

## best practices for mentor-scientists

Learning comprises knowledge, skill, feelings, dispositions (habits of mind such as curiosity & persistence)

Curriculum is the tool to teach science to your girls, with experiments, models, and explorations involved. What kind of questions might you ask to enhance each type of activity?

*“We have to play to the emotional brain; then, and only then, will we open up the intellectual brain.”*

### Check in before you start and during club time

- Create a safe environment: say hello, learn their names, smile!
- What is the emotional state of the kids? (It is the end of the day for them)
- Are they on good terms with each other today?

### Engage/Generate interest

- Engage their senses and experiences: images/objects/interesting phenomenon/perplexing question
- Work with their sense of awe
- Find out what they already know: pay attention to misconceptions
- Why should they care about the topic/activity? What is their motivation? Are you offering a meaningful reward? Do they want to find out the answer? Does it relate to someone in their family? Do they want to get better at a certain skill? Is it because their friend is doing it?
- Model enthusiasm:

### Make connections

- Connect current observations/activities to prior experience/knowledge, their every day life
- Use analogies that build on experiences/knowledge they are familiar with

### Demonstration/Cooperation

- Allow them to share interpretations and observations with each other
- Encourage them to help each other and acknowledge (need for) assistance

### Encouragement

- Offer specific praise, not generalizations; provide timely and specific feedback
- Attribute success to effort not innate ability
- Be inclusive—provide different girls with different tasks
- Create genuine sense of accomplishment by having realistically high expectations and opportunities for success
- Allow mistakes but offer help when necessary (be aware of learned helplessness)
- Never say, “No, that’s not right!”

### Reflection

- Ask open-ended questions
- Move them from magical to logical thinking
- Probe if they know what they are doing and why they are doing what they are doing
- Allow them to explain phenomenon in their own words, especially young children (use of terminology does not equal understanding)

### Others

- Vocabulary: explain when necessary
- Getting their attention on activity: consult staff, teachers, observe what’s in the classroom to pick up on rules they already know
- Kids of ages have different attention spans—use these to structure activities
- Establish routine/structure especially for younger children
- Help them develop listening skills: don’t talk too much if no-one is paying attention

Effective learning experiences include: immersing children in rich environments; modeling enthusiasm and inquiry; inviting children to talk about interesting phenomenon or data; conveying confidence in their ability to succeed; time to practice new skills or knowledge

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#### Sources

- 1) 2007. M.R. Jalongo. *Beyond Benchmarks and Scores: Reasserting the Role of Motivation and interest in Children’s academic achievement.*
- 2) 1996. S. Wasserman & JWG Ivany. *The New Teaching Elementary Science, 2<sup>nd</sup> Edition.* Teacher’s College Press.