

TEST YOUR IDITAROD I.Q. WITH STEM

Developed by:

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Discipline / Subject:

Language Arts and Science

Topic:

Research, Informational Text, STEM, Circuits

Grade Level:

4th grade

Resources / References / Materials Teacher Needs:

Mush! Sled Dogs of the Iditarod by Joe Funk and www.iditarod.com

Sticky notes

Art supplies

File folders cut in half, or construction paper cut in half

Blank quiz templates

Circuitry items: wires, D cell batteries, 1.5 volt light bulbs or smaller (ex: flashlight bulb), aluminum foil, masking tape, two 10 – 12 inch coated/insulated wires, electrical tape

How to light a bulb:

Directions:

1. Strip about 2 inches of insulating material off both ends of the wires if the wires have coated ends.
2. Attach one wire to the negative end of the battery and wrap the other end of the same wire around the base of the bulb. Use electrical tape to hold the wire in place around the metal base of the bulb and another piece to hold it to the battery.
3. Attach the second wire to the positive end of the battery with electrical tape and to the base of the bulb, completing the circuit and lighting the bulb.

Lesson Summary:

In this lesson students will begin to research the history of the Iditarod race, use sticky notes to document their findings, use templates to create quizzes from their research, then use circuitry to create tests.

Optional: use digital sticky notes online or from an app

Standards Addressed:

Common Core State Standards - CCSS

CCSS.ELA-LITERACY.W.4.1.A Introduce a topic or text clearly, state an opinion, and create an organizational structure in which related ideas are grouped to support the writer's purpose.

CCSS.ELA-LITERACY.W.4.1.B Provide reasons that are supported by facts and details.

Next Generation Science Standards – NGSS

PS3.A: Definitions of Energy

- Energy can be moved from place to place by moving objects or through sound, light, or electric currents. (4-PS3-2),(4-PS3-3)

PS3.B: Conservation of Energy and Energy Transfer

- Light also transfers energy from place to place. (4-PS3-2)
- Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy. (4-PS3-2),(4-PS3-4)

Texas State Standards – TEKS

- . 6 (A) differentiate among forms of energy, including mechanical, sound, electrical, light, and heat/thermal;
- . 6 (B) differentiate between conductors and insulators;
- . (6 C) demonstrate that electricity travels in a closed path, creating an electrical circuit, and explore an electromagnetic field

(11) Reading/Comprehension of Informational Text/Expository Text. Students analyze, make inferences and draw conclusions about expository text and provide evidence from text to support their understanding. Students are expected to:

- . (B) Distinguish fact from opinion in a text and explain how to verify what is a fact;
- . (C) Describe explicit and implicit relationships among ideas in texts organized by cause-and-effect, sequence, or comparison; and
- . (D) use multiple text features (e.g., guide words, topic and concluding sentences) to gain an overview of the contents of text and to locate information.

Learning Objectives:

1. Use graphic features of informational text to write facts for research
2. Use circuitry and STEM skills to create quizzes that utilize circuits to light a bulb when a complete circuit is created by touching the correct statement or question to the correct answer

Assessment:

1. The student's Iditarod quiz should light up when the correct answer is connected to the question or statement.

Procedural Activities

1. Review the graphic features of informational text such as: captions, maps, pictures, graphics, drawings, headings, etc.
2. Hand out the book Mush! Sled Dogs of the Iditarod by Joe Funk and go through the pages reading and looking for graphic features.
3. Students should have a stack of sticky notes available and handwrite interesting facts as they read.
4. When finished, share your research as a class.
5. On a computer, students should go to www.iditarod.com and together navigate the site for more research facts.
6. I recommend going to the “about” section together and go through the tabs as a class.
7. When the students are finished gathering facts on their sticky notes, it is optional to make them digital with an app such as “Sticky Notes” or the “Post-Its® Plus” app.
8. Hand out the different kinds of light-right quizzes and discuss each blank template.
9. Students should decide which one to do, and then take their favorite facts from their research and write a question or statement on the template. Some templates, such as the multiple choice version, require incorrect answers as choices.
10. For stability, use a stick glue to glue it down to either a half sheet of construction paper or a half of a file folder.
11. Students poke holes where they are required and turn over the template for the circuit creation with aluminum foil and tape.
12. Students cut and glue down aluminum foil to connect the question or statement to the correct answer, and then they cover it completely with masking tape to insulate it.
13. Cover the other holes with aluminum foil to “fake out” the tester. Cover with masking tape as well.
14. Staple the Quiz to another piece of construction paper or half a file folder.
15. Test your quiz to see if it works, by touching the holes of the statement or question to the hole of the correct answer. The bulb should light up.

Materials Students Need:

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Sticky notes

Circuitry items: wires, D cell batteries, 1.5 volt light bulbs or smaller, aluminum foil, and masking tape

Blank Quiz templates

Art supplies

File folders cut in half, or construction paper cut in half

Technology Utilized to Enhance Learning:

Computer or tablet

Optional web-based programs:

www.Iditarod.com

Optional:

“Sticky Notes” app in Google Chrome online or

“Post-Its® Plus” app for tablets

Other Information:

Use bulbs from science kits, small electrical appliances, or special order. They should be no larger than 1.5 volts.

Modifications for Special Learners/ Enrichment Opportunities:**Modified:**

1. Read the book together and come up with research facts as a class or small group.
2. The teacher can come up with the Iditarod facts and quizzes ahead of time or create the circuit quizzes and use them as a center for testing student knowledge.

Enrichment:

Have students create their own templates for the circuit quizzes from their knowledge of circuitry, using creative designs and formats.