⚡ Science in the Movies: Back to the Future (1985)

Grade Level: 7–12
Topics: Physics · Energy · Cause and Effect · Scientific Ethics
Scene: The lightning-powered DeLorean time travel sequence.
Approx. Timestamp: 1:40:00–1:43:00

🌱 Before You Watch

Think–Pair–Share:

1. What is energy, and how can it change forms?
2. Why is precision important in scientific experiments?
3. How can small changes in one event affect what happens next?

💭 Prediction Time!

What could go wrong when experimenting with time or energy?

🧪 A. Science Connections

1. What type of energy conversion happens when the DeLorean reaches 88 mph and is struck by lightning?
2. How does electricity create motion in this scene?
3. What scientific principles make time travel in the movie possible (even if fictional)?
4. What safety precautions should be considered when conducting high-energy experiments?

📊 B. Data & Analysis

1. The DeLorean requires **1.21 gigawatts** of power to time travel.
    - If 1 gigawatt = 1 billion watts, how many watts does it need in total?
2. Lightning can carry about **30,000 amps** of current at **100 million volts**.
    - What is the total power ($P = V \times I$) of the lightning bolt?

3. Compare this to the DeLorean's power needs — what does that suggest about using natural energy sources safely?

🌎 C. Real-World Connection

1. How is energy stored and transferred in real-life systems (cars, batteries, renewable power)?
2. What do scientists and engineers do to prevent accidents when working with high-voltage electricity?
3. Why is it important to consider the **ethics** of experimentation, not just the results?

💡 D. Reflection

- What does *Back to the Future* teach about curiosity and responsibility in science?
- How does the movie show the connection between invention and consequence?
- ✨ *Complete:* "Science gives us power to change the world, but..."

📟 Did You Know?

"1.21 gigawatts" is a real measure of power!
To generate that much energy, you'd need nearly **10,000 lightning bolts**.
The DeLorean's famous "flux capacitor" is fictional, but it's inspired by real concepts in **energy transfer** and **electromagnetic fields**.

💭 "If my calculations are correct, when this baby hits 88 miles per hour... you're gonna see some serious science!" — *Doc Brown*

🎯 Extension (Optional)

Design your own **Energy Transfer Machine!**
Sketch or describe a device that transforms one form of energy into another (e.g., solar → motion, sound → light).
Label inputs, outputs, and the energy conversions that occur.
