Main Ideas, Key Points, Questions:

After watching the video segment, write down key points, main ideas, and big questions.

Objective(s):
- Compare and contrast motors and generators, specifically on what they each use to work and how they both use electromagnetic induction.

Notes:
During the video segment, use words, phrases, or drawings to take notes.

Summary:
After watching the video segment, write at least three sentences explaining what you learned. You may ask yourself: “If I was going to explain this to someone else, what would I say?”
Unit 5K
Generators & Motors
Questions to Consider

Answer the following.

1. How does a motor differ from a generator?

2. How do motors and engines differ?

3. What is created when there is relative motion between a wire and a magnetic field?

4. In a direct current motor, what is the result of the magnetic field acting on the wire?

5. What is necessary in both direct current and induction motors in order to turn the rotors?

6. What is the easiest way to increase the magnetic force acting on the rotor in an induction motor?

7. What turns the turbines in the generators of nuclear, coal, or natural gas power plants?

8. What kind of current do power plants generate?

9. The purpose of transformers is to reduce the ____________ created at the power plant to a more manageable level at your home.
1. Faraday's law of magnetic induction states that the voltage induced by a current running through a wire directly relates to the number of loops in the wire and the area the wire makes. If both the number of loops of wire and the area of the wire are both doubled, by what factor will the voltage produced increase?

2. What is the magnetic force that 0.50 m of a current-carrying wire experiences as 3.0 A of current pass through when it is exposed to a 1.2 T magnetic field?

3. The magnetic force acting on a current carrying wire is 5.0 N. What must the length of wire be if there is 2.0 A of current flowing through and it is placed in a 0.10 T magnetic field?

4. A coil with 20 turns of wire is wrapped around a tube with a cross-sectional area of 1.0 m². A magnetic field is applied at a right angle at 0.50 T. If the coil is pulled out of the magnetic field in 5 seconds, what emf is induced in the coil?
Work each of the following problems. SHOW ALL WORK.

5. The resistance of the wire in the previous question is 0.50 Ω. What is the current running through the wire?

6. How many coils must a loop have with a cross-sectional area of 0.50m² that is pulled through a magnetic field of 0.25T in 1.0s in order for there to be an induced emf of 4 V?

7. If the current in the wire in the previous question is 3.0 A, what is the resistance of the wire?