

“Chemistry Olympics” - Have a Ball with Chemistry

National Chemistry Week 2008 - Cleveland Style

Chemistry is part of an athlete's success,
contributing to better clothing, nutrition, and equipment, including balls!
Answer the following, and reward yourself with the medals provided.

- 1) In professional baseball, what material are bats made of?**
- a) wood
 - b) aluminum
 - c) plastic

It's (a). These have different properties like compressibility. It's believed that aluminum makes the ball go too fast so wood is safer.

- 2) In professional basketball, the outer cover of the ball is:**
- a) man-made microfiber composite
 - b) leather
 - c) cellulose

It's (b). Leather was used by the NBA for years, then a man-made composite was used; the players didn't like it, so they switched back to leather. Although leather is natural, it is tanned using chemical processes.

- 3) What happens if you drop a 10-pound bowling ball and a penny in a sink full of water?**
- a) they will both sink
 - b) they will both float
 - c) the ball will float and the penny sink.

It's (c). Bowling balls between 8 and 11 pounds are less dense than water; they displace or take up more room than a gallon of water which weighs about 8 pounds.

- 4) If you hold a smaller ball (ex. tennis ball) on top of a larger ball (ex. basketball) then drop them at the same time, what will happen?**
- a) they'll hit the floor and bounce back
 - b) they won't bounce at all
 - c) after the big one hits the floor, the top one will head up toward the ceiling

It's (c). The bottom one hits the floor first and rebounds and “pushes” up the little one.
<http://www.exploratorium.edu/baseball/basketball.html>

- 5) Do you think a baseball pitch at 90 miles per hour (mph), is fast? Badminton birdies can go as fast as:**
- a) 150 mph
 - b) 130 mph
 - c) 100 mph

It's (a). They have been clocked at over 150 mph; using a racket gives extra punch.

6) Hockey goalies now wear light-weight, synthetic (man-made) protective padding; their old leather pads soaked up to how many pounds of sweat during a game?

- a) 1 pound
- b) 3 pounds
- c) 7 pounds

It's (c). New, wickable materials allow sweat to escape or evaporate.

7) The fastest ball sport in the world is:

- a) jai alai (pronounced hi-lie)
- b) baseball
- c) football

It's (a). In jai alai, a ball is caught and thrown at speeds up to 188 mph with a wicker scoop. A scoop makes your throwing arc longer, adding speed.

8) To hit a baseball farther should you:

- a) use a heavier bat
- b) swing the bat faster
- c) bend your knees more

It's (b). The ball gets energy from the bat; the bat gets more energy from swinging it fast than by being heavier.

<http://www.worsleyschool.net/science/files/homerun/homerun.html>

9) The shapes on a soccer ball look like the molecules:

- a) cyclo-pentane, a 5-unit ring of carbon atoms
- b) cyclo-hexane, a 6-unit ring of carbon atoms
- c) both

It's (c). You can look at these structures on-line.

10) You can make a "dilatant" polymer ball at home, using white glue, Borax, and water.

It will:

- a) ooze when sitting
- b) ooze when handled
- c) stay solid all the time

It's a). A dilatant gets stiff under pressure or handling, and oozes when sitting.

<http://www.newton.dep.anl.gov/askasci/mole00/mole00802.htm> To make an ooze ball, check out the directions in the book **What's the Matter in Mr. Whiskers' Room? by M. Ross** available at your local library. Use the keywords "sports" and "science" in "all juvenile materials" to find great books.