

# “Jugaad” Learning Ecosystem: Thriving on Limited Resources & Constrained Environments

**Small Resources, Big Impact:**

**Reimagining More with Less**



**Jugaad**



# Jugaad:

Jugaad is a mindset that thrives in the face of challenges



# Current K-12 construction environment:

- Limited Budgets
- Time warp
- District priorities
- Changing demographics

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*Jugaad*, an innovation principle that turns limited resources into creative solutions.

# Current K-12 construction environment:

- District priorities
- Changing demographics

*Jugaad: A mindset that thrives on clever detours and inventive paths, always finding a way forward.*

Aarti Kathuria is a registered architect in Rhode Island who brings new purpose to old spaces through her expertise in adaptive reuse.

With more than 16 years of experience, she revitalizes educational spaces by reimagining existing buildings and weaving in innovative solutions that foster 21st-century learning.

As K-12 Studio Leader at Brewster Thornton Group Architects, Aarti guides the research and design of educational spaces that spark inspiration and empower future generations.



# Jugaad:

Jugaad is a Hindi word with no exact translation, which means innovating simple, home-spun, and even frugal solutions based on six principles



Brazil  
Gambiarra

French  
*Systeme D*

Chinese  
Zizhu Chuangxin

America  
Improviser/ Innovator

Kenya  
Jua Kali

# Why is it relevant

Jugaad: A flexible approach to problem-solving that uses limited resources in an innovative way

- Norm in emerging markets
- Advanced Economies: Translating as a reality due to:
  - Climate Change
  - Policy Change
  - War Scenario
  - Complex and Fluid (Volatile) market

# Six Principles of Jugaad

1. Seek opportunity in adversity
2. Do more with less
3. Think and act flexibly
4. Keep It simple
5. Include the margin
6. Follow your heart (do well while doing good)

# Mitticool



## The Idea

To enhancing entire product with form follow function.



PROTOTYPE 3



PROTOTYPE 1



## The Challenge

To enhancing evaporative cooling system with keep in mind clay material limitation.

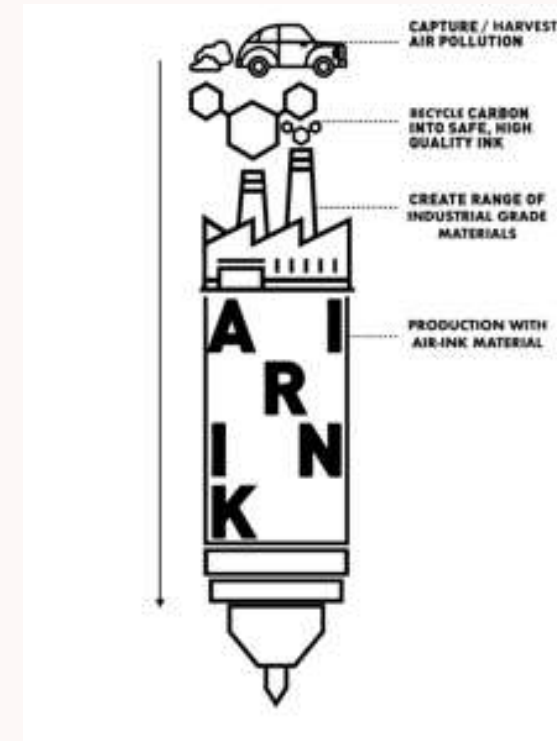
# Mitticool



# Air Ink

## This Ink Is Made From Air Pollution

About 45 minutes of diesel car pollution reaps 30 milliliters of AIR-INK, now on display at the Cooper Hewitt, Smithsonian Design Museum



# Air Ink



Carbon emissions which could have been in the lungs of millions of people are now resting as art created by over a thousand artists like Doodle Man, Christian Furr, Karatoes and Imagine.

## Turning Air Pollution into Art

MIT startup collects soot, converts it into markers and paint.

By Rob Matheson

February 21, 2018



COURTESY OF ANIRUDH SHARMA

# 2<sup>nd</sup> National Grassroots Innovation Prize – 2002

## Terrain induced forces for Transmission System



राष्ट्रीय नवप्रवर्तन प्रतिष्ठान – भारत  
विज्ञान एवं प्रौद्योगिकी विभाग, भारत सरकार का स्वायत्तशासी संस्थान  
National Innovation Foundation - India  
Autonomous Institute of the Department of Science & Technology, Govt. of India



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### BICYCLE WITH RIDER AND TERRAIN INDUCED FORCES FOR TRANSMISSION SYSTEM

[Home](#) / [Profiles](#) / [Bicycle with rider and terrain induced forces for transmission system](#)

#### AN IDEA FROM AN INDIAN VILLAGE IS TAKEN UP BY A US UNIVERSITY FOR RESEARCH.

Kanak Das belong to a village near Guwahati has developed an Idea from Bi cycle. He created a simple device which can convert the shocks received by his bicycle into acceleration energy, and the Bi-cycle can for a few meters without being peddled. The Massachusetts Institute of Technology (MIT) in Cambridge, U.S., has taken interest in the Idea for conducting further research on how to channelize the energy created in shock observers of vehicle into the acceleration.

Anil Gupta, Professor at IIM-A, who presented his idea to the MIT said, "Kanak Das came up with this innovation to seek a solution to the bad roads of his village, and when I showcased his idea to the students of MIT, they immediately adopted it, as it can bring huge change in automobile technology across the world.



## Cheap:

- Short-Term
- Hidden Costs

## Frugal:

- Intentional Decision
- Long Term

## Abundant:

- Mindset
- Scalable Solutions



# Jugaad for three scenarios



Limited Resources



Getting through  
the PLANNING  
process



Swing Space

# Limited Resources

Brita Tamm

502-555-0152

[brita@firstupconsultants.com](mailto:brita@firstupconsultants.com)

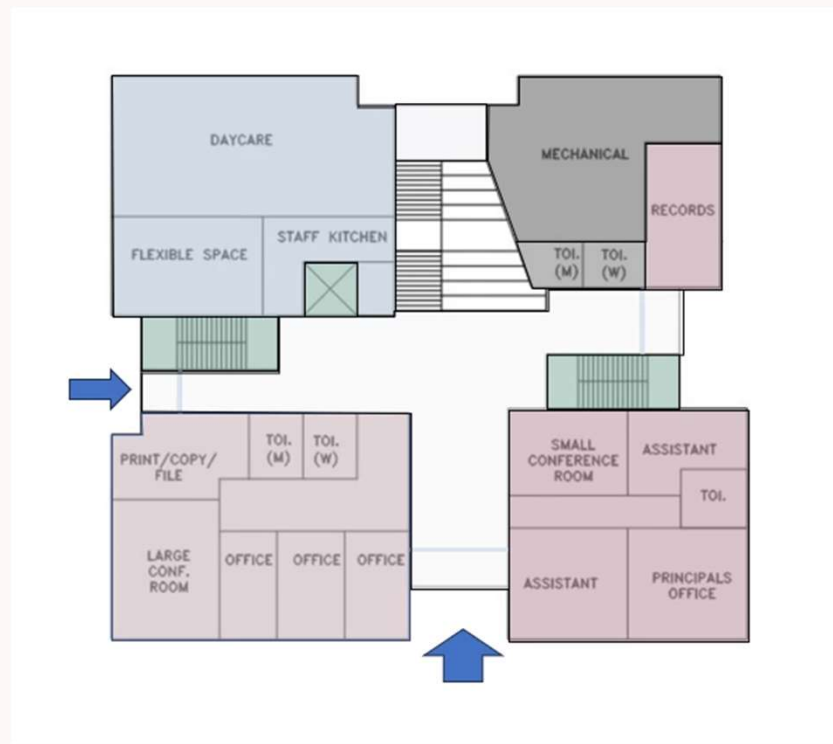
[www.firstupconsultants.com](http://www.firstupconsultants.com)

# *Interview Videos*

# Questions Asked

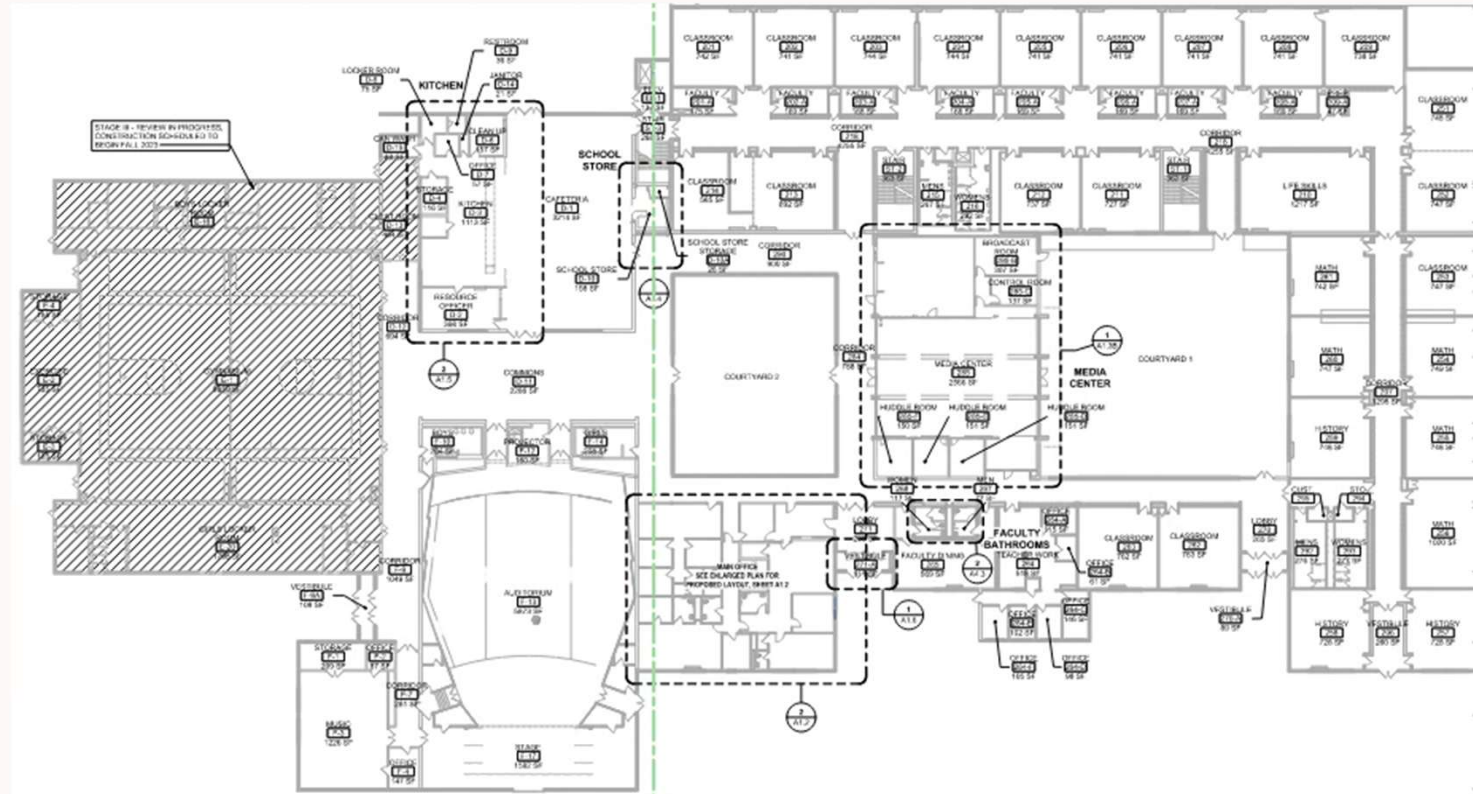
- Q1. How did you turn limited resources into creative solutions?
- Q2. When faced with a roadblock, what creative detours or inventive paths did you find to move forward
- Q3. How did you solve a design challenge in the context of adaptive reuse of existing buildings when faced with unexpected - program, spatial needs, or infrastructure?
- Q4. In the same spirit as the questions above, share an offbeat solution to a significant problem. Perhaps that changed the originally intended direction.

# JUGAAD MOVES



*Do more with less*

# JUGAAD MOVES



*Think Flexibly*

## JUGAAD MOVES



*Find opportunity in adversity/Include the margin*

# JUGAAD MOVES

The screenshot displays the DonorsChoose website interface. At the top, the logo "DONORS CHOOSE" is on the left, followed by a search bar "Find a classroom to support" and navigation links: "TEACHERS: Get funded", "Partner with us", "About us", "Help", and "Sign in".

The main content area features a grid of project cards. On the left, there is a large image of two young girls reading a book together. In the center, a hand holds a tablet displaying the "DONORS CHOOSE" logo. The project cards include:

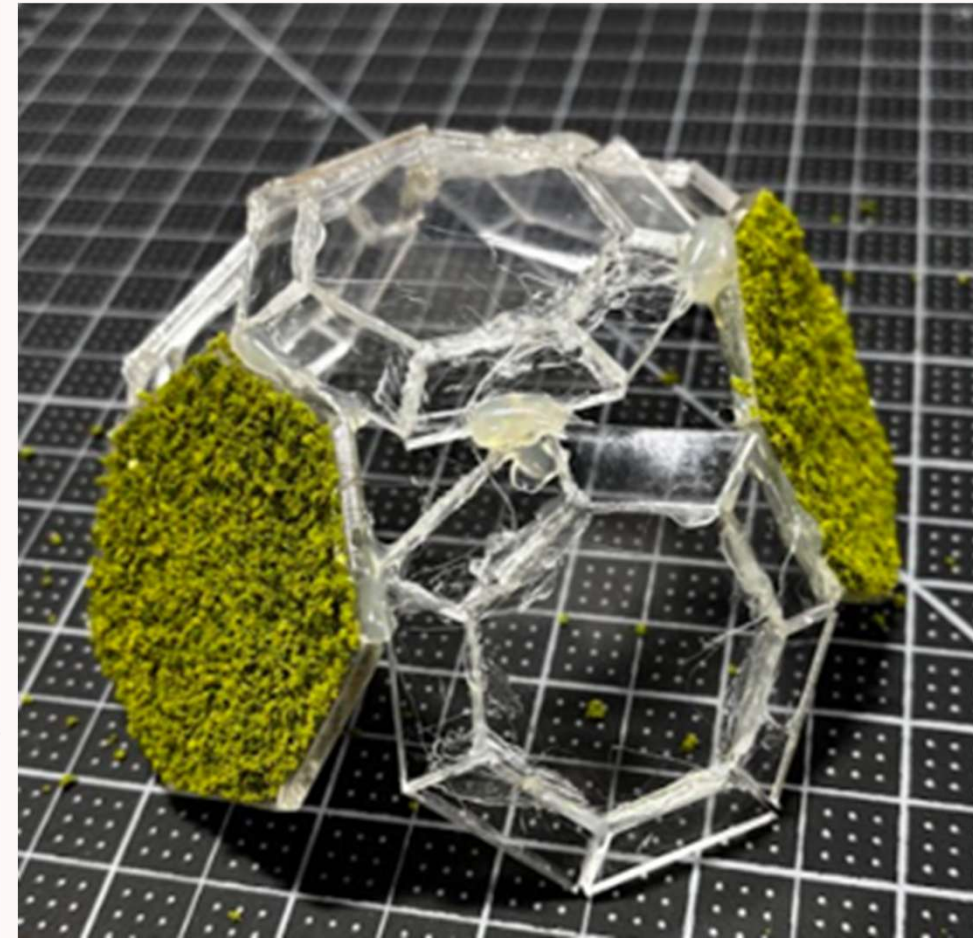
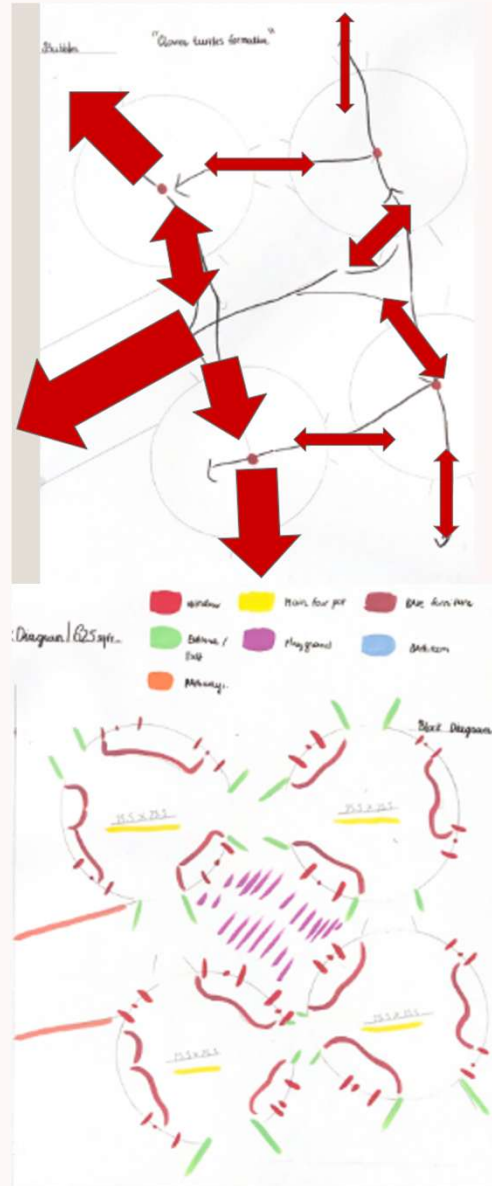
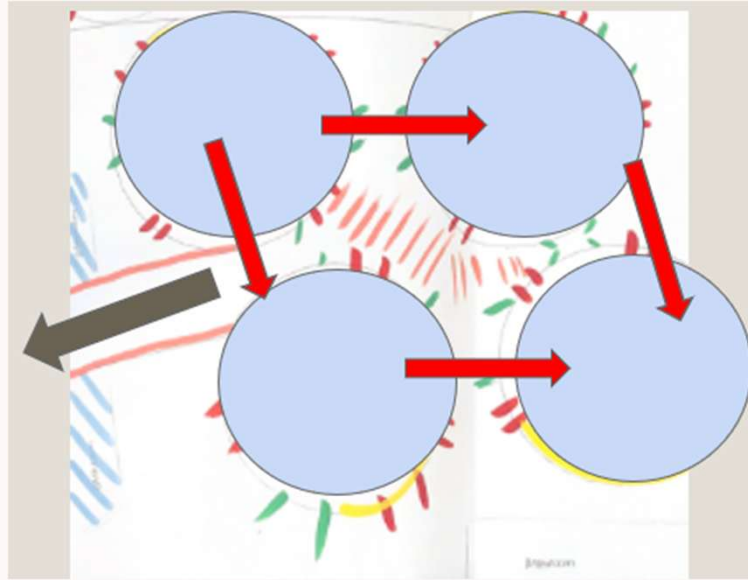
- Let's Build LEGOs**: Mrs. Scicchitano, Riletta T Cream Family School • New Jersey, \$680 donated, Fully Funded! 11/30/2022
- Simply Stem**: Mrs. Nelson-Daniels, Riletta T Cream Family School • New Jersey, \$453 donated, Fully Funded! 11/16/2022
- Reading to Expand Native Culture**: Teacher, Alaska, \$513 donated, Fully Funded! 11/16/2022
- Building Thinking in Math**: Mrs. Sechrist, Clementon Elementary School • New Jersey, \$437 donated, Fully Funded! 11/17/2022
- We Celebrate Diversity and Differences**: Ms. Londono, North Charleston High School • South, \$1,721 donated, Fully Funded! 11/1/2022
- Molding Clay and Minds**: Mrs. McGraw, Walkersville High School • Maryland, \$760 donated, Fully Funded! 11/11/2022

At the bottom, a blue statistics bar contains the following data:

- 161 Funded projects
- 149 Schools served
- 158 Teachers supported
- 227 Gift codes redeemed

*Include the margin*

# JUGAAD MOVES



*Include the margin*

# JUGAAD MOVES



*Include the margin*

## JUGAAD MOVES

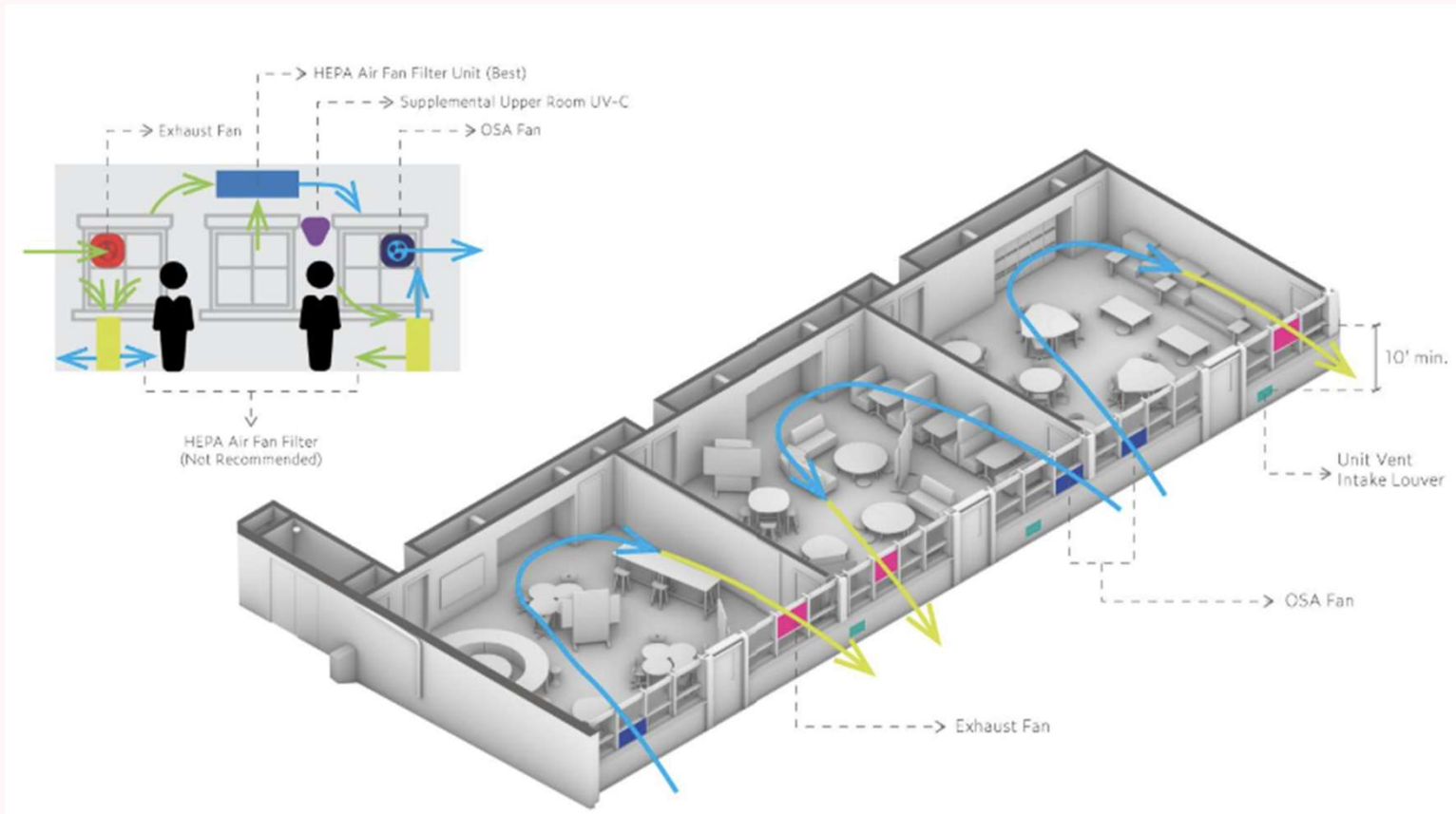


Doorstep School-on-Wheels, Mumbai [Photographs]



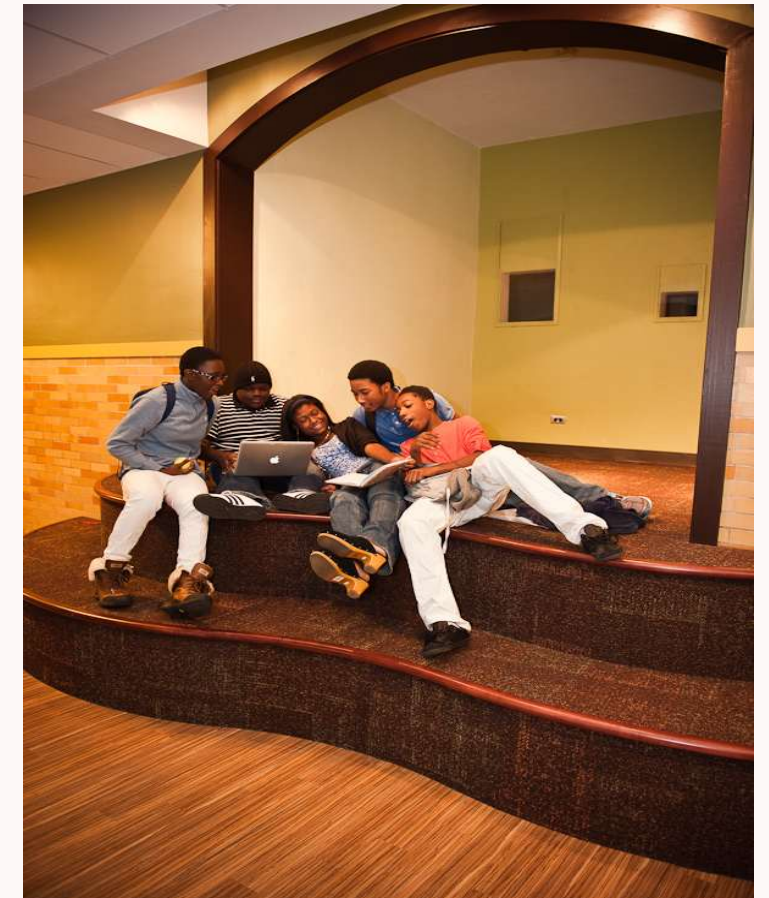
*Include the margin*

## JUGAAD MOVES



▲ The concentration of viral particles is the key to how effectively it will spread in a classroom. This can be mitigated by everyone wearing face masks, dilution of the viral particles by aggressive ventilation of the air volume with fresh outside air, by filtration of the classroom air with a HEPA based air filter at the ceiling, and if possible, filter systems that use a UV-C chamber system.

# City Neighbors Charter School



*Think flexibly*

# IMPLEMENTATION PATTERN

1. RECLAIM
2. MAKE SAFE
3. PILOT SMALL
4. ADD PEDAGOGY
5. FUND LINE ITEMS
6. MAINTAIN
7. SCALE

## ...Jugaad makes you confront questions like:

- Q1. Why did this work? What workaround emerged
- Q2. What assumptions did I have to Abandon
- Q3. How did the limitation change my thinking?
- Q4. Where else this idea be repurposed

# Going through the PLANNING Process

ALTERNATE PATH

Create Micro funding for projects in existing  
buildings

*Seek Opportunity in Adversity*

ALTERNATE PATH

Host a school design competition

*Think and Act Flexibly*

ALTERNATE PATH

Crowd Funding  
Micro Renting

*Think and Act Flexibly*

# Where Jugaad does not apply

- Code
- Detailing
- Expert Informed
- Testing & Standards

Exercise