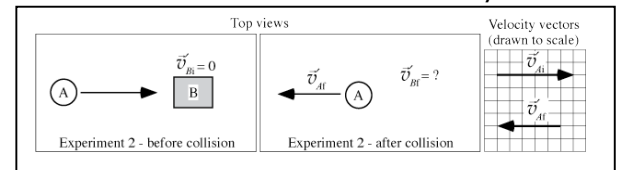
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *I (zero)*

Block B: *Not enough information*

Explain. *yeah*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*equal to*

Explain. *no*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 = 0*

Explain. *because the Final speed of block B in experiment 2 > the final speed of block B in experiment 1 = 0. Duh*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

Object A: G

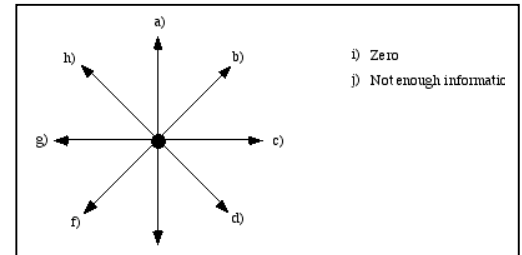
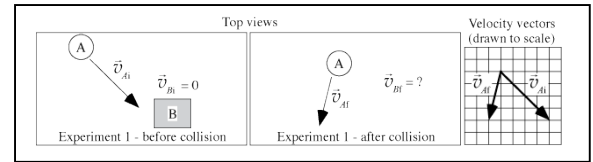
Block B: C

Explain. *Object B should go straight to the right because it's new velocity is in this direction and its initial  $v$  was zero. Object A's new velocity should be to the left because the change in velocity vector points this way (subtracting initial from final).*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*greater than*

Explain. *Greater than because B is much more massive than A and A would retain most of its velocity and only lose some of it to B.*



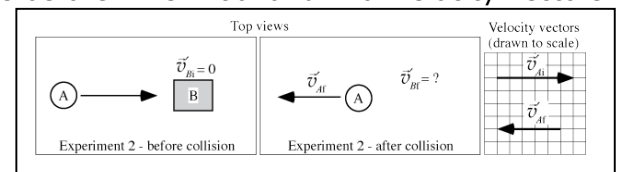
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: G

Block B: C

Explain. *Same reasoning as before.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*equal to*

Explain. *I think A only loses one value of velocity during the collision and B gains that value; thus they're equal. Perhaps I am thinking too much about momentum conservation; perhaps I'm wrong.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 > 0*

Explain. *A has a lesser x-direction velocity in experiment 1 after the collision than in experiment two and thus B must have a greater x-directed velocity for ex. 1 than in ex. 2.*



Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

Object A: *D*

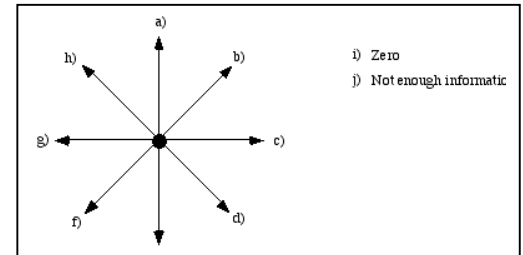
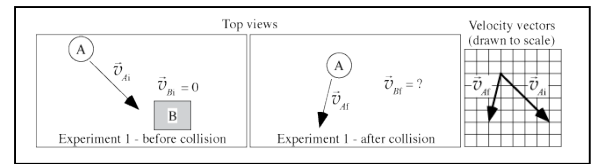
Block B: *D*

Explain.

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*equal to*

Explain.



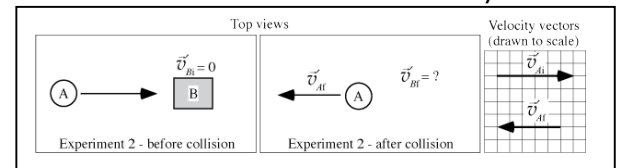
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain.



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*equal to*

Explain.

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 > 0*

Explain.

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

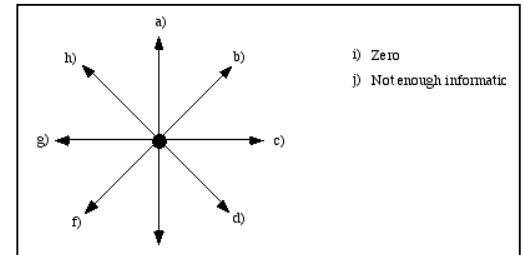
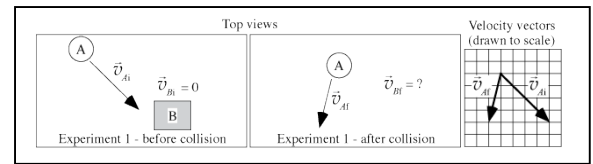
Object A: *G*

Block B: *C*

Explain. *because it is simple vector addition*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain. *Conservation of momentum plays a key role in figuring this out*



- i) Zero  
j) Not enough information

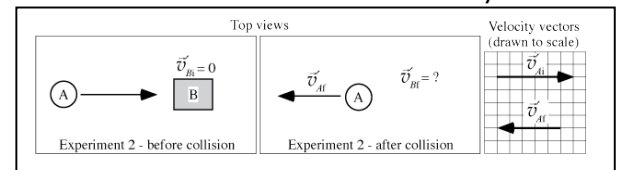
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *A*

Block B: *C*

Explain. *Vector addition*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *because it switches directions completely, so it must be greater*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *speed has to be greater than zero and there is a bigger change in momentum for block A in the second experiment, and since the mass is the same it has to be a bigger change in  $v$ , which is greater for block B due to the conservation of momentum*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

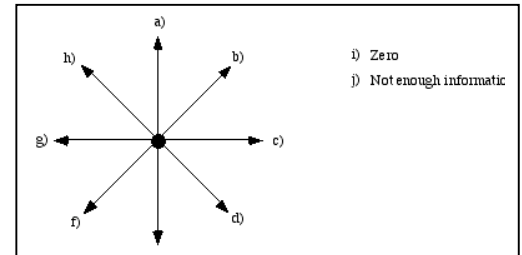
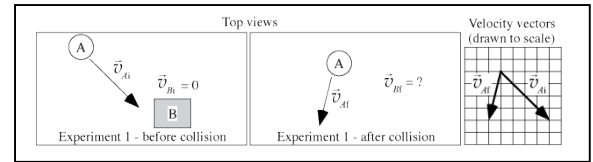
Explain. *For object A, I just took the difference between  $V_{Ai}$  and  $V_{Af}$  vectors.*

*I thought that B had to move in the opposite direction of the vector I found.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*greater than*

Explain. *Object A is much lighter than B.*



i) Zero  
j) Not enough information

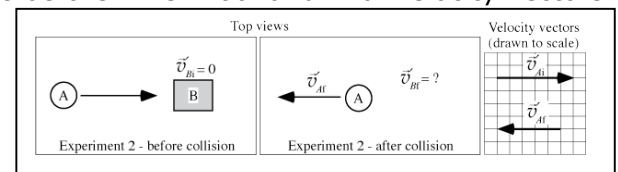
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *Like previously, I just took the difference of the vectors  $V_{Ai}$  and  $V_{Af}$  and same for B.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*less than*

Explain. *A is lighter than B.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *the velocity from A before the collision has the same direction as B for the 2nd experience contrary to the 1st one.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

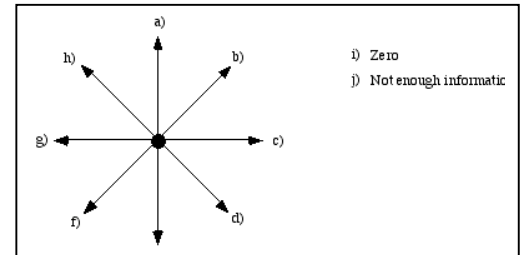
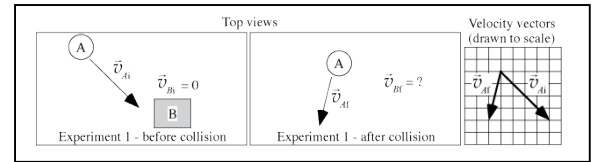
Object A: *G*

Block B: *D*

Explain. *common sense.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *mass is smaller*



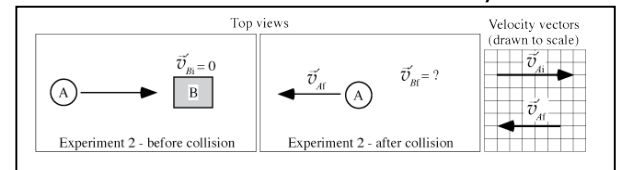
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *movement along one axis*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

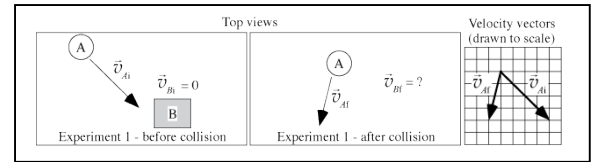
Explain. *mass smaller*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 > 0*

Explain. *because*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )



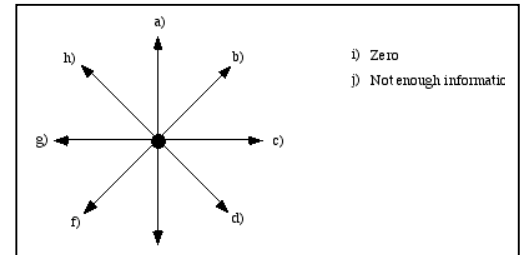
- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *just looking at it thats the way it looks like they would*

*go*

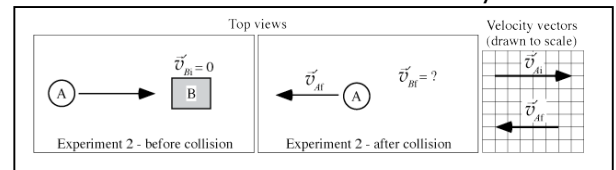


- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*equal to*

Explain. *shouldn't the whole system be equal to zero*

A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.



- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *a moved back the way it came from and b moved with a lot of force back the other direction*

- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*less than*

Explain. *object b was moving with nearly twice the force wasn't it*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 = Final speed of block B in experiment 2 > 0*

Explain. *just a gut feeling*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

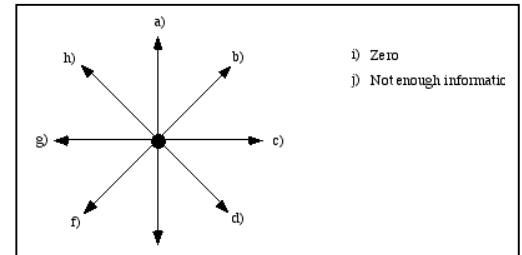
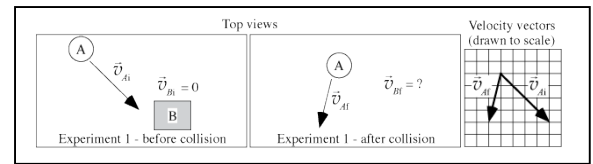
Object A: *H*

Block B: *C*

Explain. *tip to tail and there is no y direction only a difference in the x direction*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

Explain. *kinetic energy will be conserved*



- i) Zero  
j) Not enough information

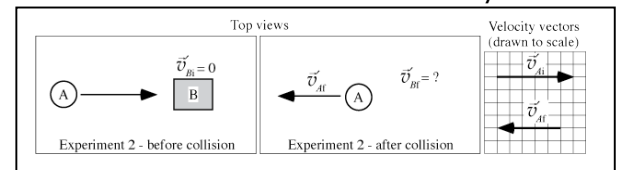
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *they are opposite*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*less than*

Explain. *they have to cancel so there must be twice the amount in b*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 > 0*

Explain. *because there is a greater difference in the x directions for 1 and they are both greater than zero.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

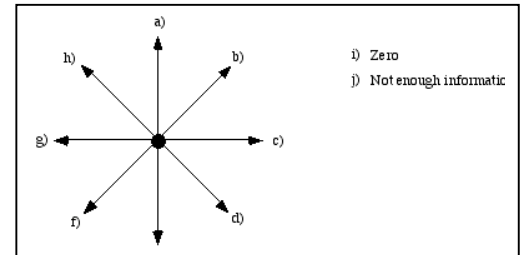
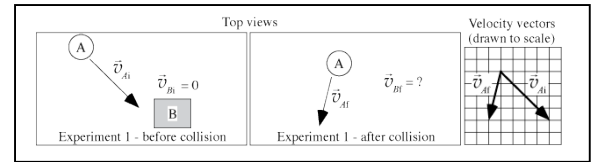
Object A: *F*

Block B: *D*

Explain. *The objects react at a 90 degree angle.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*less than*

Explain. *B was not moving initially.*



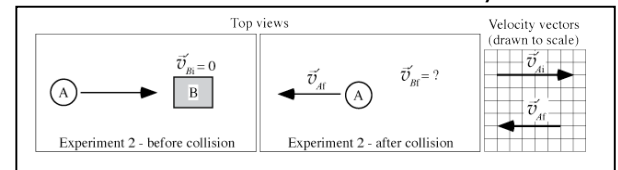
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *They hit straight on so they go in opposite directions.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?  
*greater than*

Explain. *A goes from positive to negative.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *Block B moves in both experiments, but experiment 2 gives more force to block B.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

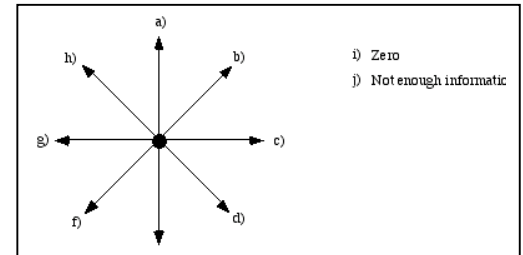
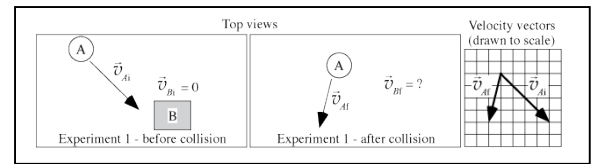
Object A: *G*

Block B: *C*

Explain.  $m\vec{v} + m\vec{v} = m\vec{v}_f + m\vec{v}_f$

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain. *conservation of momentum*



i) Zero  
j) Not enough information

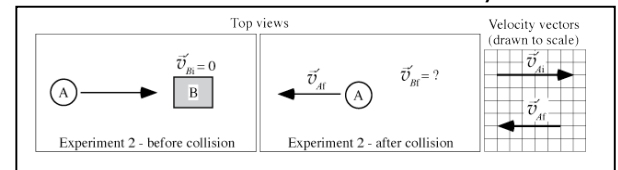
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *conservation of momentum*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?

*less than*

Explain. *B has to overcome A to bounce it back almost at the same V*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 = Final speed of block B in experiment 2 = 0*

Explain. *momentum and energy are conserved*



Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

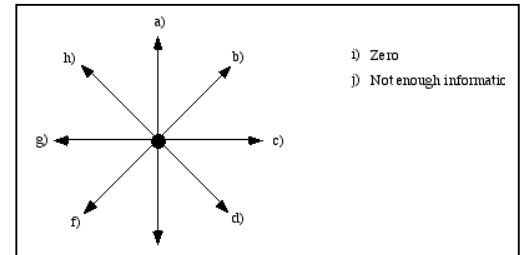
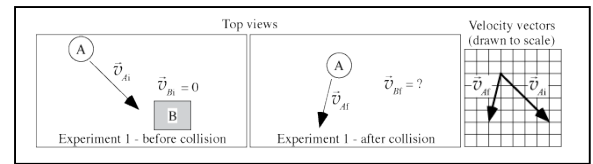
Object A: *E*

Block B: *C*

Explain. *Vector addition*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*equal to*

Explain.



i) Zero  
j) Not enough information

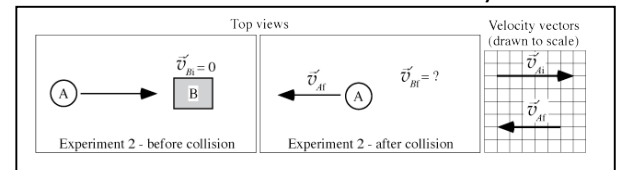
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *D*

Block B: *F*

Explain. *vector addition*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *A starts going in the opposite dir*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 1 = Final speed of block B in experiment 2 > 0*

Explain. *Vector addition and change in A = opp change in B*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

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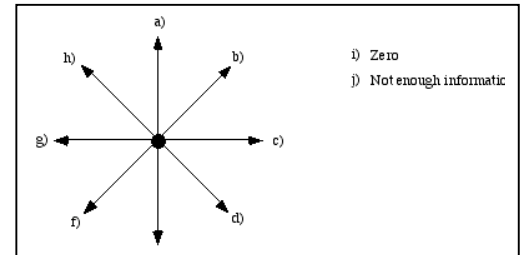
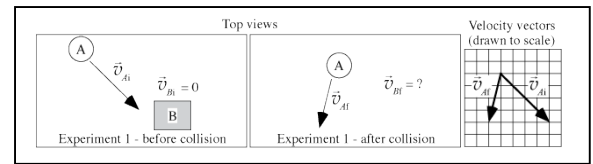
Object A: G

Block B: C

Explain. *The change in vectors of the ball appeared to be straight right, and since it was on a table the velocity of the box would be in the opposite direction.*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *The momentum changes of the two are equal, but since the ball is lighter its velocity would change more. Plus it changed direction totally, box B started from rest.*



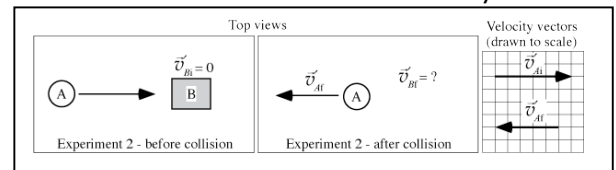
A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.

- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: G

Block B: C

Explain. *The ball is initially traveling right and then ends up going left, meaning that its change in velocity is to the left, and the box has to be opposite that.*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *A is traveling in one direction and then in the total other direction, meaning great change, and the heavier B ends up moving slower and started from rest.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *A is going straight on in experiment 2 meaning more direct force to move B than in the first experiment.*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )

- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

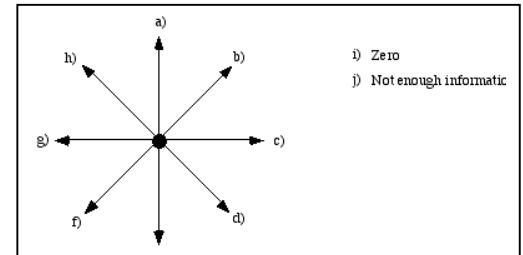
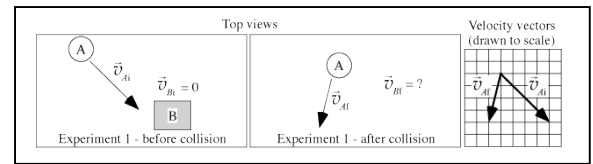
Object A: C

Block B: C

Explain. *Conservation of momentum*

- Q6.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

Explain. *From the law of conservation of momentum*



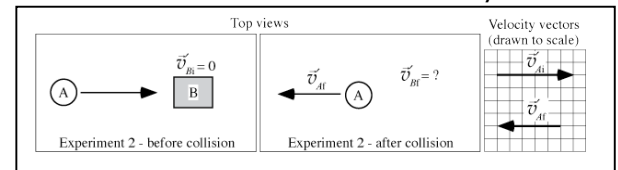
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- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: G

Block B: C

Explain. *Conservation of momentum*



- Q10.** Is the magnitude of the change in velocity of object A *greater than*, *less than*, or *equal to* that of block B?  
*greater than*

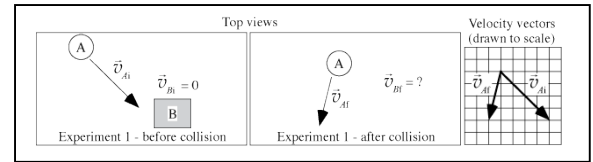
Explain. *Because momentum before the collision must equal momentum after the collision*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF}'$ ) in the two experiments?

*Final speed of block B in experiment 1 > Final speed of block B in experiment 2 > 0*

Explain. *To Make Momentum Conserved*

Two objects are arranged on a level, frictionless table as shown. An experiment is conducted in which object A is launched toward the stationary block B. The initial and final velocities of object A are shown. The mass of block B is six times that of object A. ( $m_B = 6m_A$ )



- Q4.** Which arrows indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

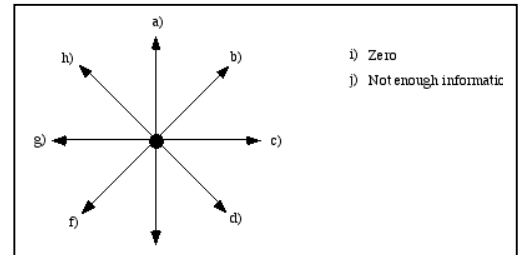
Explain. *Adding vectors for Object A*

*Change in velocity of system must be equal, so that of Object B is opposite.*

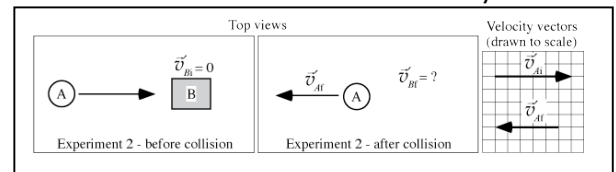
- Q6.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*greater than*

Explain. *Conservation of momentum - object B is six times heavier so it will not be moving as quickly as A.*



A second experiment is conducted in which object A is launched in a different direction toward the stationary block B. The initial speed of object A is the same as before. The initial and final velocity vectors of object A are shown in the diagram.



- Q8.** Which arrows (above) indicate the directions of the change in velocity vectors of object A and block B?

Object A: *G*

Block B: *C*

Explain. *Same as before except more straightforward (no pun intended)*

- Q10.** Is the magnitude of the change in velocity of object A *greater than, less than, or equal to* that of block B?

*greater than*

Explain. *Momentum again - Block B will not be moving forward nearly as much as object A will be moving backwards.*

- Q12.** What statement correctly characterizes the final speeds of block B ( $v_{BF}$  and  $v_{BF'}$ ) in the two experiments?

*Final speed of block B in experiment 2 > Final speed of block B in experiment 1 > 0*

Explain. *Momentum: the change in velocity of block A in experiment 2 is much greater. This will be reflected in the final momentum (and velocity) of block B.*