

Exercises for the Top Scientific Principles

1. **What would happen if you belched in Antarctica?** (By the way, the freezing temperature of CO₂ is -109° F and Antarctica can get below -140° F) (a) The carbon dioxide in the burp would freeze into a solid (b) The carbon dioxide in the burp would sublime (c) Nothing special (d) The oxygen and carbon dioxide would liquefy into carbon trioxide (e) Are you serious?
2. **When you cap a lit candle in a glass jar, what happens?** (a) The flame eventually goes out because fire eats air and the flame runs out of oxygen, which is required for combustion (b) Nothing special (c) The flame gets brighter and lasts longer (d) An explosion takes place that shatters the jar
3. **What is the difference between a light bulb and a laser beam?** (a) The laser is a focused beam while the bulb is a scattered beam (b) The laser is a scattered beam and the bulb is a focused beam (c) Lasers emit photons and bulbs emit only electrons (d) This is why I dropped out of science (e) They're both breakable and not allowed anywhere near my kids
4. **Which one generates light by electrifying a gas?** (a) Incandescent bulb (b) Neon sign (c) Fluorescent bulb (d) Car headlight
5. **What happens when you scuff across the carpet in socks on a dry day?** (a) You can zap your kids (b) You store up an electric charge in your body (c) You store up extra neutrons in your body (d) The same thing that happens to blankets in the dryer
6. **What is an atom made up of?** (a) Photons, electrons, and positrons (b) Neutrinos, positrons, and bosons (c) Protons, neutrons, and electrons (d) Gluons, muons, and gravitons (e) What on earth is a boson?
7. **Which are the three primary colors of light?** (a) Red (b) Blue (c) Green (d) Yellow (e) Pink

8. **If you inflate a balloon (don't tie the end) and let it go, which direction does the air in the balloon and the balloon itself travel?** (a) Both the same way (b) In opposite directions (c) Nothing happens (d) Inside-out
9. **What happens if after a tank of oxygen leaks and fills an entire room, you walk in and strike a match?** (a) Nothing (b) BOOM!!! (c) The match will burn brighter (d) I don't even want to know
10. **When you combine baking soda and vinegar together, what happens?** (a) Bubbles foam up (b) It belches (c) Carbon dioxide gas is released (d) It produces a chemical reaction that can propel a rocket skyward
11. **If you blow up a balloon and stick it in the freezer, what happens?** (a) It gets bigger (b) It gets smaller (c) Nothing (d) It glows
12. **Where is the higher pressure in a balloon?** (a) On the inside (b) On the outside (c) Both are the same (d) None of the above
13. **When you wire up a circuit and it does not work, you should** (a) Check for good metal-to-metal connections between wires (b) See if the batteries are in the right way (c) Replace the entire thing (d) Reverse the wires powering your electrical component
14. **What does it mean when batteries get hot to the touch?** (a) They are working well (b) They are about to explode (c) You are running the electricity back into the battery and this heats up the battery (d) They are about to leak acid everywhere
15. **What does higher pressure do?** (a) Pushes (b) Pulls (c) Decreases temperature (d) Causes winds and storms, and allows airplanes to fly (e) Meows
16. **What happens when you put a large chocolate bar in the microwave without a turntable?** (a) It melts only in certain spots (b) It freezes (c) You can measure the speed of light (d) The chocolate bar emits radiation
17. **Which of the following are examples of light?** (a) Radio (b) TV remote controls (c) Ultrasounds (d) Microwaves (e) Sunburns

18. **The electricity from an electrical outlet is the same kind as**
(a) Lightning (b) The shock you get from scuffing along the carpet (c) The electrons that flow in a circuit (d) The electricity from a battery (e) The light show from wool socks fresh from the dryer
19. **What happens when you combine a red beam of light with a green beam of light?** (a) You see polka-dots (b) You get yellow light (c) You get cyan light (d) You get a muddy-looking color just like when you mix all the paints together (e) Nothing—they stay the same
20. **If an apple is the size of the earth, then the atoms inside the apple are the size of** (a) Manhattan (b) A grain of sand (c) The size of the original apple (d) Alaska (e) Zooplankton
21. **What are the five states of matter?** (a) Solid, liquid, gas, plasma, and BEC (b) Earth, wind, fire, water, and wood (c) Oxygen, fuel, spark, ice and heat (d) Ice, water, bubbles, steam, and vapor
22. **Which of the following are seriously dangerous chemicals?**
(a) Dihydrogen monoxide (b) Sodium chloride (c) Sodium tetraborate (d) Sodium bicarbonate (e) All of these (f) None of these
23. **What happens if you fart in outer space?** (a) Nothing (b) You and your fart move in opposite directions (c) You'll scare away the space aliens (d) You'll explode during the process

Answers to Exercises

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22. **Which of the following are seriously dangerous chemicals?** (a) Dihydrogen monoxide (b) Sodium chloride (c) Sodium tetraborate (d) Sodium bicarbonate (e) All of these (f) None of these [By the way (a) is water, (b) is salt, (c) is laundry soap, and (d) is baking powder]
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