



A Collaboration Providing STEM Professional Development  
for Orange County's Expanded Learning Programs

## Orange County STEM Hub

STEM Hub Created Resource

### ***Helping Students Debrief and Reflect in their Expanded Learning STEM Programs***

#### **How to use this Resource**

- Ask one or two of these questions, depending on what the focus is or the objectives are.
- Allow for the majority of students to talk, debrief and reflect, consider introducing one of the activities on the back of this page.
- Debriefing and Reflecting do not need to occur at the end of the day, these sample questions below can be asked throughout the hands-on learning at the small group level.
- "Activities...for Large Groups" should be used at the end of the lesson/activity.

**For our purposes we are clarifying the differences by:**

**Debrief:** the learning experience/content understanding

**Reflection:** the students' individual role in the activity

**"We do not learn from experience... we learn from reflecting on experience." — John Dewey**

#### **Effective Debrief Questions for STEM Activities**

- What changes would need to be made to your group's design to ensure it...? (e.g., moves faster, slower, is more accurate at hitting the target, can hold more weight, etc.)
- If you had other materials available to you, what would you want to try? And why?
- What was the STEM Learning goal for today? Did we meet it? How do you know?
- Tell us more about the [pick a part of the Engineering Design Process – "imagine"] stage of today? What led your group to that decision?
- What is a question you'd like to ask another group about their project?
- What made your design different than another groups?
- How does what you did today relate to the world around you?
- If someone walked in right now and didn't know what you did today, what would you tell them when they asked?
- What was it that you engineered today? (Ask a follow up, e.g., how did you reinforce the edges?)

#### **Effective Reflection Questions for STEM Activities**

- If you were to take a picture of something that happened today, what would it have been and why?
- What was something that your team did well today?
- How were you able to overcome the constraints placed on your group?
- What risks did you take today?
- What role did you play in your group today?
- How successful was your groups' communication today?



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## Activities That Support Debrief and Reflection for Large Groups

### Question Games

Using a Beach Ball, Dice, or Playing Cards; students respond to questions based on the color, number or suit they are given. *For example: If your thumb lands on the red area of the beach ball the students responds to the question, "What changes would you make to your design to make it faster?"*

### Think – Pair – Share

Students are given a question to consider. They first think about it on their own (*think*), and then they talk about it with one other person (*pair*). Next they are encouraged to share out with another pair of students, or a few share their thoughts with the entire group (*share*).

### Paper Toss

Students write down one word that describes their experience, then crumbles it up and tosses it into the center of the circle. Students then pick up the crumbled paper and read the word out loud to the group.

### Index Cards

Students write down a question they still have about their project/lesson on one side of the index card. The cards get collected, mixed up, and passed around again. Students then try to help each other out by answering the question on the back side of the card. Variations: *You can rotate the cards twice, for two different answers/suggestions. OR you can have the groups ask a question and other groups answer/suggest.*

### Hot Potato

Pass around an object and when the music stops, the person with the "potato" answers a given question.

### Beads

Pass around a box of beads (or any other small object). Each student needs to take at least one bead; but encourage them to take as many as they want (within reason). For each bead, they need to say one positive thing about the activity.

### Group Notes

The facilitator takes notes on the board/chart paper as students share out the skills they used during the session.

### Inside/Outside Circle

Half the group forms a circle on the inside, facing outwards; the other half finds a partner in the inside circle to make an outside circle. The facilitator poses a question and provides up to 90 seconds for the partner pair to talk. Then have the inside (or outside) circle move to the "right" three people; and repeat the process until at least they have had three conversations. Ask another question with each rotation.

## For More Information

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*This document was created to provide additional supports to Expanded Learning program staff to help students make sense of their learning. Staff have an opportunity to debrief and reflect with students to reinforce the concepts and objectives, allowing an informal assessment to take place.*