Engaging youth in Citizen Science: Resources and Possibilities

Rebecca Meyer & Margo Bowerman
Extension Educators in Youth Development
LEARNING MORE ABOUT US
21st Century Skills

Critical Thinking

Communication

Creativity
PRACTICES OF SCIENCE & ENGINEERING

1. Asking questions or defining problems.
2. Developing and using models.
3. Planning and carrying out investigations.
4. Analyzing and interpreting data.
5. Using math and computational thinking.
6. Constructing explanations or designing solutions.
7. Engaging in argument from evidence.
8. Obtaining, evaluating and communicating information.
D2D: Citizen Science

INQUIRY

Authenticity

Engagement

Program Setting/Situation

Team Characteristics

Program Design/Structure
LESSONS LEARNED

**Leader Skills**

- Science content
  - Technical skills (ie. species ID)
  - General science knowledge

- Youth development
  - Community connections ("access" to youth)
  - Fostering safe, comfortable, informal learning environment
CITIZEN SCIENCE – THE BASICS

- Instructions/methods youth friendly and build skills
- Explicit educational goals
- Enrichment activities
- Simple mechanisms to enter data
- Over 13 y.o. to enter data online
SKILLS TO SUPPORT STEM

- Sparking Interest
- Connecting to prior knowledge and experience
- Embracing active learning
- Providing youth control
SKILLS (CONTINUED)

- Ask purposeful questions
- Effectively managing group dynamics
- Encouraging collaboration
- Making authentic assessment of learning
- Reflecting and processing experiences

from: CLICK 2 SCIENCE pd, online STEM Professional Development for Out-of-School Providers
OBSERVATION
DRAWING OUT THE WONDER
EFFECTIVE QUESTIONING

▪ Use questions wisely.
▪ Prompt further investigation.
▪ Keep questions open.
EXPLORATION

Dan
“Democratizing” science education

“...At the nexus of science education and participatory democracy is a commitment to educating students to make more informed choices, think critically, and believe they can make a difference.”


- Time spent
- Authentic science
- Relationship to place
- Sharing experience/knowledge
SOCIAL ACTION
GROUP MANAGEMENT

- Effective strategies, include:
  - Be prepared & over plan
  - Establish clear expectations & guidelines
  - Offer various youth roles and responsibilities
TEAMWORK

▪ Assign roles
  – Research Coordinator
  – Recorder
  – Equipment Manager
  – Reporter
  – Ambassador
Thank you.

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Steve Bowles...
“something that happens between the youth worker, the young people, and the sun, the moon and the campfire.”

~ Siurala
## AGES 5-7

<table>
<thead>
<tr>
<th>Physical Growth</th>
<th>Growth in Thinking</th>
<th>Social Growth</th>
<th>Emotional Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Busy mastering physical skills and learning how to use their bodies</td>
<td>More interested in process than the product</td>
<td>Learning to be best friends</td>
<td>Not yet confident with themselves</td>
</tr>
<tr>
<td>Small and large motor skills are not yet polished</td>
<td>Finishing the project is less interesting than working on it</td>
<td>Works well in small groups or pairs</td>
<td>Seeks adult approval</td>
</tr>
<tr>
<td>Attention Span is short</td>
<td>Thinking is concrete; difficulty with abstract</td>
<td>Peer opinion is becoming important; adult approval is important</td>
<td>Enjoying playing games; however not yet ready to accept losing</td>
</tr>
</tbody>
</table>

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### AGES 8-11

<table>
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</thead>
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<tr>
<td>Youth are very active; they like hands-on involvement</td>
<td>Beginning to think logically and symbolically</td>
<td>Beginning to identify with peers; still look to adults for guidance</td>
<td>Have a strong need to feel accepted and worthwhile</td>
</tr>
<tr>
<td>Unable to stay confined or sit still for long periods</td>
<td>Still think better in terms of concrete items</td>
<td>Satisfaction from completing projects comes from pleasing an adult</td>
<td>Successes, no matter how small, should be emphasized</td>
</tr>
<tr>
<td>Hand-eye coordination and focus is becoming better</td>
<td>There is no middle ground; things are either right or wrong, fun or boring</td>
<td>Prefers working with peers of the same gender</td>
<td>Strong need to “belong”</td>
</tr>
</tbody>
</table>
# AGES 11-13

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</thead>
<tbody>
<tr>
<td>Growth spurs occur; creates a problem with clumsiness</td>
<td>Enjoy playing with ideas</td>
<td>Enjoy participating in activities away from home</td>
<td>Mood swings</td>
</tr>
<tr>
<td>Girls maturing faster than boys</td>
<td>Move from concrete to abstract thinking</td>
<td>Opinions of peers gaining more importance</td>
<td>Beginning to test values</td>
</tr>
<tr>
<td>Self conscious</td>
<td>Enjoy finding solutions on their own</td>
<td>Developing mature friendship skills</td>
<td>Performance should be compared to past accomplishments</td>
</tr>
</tbody>
</table>
### AGES 14-18

<table>
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<th>Emotional Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>While some youth are experiencing growth, most of the awkwardness has been overcome</td>
<td>Peers play significant roles</td>
<td>Relationship skills are usually well developed</td>
<td>Independence and identity are important</td>
</tr>
<tr>
<td>Most know their own talents and abilities</td>
<td>Mastering abstract thinking</td>
<td>Recognition is important</td>
<td>Learning to cooperate</td>
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<tr>
<td></td>
<td>Goals are based upon feelings of personal needs and priorities</td>
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<td>Development of personal values</td>
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While some youth are experiencing growth, most of the awkwardness has been overcome. Peers play significant roles. Relationship skills are usually well developed. Independence and identity are important. Most know their own talents and abilities. Mastering abstract thinking. Recognition is important. Learning to cooperate. Goals are based upon feelings of personal needs and priorities. Development of personal values.