Name:_____ Period:____

Projectile Motion Homework

Show your work on a **separate paper** for all questions on this page. Answers/Help can be found in McGraw Hill Ch 6. Section 1. Projectile Motion p.152

Essential Questions:

1. How are the vertical and horizontal motions of a projectile related?
2. What are the relationships between a projectile height, time in the air, initial velocity, and horizontal distance traveled?

Vocabulary
Define the following terms:

1. Acceleration due to Gravity
2. Dependent
3. Freefall
4. Horizontal
5. Independent
6. Parabolic
7. Projectile
8. Projectile Motion
9. Trajectory
10. Vertical

Problems: See Example Problem 1 p.155

1. You are preparing breakfast and slide a plate on the countertop. Unfortunately, you slide it too fast, and it flies off the end of the countertop. If the countertop is 1.05 m above the floor and it leaves the top at 0.47 m/s, how long does it take to fall, and how far from the end of the counter does it land? (Use **GUESS** method.)

2. A ball rolls off the edge of a table that is 1.15 meters high. The ball lands 0.65 meters from the base of the table. Calculate the ball's horizontal velocity as it left the tabletop. Ignore air resistance. (Use **GUESS** method.)

3. A stunt car in a movie drives horizontally off a cliff at 26.2 m/s and lands 42.5 meters from the base of the cliff. Calculate the height of the cliff. (Use **GUESS** method.)

4. A stone is thrown with a horizontal velocity of 37 m/s from a tower with a height of 20 m. Calculate the distance from the base of the tower to where the stone lands. Ignore air resistance. (Use **GUESS** method.)

5. A collision cart runs off the edge of a lab table that is 0.95 m high. The cart lands 0.40m from the base of the table. How fast did the collision cart leave the table? (Use **GUESS** method.)

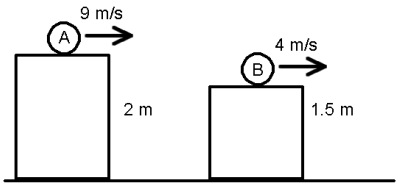
6. A baseball is thrown horizontally from a cliff at 15 m/s and lands 32 m from the base of the cliff. How high is the cliff? (Use **GUESS** method.)

Answer Bank:
0.91 m/s; 1.34 m/s; 74.75 m; 0.46s; 0.34 m; 22.30 m; 12.9

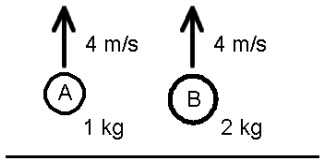
Name: _____

Period: _____

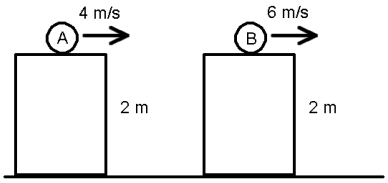
Projectile Motion Comparisons



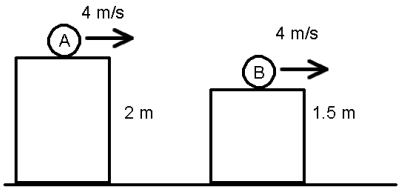
1.Which one hits the ground first?



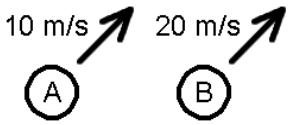
2. Which has the greater maximum height?



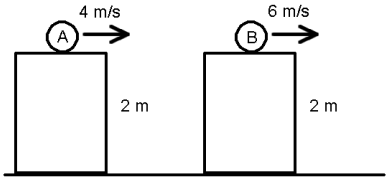
3. Which one has the greatest range (lands farthest from the table)?



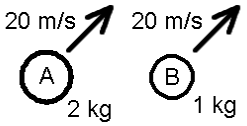
4. Which one has the least range (land closest to the table)?



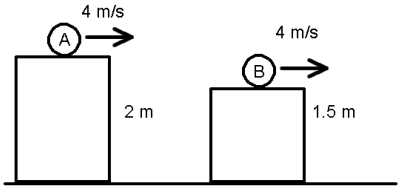
5. Which as the greater maximum height?



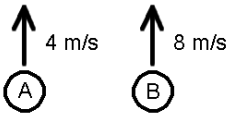
6. Which one has the greatest acceleration when it leaves the table?



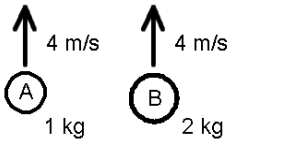
7. Which has the greater maximum height?



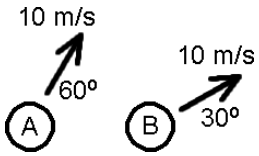
8. Which one hits the ground last?



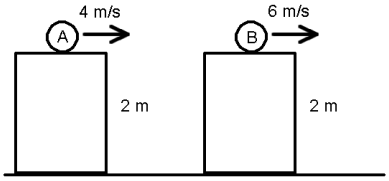
9. Which has the greater maximum height?



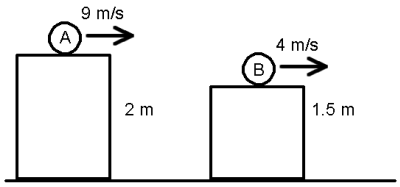
10. Which has the greater speed at the top of its path?



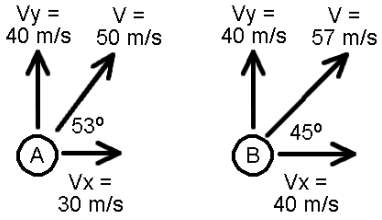
11. Which has the lesser maximum height?



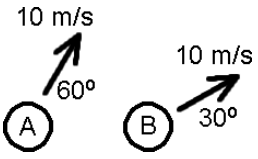
12. Which one hits the ground first?



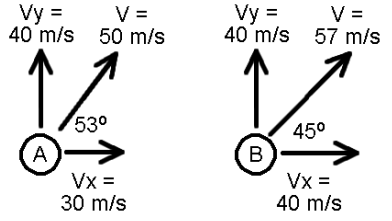
13. Which one has the greater vertical displacement?



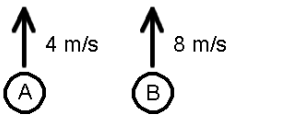
14. Which one has the smaller maximum height?



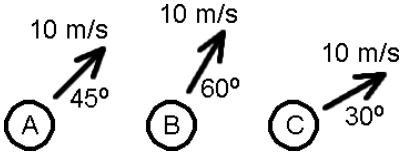
15. Which has the greater vertical acceleration?



16. Which one has the greater range?

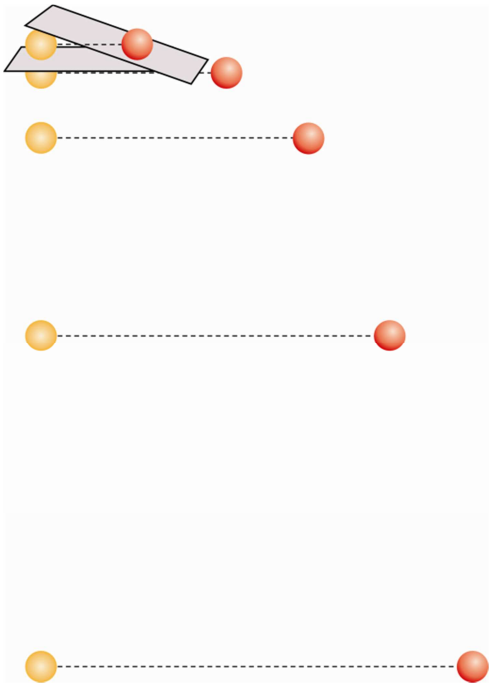


17. Which has the greater acceleration?



18. Which has the greater range?

Vertical and Horizontal Projectiles



1. How do the vertical velocities of the two balls compare?

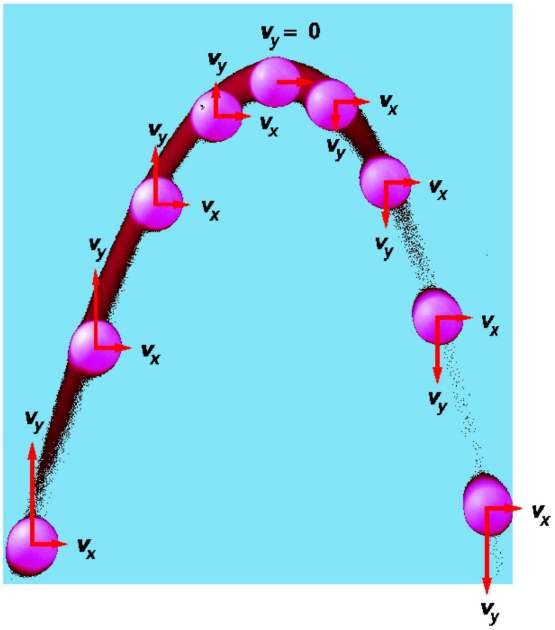
2. How do the accelerations of the two balls compare?

3. How does the red ball's horizontal motion affect its vertical motion?

4. How do you know that the vertical velocity of both balls is greater near the bottom of the figure than it is at the top of the figure?

5. How do you know that the horizontal velocity of the red ball is constant from the top of its fall to the bottom?

The Trajectory of a Projectile



6. At what point is the magnitude of the ball's velocity vector the smallest? Why?

7. What can be said about the relationship between the vertical component of the ball's velocity at the moment it leaves the ground and the moment it returns to the ground?

8. What can be said about the relationship between the horizontal component of the ball's velocity at the moment it leaves the ground and the moment it returns to the ground?

9. For each graph below, draw a line that represents the appropriate position of the ball as a function of time.