

Worksheet - ELECTROMAGNETIC WAVES

1. What is the source of all electromagnetic waves?
2. What determines the frequency of an electromagnetic wave?
3. What is the wavelength of an electromagnetic wave having a frequency of 1 hertz? Of 100,000 hertz? (*remember - you know the speed of light*)
4. Distinguish between AM and FM radio waves.
5. Are the wavelengths of radio waves longer or shorter than those detectable by your eyes?
6. Use the idea of resonance to explain how microwave ovens are able to cook food.
7. About how many more times greater is the frequency of a 100-megahertz-carrier radio wave than a medium-range sound wave? (*Remember, you know the frequencies of sound that humans can hear.*)
8. Electromagnetic radiation has been detected with a frequency as low as 0.01 hertz. What is the wavelength of such a wave? What type of wave might this be?
9. What is the wavelength of the carrier wave received at FM station 100 megahertz on your radio dial?
10. What is the frequency of an electromagnetic wave that has a wavelength of 300,000 kilometers?
11. If you charge a comb by rubbing through your hair, and then shake it up and down, are you producing electromagnetic waves?
In theory, could you shake the comb to produce visible light?
12. If all objects radiate energy, why can't we see objects in a darkened room?
13. An ordinary light bulb gives off visible white light. If you were moving toward it at nearly the speed of light, it would appear to be emitting X rays, while if you moving away from it at the same high speed, it would appear to be emitting radio waves. This is an example of what wave phenomenon?
In both cases you could not see the bulb's "light" with your eyes. Why?