

Professional Development Situation: Coaching

Skill Focus: Modeling Engineering Practices

Time Required: 15 minutes

DESIGN AND TEST

Participants will use “What-If” cards in order to help youth engage in engineering design practices like using criteria and constraints, facing a failed test, and redesign.

Agenda

What-Ifs—15 minutes

- [What-If Cards: Engineering Practices](#)

Materials

- Set of [What-If Cards: Engineering Practices](#) cut apart

Before the Session

- **Read this coaching guide** to become familiar with the content and allow time to personalize the activities to best suit your presentation style.
 - *Italics indicate text that can be read aloud or emailed to the participant.*
- Send an email to the participant being coached:
 - *Our coaching session is scheduled for DATE at TIME. We will focus on “Modeling Engineering Practices”. Please feel free to contact me with your questions or concerns at CONTACT INFORMATION.*
- Gather all materials needed for the coaching session.

During the Session

What If? (15 minutes)

- Place the pile of [What-If Cards](#) on the table between you and the participant.
 - *Each of these cards contains a situation related to engineering design that can be difficult for youth and staff to navigate.*

- Ask the participant to sort the situation cards into two piles: situations that they would feel the **most comfortable** addressing and situations they would feel **less comfortable** addressing.
- Ask the participant to share a couple of the cards that they are most comfortable with.
 - *What kinds of things seemed easier to you? Why are those easy? What strategies do you have for dealing with them?*
 - *It is often less comfortable for us to deal with situations in which we have fewer strategies to support us. What cards did you note as least comfortable? Let's talk about them to see if we can't figure out some strategies for supporting youth.*
- Facilitate a conversation in which the participant can ask questions and get advice (not instructions, directions, or mandates, but rather advice) related to engineering design and in particular, supporting youth to feel productive when they encounter failure, and to persist through difficult tests and re-tests.

Conclusion

- Choose 1-2 cards that the participant might try to work on in the next 2 weeks. Have the participant write a strategy on the back and take those cards with them.

After the Session

- Follow up with your participant to see how they are progressing on their action plan. Try to be supportive and helpful, not evaluative.

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>

What-If Cards: Engineering Practices

Youth exclaim, “I can’t do this!” after a failed test.	A girl is being shut out of engineering by an all-male group.
Youth are too nervous to test their design.	One student refuses to work with others.
Youth aren’t making connections between a rollercoaster design and other things they know about rollercoasters, gravity, etc.	Middle school youth don’t see the point in building something out of cardboard and tape.
Youth aren’t connecting the idea of force to speed and mass during an egg drop challenge.	Youth forget to write down their design notes.
A student experiences “perfection paralysis” where she can’t do anything because she’s worried about getting it wrong.	Youth are forgetting the criteria for success.
Youth aren’t using materials thoughtfully (e.g., requesting huge amounts of them).	Youth aren’t sharing the testing equipment.