

Applied Physical Science - Individual Presentation Follow-Up Assignment

Name: _____

Section 1 - Bowling Ball Physics

1. What is meant by "moment of inertia?"
2. Two bowling balls have the same diameter and mass. One is solid (one material throughout), and the other has a light core with a dense coverstock. Which has the greater moment of inertia?
3. Given the two balls in question 2, which would roll faster down an incline?
4. Does a figure skater with his/her arms out have a *greater* or *lower* moment of inertia than when he/she has his/her arms in?
5. What is the law of Conservation of Angular Momentum, and how does it apply to a spinning figure skater?
6. What is meant by the "radius of gyration" of a bowling ball?
7. What is meant by the "differential radius of gyration" of a bowling ball?
8. Would a bowling ball with a spherical core have a higher or lower *differential radius of gyration* than a ball with a cylindrical core?
9. TJ uses two different bowling balls. One he uses when he wants the ball to curve a lot, and the other he uses when he wants the ball to go straight (to pick up spares). Which ball has a greater differential radius of gyration?
10. What coverstock materials are bowling balls made of, and which ones are better for making the ball curve down the lane?

Section 2 - Ballistics

1. What is meant by the *ballistic trajectory* of a bullet?
2. What is a *ballistics chart*? What does it show? Sketch an example ballistics chart.
3. What does it mean for a rifle to be "sighted in" at a given distance?
4. If a rifle is sighted in at 200 yds, and a target is placed at 100yds, will the rifle shoot high or low?
5. If a rifle is sighted in at 200 yds, and a target is placed at 300 yds, will the rifle shoot high or low?
6. Explain how the parabolic nature of a bullet's path affects a shooter's ability to hit a target *further* than the sighted-in distance much more than it affects the shooter's ability to hit a target *closer* than the sighted-in distance. Sketch a picture to help explain.