Why is _____ critical to MWEE?

Issue Definition → tied to skills of inquiry not just science content
- → opportunity to bring focus to a broad concept
- → classroom integration, choosing an issue anchored to curriculum standards

Outdoor Field Experiences → makes MWEE authentic
- → exposure to <u>local</u> places (schoolyard, river, etc.)

ction Project → supports use of interdisciplinary skills and standards (beyond scienc
- → connection to careers (especially local impact)
- → more than the physical action, process of getting there
- → sense of control, ability to impact for students

thesis & Conclusions → easy, obvious ties to language arts skills in order to put words to the process
- → improve student understanding of science language and experience with phenomena
- → forces interpretation of data as it is

... potential assumptions or points of confusion...

Issue Definition
- Issue should/needs to be tied to a standard ... using driving and supporting questions to provide "structure"
- 'Issue definition' boils down to 'identifying a problem' terminology possibly a struggle or barrier
- progression of independence in defining issue

Outdoor Field Experiences
- Assumption that teachers are prepared to lead this type of work
- Bay Agreement as "permission" to do this work
  - ↳ varies from LEA to LEA, better luck with mandate from the top
- Misconceptions around waste of time, safety and management with taking students outdoors
- For offsite experiences, issue of funding that is sometimes assumed to be easy to figure out
- Power of the schoolyard

Action Project
- not in the standards (science)
- Confusion that MWEE is always science
- Misconceptions around what makes a quality project
- Reality of systemic implementation with student choice
- Confusion of other types of action beyond restoration

Synthesis & Conclusions
- This should really be happening throughout MWEE should not be linear
- Students having difficulty describing their process and results
- Assumption of synthesis as the same product for all students
- Struggle of students to accept and interact with data

How to Address

Integrating Supporting Practices into Essential Elements

Active Teacher Support

+ Build interest +Give examples
+ Increase comfort outdoors + content
+ Model "guide on the side" with questioning strategies to lessen teacher talk
+ Ongoing / 1-on-1 support for teachers
+ Support, Buy-in from administrators
+ Teachers supporting other teachers

Classroom Integration

+ know your standards, justification for doing a MWEE
+ This type of interdisciplinary learning sticks
+ Ask classroom teachers what they need

Local Context

+ Provide list of natural resource experts
+ Connect them to local context
+ Increase understanding of local area
+ Recognize that students may not have inherent value of their local environment
+ Bring in current, local events
+ Listen to and learn perspectives of studen
+ As a provider/supporter to teachers, try to know the teachers' local contexts

Sustained Activity

+ Ties back to curriculum integration
+ One theme / focus throughout
+ Continuum of energy, pieces of MWEE system
+ Use of visual aid, story boards, portfolios to tie all learning back to

Synthesis & Conclusions

Own the data (your)

Ongoing & spiraling
as knowledge is gained & reflected upon
& built upon

Build toward action

Make sense & apply

Develop driving question

community parents experts

Share w real audience
beyond classroom

Teacher PD

Partner w University researchers

Relevance > cross-~~disc~~discipline
opportunities to spiral

Citizen Science

Multiple systems

DNF

Outdoor Field Experiences

Never a 1 day trip or program

Needs context

Value of experiencing nature can generate other elements

"Forced march" negative

Teachers understanding how to teach outdoors

Outdoors as a classroom

uckets as seats, white boards

Preparation

Outdoor logistics & protocols to make the experience (+) and worthwhile

atellite image connection"

Loaner kits data collection

First aid training

exploration

Teacher comfort outdoors

students react to it

sensitivity training

Student interaction to nature

GLOBE

logistic challenges

DMB

Issue Definition

Relatable
Meaningful to students
to community
to curriculum; standards

LOCAL

WHO ??

If systemic MWEE, instructor decision?

H_2O Quality as theme

Maryland's Changing Hydrology Unit

Issue is
↳ local

Teacher preparation as issue
↳ ex: elementary teachers
↳ PD

Admin Buy In
Superintendent Leadership

Student impact

DMB

MWEE

Ambassador

Role

① Support + remove barriers

② Action Project or Bay Back Pack

Upload

③ Interpret to teachers & admin

→ relevance; real world

④ Leadership (develop teacher leaders
bring others onboard w excellent leadership
getting Superintendents, principals on board)

Interconnected Goals

Action Projects

Open-ended ? — land manager

student input — facilites manager

Student Relationships

Reality vs. proposal

Evaluation ?

Time factors → curriculum constraints

Admin support

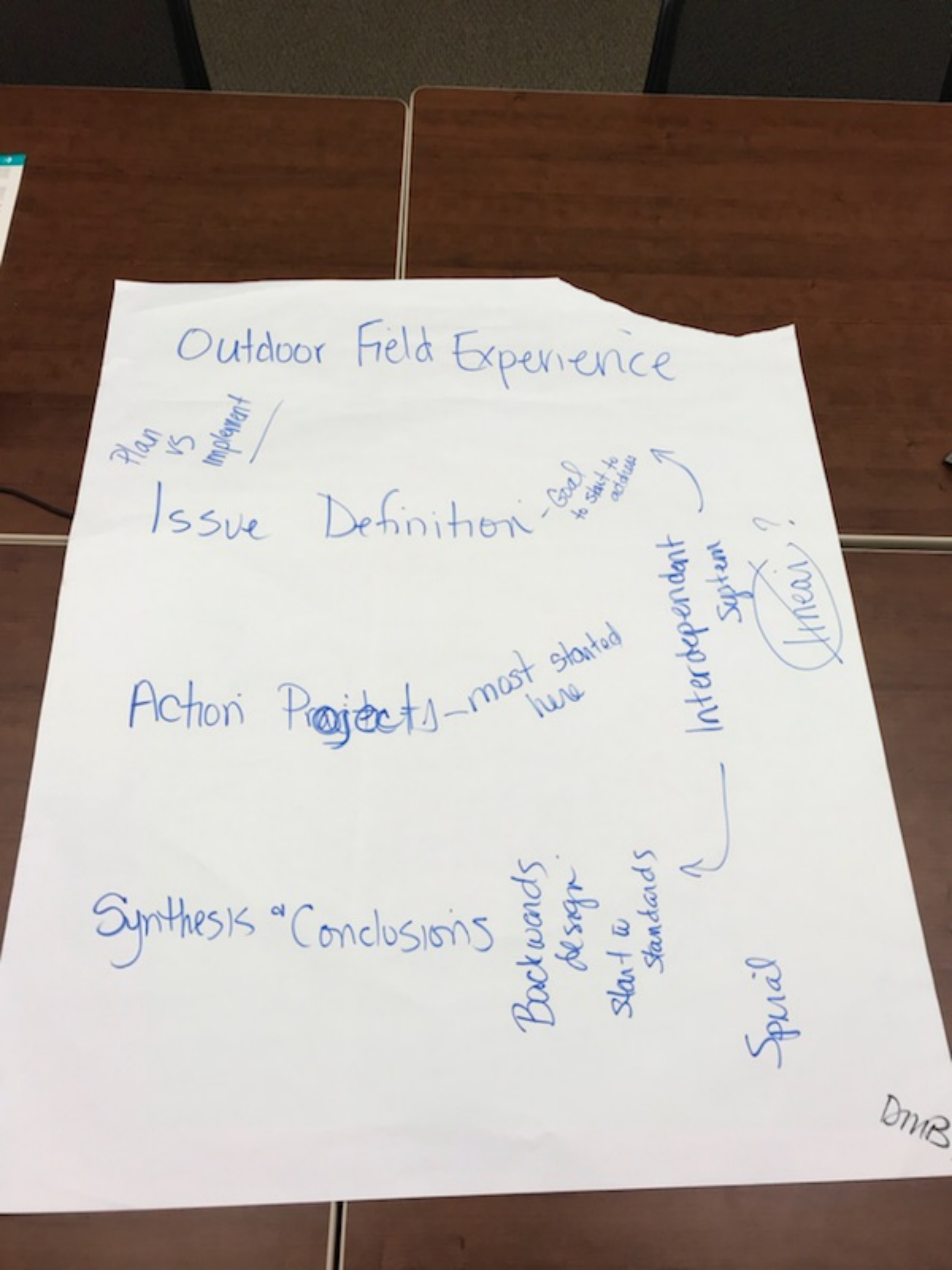
Funding? - grant flexibility

Student
Confidence & esteem

completion

Real Life / Real World

DMB


Outdoor Field Experience
Plan vs Implement
Issue Definition - Good to start to address
Action Projects - most started here
Interdependant System
Linear ?
Synthesis & Conclusions
Backwards design
start w standards
Spiral
DMB

Pervious Paver Parking Lot

Action product portal
on bay-back-pack
Kids or teacher ideas + products

Data repository (FieldScope, GLOBE)
Citizen Science (The Downstream Project)

Issue Identification

- empowering students [teachers drive w/ questions]
- accept "small" ?'s
- gives shape to entire process (essential)
- intersection of human/natural sys.

* start with what teacher already does

Standard-based

strategy for

Empower students with educators asking questions

2

3

MWEE Supporting Practices

Active Teacher Support

"Guide on the side"

- Levels of MWEE
- not sage on stage = Teachers need support (P.D.)
- Differentiation — Support = models – examples – tips –
- Legislative
- Legislative topics (MEMBERS)

Support for all levels of Ed support

Classroom Integration

- governments

Curriculum Writers & Interdisciplinary = Run MWEE

"ELM"

Formalizing | Standardizing Lesson Plan

Local Context

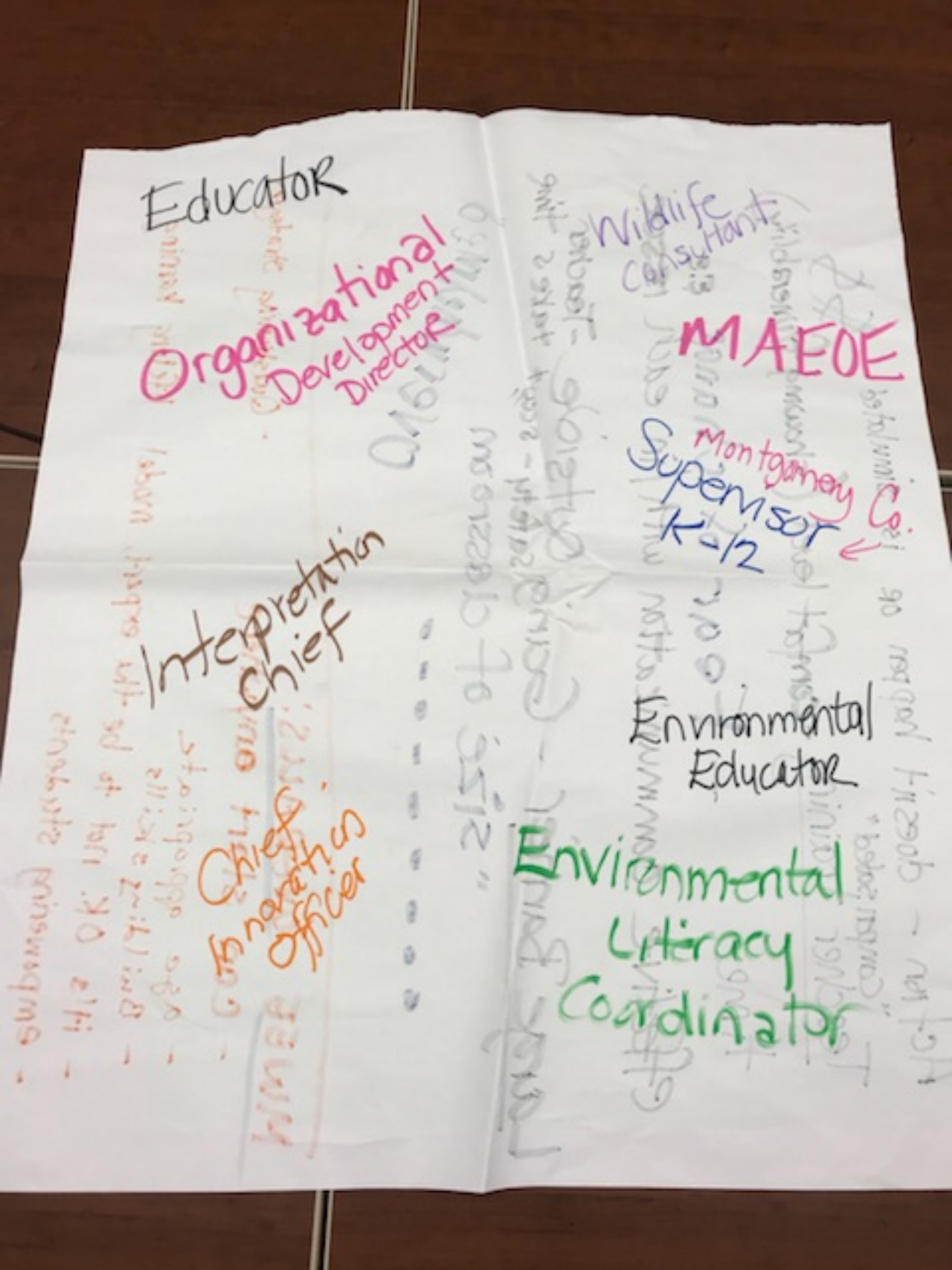
- Partners

Sustained Activity

(Dalinna) confusion on timing of

* umbrella of the MWEE

Cindy Duncans


Educator
Organizational Development Director
Wildlife consultant
MAEOE
Montgomery Co. Supervisor K-12
Interpretation Chief
Environmental Educator
Chief Information Officer
Environmental Literacy Coordinator

Action - doesn't happen or is simulated

"Compensated"

Teacher training - comfort level (showing vulnerability) $$

time

+ Fear of change E.E

effective communication with/in each issue

Large Barrier - Gang Outside - Teacher safety - scout takes time

"size of classroom

overwhelmed

MWEE OVERALLS:

- can start anywhere
- age appropriate
- Building skills
- it's OK. not to be the expert, model lifelong learning
- empowering students
- Questioning strategies

outdoor field exp.

*real-~~field~~ world scientific application
- generates info for analysis
- ~~local~~ place-based
- scaffolded for students
*integrated w/ rest of MWEE
**allows for reflection + explore
- generates more ?s

Empowers

Int

Synthesis + ~~Analysis~~ ~~Conclusion~~ ADD

- evaluate quality and interp. data
- display / communicate findings
- cyclical - not an endpoint
- interdisciplinary meaning & understanding
- interwoven in MWEE

Empowers

ACTION

- can be a starting point for MWEE
- Community-based is strongest
- empowers kids

(Needed)
- Teachers
- Experts
- Partners

Employment

career ops

- Not always end *

So WHAT?

TRANSFER SKILLS

Supporting Practices

- Do NOT assume teachers have the content knowledge
- Standard alignment = priority
- Administrator support
  - ⇒ VALUE
  - ⇒ How vs. what
    - ⇝ New name = new thing ☹ unfunded mandated ⇝
  - focus on pedagogy
  - ⇒ No school accountability
- Support teachers in classroom - coaching

PD

Need for teachers to experience doing a MWEE

Training for teaching outdoors

Train the trainer- Science Supervisors

Synthesis / Conclusion

Where bridge/connections are made

Happens throughout process
formative & summative

who
Students; teachers; partners

Self evaluation
What did we learn?

Comparing to other experiences
Modeling to inform conclusions

how
formal communication ~ poster; etc.

Synthesis should have student experience compared to other literature/ or other class results
research

Supporting Practices

Teachers:

- → Need to learn new pedagogy
- → Experience MWEE
- → outdoor classroom management

Nonformal involvement must include "eduspeak!" in supporting teacher PD etc.

↳ working w/students

Paradigm Shift

↳ teaching volunteers/others proces

Sustainability of MWEE in LEA

↳ new teachers

(EIA > Environmental Literacy Plan

Creative Resources

Issue Definition

Who? Organizations/Partners

Age Based ⟹ Teachers - set parameters

Students

Younger - more teacher facilitation

⟹ School District - standards

↳ STATE Dept. of Ed

⟹ Resource driven

Issue Definition

Student ownership/relevance

Sets the stage for the MUSEE/Bedrock

Defining Parameters for management by teachers
- could have overarching questions for students to help define/refine
  - guided inquiry
- TOOLS
- location for field experience

KUD's ~~De~~ Knowledge; Understanding; Doing

- Student research and refining Issue definition based on findings

Issue def = Hypothesis development

Outdoor Field Experiences

Authentic
Meaningful
Gives Context
Engaging
Stimulating
Career Exposure
Doing vs. Reading
'Real' tools

- Problem kid – no problem in field!
- Differentiated instruction
- Depth vs Shallow learning
- Bridge between content & experience

How do you make schoolgrounds experience as exciting as off site?

* infrastructure
* texture
* Make multiple experiences

Bringing field data/samples into classroom for analysis

Outdoor Field Experiences

Teacher comfort

Natural world

Who
- Administrators
- facilities staff (schoolgrounds)
- Providers
- teachers / expectations of teacher involvement @ sites
- Volunteers

How to investigate issue outdoors?
- teacher knowledge

Action

Deeper learning ~ implications;
Stewardship through youth driven
Empowering - they can make a change

⇒ Does action project have to come as a result of MWEE or can it be the impetus for investigation? Need Why - Can it set the stage for next stage of action? for next class?

Student Driven

⇒ It is about caring ❤ & taking action
Locus of control

ACTION

Who?

- Community
- Partners
- Teachers
- Administators
- Students
- parents/families
- elected officials

make it shine!

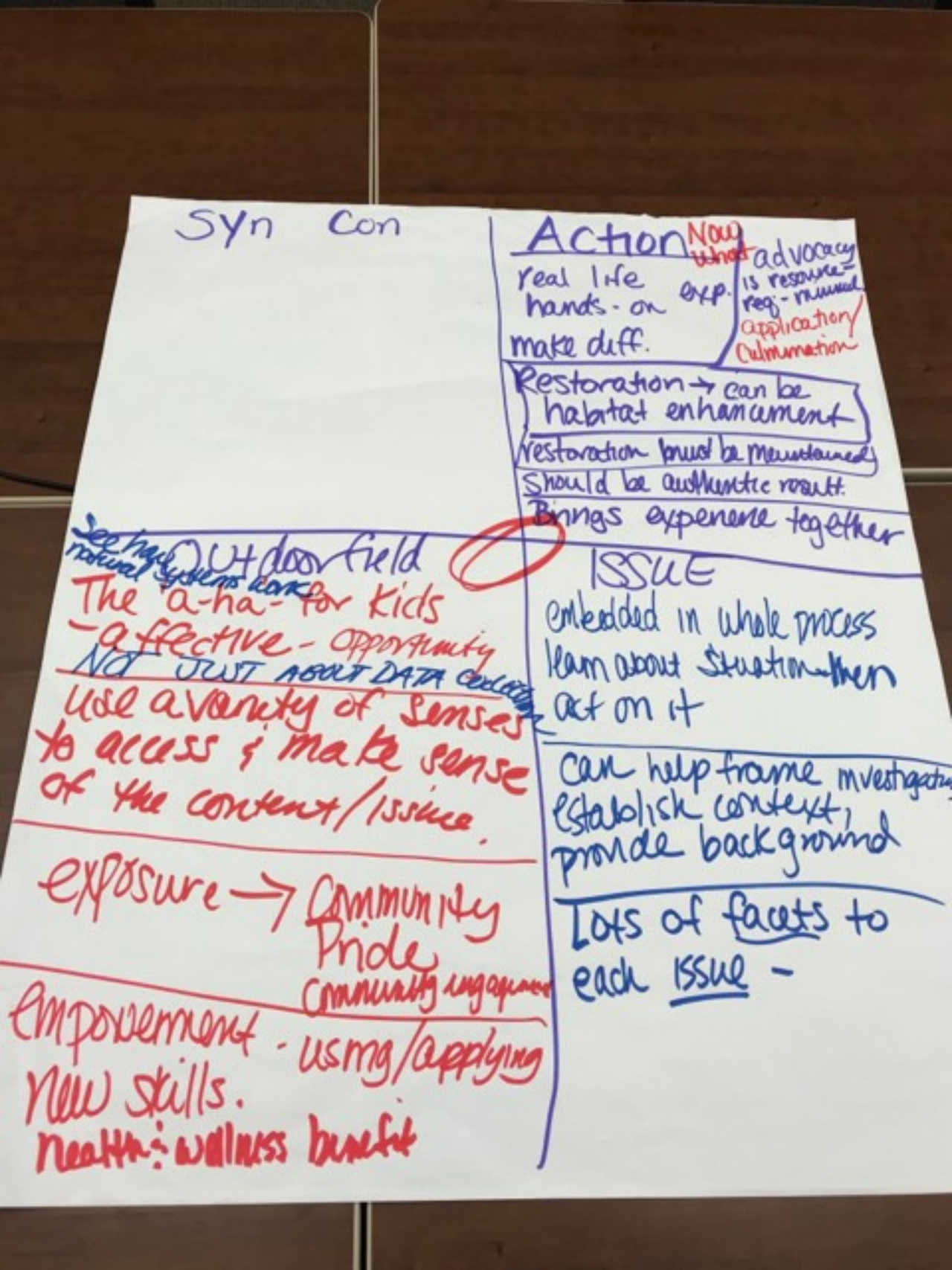
Media
- Newspapers
- twitter
- etc...

↑ Sustainability

↑ funding

Stakeholders

More student driven - more it happens


Syn Con
Action
Now what
real life hands-on exp.
make diff.
advocacy is resource-req-ruined application/ Culmination
Restoration → can be habitat enhancement
restoration must be maintained
Should be authentic result.
Brings experience together
OUT door field
The 'a-ha' for kids
-affective - opportunity
NOT JUST ABOUT DATA
use a variety of senses to access & make sense of the content/issues.
ISSUE
embedded in whole process
learn about situation then act on it
exposure → Community Pride
Empowerment - using/applying new skills.
Health & wellness benefit
can help frame investigation establish context, provide background
Lots of facets to each ISSUE -

Outdoor field
Synth. conc.

Eric
Grace Ann

- plan activities that can only be done outdoors
- inspire sense of wonder and connection with nature
- activities that stimulate all the senses and learning styles
- intentional, well-planned, and grounded in best practices

- understand all sides of an issue
- encourage sharing of experience with others
- formulate actions to make improvements or celebrate achievements
- give students opportunities to voice opinions and make informed decisions

As ambassadors, how will we prepare/support audiences to integrate Supporting practices into the "MWEE SYSTEM"

Active Teacher Support	- collaboration between teacher + field staff to plan - recognize and support master teachers - peer teaching - school community - more than just 1 teacher - mentorship among teachers
Classroom Integration	- "trip" is just a part of the process - data is analyzed in the classroom - sets up more activities - cross-curricular - encourage team teaching across subjects - admin buy-in → interaction between field staff (provider) & classroom teac
Local Context	- relevance - lifestyle impacts - recreation - focus on local stream rather than Bay - local history - emphasize proximity - nearby water/streams
astained detivity	- Support system/advisory committee - top→bottom buy-in - idea becomes part of the curriculum

Issue def
Synth. Conc.

Jim
Chris

- Framework: Options for questions
  - Design
  - Investigation / Critical Analysis
- Refined - defined throughout process
- Provides background information + context
- Identifying biases / preconceived ideas
  * grade level dependent

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nth/Conclusion

Allow students to form own conclusions
- explain rationale / how did they answer question

orm additional questions

Action
Synth Conc. – Reflection Communication

Meg
Andy
Laura

Why
Personal/relevant/ownership for Student

Solution-focused / full circle
Meaningful

Who
local stakeholder - community/elected officials

When
Best at the end
Can overlap w/ outdoor experience

Challenges

- resources
- time (esp. for teachers)
- doable scale
- Funding parameters - challenges w/ # students in Systemic projects
"restoration" vs. habitat enhancement

Challenges / Barriers

→ Systemic restoration projects are tricky

res conv
pers choice
civic ~~engagement~~ election
common enfo

People think of restoration as this big [intimidating] thing - can be a barrier to many teachers

Student-driven v
Student-centered

BARRIERS / CHALLENGES

> How to have issue def. be student-directed?
  ↳ Defining parameters - teachers set overarching Qs but students define/refine specifics

> MWEE as another thing
  ↳ VA Performance Based Assessment is a MWEE (build it all in together)

> Time to allow students to develop hypotheses (issue def.)

- School grounds not as exciting

Issue Def:

- Puts everything in context
- Relevance
- Invites more stakeholders
- ★ Incorporate wide variety of topics (not all water-related)
- Can drive student-driven/centered piece — if THEY define the issue or question
- Culture of stewardship/empathy
- ★ makes curric. integration easier → Standards
- Develop critical thinking

WHO: Teacher as facil.
STUDENTS "Experts" to help provide/develop knowledge

- ★ Need interdisciplinary collaboration — Requires culture change among educators
- "Watershed ≠ just water
- Help focus driving Q
- Not one answe

Complicated getting students to define Qs

OUTDOOR FIELD EXP. Yay! ☺

- Need it / passion → nec. for behavior change
- connects us to envit.
- Ideally off-campus / can do @ school, locally
  - Need Both
  - "Nature Near School" (Continuum of Experience)
- Meaningful data coll.
- Emphasis on EXPERIENCE / discovery as well as organized learning
- Spurs creativity / curiosity
- True observation
- Provides for more equity if we assure ALL students have opp to exp. true nature

WHO? EVERYONE - EVERY STUDENT

- Teachers
- Admins.
- Health experts
- Diff. disciplines
- Nontraditional learners

Partners

SHOULD: As many times as poss.

NEED: Teacher comfort level - enough to make it "worth" the paperwork

Need - culture change

ACTION PROJ. • students +

Why critical?

- Broadening kinds of projects — Civic Action, Commy. Engagement, Restoration, Daily choices
- Opps. for peer & commy. edu
- Must be student-driven
- Empowering - make difference, apply what learned
- Lend selves to partnerships
- Opp. for continuity year to yr. - progression + depth

Students
Commy. Leaders/members — Businesses + partner orgs - families
Building services/Admins.
Elected officials
Teacher as facil.

ASSUMPTIONS: • "Too hard" / Not enough time

- Vary from the "easiest"/most obvious or known
- Large, in-ground are "only" - overlook other types projects
- Assessment + should fit the driving Q
- Not strictly science - can involve other disc.

SYNTH/CONC

- Observations/data collect come 1st

*STUDENTS
- Teacher as facil.
- Commy. PARTNERS (var.)
  - EE Providers
  - College folks
  - Scientists

- Now where can I go? (Not an "end")

- Makes meaning + connections
- ★ Can inform action project
- Can be ongoing/revisited —
  new conclusions
  inspire curiosity

of facilitating
- Assume person in charge is confident
- No one right process or answer
- Powerful need for PD
- Assumpt. = this is end

ACTIVE TEACHER SUPPORT

- Diff. type of teaching / not familiar not modeled
- Teachers need to find success in the model (change management)
- "External" people see it as success (what does learning look like?)
- Teachers engaged = students engaged
- Has to be systemic (all teachers)
- Consistency / sustainability long term
- Dissemination of training to all teachers delivering course (sem. to sem., for example) + for new teachers — district level support

CLASSROOM INTEGRATION

- Must be systemic, sustainable > Has to be in curric.
- Support from State level on down

How it's presented changes

* Awareness of MWEEs / marketing of how helps meet ... STEM ... NGSS ... etc
  → ~~APPROACH~~ to doing what teachers already need to do
- Need way to show it works / is "assess-ible" (can use NAAEE · Stanford study as evidence)
- Provide "baby steps" – action projects can be one way (provide them w/ alignment to standards)

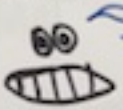
LOCAL CONTEXT

- What drives MWEE, who partners are, etc.
  what action project is
- ↑ potential for making interdisciplinary
- ↑ stewardship when "nest" is smaller
- Teachers may not be local so may not know local issues, partners (= discomfort for some) - should be great opp. for teacher to learn
- ↑ relevance
- "Hyper local" (within neighborhood or on school property)
  = economical + exciting

Tie to broader context

→ Challenge: Safety in some areas (should be a consideration but not deterrent)
  - need strategies

CRIME + BEARS > MOSQUITOS



Sustained Activity

- Need strategy to manage data
- How involve student long-term?
  (3 opps. to participate over K-12 years)
- ↑ impact to student & watershed
- All "systems" in place:
  - Admin. Support @ highest levels (& down)
  - Teacher continuity
  - LEA-level commitment / requirement
  - Teacher PD
  - FUNDING
- Demonstrating success, meeting multiple requirements & Communicating that
- Poisonous snakes  ← just adds interest

Supportive Process

Teacher support

- active teacher support not assumed

Why important as a sustainable process?

- Classroom teachers better able to make connections to curriculum + other areas of the school
- Teacher support is diverse
- Teachers are not staying at school long enough
- Teacher PD

Supportive Process

Who is active in teacher support

- Admin needs to understand direct connection + relevance in order to support PD
- Partnerships.
- Teachers working together to Solve problems → different perspectives
- EdMoto / Google Classroom

WI Active teachers support, how does this lead to Meaningful Student action?

- have teachers participate in videos showing their MWEEs
- teachers have to have wide knowledge base + have access to more resources
- making students aware of the resources available to them
- A MWEE is not possible w/o a knowledgeable, confident teachers to teach outdoors
- Outreach targeting specific schools + telling them that they have land use issues they want to address → need to implement MW

Classroom Integ.

How are we meeting needs?

- Students + teachers need to integrate OFEs into curricula + enrich learning

Why is local context necessary?

- To make authentic + relevant
- Can better understand local issues
- Student in these schools will have the greatest impact on their home towns when they graduate + find jobs

The more excited they get about their local env. Students learn about the area, the more

Sustained Activity

- Making connections b/t multiple domains
- Keep local context
- Multi-Day experiences as opposed to single day
- linking elementary, Middle, + High Schools

Issue Def:

Who is involved?

- Connecting the action to the issue
- Who is doing the research + where can the info be accessed-
- Make the different connections throughout diff courses
- Connect Students to Members of the Community

Issue Def

What are the assumptions/ points of confusion

- Guidelines for potential projects
- honing in on an actionable issue
- Different points of view on environmental issues

Synthesis | Conclusion

Why is it in the MWEE

- Means to analyze data
- Constructs meaning
- Brings all pieces together
- Impact
- Critical Thinking
- This could take time
- ongoing
- As part of the issue def. there needs to be a Synthesis + Conclusion

Should address an emotional response - student feels ethical obligation to restore

Synthesis/ conclusion

Why in the MWEE?

- hitting all classroom subjects
- questions that lead to other questions

Outdoor Field Experiences

Why critical to MWEE's

- Can't assume students are being provided MWEES
- hands on → Makes it more Meaningful → is the "Why we care piece" Protect What you love
- building connection to nature

Why Critical to MWEEs OFE's

- authenticity piece
- experience that is larger than yourself
- OFEs can still be done through facility tours, e.g. Processing plants, aquariums

MWEE Elements Activity

- Sequence – order? no order? work backwards?
- Discovery, Observation, real world application (OFEs)
- Frequency of MWEE
- Comparative
- Addressing multiple elements at once

Action Projects / Outdoor Field Projects

- do activities that don't cost lots of $
- How do action projects fit in?
  - Promotes stewardship
  - Empowering students to make a difference
  - Decision making power
  - 21st century skills → action projects help students make that emotional connection

Action Projects

- Required to achieve Stewardship
- Gives that "Meaningful" experience
- Who is involved?
  - Students
  - teachers
  - custodians
  - admin.
  - Buildings / Grounds / Maintenance / Facility Management
- ~~What Color~~

How Student driven should action projects be + who should be involved?

- Students figured out what methods ~~would~~ would be → determining what tech. can be helpful
- bringing in outside organizations, community members

Action Projects

Assumptions / Points of Contention

- Students taking action to
- time cut out for Action Projects
- what resources are available to support MWEES? — this can be overwhelming
- Find relevance/Applicability in non science classes as well

★ Facility staff support is critical

- Action Project does not have to be off campus
- what does student choice directed mean?

Issue Definition

Why is defining an issue important

- relevancy to students + community
- age consideration
- env. advocacy, community action, personal action
- Defining the issue in context of location for doing field experience