Professional Development Situation: Meeting

Skill Focus: Reflecting and Processing STEM Learning

Time Required: 25 minutes

MAKING MEANING THROUGH REFLECTION

Participants will discuss the "Making Meaning from STEM" video-based learning module to brainstorm strategies in order to learn how to support reflection.

Agenda

Introduction—5 minutes

- Self-Reflection: Reflecting and Processing STEM Experiences
- The Reflective Process

See the Skill in Action—15 minutes

- Making Meaning from STEM Learning video-based learning module
- Transcript: Making Meaning from STEM Learning

Shared Action Plan— 5 minutes

Materials

- Computer with internet
- Projector and speakers
- Chart paper and markers
- One copy of Self-Reflection: Reflecting and Processing STEM Experiences for each participant
- One copy of The Reflective Process for each participant
- Making Meaning from STEM Learning video-based learning module
- One copy of Transcript: Making Meaning from STEM Learning for each participant

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Before the Session

- **Read this meeting guide** to become familiar with the content and allow time to personalize the activities to best suit your presentation style. Watch all videos and read informational materials.
    - *Italics indicate text that can be read aloud or emailed to participants.*
- Send reminder email about the meeting. Determine if any participants require accommodations (sight; hearing; etc.).
    - *The next professional development opportunity to enhance our STEM skills will be on DATE at TIME at LOCATION. Our focus for this session will be "Reflecting and Processing STEM Learning". Let me know if you require any accommodations to participate in the training. I am happy to answer any questions you have and look forward to seeing you at the workshop. I can be reached at CONTACT INFO*
- Gather all materials needed for the session.
- Develop a list of all possible questions participants might have during the meeting. Create potential responses to be explored through informal conversation. Review any key terms or ideas that may be unclear.
- On the day of the session, test the audio and video equipment.

Session Outline
Introduction (5 min)

- Pass out the Self-Reflection: Reflecting and Processing STEM Experiences. Ask participants to read it and complete it at their tables.
- Ask if there are questions about any of the items as participants are completing it.
- Pass out The Reflective Process handout
    - **Note**: If you print both handouts on opposite sides of the paper participants can just turn it over.
    - *Reflection is an iterative process that requires time, attention, and a commitment from the facilitator. Take a look at the reflective process and see if you can identify where you might start with youth in your program.*

See the Skill in Action (10 min)

- Introduce the video-based learning module.
    - *You will see the frontline staff facilitating an air tunnel activity with the youth. The youth have tested their designs and they are going to use "plussing" to support each other. Watch what the facilitator does and what they youth say.*
- Play the skill video under step three of the Making Meaning from STEM Learning video-based learning module.

- Ask participants to share what they saw and heard related to collaboration.
  - *How was the space organized?*
  - *What did the adult do ahead of time to prepare?*
  - *How much time would the adult have to plan to spend to include a debriefing?*
  - *How did the questions the adult asked 'push' or deepen children's understandings?*
    - *If the group feels they did not, what questions would they have asked?*
  - *What materials were used? (chart paper—to write questions and record experiences, materials for activity, etc.)*
- Pass out the [Transcript: Making Meaning from STEM Learning](#).
- Play the video again, this time asking participants to note the questions the staff member asks to encourage reflection.
  - *What did you recognize from the Reflective Process that the facilitators seemed to use?*

Shared Action Plan (5 min)

- Post a large piece of chart paper and make space for "before," "during," and "after". For each of these spaces, ask participants to brainstorm questions they can ask youth in upcoming activities.
  - You will want to save this as a photo or list for participants to use later.

After the Session

- Email the participants:
  - *Thank you for your participation in the recent Click2Science training on "Reflecting and Processing STEM Experiences". I hope you found it useful and applicable to your practice. I am including a list of strategies you identified as potentially helpful for supporting reflection. Consider sharing your thoughts with a co-worker, supervisor, or friend. Please let me know if you have any questions. You can reach me at CONTACT INFO.*
- Attach the list of questions that was developed by participants during the meeting.

Want to Earn Credit? Click2Science has teamed up with Better Kid Care to provide continuing education units. Check it out at: http://www.click2sciencepd.org/web-lessons/about

Self-Reflection: Reflecting and Processing STEM Experiences

Think about how often you do the following reflective activities with youth in your program. Use the rating scale below to choose responses to each statement.

1=never tried it   2=not usually   3=sometimes   4=most activities   5= every activity

1 2 3 4 5   I reflect on the activities we've done in our program to try to improve.

1 2 3 4 5   I ask questions like, "How can you explain what happened?" to help learners

make meaning of their experiences.

1 2 3 4 5   I help learners connect our STEM experiences to real-life phenomena.

1 2 3 4 5   I ask guiding questions <u>during</u> investigations to help learners make sense of

what's happening.

1 2 3 4 5   I encourage learners to reflect on what they have learned <u>at the end</u> of each

activity.

1 2 3 4 5   I ask learners what they would try next.

1 2 3 4 5   I meet with learners to help them plan next steps.

1 2 3 4 5   I provide time for individual reflection.

1 2 3 4 5   I provide time for group reflection.

1 2 3 4 5   I ask questions to connect learners to other activities we've done.

1 2 3 4 5   I encourage youth to write about their STEM learning experiences.

1 2 3 4 5   I help learners build on their own knowledge in meaningful ways.

1 2 3 4 5   I am confident guiding group discussions in which youth explain their learning.

1 2 3 4 5   I reflect on my own understanding of STEM with other staff.

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The Reflective Process

When facilitating the Reflective Process (with learners or facilitators), the following sequence is suggested as a way to create an expectation of participation and sharing among individuals.

Each person should be asked to answer each question before the next question is asked of the group. This systematic approach allows the reflection and processing to 'build' on each person's experience and interpretation. As the group becomes more accustomed to sharing ideas, the structure can become more 'loose,' but initially, a similar process shown here should provide structure to the reflective process.

What happened? → Why do you think it happened? → Was this different than what you thought would happen? → What questions do you still have? → What could we do next? → (back to What happened?)

Transcript: Making Meaning from STEM Learning

[voiceover]

[:49]

Staff: I'm wondering what you guys know about gravity. What do you know about gravity?

Youth: Gravity's holding me on the ground right now

Staff: Gravity's holding you on the ground right now?

Youth: And it's something that keeps, pushes something down.

Youth: And it keeps something down.

Staff: What do you guys know about lift? (pause) Or have you ever heard about lift?

Youth: I've heard of it __ somewhere.

Staff: Okay

Youth: It lifts you up. Like in, in outer space there's a lot of lift.

Staff: What things do you guys know that SLOWly float to the ground? Yes?

Youth: This paper

Youth: A balloon

Staff: A balloon, yes

Youth: A parachute

Staff: A parachute

Staff: So what we're going to be doing is creating a contraption that can first float up and out of the wind tunnel.

[1:37] Group reflection begins

Staff: So what is adding an egg and another army guy gonna do to your contraption?

Youth: Pulling down

Staff: Pulling down. So what made you want to change it what did you notice about yours?

Youth: Um, I noticed that when you open it it stays open and when you close it it stays closed. That's one thing it does. And the other army guy just adds more weight to it.

Staff: Adds more weight to it. So you've created more drag. And what did you say? It catches the air?

Youth: Yeah it's kinda like a parachute.

Staff: Yeah just like a parachute basically

[2:05]

Youth: I added this to make it have more gravity sort of.

Staff: So why did that not work

Youth: Cuz it didn't even fly.

Tania: and I did do this and I had the army man on top inside with the parachute on top and that still didn't work because it was too heavy still and the thing so it'll just go down.

Staff: Does anyone have a plus for Tania? What could she have done to this design to get it to hover more?

Youth: Maybe make it farther from the actual cup?

Staff: Make it farther from the cup? What do you think that would have done?

Youth: Made it float.

Staff: Made it float more.