Designing Culturally Responsive Makerspace Pop-Up Activities

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Today we will...

• Improve culturally responsive teaching in an informal makerspace environment through the development of makerspace pop-up activities and training approaches following a makerspace project-based literacy process;

• Increase scientific literacy achievement through informal literacy hands-on makerspace pop-up activities focused on STEM real-world activities;

• Describe opportunities and hands-on mobile approaches to build capacity of existing informal makerspace learning of remote communities, diverse learners, and STEM professionals serving underrepresented minority populations.
How does a community and school benefit from makerspace?

https://jamboard.google.com/d/1gpY916CcOzxmZgls3Y2Q4rtngilSJQyiYOGlrlj_NVC8/edit?usp=sharing
Culturally Responsive Values "Funds of Knowledge"

HTTPS://WWW.YOUTUBE.COM/WATCH?V=GKVHUUSDN1Q
Considering Culture as Design Element for Makerspace Kits or PopUp Activities
Reducing Bias via Informal Assessment of Makerspace Products and Reflections in e-Portfolios, Journals and Blogs
Idea of Maker Place
How is makerspace connected to literacy?

https://www.menti.com/2ce4bwovia
Valuing "Funds of Knowledge"

Literacy
competence or knowledge

Making Meaning

Fluency
ability to express oneself articulately with an understanding of how to reach a desired effect

Transfer of Knowledge
Future Ready Skills Through Makerspace
How are digital tools best integrated into makerspace projects to encourage improved digital literacy for young children?
Materials for High and Low Tech Design of PopUp Activities

- Scissors
- Yarn and Textiles
- Paper Cutters
- Glue gun
- 3D Printer Pen
- Circuitry
- Video and Cameras
- Green Screen

- 3D Printing
- Virtual Reality
- Code
- Drones
- Wearable Technologies
- Robot Kits
- Ardunios
- Rasberry Pi
Pop-Up Activities
Can

• Mobile Activity
• Incorporate at Home, Outdoors, etc.
• Task Cards or Box as a Kit
• Challenges on Website as Virtual Option for COVID-19
• Challenge Students to Create Task
Scaffolding Approach

EXPLORATION

SKILL BUILD

PROJECT CHALLENGES: 4 STEM CAREER APPROACH
Encourage Literacy through Pop-Up Activities

Identify Main Ideas and Summarize in Class

Inferencing Through Makerspace PBL Challenges (Pop-Up) Activity
Designing Pop-Up Activities via 4 STEM Career Stations

Further Connections to Literacy in Stations/Task Card:

Media Literacy and Communication to Community

- Step 1: Research
- Step 2: Make
- Step 3: Reflect
Example of Pop-Up Activities to Celebrate Earth Day
Earth Day Design Pop-Up Activities

STEM Friday
Friday, April 26
10am-12pm
SRSU Library

SRSU Community members are invited to participate in makerspace, be a(n):

Engineer  Scientist  Journalist  Artist

STEM FRIDAY
is brought to you by
Department of Education’s Jennifer Miller, PhD and TSTA

For more information call 432.837.8019
Selecting CRT Texts

- The Boy Who Harnessed the Wind
- Girls Think of Everything
- Sunpainters: Eclipse of the Navajo Sun
- Round Is a Tortilla: A Book of Shapes
Your Turn: Let's Design a Pop-Up Activity

Anna's Extraordinary Experiments with Weather
Author: Nandita Jayaraj
Illustrator: Priya Kurian
Breakout Challenge: Design CRT Popup
Task Card

- Artist
- Journalist
- Scientist
- Engineer
Share Your Challenge

- https://jamboard.google.com/d/1gpY916CcOzmZgls3Y2Q4rtngilSJQyiOGlrj_NV_C8/edit?usp=sharing
Authentic Reflections

• Summary of Articles/Readings
  • Main Ideas
  • Inferences
• Write to Inform Others on Makerspace Design Process
• Written Reflection
• ePortfolio
• Blogging
“Disciplinary literacy refers to the shared ways of reading, writing, thinking, and reasoning within academic fields” (Moje, 2007; Shanahan & Shanahan, 2008).
Engagement is Key!

“I am convinced that the best learning takes place when the learner takes charge.”

– Seymour Papert

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How can you extend learning through makerspace Pop-Up Activities?
Questions are the path to learning

Thank you!
Connect with Us!

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“Foooo! Foooo!” Anna Mani blew out all eight candles on her birthday cake. "Happy Birthday, Anna!" shouted her brothers and sisters.

Anna had a big family and a big house on a hill. But on her birthday, she had only one small wish.
Anna tore open her birthday gift and peered in. There was something sparkling inside.
“Diamond earrings? Aiyye!”
She did not want diamond earrings. They were expensive and useless!
Do you know what Anna really wished for?
**Books, books and more books!**
“We have books at home!” said her brother. But Anna had already read those.

“There are more in the library!” pointed out her grandfather. But Anna had read those too!

She marched into her room. “Hmmph!”
Later that day, there was a knock on Anna’s door. But there was nobody outside!

Instead, there lay a big box at her doorstep.

“This better not be more jewellery!” she said loudly. It wasn’t. It was a brand new set of Encyclopaedia books!

“So many books. Hurray!” Anna ran around her house, hugging everyone.
Many years later, and many, many, many, many books later, Anna found a job in the laboratory of a famous scientist.

“What should I do here?” asked Anna. The scientist pointed to a box.

What do you think she found inside?
“Diamonds? Aiyyyye!” said Anna.

But this time, the diamonds were not to be worn. They were for experiments.

The scientist wanted Anna to find out what makes diamonds shine. So she read books about diamonds.

Books, books and more books!
Being a scientist was the best! She could study anything she wanted. Anna did like things that shine. And what shines brighter than diamonds? The sun! So Anna read books about the sun, sunlight and the weather. **Books, books and more books!**
Anna did hundreds of experiments.  
She built many gadgets that could measure the weather of a place.
How sunny is it in Bombay?
Anna built a gadget to measure that.

How windy is it in Madras?
Anna built a gadget for that too.
Her favourite gadget took many months to build.

It is a special balloon called an ozonesonde. It has a small machine fixed to it. The machine can measure a gas found in air called ozone.

It can fly really high.

Look, there goes Anna’s ozonesonde!
Guess how many gadgets Anna Mani built in all?
Nearly one hundred weather gadgets!

She even had her own factory where these were made.
It was as if she could build anything!
Anna Mani became one of the wisest weather scientists in India.

Even as she grew older and more well known, her best friends remained the same.

**Books, books and more books!**
Life & Times of Anna: A Timeline

23 August, 1918 - Anna Mani is born in Peermedu in Kerala.

1940 - She gets a scholarship to work at CV Raman’s laboratory in Bangalore.

1945 - She leaves for England to study Meteorology.

1948 - She returns and joins the Indian Meteorological Department in Pune.
1962 - She starts work on the ozonesonde project.

1976 - She retires as Deputy Director General of the Indian Meteorological department.

In the 1980s (exact year unknown) - She starts her own company to manufacture her gadgets.

16 August, 2001 - Anna Mani passes away in Kerala.
**Wonderful Weather Words**

**Meteorologist** (say it like this: ‘meet-your-all-o-jist’): A meteorologist is a scientist who studies the weather and climate of a region. Anna Mani was one of the best meteorologists there ever was!

**Ozonesonde** (say it like this: ‘oh-zone-sond’): Ozonesondes are balloons which fly high up into the sky. The balloons have gadgets fixed to them which measure the amount of ozone present in the air. Ozone is important because it blocks out harmful light coming from the sun. Too little ozone high up in the sky means we are in trouble!

**If you could be a scientist, what would you want to study?**
A Note on the Book

This story is a work of creative non-fiction based on the life of Anna Mani.
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https://www.ias.ac.in/public/Resources/Initiatives/Women_in_Science/Contributors/annamani.pdf (by Abha Sur);
http://www.iisc.ernet.in/~currsci/oct252001/1129.pdf (by CR Sreedharan)

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Anna's Extraordinary Experiments with Weather
(English)

Anna Mani was an Indian scientist who loved to read about the world around her. Peek into her eighth birthday party and follow her through her extraordinary scientific adventures.

This is a Level 3 book for children who are ready to read on their own.