

Grade 3 Testing Materials and Designs – Shelter Building Project

My name is Nancy Ha and I am a Secondary Science specialist; however, I believe that there is so much to be learned across disciplines and grade-levels! I have always had a love for education and learning, and I cannot wait to share that passion with my students. My interests outside of teaching include my ever-growing collection of household plants, bouldering, and continuing my learning of biology beyond my science degree.

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| Resources used and possible concerns | A Native American Thought of It by Rocky Landon and David MacDonald |
| Author/creator and/or literature background | <p>Rocky Landon</p> <ul style="list-style-type: none"> - From Northwestern Ontario where he learned Ojibwe traditions, culture, and ways of life - Studied at Trent University, where he deepened his appreciation for his ancestors, and Queen’s University where he earned his Education degree <ul style="list-style-type: none"> - Encourages others to learn about their history and embrace their culture - Wrote ‘A Native American Thought of It’ because he wanted people to learn more about Indigenous people and their culture <ul style="list-style-type: none"> - Part of the ‘We Thought of It’ series <p>David MacDonald</p> <ul style="list-style-type: none"> - From Southern Ontario - An avid reader who studied at the University of Toronto and specializes in writing books for youth |
| UPE course connections (not exhaustive) | <ul style="list-style-type: none"> - EDUC 427: ‘A Native American Thought of It’ is a great book for pre-service teachers to bring Indigenous STEM materials into the classroom. The authors discuss multiple innovations that come from Indigenous groups throughout history which opens the door for many interesting, engaging, and hands-on STEM activities that can be utilized in Science and Pre-Engineering classrooms. |

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| | <ul style="list-style-type: none"> - EDUC 546: The innovations outlined in Landon and Macdonald's (2008) book provide many examples of how groups of Indigenous people were required to use the design process to create a solution to a problem. This is not only great for inspiring pre-service teachers when completing their own learning tasks in class, but is also a resource that they can bring into the classroom when coming up with design challenges for their students. |
| K-12 connection | <p>Grade 3: Unit C – Testing Materials and Designs</p> <ul style="list-style-type: none"> - This lesson covers materials and their properties, building with a variety of materials and tools |
| Materials | <ul style="list-style-type: none"> - A Native American Thought of It by Rocky Landon with David MacDonald - Building materials, e.g. paper, rocks, clay, wood (branches, toothpicks), twine/yarn - Building tools, e.g. scissors |
| Rationale | <p>Big idea: For students to gain an appreciation of the diverse shelter innovations made by Indigenous people in North American throughout history.</p> <p>Purpose: Using <i>A Native American Thought of It</i> by Rocky Landon and David MacDonald, students will learn about different types of shelters created by groups of Indigenous people across North America. Particular attention will be paid towards the materials, their properties, and how the shelters met the needs of the people who used them. After learning about specific materials, students will be shown a series of shelters out of Landon and MacDonald's book, with emphasis put on how each group adapted their shelter to their local environment. Then, students will create their own miniature shelter that will need to be built with a particular, randomly assigned climate in mind. The ultimate goal is for students to foster an appreciation for the many Indigenous creations that have been invented throughout history.</p> |

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| <p>Lesson/activities</p> | <ol style="list-style-type: none">1. Ask students the question: what materials make up a house?<ul style="list-style-type: none">- Brainstorm ideas as a class- Afterwards, show this video on materials and their properties: https://www.youtube.com/watch?v=S0d0elqaim8<ul style="list-style-type: none">- A good segway into the rest of the lesson!2. Go over the materials students need to know and their properties (wood, clay, glass, metal, etc.) – this can be done however you normally cover these topics, e.g. word walls, card games, etc. or with an alternate activity:<ul style="list-style-type: none">- Materials Matching Activity provided at the end of the document3. Bring out <i>A Native American Thought of It</i> by Rocky Landon with David MacDonald<ul style="list-style-type: none">- Tell students that there have been people living on the land in this country for thousands of years<ul style="list-style-type: none">- Introduce the term ‘Indigenous’ as some may not have heard it before- Show students the map on pages 10-11 of the book. Discuss how the borders that divide up Canada and the US today were not always there. Instead, different groups of Indigenous people lived all across North America and still do- Ask the class to describe:<ul style="list-style-type: none">- Our local weather- The weather if you start to go more north (note: there will not be any innovations by Inuit people in this book. That information is in a separate book called <i>The Inuit Thought of It: Amazing Arctic Innovations</i> by Alootook Ipellie)- The weather as you start to go more south- The weather going out towards each coast (weather from the Atlantic vs. Pacific ocean) |
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| | <ul style="list-style-type: none">- The idea is to get students to think about different groups of Indigenous people who had to create different tools, shelters, etc. based on their geographic location. The map in the book has visual cues such as pine trees and cacti to get students to consider the differences in climate.- Discuss that:<ul style="list-style-type: none">- There are lots of different groups of Indigenous people, each with their own culture, traditions, and beliefs, and that there are Indigenous people all over the world.- Each group had to learn how to survive off of the land, and that survival looked very different depending on where the group was.- Show pictures of the different shelters in the book and the importance of some of the design elements (e.g. easily assembly and disassembly, use of triangles for strength, insulation to keep out the heat or cold, use of clay in hot climates because of how quickly it dries, holes that provide ventilation) <p>4. Shelter Design Challenge:</p> <ul style="list-style-type: none">- For this project, students (in groups or individually) will be asked to build their own miniature shelter based on a hypothetical area and climate<ul style="list-style-type: none">- At the bottom of the document are a series of 'climate cards' that can be randomly assigned to the class. The goal is for each student to build a miniature shelter that fits their climate (e.g. if it is a wet climate, they should choose materials that are less likely to leak, and should not include things such as a ventilation hole at the top of their shelter) |
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- Students should be encouraged to come up with a design before they begin building
- Once they are ready to build, there should be a station for students to pick up materials for their shelter, and alternatively students can be brought out to the playground area to forage some of their own shelter supplies
- The goal is to get students to consider and appreciate the many innovations and adaptations that Indigenous people were required to come up with in order to survive on their respective lands
- At the end of the project, the class can have a gallery walk to view everyone else's shelters

A prototype:



Materials Matching Activity

An **object** is made up of different **materials**. Each material has different **properties** that make it unique! Try to match each of the materials with the property that you think describes it:

1. Wood:

Flexible / Inflexible

Breakable / Non-breakable

Waterproof / Non-waterproof

Can conduct electricity / Cannot conduct electricity

2. Glass:

Flexible / Inflexible

Breakable / Non-breakable

Waterproof / Non-waterproof

3. Clay:

Flexible / Inflexible

Breakable / Non-breakable

Waterproof / Non-waterproof

4. Metal:

Flexible / Inflexible

Breakable / Non-breakable

Waterproof / Non-waterproof

5. Plastic:

Flexible / Inflexible

Breakable / Non-breakable

Waterproof / Non-waterproof

Climate Cards

Climate #1:

Your shelter is for an area that has warm summers and very cold, snowy winters.

Climate #2:

Your shelter is for an area that has very hot summers and slightly cool winters. It is usually very dry all year round.

Climate #3:

Your shelter is for an area that is never very hot or very cold, but is wet and humid.

Climate #4:

Your shelter is for an area that is snowy all year round, with very short, mild summers.

Supporting Sources (APA):

Landon, R., & MacDonald, D. (2008). *A Native American thought of it: Amazing inventions and innovations*. Annick Press Ltd.

The Pique Lab (2020, March 20). Primary school science series: Physical properties of materials for kids [Video file]. YouTube. <https://www.youtube.com/watch?v=S0d0elqaim8>