

KEY - Some physics review questions (light/color)

1. Deep water is cyan colored (filter), so red fish are dark in deep water. If water was yellow, what would be a good color for fish to be so as to not be visible to predators (besides black!)
 - a. Blue
2. When cyan light passes through a yellow filter and combines in equal intensity with a blue light. The combined light then strikes a Magenta tshirt. What color does the Magenta tshirt appear to the audience?
 - a. Blue
3. What kind of color mixing takes place with an inkjet printer?
 - a. Subtractive
4. As proved in in-class demos, what does NOT get fatigued when you stare at a cyan image of a red devil?
 - a. Your red cones
5. What is color constancy and how does this explain the problems for a light sensitive machine to “see” like we do?
 - a. Your brain processes images, not just colors, so your brain can compensate for lighting by comparing to known colors
6. When you add green dye to clear water do you “add” color? What happens to red and blue photons?
 - a. No, you subtract it. They heat up the water.
7. Microwave ovens have small holes in their doors that we see through, but keep microwaves remain confined. Explain.
 - a. Visible light have tiny wavelengths that pass through the small holes, microwaves are larger and can't escape the small holes
8. What kind of reflection would be good for a tennis ball in a tennis game: Specular or diffuse?
 - a. Specular. Diffuse would be like playing tennis on gravel, the ball would bound randomly
9. Draw a picture of sunglasses useful for a fisherman:
10. Draw a picture of the eye labeling: retina, optic nerve, pupil, iris, cornea, lens
11. What colors does a tube TV display to make a white image?
 - a. R, G, B
12. Why is the sky black on the moon? Why is the sun red at sunrise and sunset? Why is the sky blue?
 - a. Rayleigh scatter means small-wave light (blue) scatters much more than big waves (red) when it encounters air molecules. On the moon there are not air molecules, so no scattering means the sky doesn't get lit up. The sun is red at sunrise and sunset because light travels so much longer when light rays are nearly tangent to the earth's surface and so much of the blue and even a lot of the green gets removed from the sun's original light beam.
13. It takes 8 minutes for light to travel from the sun to earth. About how long would it take radio waves to travel from the earth to the sun?
 - a. Exactly the same: 8 minutes
14. What after image color would you see if you stared at red light for a long time?
 - a. Cyan
15. What does it mean to say that UV light is opaque with glass?
 - a. UV light does not pass through glass (like visible light does)