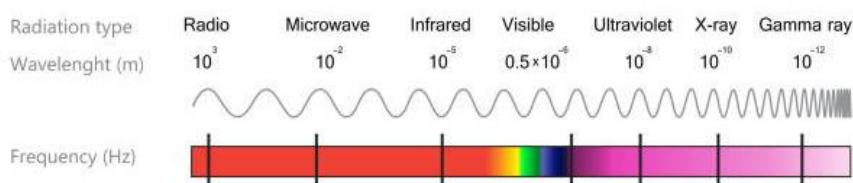


X-RAYS (6-8)

KEY CONCEPTS:

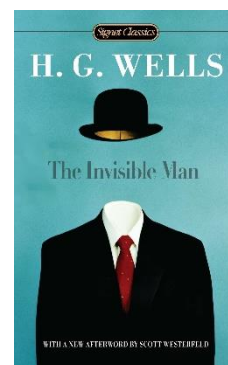
- The **electromagnetic spectrum** is a range of wavelengths from radio waves to gamma rays.
- **X-rays** are waves of high energy moving at frequencies too fast for the human eye.
- X-rays can pass through many **opaque** objects, like skin. So, doctors use x-rays to take images from inside our bodies.

Electromagnetic Spectrum



LITERACY CONNECTION:

H.G. Wells' classic novel, [*The Invisible Man*](#), is a haunting tale of science gone wrong. Do you think x-rays would work on the invisible man? If you don't have access to the book at home, the Open Library has the [book available](#) online.



ACTIVITY: EGG X-RAY

Materials: raw egg, white vinegar, clear glass or jar

1. Carefully place an egg in the glass jar.
 2. Fill the jar with white vinegar (enough to completely cover the egg).
 3. Wait 24 hours, until most of the egg shell has dissolved away. Pour the liquid out and remove the egg.
 4. Wash the egg under running water, rubbing the remaining bits of shell off with your fingers. It should come off like a powder.
- TIP:** If the shell isn't coming off easily, return it to the jar with fresh vinegar for another day.
5. The egg is basically intact, held together with membranes instead of a shell.
 6. Wash your hands when finished.

What is happening? Egg shells are made of calcium carbonate, the same material found in seashells. The vinegar is a weak acid (~4%). These materials react with each other, resulting in calcium acetate (white powder), water, carbon dioxide (bubbles), and a strange looking egg.

EXPLORE: Add food coloring to the vinegar to change the color of your egg. To make a 'bouncy egg', let the egg soak for several days. What happens when you break the egg open?

For step-by-step instructions, watch the video at: [Egg X-Ray STEM Activity](#)

This at-home educational activity is from the Literacy Coalition of Palm Beach County's literacy-based Stories & STEM program. Stories & STEM is made possible with support from Prime Time Palm Beach County, Inc., which receives significant funding from the Children's Services Council of Palm Beach County, Inc.

Having fun? Send pictures or video links of you and your Stories & STEM projects to csharkey@literacypbc.org