



Experiments: contest

1. A potato is floating in salted water. The potato is cut in half and dropped into the water.

Where will the potato be after a couple of hours?

- A. on the surface of the salted water
- B. at the bottom of the salted water
- C. in the middle of the salted water

Answer B: When half of the potato is dropped into the water it will still float because the density stays the same. But after already half an hour it will sink to the bottom due to 'osmosis'. Water in the potato will migrate to the more concentrated solution around the potato. So the potato will shrink, the volume decreases, the density increases and the potato will sink to the bottom.

2. An hour-glass is floating in a tube filled with water.

What will happen with the hour-glass if the tube is turned upside-down?

- A. it immediately sinks to the bottom
- B. it stays on the surface of the water
- C. after a while, it sinks to the bottom

Answer C: When the tube is reversed the upper part of the hour-glass is filled with sand. Owing to this the hour-glass is pushed against the inner side of the tube. This gives a little bit of friction, just enough to keep the hour-glass at the upper part of the tube. When the sand is going to the lower part of the hour-glass this friction decreases and the hour-glass sinks to the bottom. This takes about 30 to 50 seconds.

3. A Coke bottle is placed on a double inclined plane. When you let it roll, it takes about 30 seconds to stop.

When you shake it vigorously and then do the same, it will stop after:

- A. the same amount of time
- B. a shorter amount of time
- C. a longer period of time

Answer B: When you shake the coke bottle then CO₂-bubbles are released by the liquid. This creates a higher pressure above the liquid and due to the law of Pascal the liquid is pushed against the inner side of the bottle. So friction will slow down the movement of the bottle.

4. Three cups (a, b and c) are placed on the table. When you pour water in a nothing happens. When you pour cup a into cup b it colours purple. When you pour cup b into cup c the liquid becomes again colourless?

What did we put before into the cups?

- A. a: NaOH b: phenolphthalein c: HCl
B. a: phenolphthalein b: HCl c: NaOH
C. a: HCl b: NaOH c: phenolphthalein

Answer A: Phenolphthalein is an indicator that turns purple in a soda solution. When this solution is mixed with HCl the solution is neutralised and the colour disappears.

5. An aluminium ash-tray is spinning. When you hold a super magnet nearby, it will stop due to Lenz' law (Foucault).

What will happen if you hold the magnet to the middle of the ash-tray?

- A. it continues spinning for a while
B. it stops
C. it starts spinning in the other direction

Answer A: A changing magnetic field causes eddy currents in a conducting device. These currents generate a magnetic field that opposes the change. When one holds the magnet close to the rotation axis of the ash-tray, all fields and changes are symmetric around this centre of rotation, hence the net result will be zero: it continues spinning in the same way it did before (it does NOT stop very quickly)

Some statistics: 121 people participated

Score	How many?	Question...	How many right answers.
5/5	12	1	28
4/5	33	2	79
3/5	38	3	36
2/5	24	4	89
1/5	13	5	78