Connecting the Dots: 
Integrating STEM in the Classroom 

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Agenda

★ 8:45-9:15
  ○ Grounding
★ 9:15-10:30
  ○ Model integrated STEM lesson and debrief
★ 10:30-11:00
  ○ Reflect on the Science and Engineering Practices for NGSS and the Standards for Mathematical Practice from the CCSS
★ 11:00-11:30
  ○ Supporting teachers through a STEM Coaching Cohort Model
★ 11:30-11:45
  ○ Closing, Reflection, Q&A
Grounding

Read through the Innovator’s Mantra.

First Thinking: Annotate the text with:

3 “Yep that’s me, that’s what I believe and do often.”

2 “I do believe this, but don’t always do it.”

1 “I’ve never really thought about this, but I like it.”

? “I’m not sure I buy this one”

Group Thinking: Form a group of three - make a small fire group! Introduce yourself and share and compare your mantras - tell your story about why you are here, hope to learn, and your innovations!
Model STEM lesson: Connecting the dots

Mini - Lesson:

Choose your problem: Life Science, Earth Science, Physics

Worktime/Engage: First thinking on your own

Worktime/Explore and Explain: Group thinking: Share your thinking with your group. As a group, create a One Pager (Bybee) to present
Use this sample one Pager to hold your Group’s thinking.
Model STEM lesson: Connecting the dots

**Worktime/Elaborate**: Share out one pagers - sticky note feedback protocol - what I like, what I wonder, what I have.

**Debrief/Evaluate** Reflection on feedback - what revisions would you make?

Reflection for teachers: What are you thinking about for planning so far? What takeaways do you have? Ideas? Questions?

How could you integrate more technology or engineering in this lesson? (besides what occurred naturally)
Connecting the Thinking:

★ Sort the Science and Engineering Practice (SEP’s) and the Standards for Mathematical Practice (CCSS SMP’s) cards.

★ Take a stroll and look at the ways others sorted these.

★ Which practices did you find yourself engaged in during the model lesson?

★ Complete “how this shows up for my students” for SEP’s and/or SMP’s
STEM Coaching Cohorts

- What they are.
- How they work.
- Impact on teachers and students.
Beliefs that guide our work.

Big Ideas
Guiding Questions
Teaching Targets
How STEM Coaching Cohorts work.

★ 3 Learning Days
   ○ 1 workshop day
   ○ 2 lab days

★ Coaching Cycles
   ○ Planning
   ○ Observation/Debrief

★ Workshops outside of school
   ○ 2 hour workshops - coding, ArcGIS, Analyzing Data, Engineering Design Challenge, Maker Space trainings
   ○ Workshops with partners:
     ■ Denver Museum of Nature and Science
     ■ InWorks design center - UC Denver
     ■ University of Colorado, Boulder
     ■ Denver Botanic Gardens and Plains Conservation Center

[Link: Cohort Structures (2019-20):]
Discussions during Observations

Kate's Lab Day 11-14-17

Tracy Voreis Tue Nov 14, 2017 at 8:55 am
Kate frontloads them with strategies to use when they get stuck.
WIM: She is helping them be independent learners, which will help them in life and with the 2 required independent AP projects.
Like · Reply

Denise Goldin-Dubois Tue Nov 14, 2017 at 8:56 am
Catch at 8:54 - What can you do if you get stuck? Use the reference, look back at resources. Have something to look at by about 9:20
WIM: Universal Nugget to propel kids on and direct them to their resources. Give them a set timeframe.
Like · Reply

Shaina Jewell Tue Nov 14, 2017 at 8:56 am
I like the Real Groups vs Ideal Groups poster. WIM - supports students in making choices that promote their academic success.
Like · Reply

Ms. Mcdonnell Tue Nov 14, 2017 at 3:33 pm
I did this with them really early on in the semester. Even though I collected their thoughts, they were the ones who came up with the descriptions. It was a great conversation that really cleared the air -- they knew I was aware that not everybody does it. We also discussed the fact that they can "fire" a group member and make them do the project on their own (after a process, of course).
Like · Reply

Sarah Gosselin Tue Nov 14, 2017 at 8:56 am
Students adjusted their images based on each other's feedback WIM: Learning is flexible and often times revising is needed.
Like · Reply
Leslie Donnelly  Wed Nov 15, 2017 at 8:58 pm
I figured out that I could possibly integrate PBL work with ADI work.

I'm thinking that I should get started on planning my first PBL. I know our goal is to do at least one PBL this year and we were thinking of trying it with weather. So my do now is getting my thoughts on paper and my do later is ?

I feel better with using the 5E's, but I'm struggling with writing out daily 5E lessons versus multiple days. As for STEM, based on the article from today's workshop, I would say I would like to work my way up the ladder to get to a transdisciplinary unit or lesson. Finally, as for NGSS and teh S&E practices, thankfully ADI covers most of those, so it's just me getting better with how I scaffold the elements within the ADI format to ensure every student is able to reach those targets.

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Lexie Baldwin  Thu Nov 16, 2017 at 2:58 pm
I figured out that I need to do more inquiry and resource usage throughout each class period, especially with my Algebra 1 classes.

Now, I need to take a step back and ask, "What can my students do on their own?"

Later, I need to work with and collaborate with my co-teachers to get on the same page.

Math: I need to use first thinking and reflection more in my classes to establish inquiry and help my students think at a higher level. I bring in SMPs and am doing a PBL all semester, but am I truly making them think at a higher level and helping them reflect on their think?

Thank you!! :) This was awesome!! I can't wait for y'all to see my PBL day next semester!

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Reflections and Debrief from Lab Days in Schoology Discussions and video debrief
- Interviews
- Student and Teacher Pre and Post STEM efficacy Surveys
- Classroom Observations - written and/or video with debrief
- Teacher reflections on beliefs and classroom practices - survey
- Test scores (ACT, SAT, Explore, etc…)
- Teacher created common performance tasks with rubrics
- Discussion Reflections

Other Feedback/Evaluation of our program
Debrief

Turn and Talk - Wonderings, Takeaways, Things to try right away, or future.

Q and A

Feedback in Kick up
Take our 3 minute survey!

Session ID: 1326

NOTE: Session ID should be in all CAPS and is case-sensitive.