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PROGRAM IN EDUCATION, AFTERSCHOOL & RESILIENCY

MRSEC Education Directors Meeting

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Program in Education, Afterschool, and Resiliency

Friday, September 28, 2012

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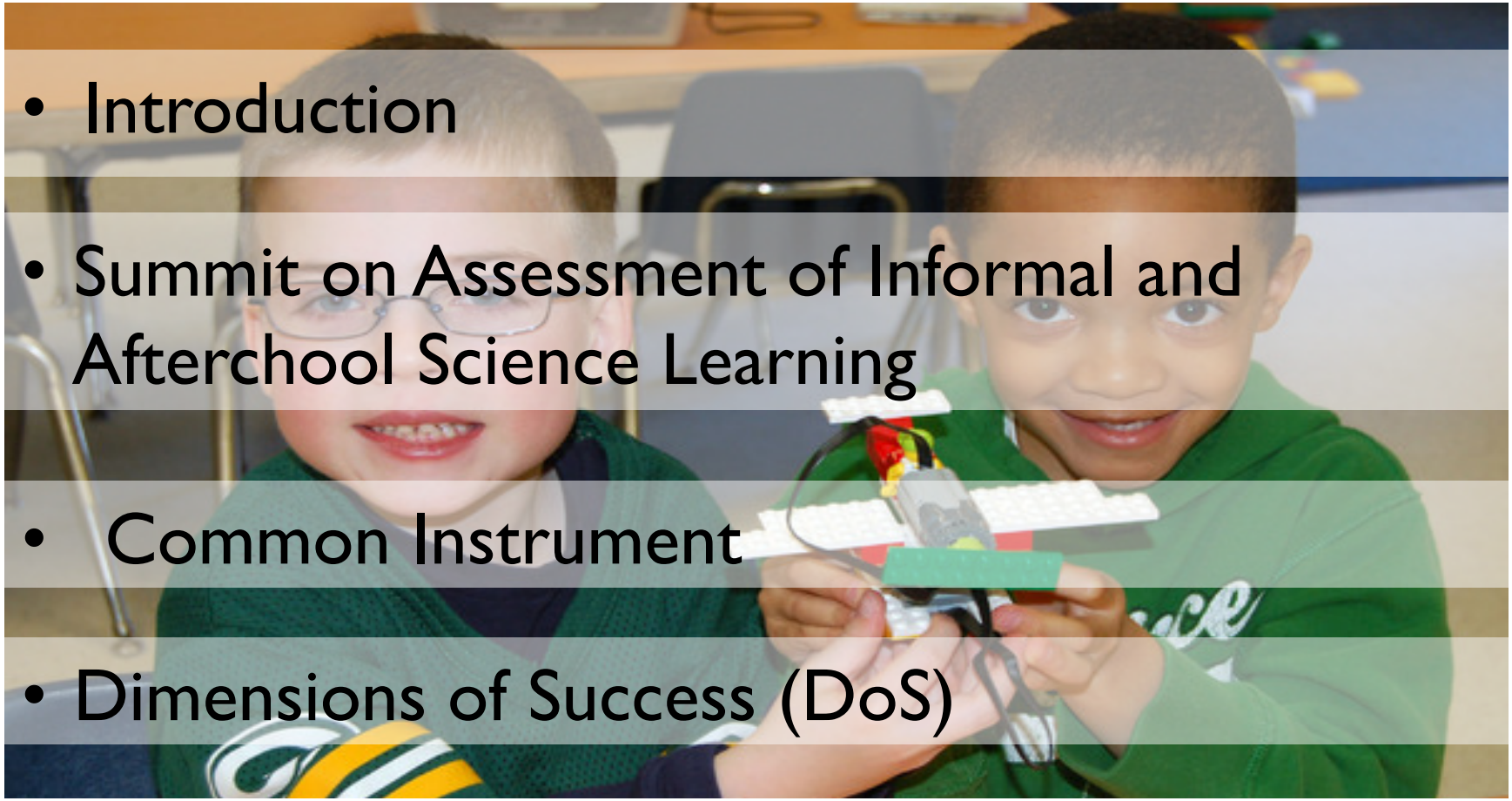
PROGRAM IN EDUCATION, AFTERSCHOOL & RESILIENCY

Agenda



- Introduction
- Summit on Assessment of Informal and Afterchool Science Learning
- Common Instrument
- Dimensions of Success (DoS)

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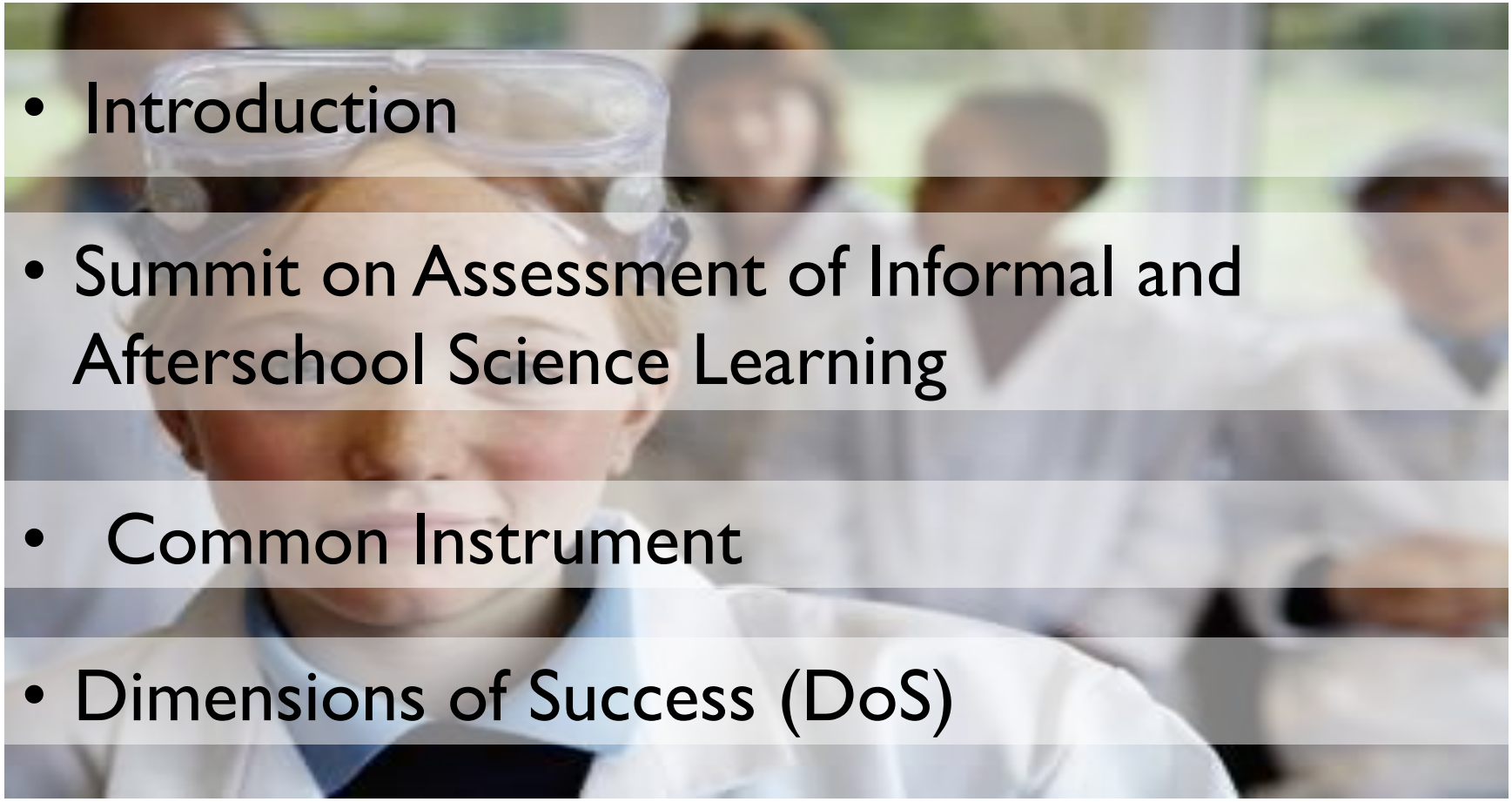

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What's Happening Here?

- Hands-on exploration
- Students engaging in principles of inquiry by asking questions about the animal, making observations, providing evidence for its behavior
- Students deciding what style of presentation they want to give (voice/choice)
- Didactic is not quite working

How do we measure the learning and STEM program quality? How do we assess outcomes and which ones?

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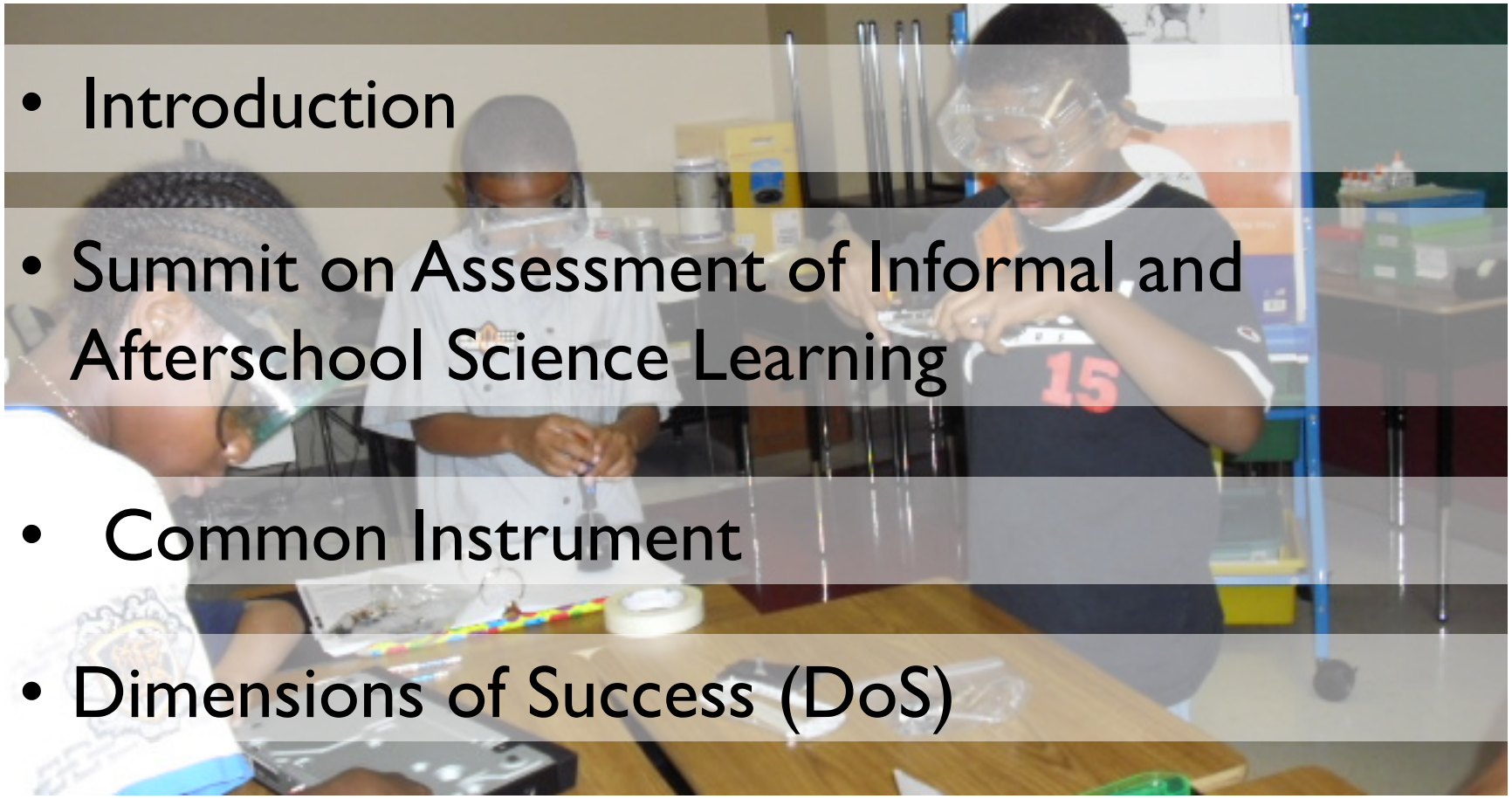

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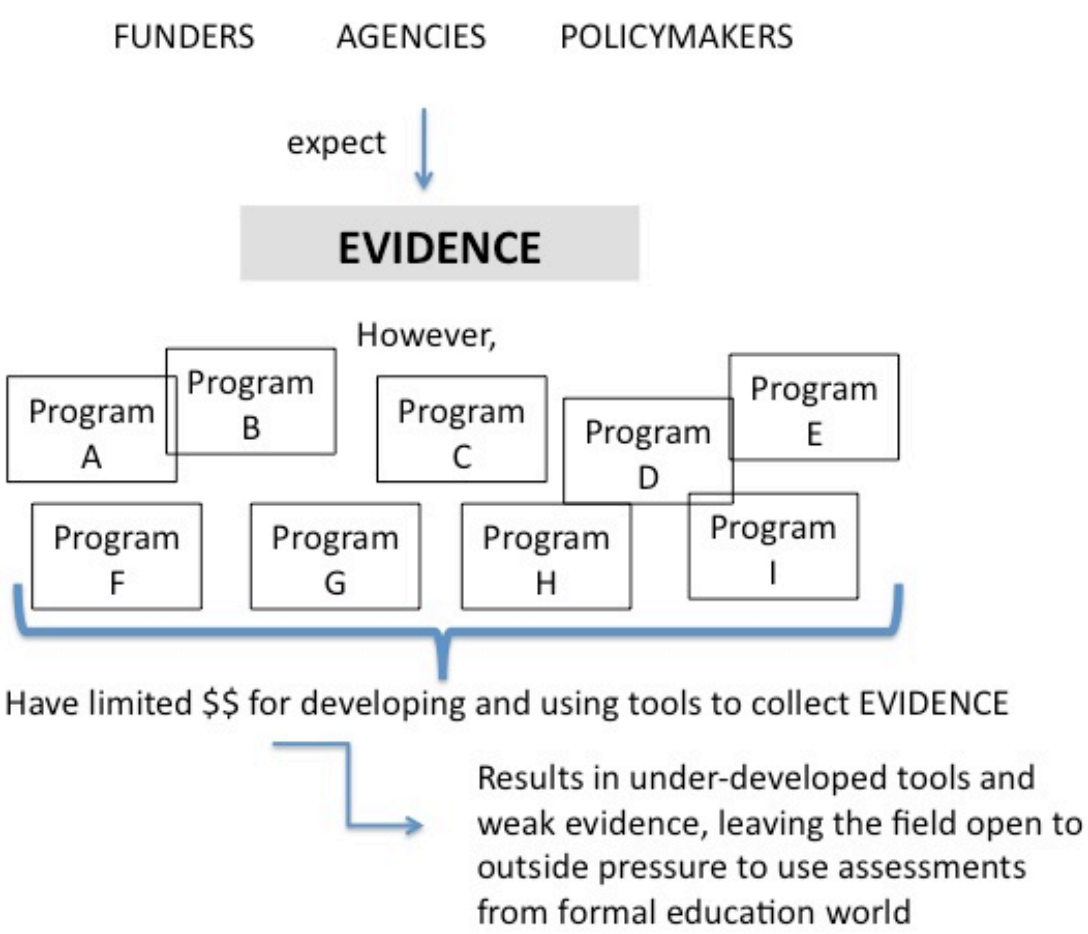
Summit on Assessment of Informal and Afterschool Science Learning

June 10-12, 2012

Experts in measurement and assessment, informal and formal science, along with those who focus on content development, student engagement and motivation, and learning theories.

- NRC
- PEAR at Harvard
- Noyce, Moore, Bechtel, Samueli Foundations
- Report will be released this fall

Current Climate of Assessment for Afterschool Science



Starting Points…to build evidence and a Center

Afterschool is more than homework help and extra-curricular activities--it is an opportunity to access science content/ practices in a way different from school...	→	School assessments are inappropriate; afterschool field needs assessments that do not take away from the informal, youth-oriented feel of afterschool
Common Core and Next Generation Standards push for integrated learning and content/practices learned together	→	Afterschool assessments can help lead the way in designing assessment tasks and items that integrate science with other subjects, are hands-on, and performance-oriented
Partnership and collaborations among afterschool sites and other community resources; more funding opportunities for larger networks	→	Assessments need to be able to be used across sites, even if they have unique program structure allowing for aggregation of data and building of evidence-base
There is a push for afterschool science programming to be more outcomes-driven	→	Afterschool assessments should focus on key outcomes that are most salient for science learning in afterschool. If we don't choose outcomes, they will be defined for us.

ATIS

www.pearweb.org/atis

Agenda

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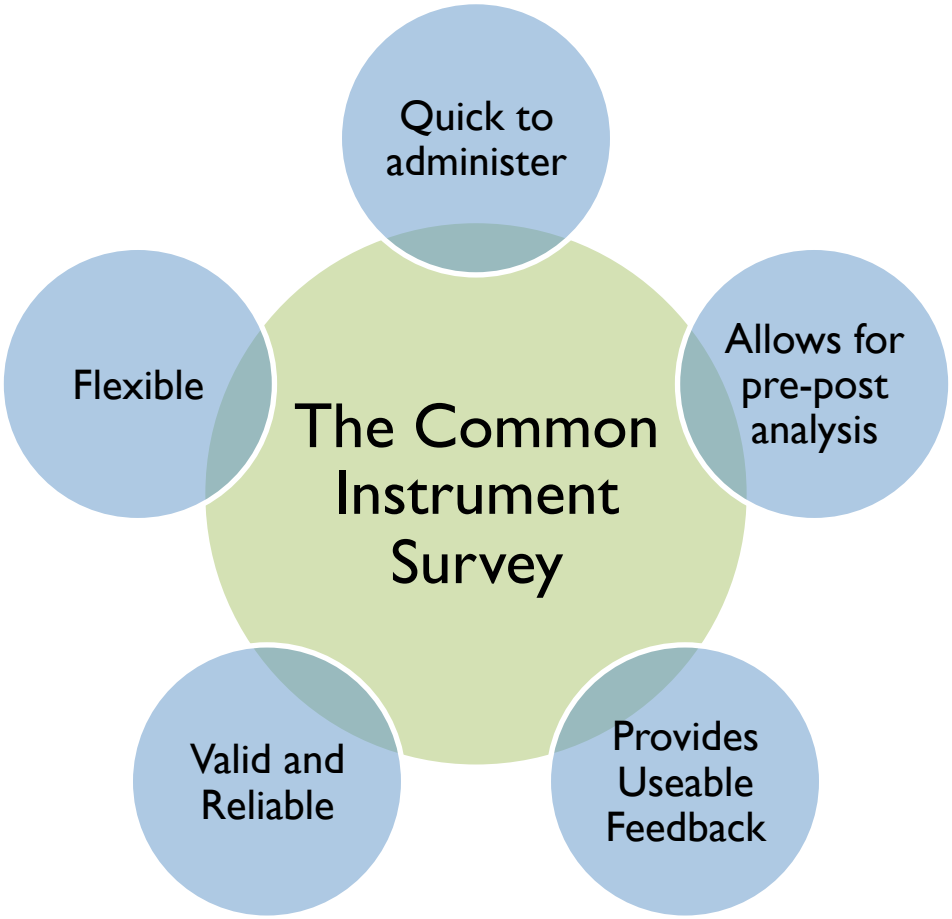
The Common Instrument: The Development Process

- Developed in 2010
- Supported and initiated by the Noyce Foundation
- Leading national afterschool and ISE networks directly involved, including 4H, TASC, Techbridge, Project LiftOff and Build IT

The Common Instrument Project



The Common Instrument

24 Items

18 items created by PEAR

6 items from NAEP

The Common Instrument

The Common Instrument

Dear Student,

Thank you very much for answering the questions below. This survey is voluntary, you do not have to fill this out, and you can stop it at any time without causing any problems for you. This survey will help researchers learn more about the attitude of youth towards Science, Technology, Engineering and Math.

Please print as clearly as possible.

First Name: _____ Middle Initial: ____ Last Name: _____

Birthdate:

What *month* were you born? (Choose one)

○ January ○ February ○ March ○ April ○ May ○ June

○ July ○ August ○ September ○ October ○ November ○ December

What *day* were you born? _____ What *year* were you born? _____

This is not a test and you will not be graded for answering these questions. There are no right or wrong answers. Simply indicate how much you DISAGREE or AGREE with the following statements. Choose only one answer on each line.

	Strongly Disagree	Disagree	Agree	Strongly Agree
1. Science is something I get excited about.	○	○	○	○
2. I like to take things apart to learn more about them.	○	○	○	○
3. I like to participate in science projects.	○	○	○	○
4. I'd like to get a science kit as a gift (for example, a microscope, magnifying glass, a robot, etc).	○	○	○	○
5. I like to see how things are made (for example, ice-cream, a TV, an iphone, energy, etc).	○	○	○	○
6. I like to watch programs on TV about nature and discoveries.	○	○	○	○
7. I am curious to learn more about science, computers or technology.	○	○	○	○

PLEASE CONTINUE TO PAGE 2 →

Boston STEM Data and Other Projects

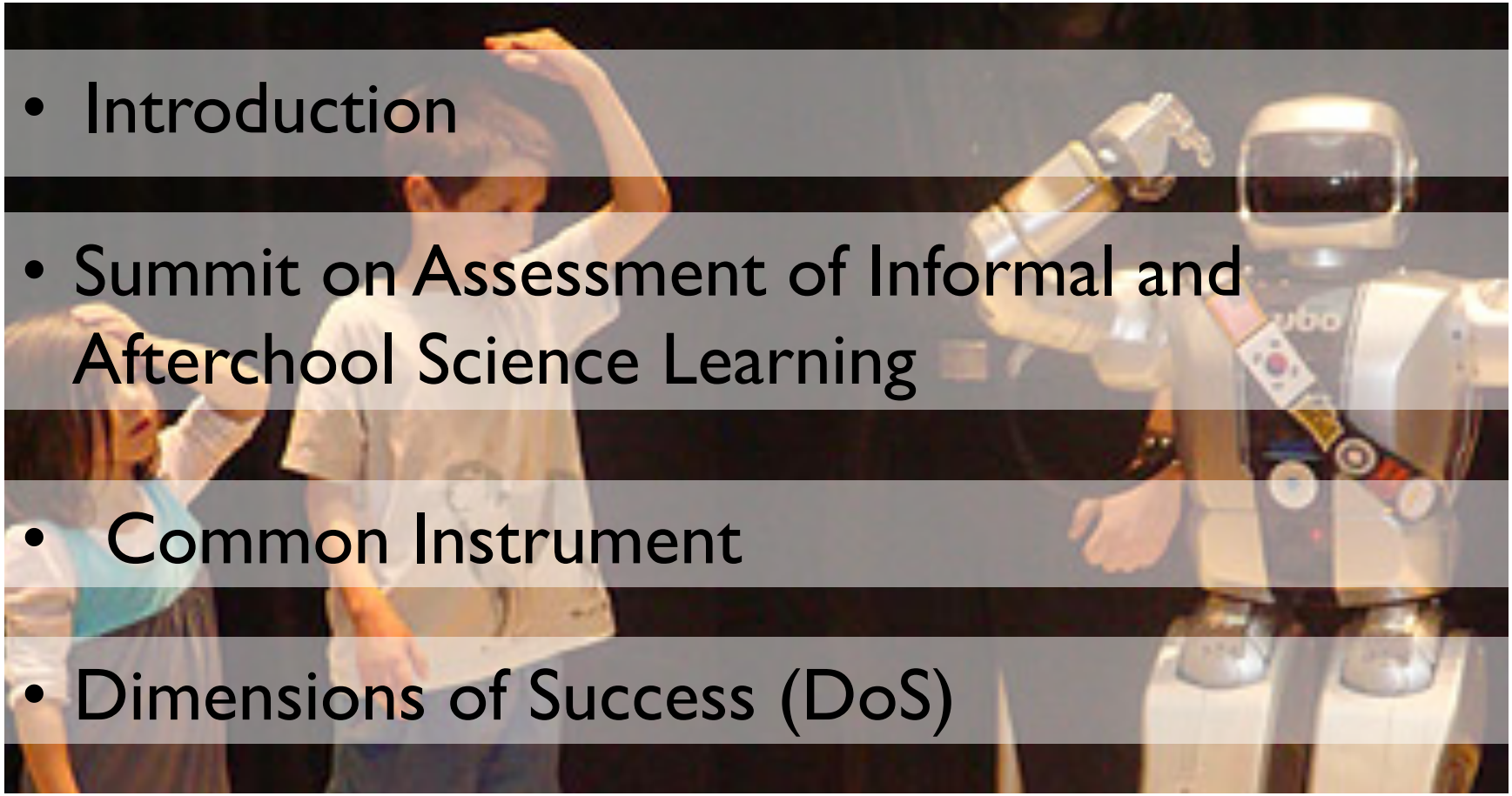
2010 study

- 1200 students
- Cronbach alpha= .92
- Dosage

Boston Summer STEM project

- 454 surveys administered
- Cronbach alpha= .92
- Boys increased most

Agenda



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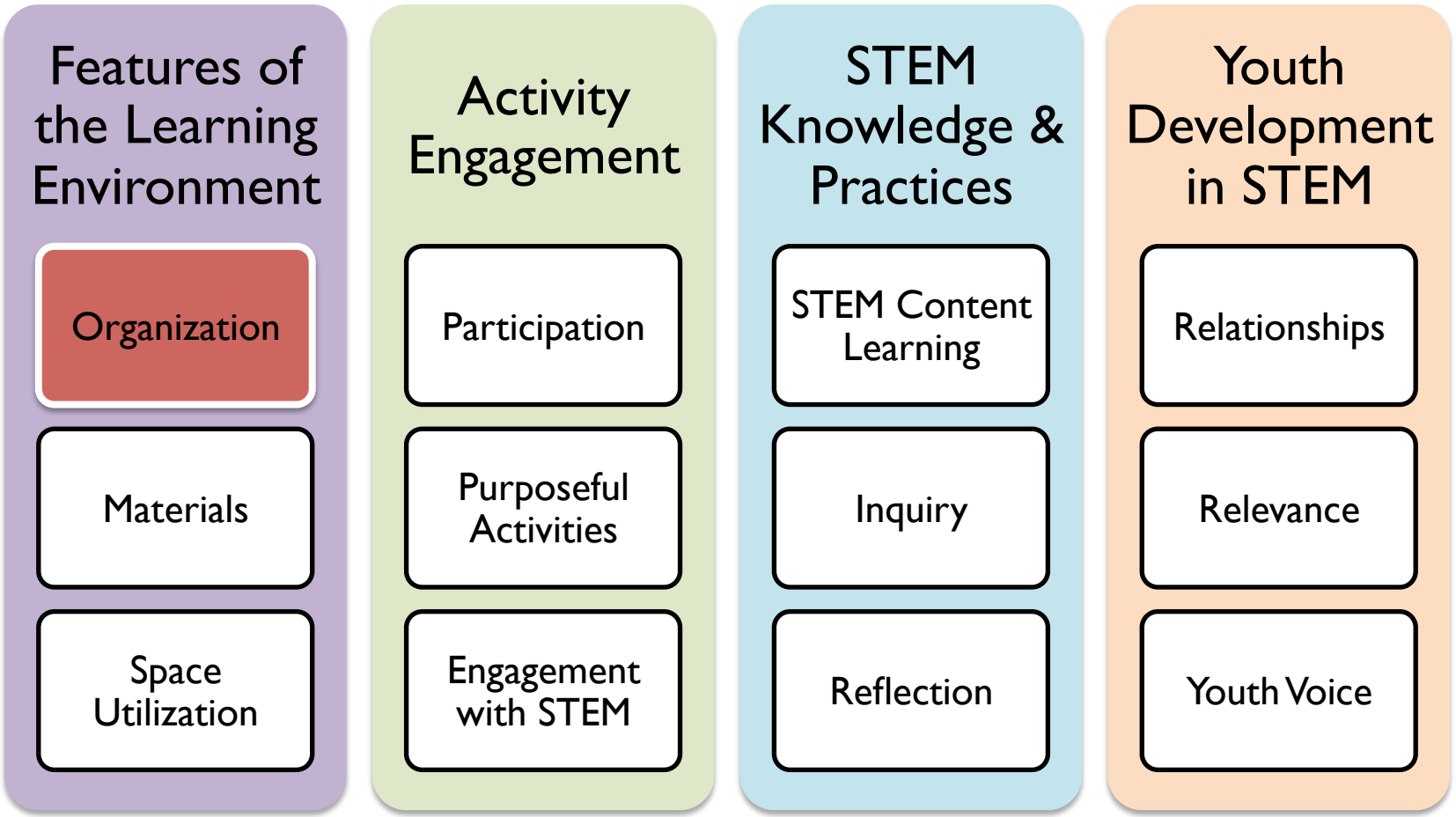
Dimensions of Success
a pear observation tool

Features of the Learning Environment	Activity Engagement	STEM Knowledge & Practices	Youth Development in STEM
Organization	Participation	STEM Content Learning	Relationships
Materials	Purposeful Activities	Inquiry	Relevance
Space Utilization	Engagement with STEM	Reflection	Youth Voice

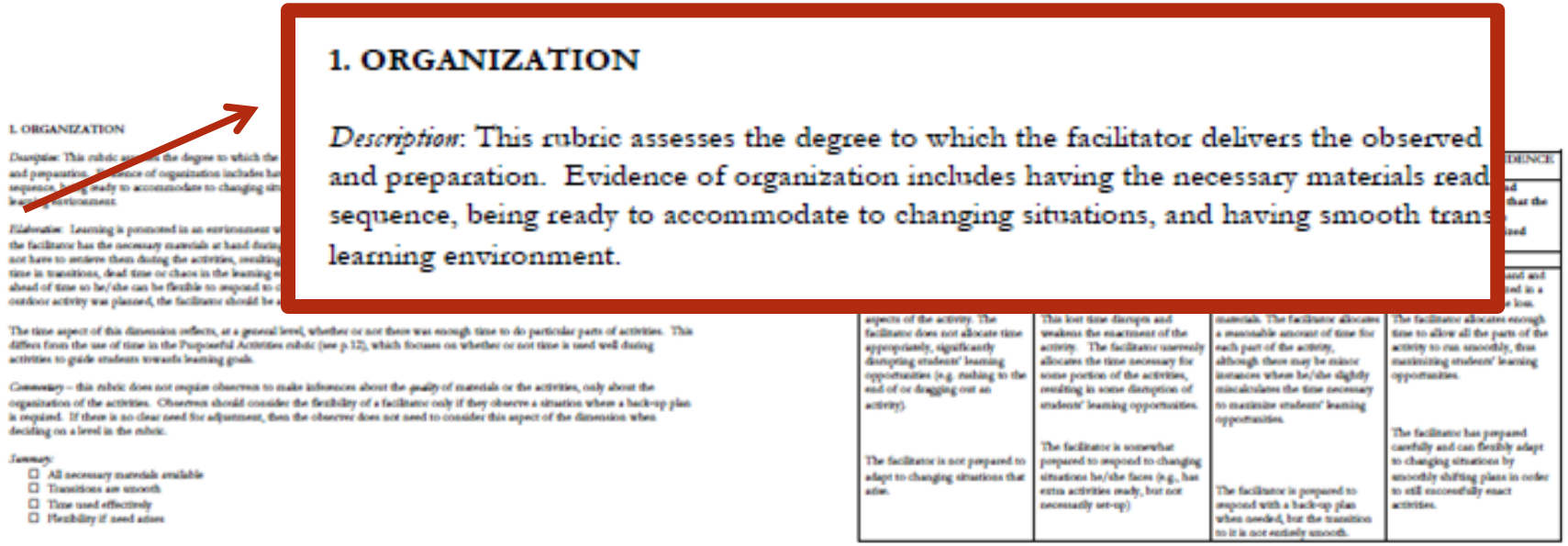
12 Dimensions of Success



Organization Dimension

- Materials are prepared
- Transitions are smooth
- Time used effectively
- Flexibility **if** need arises

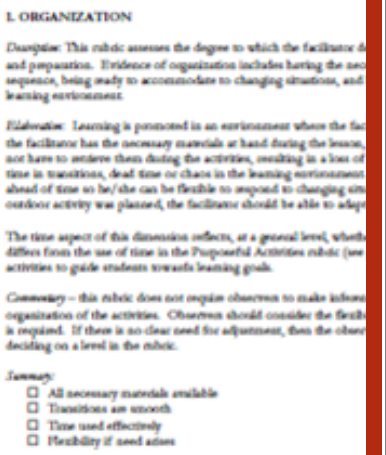
The DoS Tool



1. ORGANIZATION

Description: This rubric assesses the degree to which the facilitator delivers the observed and preparation. Evidence of organization includes having the necessary materials read sequence, being ready to accommodate to changing situations, and having smooth trans learning environment.

The DoS Tool


I. ORGANIZATION

Description: This rubric assesses the degree to which the facilitator d
and preparation. Evidence of organization includes having the nec
sequence, being ready to accommodate to changing situations, and
learning environment.

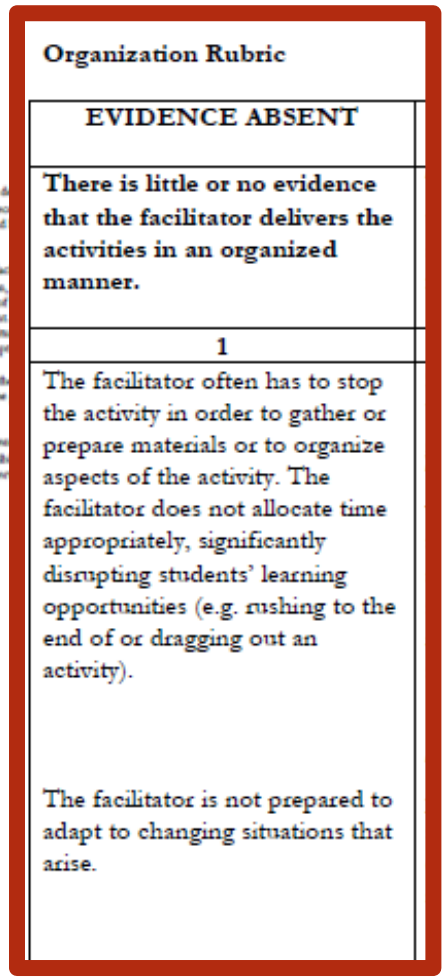
Elaboration: Learning is promoted in an environment where the fac
the facilitator has the necessary materials at hand during the lesson,
not have to retrieve them during the activities, resulting in a loss of
time in transitions, dead time or chaos in the learning environment
ahead of time so he/she can be flexible to respond to changing sit
outdoor activity was planned, the facilitator should be able to adapt

The time aspect of this dimension reflects, at a general level, whether
differs from the use of time in the Purposeful Activities rubric (see
activities to guide students towards learning goals.

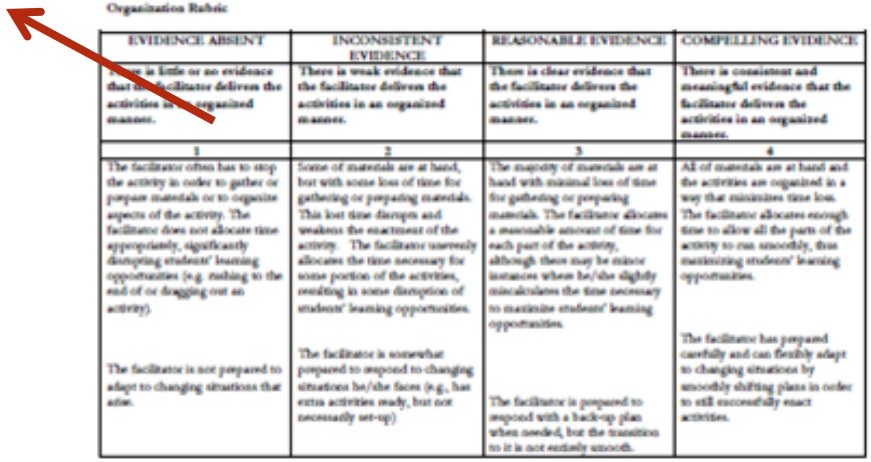
Commentary – this rubric does not require observers to make inferen
organization of the activities. Observers should consider the flexibi
is required. If there is no clear need for adjustment, then the obser
deciding on a level in the rubric.

Summary:

- ☐ All necessary materials available
- ☐ Transitions are smooth
- ☐ Time used effectively
- ☐ Flexibility if need arises

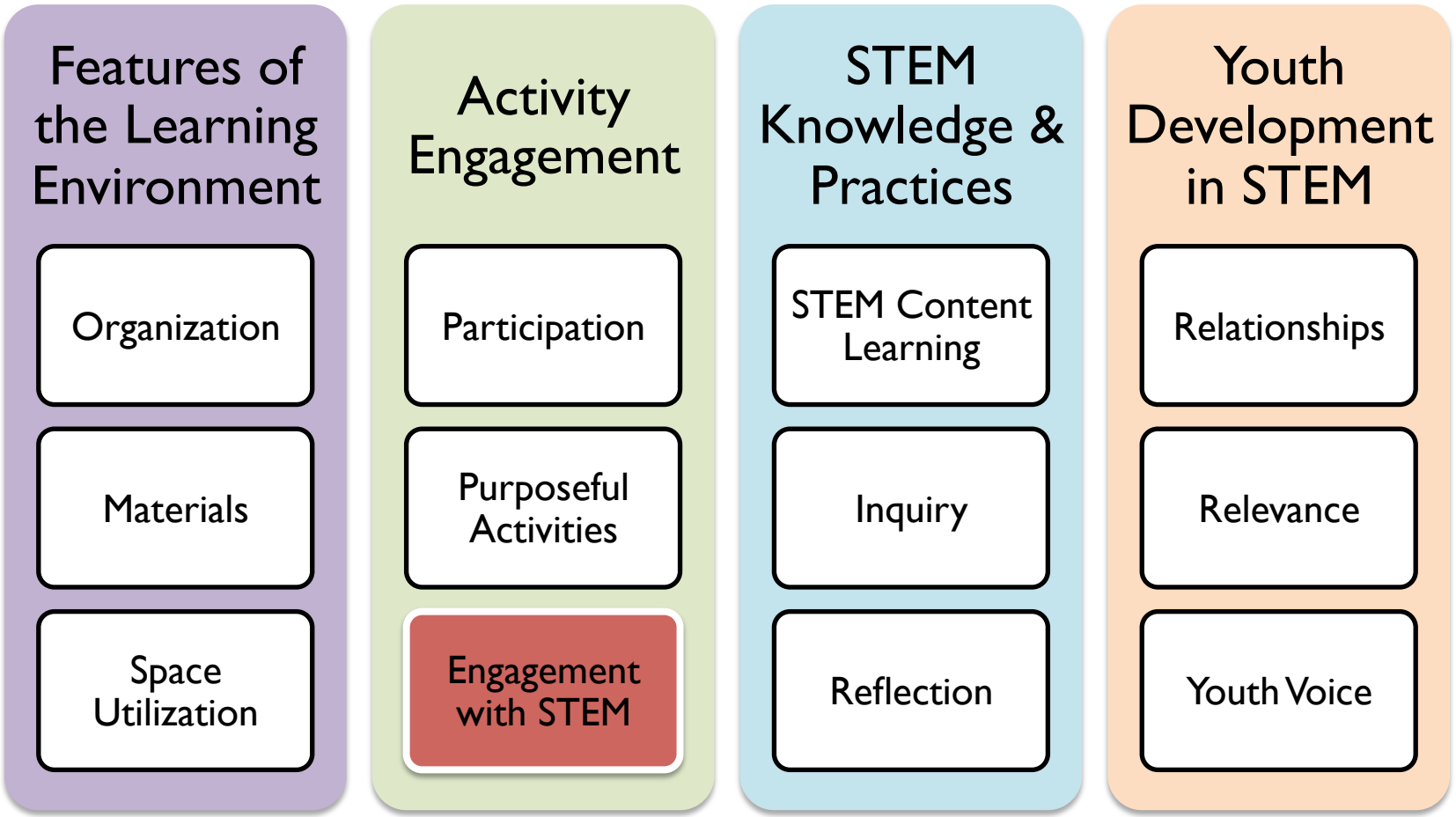

Organization Rubric

EVIDENCE ABSENT
There is little or no evidence that the facilitator delivers the activities in an organized manner.
1
The facilitator often has to stop the activity in order to gather or prepare materials or to organize aspects of the activity. The facilitator does not allocate time appropriately, significantly disrupting students' learning opportunities (e.g. rushing to the end of or dragging out an activity). The facilitator is not prepared to adapt to changing situations that arise.


Organization Rubric

EVIDENCE ABSENT	INCONSISTENT EVIDENCE	REASONABLE EVIDENCE	COMPELLING EVIDENCE
There is little or no evidence that the facilitator delivers the activities in an organized manner.	**There is weak evidence that the facilitator delivers the activities in an organized manner.**	**There is clear evidence that the facilitator delivers the activities in an organized manner.**	**There is consistent and meaningful evidence that the facilitator delivers the activities in an organized manner.**
1	2	3	4
The facilitator often has to stop the activity in order to gather or prepare materials or to organize aspects of the activity. The facilitator does not allocate time appropriately, significantly disrupting students' learning opportunities (e.g. rushing to the end of or dragging out an activity). The facilitator is not prepared to adapt to changing situations that arise.	Some of materials are at hand, but with some loss of time for gathering or preparing materials. This lost time disrupts and weakens the enactment of the activity. The facilitator unevenly allocates the time necessary for some portion of the activities, resulting in some disruption of students' learning opportunities. The facilitator is somewhat prepared to respond to changing situations he/she faces (e.g., has extra activities ready, but not necessarily set-up)	The majority of materials are at hand with minimal loss of time for gathering or preparing materials. The facilitator allocates a reasonable amount of time for each part of the activity, although there may be minor instances where he/she slightly miscalculates the time necessary to maximize students' learning opportunities. The facilitator is prepared to respond with a back-up plan when needed, but the transition to it is not entirely smooth.	All of materials are at hand and the activities are organized in a way that minimizes time loss. The facilitator allocates enough time to allow all the parts of the activity to run smoothly, thus maximizing students' learning opportunities. The facilitator has prepared carefully and can flexibly adapt to changing situations by smoothly shifting plans in order to still successfully enact activities.

12 Dimensions of Success



Engagement with STEM Dimension

- Opportunities to participate in hands-on activities
- Active cognitive engagement in learning
- Hands-on activities should help students explore and think about STEM content
- Activities are not "hands on, minds off"

Engagement with STEM Rubric

There is minimal evidence that the students are engaged with hands-on or interesting activities where they can explore STEM content.	**There is weak evidence that the students are engaged with hands-on or interesting activities where they can explore STEM content.**	**There is clear evidence that the students are engaged with hands-on or interesting activities where they can explore STEM content.**	**There is consistent and meaningful evidence that students are engaged with hands-on or interesting activities where they can explore STEM content.**
1	**2**	**3**	**4**
The activities mostly leave students **in a passive role, where they are observing a demonstration or listening** to the Activity Leader talk. (minimal hands-on opportunities)	Students engage in hands-on activities; however, there is limited evidence that the hands-on activities encourage students to engage with STEM content in meaningful ways. **("hands-on, minds-off")**	There are some opportunities for students to engage in hands-on activities that allow them to actively explore STEM content. **Some parts of the activities still leave students as passive observers while the Activity Leader does all the cognitive work**.	There are consistent opportunities for students to actively explore STEM content by engaging in hands-on activities**, where students do the cognitive work themselves** and the Activity Leader maintains the role as Activity Leader versus teller.

Let's Try It!

- View "Aquarium" Video
- Rate **Engagement with STEM** dimension using the rubric

Scoring for Engagement With STEM

Time Start: 4:00 **Time End: 4:15**		
Dimension	Evidence	Rating (1-4)
	FEATURES OF THE LEARNING ENVIRONMENT	
Engage-ment with STEM	▫ Students are **engaged in a hands-on activity** where they can touch several aquatic organisms. ▫ However, the students are only hearing disconnected facts or descriptions about the animals, and are **not having a hands-on experience that allows them to explore STEM content**. ▫ The **Activity Leaders are doing all the cognitive work** by providing information, they are not asking students to think (e.g., "what do you observe on these animals that might help them survive under water?" "how are the legs different on this animal from this other animal or how are the legs similar or different from yours and why?"). ▫ This is a good example of a very hands-on activity that is unfortunately only designed to be fun and not "mind-on".	2

Questions & Answers

CONTACT



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