

Yikes! I Forgot My Hat!

Properties of matter

Developed by:

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Discipline / Subject:

Science/ STEM

Topic:

Identify the properties of specific materials and their intended purpose.

Grade Level:

Second Grade

Resources / References / Materials Teacher Needs:

1. Hat Task Cards
2. Yikes! I Forgot My Hat Planning Sheet
3. Access to the internet for weather details
4. Properties of materials interactive website
http://www.bbc.co.uk/schools/scienceclips/ages/7_8/characteristics_materials.shtml
5. Access to Seesaw for presentation
6. The following building materials:
 - Cotton balls
 - Cardboard
 - Paper plates
 - String
 - Saran Wrap
 - Aluminum Foil
 - Packing Peanuts

- Paper Towels
- Tape
- Bubble wrap
- Masking Tape
- 8. Hair dryer or leaf blower
- 9. Flashlight
- 10. Samples of cold weather clothing

Lesson Summary:

The students will be introduced to several properties of matter. Using what they learned the students will create a hat to withstand certain weather conditions.

Standards Addressed: (Local, State, or National)

1. 2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.]
2. 2-PS1-2. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
3. K-2-ETS1. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

Learning Objectives:

1. Students will identify the properties of various materials.
2. Students will determine which materials have the properties that are suited for an intended purpose.
3. Students will clearly and effectively present their findings as to why they choose specific materials for their hats.
4. Students will reflect on their findings to determine what changes need to be made to make their hat better suited for the environment.

Assessment:

Presentations on Seesaw
 Class discussion questions:

1. What worked?
2. What didn't work?
3. How can you change your design to make it better?

Procedural Activities

1. Begin the lesson by talking about packing and gathering new clothing for a trip to Alaska. "Soon I will be heading to Alaska for the Iditarod. As part of my preparation, I have been buying a lot of new clothes — hats, gloves, jackets, long underwear, etc. So I started thinking. Why do I need all these clothes? Why do we wear all these clothes in the cold?" Brainstorm ideas with the class. The concept of protection should be brought up.

2. Next, discuss with the students: What are the properties of our clothing that protect us? Think of all climates and the clothing we wear in each. Share a few pieces of clothing with the students (suitcase with long underwear, ball cap, winter hat, rain jacket, boots, socks) and list the properties that make that piece of clothing useful and essential.

Be sure to cover:

- Waterproof/Absorbent
- Heat-trapping (Insulation)
- Color
- Soft/ hard
- Light/ heavy
- Stretchy

Conclusions might include: heat-trapping on the inside/waterproof on the outside; soft (socks) close to body/hard (boots) to protect the outside; dark colors absorb heat; stretchy materials move with you; heavy parka for severe cold;

Today the students are going to think about each of these properties and how they are useful in protecting us.

Return to the Alaska story by having the students imagine that they are on the Iditarod trail. Ask a few questions about the scene: What do you think the weather in Alaska is like in March? (Look up the weather in March in Alaska to share) What clothing would best protect you? Be sure a hat is stated and talk about the importance of a hat protecting your head and keeping heat in your body.

3. Next, introduce the three tasks to the students. Instruct them to work as partners to complete one.

#1 You are cruising down the Iditarod trail and are quickly approaching Shaktoolik. You know you are headed out over the ice of Norton Bay next. This part of the trail will be very windy. You reach in your bag and realize you forgot a hat that will protect you from the wind! With the given materials create a hat that will provide you with the protection you need to make it to the next checkpoint.

#2 You are cruising down the Iditarod trail and are miles from the next checkpoint,

McGrath. You start to notice snow beginning to fall, and it is very WET and heavy. You reach in your bag and realize you forgot a hat that will protect you from the wet snow! With the given materials create a hat that will provide you with the protection you need to make it to the next checkpoint.

#3 You are cruising down the Iditarod trail and are quickly approaching Rohn. The sun is shining bright, and it feels nice on your face. However, you know that you must protect your face from too much sunlight. You reach in your bag and realize you forgot a hat that will protect you from the sun! With the given materials create a hat that will provide you with the protection you need to make it to the next checkpoint.

Show the students the materials they will have to use to make their hat:

- Cotton balls
- Cardboard
- Paper plates
- String
- Saran Wrap
- Aluminum Foil
- Packing Peanuts
- Paper Towels
- Packing Tape
- Bubble wrap
- Masking Tape

4. After about 20 minutes of building time, the students will present the hat they created. During the presentation, they should name: (These presentations can be recorded and posted to Seesaw)

What materials did they use to build the hat?

Why did they choose the materials? Be sure to use the vocabulary for the properties of matter.

5. Finally, after the presentations are the tests.

Task #1 Leaf blower/hair dryer test.

Task #2 Travel outside in the snow to see if it keeps your head and ears warm.

Task #3 Flashlight above and around the head to see if the face stays shaded.

Follow up questions for group discussion.

What worked?

What didn't work?

How can you change your design to make it better?

Materials Students Need:

Task Card
Planning Sheet
Cotton balls
Cardboard
Paper plates
String
Saran Wrap
Aluminum Foil
Packing Peanuts
Paper Towels
Packing Tape
Bubble wrap
Masking Tape

Technology Utilized to Enhance Learning:

Seesaw for presentation
Properties of materials interactive website
http://www.bbc.co.uk/schools/scienceclips/ages/7_8/characteristics_materials.shtml

Other Information:

1. The following website can be used before or after this lesson
Properties of materials interactive website
http://www.bbc.co.uk/schools/scienceclips/ages/7_8/characteristics_materials.shtml
2. A lesson could be taught prior to this lesson to have the students experiment with the various properties. (For example: raincoat to show water resistance, cotton balls to show absorbency, etc.)

Modifications for Special Learners/ Enrichment Opportunities:

Modifications:

- Pre-teach vocabulary
- Pairing students
- Scaffolding the building process

Enrichment:

- Build a hat that could be used for all task cards