STEM from the Beginning

...

Setting up an Elementary STEM Classroom and Program
K-5

Begin with the end in mind...

Why for our building (PK-12)...

- Came about in our DLT decision framework discussions
- Need students to develop soft skills like:
  - Grit,
  - Problem-solving,
  - Flexible/nimble of thought and action, and
  - Persistence
- Big push for PBL/PrBL

Begin with the end in mind...

Why for our level (K-5)...

- Soft skill habits take a long time to develop
- They need these skills just as much as the older students, seeing a deficit
- Consistency
- Help classroom teachers with meeting our expectations from DLT
- Different viewpoint of students

Why me?... my position is titled: K-5 STEM Integration Specialist

- LUCKY!
- Licensure (4-9 Sci/ELA; PK-12 Media Specialist)
- Hands on
- Plays well with others :)

#1 Key to Success... in my opinion...

This is the holy grail.... **CO-TEACHING/Collaboration** and Integration

Who do I collaborate with:

1. Grade-Level Teachers (my co-teachers in crime)
2. Tech Coordinator, Curriculum Coordinator, HS Robotics, Elementary Principal, ~~7th and 8th grade PLTW teachers~~
3. New the to the district 2022-23: 7-12 STEM Integration Specialist

Integrate:

- Why? Does all of it have to be?
- Gateway/Foot in the door: Science
- Can apply to any subject

The Space...

Things to think about (challenges for your space)...

- Student population you are serving
  - Furniture
  - Style
- Organization
  - Materials/Tools
- Layout
  - Think about your procedures
  - Convenience/Ease
- It Takes Time
  - Go sit in your space and daydream - I used tape and paper on my walls and floor to “map” out what it would feel like and look like

The Space... Student Population the Space is Serving

For me it's K-5 ... and those bodies are WAY different.

I needed to think adjustable, flexible, movable because who knows what we are going to get into?!

- Furniture:
  - Tables ... the Cadillac of tables... HATT tables... I don't have them, but someone should.. :)
  - Chairs ... get stools
  - Outlets reels in the ceiling
  - Carpeted area
  - Multiple trash cans... I have one on wheels, you should get one (your janitors are your best friends)
  - CART!! Look at rubbermaid... expensive but worth it

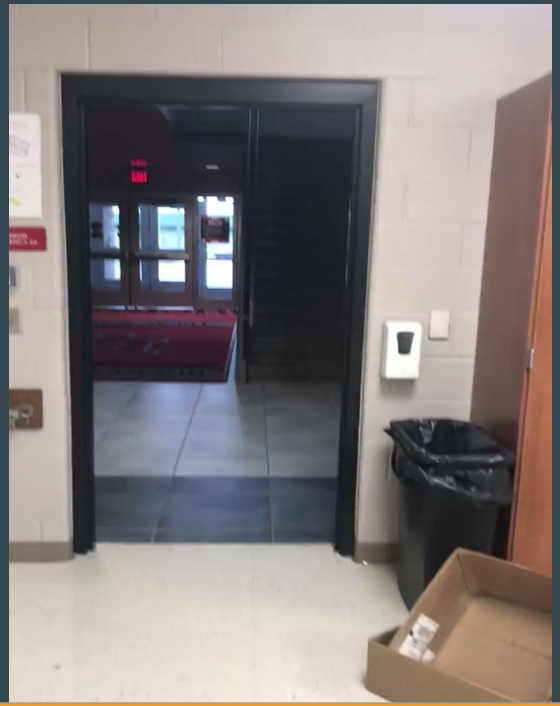
The Space... Organization

Organizational needs: ability level, line of sight, ease of use, sustainability, adjustability

- Adjustable wall system (the container store, 20% off if you time it right, it's completely adjustable)
  - Drawers
  - See-through
  - Counter-top
  - Peg Board
- Shelving (my silver ones for projects are on wheels)
- Shelving for paper (mine is an old wall mailbox unit)
- Existing wall unit of traditional cupboards
- Containers for projects in progress... I got mine at the dollar store, not my favorite but they do
- Talenti gelato containers... clear, heavy duty plastic with screw-top lids... your welcome.

The Space... in pictures and videos

IN PROGRESS - Summer 2021



CURRENT - March 2022

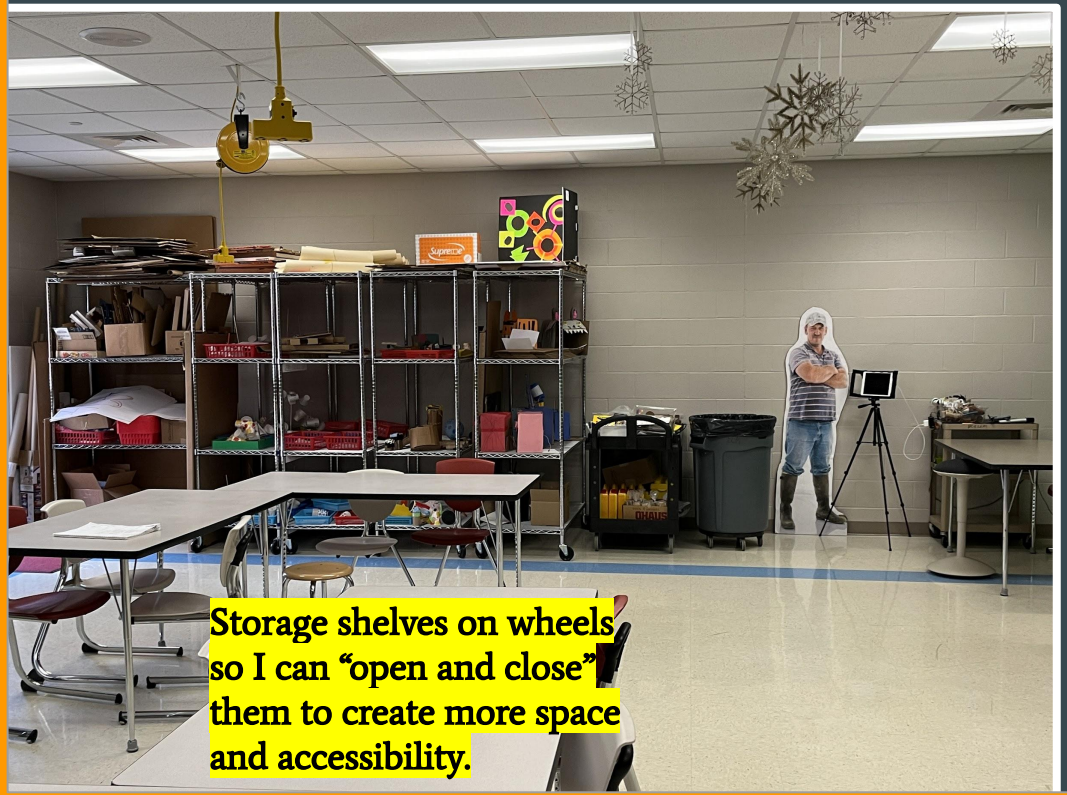
The Space... in pictures and videos

Construction of the wall unit.

The Space... in pictures and videos

You need to think through the location of tools for older and younger students... Even young kids need to have independence or you will go bananas helping everyone.

The Space... in pictures and videos



Storage shelves on wheels so I can "open and close" them to create more space and accessibility.

Paper, Foam, Felt Transparencys, Notecards, Labels, Envelopes, etc.

The SPACE

Beginning Tools...

*I started with Bob's list on STEM is Elementary... sign up for his newsletter too.

Robotics:

- Bee Bots
- Botley
- Ozobot
- Hummingbird Kits
- Micro:bit (BBC)

Equipment:

- KEVA blocks
- 3 Dux Design
- 3Doodlers
- Paper Circuit materials (I need makey-makey's)
- Poster maker

Tools:

- Cardboard saws
- Cardboard scissors
- Tape measures and rulers
- Hot glue guns
- Tacky glue

Beginning Resources

Professional Groups (Ohio/National)

- OTEEA / ITEEA
- SECO / NSTA

Standards

- STEL - ITEEA's Standards for Technology and Engineering Literacy
- NGSS
- Ohio Science Standards

Books

- Picture Perfect STEM Lessons (K-2, 3-5)

Beginning Resources

Websites to START with...

- STEM is Elementary
  - (great for Ohio Science Standards integration as well as tool resources and other places to go to find information - sign up for his newsletters - this is where I started, Thanks Bob!!)
- TeachEngineering
  - Top-notch resource, can search by topic
- NASA STEM Engagement
  - Each division of NASA has their own STEM/Education resources... you can find stuff all over the place on NASA's website, this section I have linked is actually some of their older stuff, NASA's Best Resources, but is a FABULOUS place to start
- Code.org
  - Every class uses it, I link it to Google Classroom, super easy to use, quality resource
- Don't forget: Professional websites you are a member of as well as the websites from the tools you have (ex. ozobots)

Beginning Resources

Blog/TPT people to follow to START with...

- Teachers are Terrific
  - STEM challenges - design process
- VivifySTEM
  - Sign up for their newsletter and get their free resource library - terrific resource
- Momgineer
  - STEM challenges - design process, book connections
- Teach Outside the Box
  - Does a lot with the robotics tools
- Feel Good Teaching
  - Science and ELA connections, design challenges
- Carly and Adam
  - Challenges are based on books

Supports

Grants

- Endowment fund
- Companies... PPG, North Central Electric Community Fund

Staff Community

- Collaboration and recyclable materials

Administration

- Need to be on board - they control scheduling, funds, and the overall vision for the whole school

Community/Parents/PTO

- They love it - want to see kids learning how to use tools and processes they use in their everyday lives - create different opportunities
- Willing to save PT/TP rolls/egg cartons and that sort of materials
- Offer parent/student opportunities that can have a STEM bend for families to enjoy at the school, ex. Slime Night

What I'm working through currently...

- What percentage of each: coding/robotics/maker/design challenges, am I doing in each grade-level... and is that what we want?
  - Do we need to focus or continue to offer a variety?
  - True collaboration
- Need to get more writing done in my time as well as start an Engineers Notebook that will follow students as they go
- Are students showing growth because of these experiences?
  - How do I know?
  - Need to think through a beginning, middle, and end moment to assess... challenges to take a look at each student and gauge how things are going...
  - Rubrics
- After school/summer opportunities?
  - Going to offer a hummingbird week with incoming fifth graders and a LEGO experiences for my incoming fourth graders
  - Vex?