Charge:

- Two Balloons tied together on string
  - Show that like charges repel
  - Paper "blocks" charge
  - Try Aluminum foil...
- Pick up things with charged balloon/pvc
- Use an Electroscope to test charge
- Balloon and Static Applet

Electricity:

- Lemon clock
  - Generate electricity (clock not light bulb?)
  - Ask for examples of other chemical generators
- Hand crank generator
  - Generate electricity
  - Ask for examples of other mechanical generators
- Light up ball circuit
  - Bring up a circle of kids
- Resistor circuit applet
- Circuit signal applet (turn on light)

Magnetism:

- What are magnets?
  - What kinds have you seen?
  - How do they act?
  - What happens to non-magnets around magnets?
- Pick up things with a magnet
  - What kind of things to magnets pick up?
  - Notice that different stuff gets picked up this time...
  - What does magnetic force go through? (pick up stuff through paper)
  - Stick rare earth magnets together through hand
- (Use Electroscope on a magnet?)
- Introduce & Discuss compass
  - The Earth is a magnet, too!
  - Play with a magnet around the compass (on overhead projector)
- Faraday applet
  - Show field of a magnet
- Magnets on Pencil
  - Point out the effect of the weight of higher magnets on lower ones...
  - Use the very strong magnets to repel each other!
  - Where else are very strong magnets used?
- Back to Faraday applet...
  - Show how changing magnetic field creates current
  - Show the "generator"
- Lenz's Law Tube
  - Show that induced current has a consequence!
  - Remember how hard the hand crank generator was to turn?
  - Same concept used in metal detectors...
- Electromagnets
  - We can also make a magnet out of electricity!
  - Pick up some things with an electromagnet
- TV Distortion
  - Explain a cathode ray tube
  - Deflect picture with magnets

Back to Charge:

- Van de Graaff generator
  - Show the pie plates repel and fly off
  - Hair demo?
  - Blow bubbles at it
  - What is lightning? (Show air ionization)
  - Light up the Light bulb

Q&A on Charge, E&M

Q&A on Fermilab and Scientists

- If no questions, ask the group:
  - Why use AC current?
  - Capacitors and Inductor
  - Have you visited Fermilab?
  - What do you think we do there?
  - Producing Antimatter