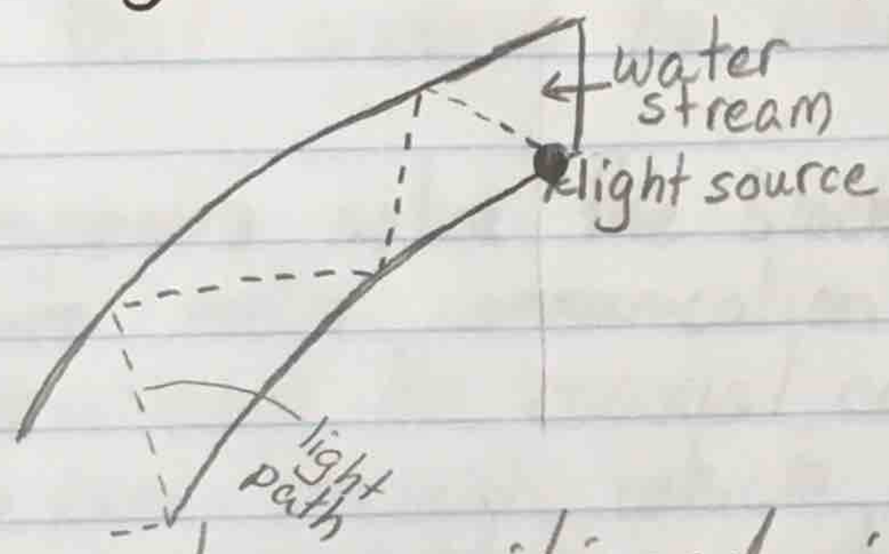
Homework 1

1. How did Bell solve the capacity problem?
Bell solved the problem with a process known as multiplexing. He used different notes to represent different messages. Through this, he invented the telephone.

2. How do magicians bend the path of light?



When properly positioned in a water stream, a beam of light reflects into the stream of water anytime it approaches a water-air boundry

3. How do we use radio to communicate? Explain how signals are converted to radio signal.
We use radio to transmit data without wires. Radio waves are used to transmit voice, music, and video. Signals are converted to radio singnals by turning on and off the wave. This sends information simillarly to the telegraph.

4. Why is low frequency radio bad for delivering voice wirelessly?
While low frequency waves are not affected by most obstacles, the rapid turning on and off of the signal causes the wave to deteriorate. Because of this, low frequency waves cannot transmit the large amount of data fast enough to transmit voice.

5. How do engineers solve the blocking problem in microwave radio communication?
Engineers developed the coaxial cable. This was a hollow pipe through which the high frequency waves could be sent. The problem was the pipes absorbed part of the energy from the waves causing them to overheat

6. What are the problems of satellite communication?
Satellite communication had a delay in recieving the information. It took a quarter of a second for information to be sent to the satellite and transmitted back to earth. Satellites were also difficult to launch

7. Why is laser able to carry a lot of data?
Laser waves are a very high frequency. This allowed them to be winked on and off incredibly quickly allowing large amounts of data to be transmitted.

8. The capacity of Fiber Optics eventually made telecommunication industrial market crash, why?
Because of Fiber Optics' large capacity to transmit information, more fiber optic cables were produced than what was needed. Without the demand, the market crashed.

9. What are the two key technologies in communication that make long distance medical surgery possible?
Fiber Optics and robotics make long distance surgery possible. Fiber Optics allow the information to be transfered fast enough and robotics allow the surgery to be performed without direct interaction with the individual recieving the surgery.