

## Electrical Connections Lesson Plan

### **Context** (InTASC 1,2,3)

**Lesson Plan Created By:** Benjamin L. Strand

**Created:**

**Lesson Topic:** Conduction/Predicting (Science & ELA)

**Grade Level:** 4<sup>th</sup> Grade

**Duration:** 60-90 minutes

**Kit Contents:** [http://odin-primo.hosted.exlibrisgroup.com/nmy:nmy\\_all:ODIN\\_ALEPH007372271](http://odin-primo.hosted.exlibrisgroup.com/nmy:nmy_all:ODIN_ALEPH007372271)

### **Desired Results** (InTASC 4)

**Purpose:** The purpose of this lesson is for students to test different items to see if they are conductors or non-conductors.

#### **North Dakota English Language Arts & Literacy Content Standards:**

- Speaking and Listening Standards: Presentation of Knowledge and Ideas
  - SL.4 (Grade 4) Report on a topic or text, tell a story, or recount an experience in an organized manner, using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

#### **North Dakota Science Content Standards**

- Science Standards: Energy
  - PS.3-2(Grade 4) Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

### **Objectives:**

Students will:

1. Understand the difference between conductor & non-conductor (insulator).
2. Cooperatively work in groups.
3. Experiment with different objects to prove/disprove their theory.
4. Perform in a question & answer situation.

### **Assessment Evidence** (InTASC 6)

- Evidence of meeting desired results:
  - Pre/Post Test (Before/After)
  - Q&A after lesson
  - Scavenger Hunt of the classroom.

### **Learning Plan** (InTASC 4,5,7,8)

**Instructional Strategy: (Check all that apply)**

Direct  Indirect  Independent  Experiential  Interactive

**Technology Use(s): (Check all that apply)**

## STEM Collaborative Cataloging Project

Student Interaction  Align Goals  Differentiate Instruction  Enhance Lesson

Collect Data  N/A

**Hook and Hold:**

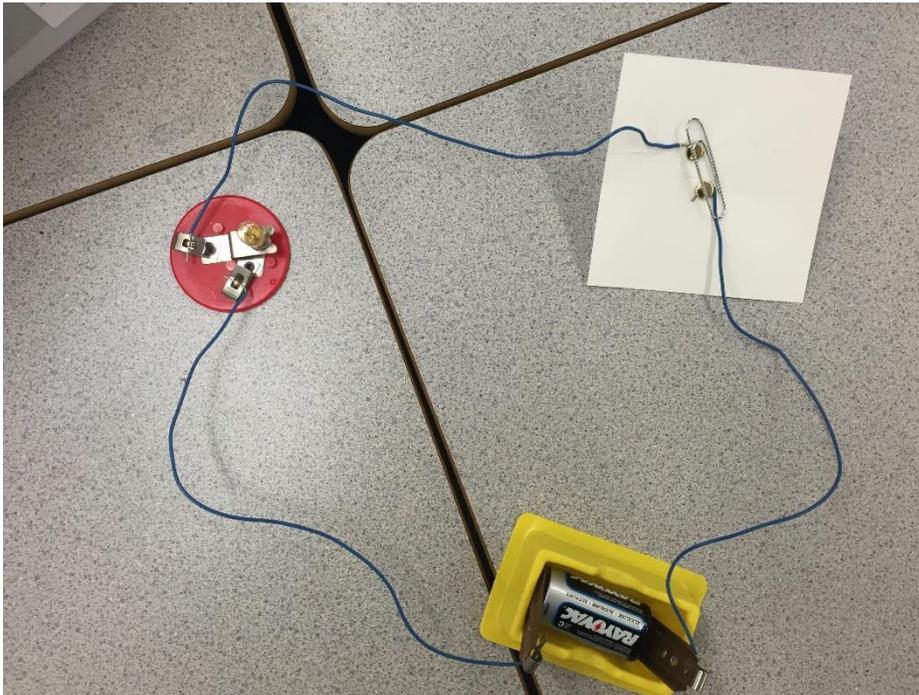
Tell the kids that you need to use the rest room (have someone watch your class) and then come back to class with your train conductor/engineer outfit on making the train whistle sound saying “All abooooard!! All abooooard!! Anyone who wants to use electrical circuits!” Then start asking different kids if they want to! (Trust me, they will love this!)

**Materials:**

- Train whistle
- Train conductor outfit
- Electric Tape
- Aluminum foil
- String or thread
- ncils (wood)
- Plastic rulers
- Insulated wire
- Non-insulated wire
- Metal coins
- Plastic “caps”
- Tap water
- Sugar Water
- Salt Water
- Cardboard/Poster Board
- Glass
- Rubber
- Paper
- Paper Clip
- Or Use your imagination!
- Pre/Post Test
- Electrical Connections Kit
- Pencils for kids to write with
- 4”x 4” tag board with thumbtack fasteners attached
- Speaking & Listening Response Rubric

## STEM Collaborative Cataloging Project

1. Once you are done with the hook and hold, write the word “conductor” on the board. Explain to them that the word conductor actually means “leader”. That is why someone who is in charge of a train is called a conductor!
2. Next explain to them that when working with electricity, the word conductor means the same. Without a leader, there is nothing that gets done. Without a conductor with electricity, nothing lights up!
3. Conductors allow electricity to flow, Non-conductors (called insulators) resist the flow of electricity and make it stop!
4. Show the class how the paper clip is a conductor using the bulb, socket indicator, wires, and tag board with thumbtack fasteners (have these done before hand). Show them how to properly attach the wires that remind them that these are not to be fooled around with! (Here is what your example would look like!)



5. Hand them their pre/posttest and have them start to predict whether they think each item is a conductor or not. If they put “no”, remind them that they need to put their reason why not.
6. Help the students set up their battery, socket indicators, and bulb.
7. Once they have that all set up and the battery and posts are electric taped down, they can start testing them!
8. For the water items, have them take the wires off of the thumbtack fasteners, and remind them that they should only touch the wires by the insulated part.
9. Once they are done, have them total the number of items they predicted correctly!

## STEM Collaborative Cataloging Project

10. After everyone is done, ask them why they thought some items were insulators, while others were conductors?
11. Allow them some time to walk around the room and see if they can find some insulators/conductors in the classroom!
12. Call over students individually while students are looking for conductors.
13. Explain to them that they are being checked for eye contact, voice volume, and content knowledge.
14. Ask them the following questions and record results using the Conductor Speaking & Listening Rubric.
  - Did you choose the pencil as a conductor?
  - What is a conductor?
  - What could we have done to make this activity even more fun?
15. Tell them thank you and let them get back to searching for conductors!

**Summary:** In this lesson, students will be learning about conductors/insulators and testing many different objects to see if their prediction (conductor or not) will be true or false. They will also be assessed in a speaking & listening ELA standard to check their knowledge of conductors as well as their ability to articulate their thoughts to their teacher.

### **Reflection** (InTASC 9)

#### **Reflect On:**

- *Preparation*
- *Planning*
- *Teaching*
- *Student Engagement and Participation*
- *Evidence of Student Learning*

### **Standards**

Council of Chief School Officers. (2011, April) *Interstate Teacher Assessment and Support Consortium (InTASC) model core teaching standards: a resource for state dialogue*. Washington DC. Retrieved from [http://www.ccsso.org/documents/2011/intasc\\_model\\_core\\_teaching\\_standards\\_2011.pdf](http://www.ccsso.org/documents/2011/intasc_model_core_teaching_standards_2011.pdf)

North Dakota Department of Public Instruction. (2011) *North Dakota English language arts & literacy content standards*. Bismarck, ND. Retrieved from [https://www.nd.gov/dpi/uploads/87/ELA\\_JUN0811.pdf](https://www.nd.gov/dpi/uploads/87/ELA_JUN0811.pdf)

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