

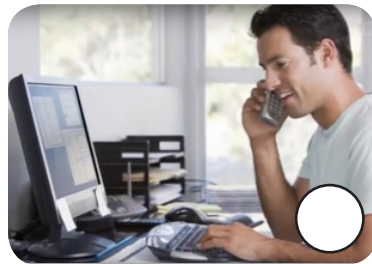
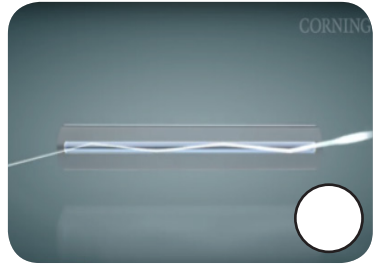
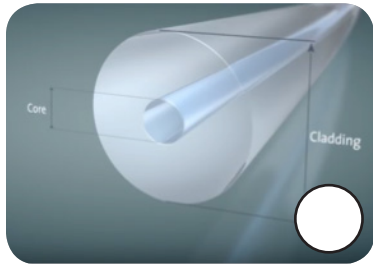
# Activity 2 | Glass Networks

## This is Life in the Glass Age

Invented at Corning's labs more than 40 years ago, optical fiber has revolutionized the way the world communicates and connects. Today, optical fiber is the backbone of our most advanced telecommunications networks. When we make a quick phone call, check a website, or download a video in today's highly connected world, it's all made possible by beams of light constantly bouncing through hair-thin strands of optical fiber.

### Part 1: How Does It Work?

Watch the video Fiber 101 at [https://youtu.be/N\\_kA8EpCUQo](https://youtu.be/N_kA8EpCUQo). Then number the photos to identify which step they represent in the process described below. Need help? The underlined words are hints.



1. When a device like your computer has information to send, that data starts out as electrical energy.
2. A laser in the computer converts the electrical energy to photons – tiny particles of electromagnetic energy, otherwise known as light – and sends them in rapid succession down the core of the hair-thin fiber.
3. Photons travel in waves through the inner core of the fiber. The light signal is focused within the core and prevented from radiating out of the fiber.
4. Optical fiber also includes an outer layer, or cladding, made from a different glass composition. The cladding material has a low refractive index designed to reflect light back into the core without allowing it to escape.
5. When the photons reach their destination, a photocell-equipped optical receiver decodes the digital light signals and converts them back into electricity, displaying the data on the other user's computer, television, smartphone, or other device.

### Part 2: How Is It Made?

Corning makes all of the glass for its fiber to ensure strength and purity for performance and longevity. To make the highest quality fiber in the world, Corning invented a manufacturing process called *vapor deposition*. See it in action by watching the video at [youtube.com/watch?v=7tsF3mSpqX8](https://youtube.com/watch?v=7tsF3mSpqX8).

Using what you learned from the Fiber 101 and vapor deposition videos, choose two scenes from *Life In the Glass Age* and explain how the unique properties of Corning's low-loss optical fiber help make communication happen. Some key concepts to consider include:

- Attenuation
- Dispersion
- Optical transmission
- Refractive index
- Single Mode
- Multi-mode

You get bonus points if you can suggest when single mode or multi-mode fiber might be most beneficial and why. One example has been started for you:

| Scene           | How Optical Fiber Enables Communication   |
|-----------------|---|
| Conference Call | <ul style="list-style-type: none"> <li>• Single-mode fiber can connect the lab and the conference room whether they're across town or across the world.</li> <li>• Multi-mode fiber could be used to build the Local Area Network (LAN) at the lab and office, supporting video and data communications among many devices simultaneously.</li> </ul> |
|                 |   |
|                 |   |

**Fun Fact!** A single, hair-thin strand of Corning's optical fiber can support up to 4 million high-definition video streams at the same time.

## MY LIFE IN THE GLASS AGE

What do you think the biggest impact of optical fiber is on the way you connect with your family and community? On the way you learn? Check out [LifeInTheGlassAge.com](http://LifeInTheGlassAge.com) and then discuss in class experiences you have had that are enabled by optical fiber.