Light Up the Iditarod Trail!

Developed by: Jill Wilson

Discipline / Subject: STEM

Topic: Electrical Circuits / Measurement

Grade Level: 3 - 5

Resources / References / Materials Teacher Needs:

- **Map of the Iditarod Trail**
- **Mileage Chart (see attachment)**
- **A video or explanation about paper circuits… here is an example…Paper Circuits**
- **X-Acto Knife (or some sharp knife for cutting slits in the tag board)**
- **Green screen, iPad, green screen app (we use Green Screen app by Do Ink)**

Lesson Summary: Students will create paper circuits to light up checkpoints on the Iditarod Trail.

Standard's Addressed: (Local, State, or National)

1. NGSS 4-PS3-2 Energy
2. NGSS 4-PS3-4 Energy
3. NCTM

Learning objectives:	**Assessment:**
1. Students will gain an understanding of electrical circuits by creating an electrical circuit to light up an Iditarod checkpoint. 2. Students will practice their measuring skills. 3. Students will become familiar with the Iditarod Trail.	Method of assessment for learning Students will present their final project in the form of a green screen project. Students should be able to explain how a basic electrical circuit works.

Procedural Activities

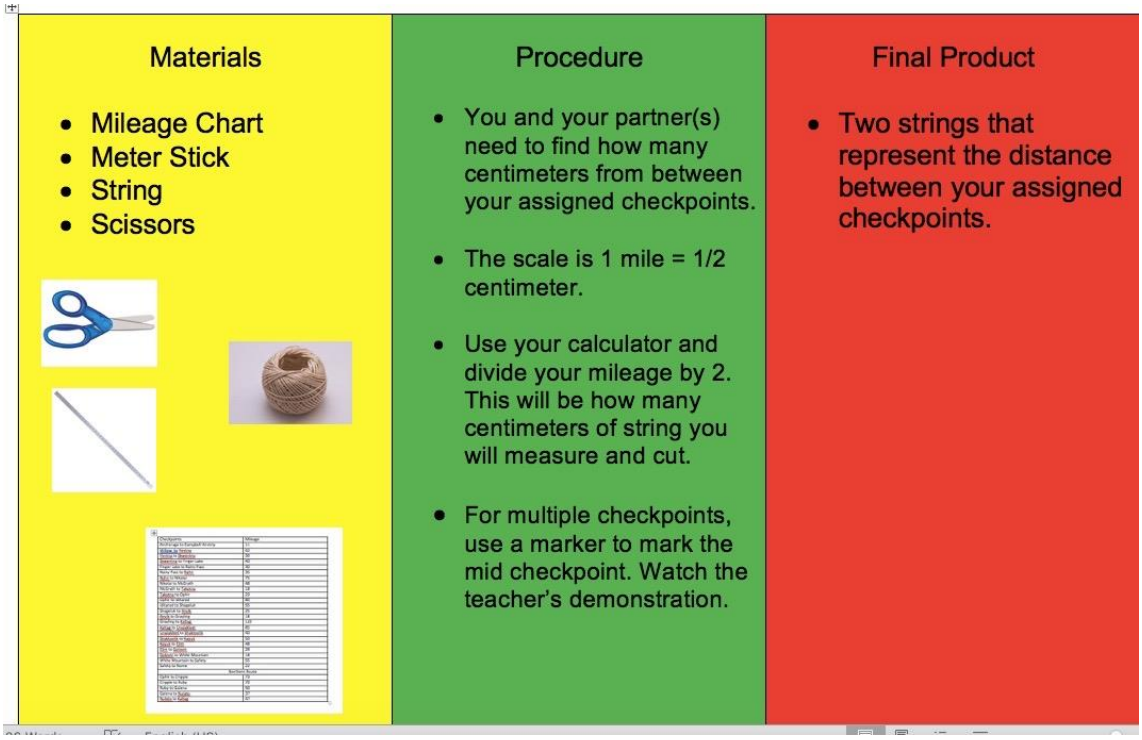
1. Teacher should have students paired up and checkpoints assigned prior to introducing the project. Also, a scale should be determined ahead of time.

2. If students do not have background information on electrical circuits, one class period should be dedicated to providing basic information on electrical circuits. One way to introduce electrical circuits is through the BrainPop video on electrical circuits.

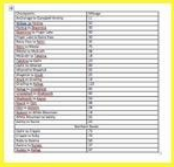
3. The teacher should create a paper circuit for the Ceremonial Start to show the students as an example.

4. The project is divided into three parts. Visuals are created for the students to display in front of the class for each part.

5. Part 1:



6. Part 2

Materials	Procedure	Final Product
• Mileage Chart • Blue Paper • String • Pencil    	• You and your partner(s) lightly pencil a path for your string to be hot glued on the blue paper. • Label your checkpoints	• Your map labeled, ready for the circuits to be installed.

7. Part 3

Materials	Procedure	Final Product
• 3 LED lights • Blue Paper • Copper Foil Tape • Pencil • Electrical Tape • Coin Battery      	• Have the teacher cut slits for your lights. • Choose three lights. • Draw your circuit (on the back) with a pencil – you can use a ruler for a straight line. • Ask an adult for a pieces of foil tape to lay on the circuit path you drew. • Tape the prong of the lights down • Ask for a battery to test your circuit.	• A lighted map of sections of the Iditarod Trail.

Additional Notes:

- Most paper circuits show to lay the copper tape in a rectangle. However, when working on this project, I found that two parallel lines work for the copper tape with the prongs of the LED lights completing the circuit work the best.

- By using a small piece copper tape with electrical tape on one of the prongs of the light, it can act as a switch.

- After students complete their sections of the map make a green screen video of students explaining how they did their project, using an Iditarod Trail map as the background. The videos can be put into iMovie to make a movie of the Iditarod Trail.

- Another alternative would be for student to use their portion of the map and do an iMovie on the checkpoints they were responsible for.

Materials Students Need:

- **Map of the Iditarod Trail**
- **Copper Tape**
- **Coin Batteries**
- **LED lights**
- **Tag Board**
- **String or Twine**
- **Measuring Tools**
- **Pencil**
- **Electrical Tape**
- **Markers**
- **Calculator**
- **iPad with green screen app**

Technology Utilized to Enhance Learning:

- **iPads for green screen videos**
- **iMovie**
- **Access to the web to research the villages for their assigned checkpoints**

Other Information

- **It is helpful for the teacher to hot glue the string/rope onto the tag board.**
- **Students may add the geography of the land to their maps (**

Modifications for special learners/ Enrichment Opportunities

- **Modify the scale to either make it easier or harder for your students.**
- **Depending on your students, the map can be prepared ahead of time.**

Checkpoint Mileage Chart

Checkpoints	Mileage
Anchorage to Campbell Airstrip	11
Willow to Yentna	42
Yentna to Skwentna	30
Skwentna to Finger Lake	40
Finger Lake to Rainy Pass	30
Rainy Pass to Rohn	35
Rohn to Nikolai	75
Nikolai to McGrath	48
McGrath to Takotna	18
Takotna to Ophir	23
Ophir to Iditarod	80
Iditarod to Shageluk	55
Shageluk to Anvik	25
Anvik to Grayling	18
Grayling to Eagle Island	62
Eagle Island to Kaltag	60
Kaltag to Unalakleet	85
Unalakleet to Shaktoolik	40
Shaktoolik to Koyuk	50
Koyuk to Elim	48
Elim to Golovin	28
Golovin to White Mountain	18
White Mountain to Safety	55
Safety to Nome	22
Northern Route	
Ophir to Cripple	73
Cripple to Ruby	70
Ruby to Galena	50
Galena to Nulato	37
Nulato to Kaltag	47