

Idita-Boxes: Tinkering Along the Trail

Developed by: Jen Reiter, 2014 Iditarod Teacher on the Trail™, created February, 2018

Discipline / Subject: Maker Space/ Design Thinking/ STEM/ STEAM/ Engineering

Topic: Tinkering Boxes

Grade Level: 1-5 – Others with modification

Resources / References / Materials Teacher Needs:

Design Thinking in the Classroom: The Beginner's Guide to Design Thinking in the Classroom

Iditarod Then and Now: <http://iditarod.com/edu/then-and-now/>

Jon Van Zyle story to share (included)

To Assemble Idita- Boxes:

- Plastic boxes to house materials, clear boxes with lids work best
- Various building materials (See Procedural Activities #1 for list of suggested items)

To Assemble Artifact Card Rings:

- Powerpoint with artifact pictures (print slides two or four to a page)
- Binder rings

Lesson Summary: Students will be provided materials to try to build various artifacts associated with the Iditarod Sled Dog Race. This activity is great for bell ringer, early finishers, indoor recess, or free time the students have.

Standards Addressed: (Local, State, or National)

Next Generation Science Standards: Engineering Design

3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Learning Objectives:

TLW plan and carry out a building challenge.

Assessment:

Students can display their work in a classroom “Idita-vation Studio.”

Students can self assess themselves using the included checklist.

Teachers can assess the students using the same checklist.

Procedural Activities:

Teachers **PRIOR** to launching activity:

1. Create a series of Tinker Tubs. Each tub should hold a specific building material. Suggested materials for tubs include:

- Foam balls and toothpicks
- Dominoes
- Wooden planks (I use carpenter pencils)
- Paper towel rolls (cut in various lengths)
- Dixie cups
- Magnetic blocks
- Popsicle sticks
- Clothes pins
- Index cards and tape
- Legos
- Pattern blocks
- Unifix cubes
- Toothpicks and playdough
- Popsicle sticks with Velcro dots
- Geoboards
- Straws with pipecleaners

2. Print and laminate the included task cards. Punch a hole in the corner and store them on a binder ring. You want to have as many rings as you have boxes, but all of the rings do not have to have all of the cards. Four or five cards per ring is plenty.

Introducing the Idita-Boxes to Your Students:

1. Share with your students the idea that the Iditarod is a constantly changing event and that its racers are more than just mushers, they are inventors, innovators and tinkers as well. They are constantly building, testing, and rebuilding the objects they need to be successful in the race.

2. Share with the students the included story from Jon Van Zyle and ask them to identify three changes in the race that he mentions. (Answer: the way the trail is marked, Golovin is not a check point anymore, and mushers staying at people's homes) The Iditarod Then and Now Article referenced in the teacher resources section above discusses some other changes that Jon Van Zyle has seen happen in the race.

3. Tell the students that they are going to have the chance to tinker around with some Iditarod objects and maybe even redesign or improve some of them.

4. Discuss the directions, challenges, and rules about the Idita-Boxes as you have set them for your class. My class standards are included.

5. Distribute the boxes and a ring of cards to small group of students. Allow them to look through the cards on the ring and identify an object they would like to tinker with. They need to complete a Mini-Design Challenge Sheet to help them organize their thoughts before beginning to build. Using the materials found in their Idita-Box they should create a model or version of the object.

6. If time allows, students can do a gallery walk to see what other students have created.

Materials Students Need:

Idita-Boxes

Rings of Artifact Cards

Mini-Design Challenge Sheets

Technology Utilized to Enhance Learning:**Other Information:**

Possible uses for the Idita-Boxes after the initial introduction period:

- Centers
- Bell Ringer activities
- Early finishers
- Indoor recess

Modifications for Special Learners/ Enrichment Opportunities:

- Younger students could not be required to complete the Design Thinking Sheet
- Students could expand their reflections through writing a descriptive paragraph of their creation.
- As an occasional bonus challenge, allow students to combine boxes and use materials from both in their design.
- To make the challenge more difficult, you can add additional parameters such as: you have to use ALL the materials in the box, your design has to be three-dimensional, your design has to be able to be picked up off the table in one piece, etc.

Additional Information:**Photo Credits:**

- Snow Machine – Terrie Hanke
- Dryland Cart – Kathleen Wied Vincent
- All Others –Jen Reiter

A Story from Jon Van Zyle

In my first Iditarod in 1976, we had no real marked trail and everyone got lost a lot. There were very few markers, most of them were an ax blaze on a tree, or a ribbon tied to a bush; impossible to see at night or if it was snowing. Not like the trail of today that is marked with 30,000 painted, reflected lath strips!

On my way to the checkpoint at Golovin, in the wind blown snow and dark night, I climbed a steep hill, nicknamed "Little McKinley." Once on top, I looked for a trail across the sea ice to Golovin, but it was so windy that I could not see one. Finally I decided to wait till daylight to be able to see Golovin. Suddenly I saw a light come on in a house in Golovin, and so I pointed my dogs towards the light and arrived about an hour later at Maggie Olson's home in Golovin.

In my second Iditarod in 1979, as I was coming into McGrath for my 24 hour stop, down a road towards the check point, Belle, my leader suddenly turned into a drive way of a house. I stopped and gave her the command to haw. She turned back onto the road, took a few steps and immediately turned back into the driveway of the house. I stopped her again, gave her another haw command. She turned back onto the road and we continued down the road to the checkpoint. After checking in, I asked the checker who I was staying with (back in the early years of Iditarod, mushers could stay with families and friends during their 24 hour stop, not so today). The checker looked at me and said, "Just tell your leader to go back to the house she turned into, she knew where you were staying." Dogs have an uncanny sense.



Idita-Box Manual

1. Materials from the different Idita-Boxes are not to be mixed unless specifically directed to do so.
2. Before you begin designing, be sure to fill out a Design Thinking sheet. Your final design may be different than your original plan, but you must THINK before you BUILD!
3. Document your final creations in SeeSaw with a photo and a caption. You may also choose to do a voice-over to document your thinking.
4. If you create something you are especially proud of, you may display it in the Idita-vation Museum for two days. After that your project needs to be dismantled and returned to the boxes so someone else can use the materials!
5. Everything must be cleaned up and put away after each use.



Labels for Boxes



Foam Balls 🐾

Toothpicks

Dominoes



Wooden
Planks



Paper Towel
Rolls





Magnetic
Blocks



Dixie Cups



Straws &
Pipecleaners



Clothes
Pins



Index Cards
Tape



Legos



Pattern
Blocks



Base Ten
Blocks



Unifix
Cubes



Geoboards



Toothpicks
& Playdough



Velcro
Sticks

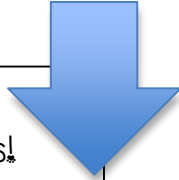
Popsicle Sticks





Mini- Design Challenge Sheet

Define:
What are you designing?



Ideate:
Brainstorm many possibilities!



Prototype:
Sketch and label your design!

Name: _____

Project: _____

Building Materials Used: _____



Mini-Design Challenge Scoring Tool

Think carefully about your work on this mini-design challenge and thoughtfully respond to the following statements by putting a check in the correct box.

Objective:	I did my best ALL of the time.	I did my best MOST of the time.	I need to work on this area.
I contributed to the team (if applicable).			
I exhibited scientific thinking by planning BEFORE I started building.			
I maintained a positive attitude and didn't give up.			
I completed the building task.			
I recorded my prototype.			
I reflected on my work.			