What makes a good science activity?

A checklist for preparing youth activities.

How to use this list:

- This is a program planning tool – a detailed response to a question of interest.
- You might not have each of these in an activity, but our goal may be to have all of them in our total 4-H youth development program.
- We're encouraging a spirit of reflection -- an ideal to strive toward -- not a harsh "critique."
- You might begin by looking to those areas in which you think you need some additional assistance.
- Use these to prepare for an activity or workshop; to assist leaders; to self reflect; to observe a peer who asked for your help.

Practical Considerations

_____ Have all the supplies you need in advance.
_____ Use common, everyday materials that are readily available.

Real World Science

_____ Relate a science concept to an everyday, familiar thing.
_____Link the kids' research with real research.
_____ Do something with "real scientists."

Activity Design

_____ Is it interesting, fun, exciting?
_____ Does it make sense to young people?
_____ Take an activity outside or into a "real" environment.
_____ Provide the chance to enjoy the challenge of doing a difficult project. Appropriately stage the level of difficulty.
_____ Is there a way to explain the process or technique in such a way that students can teach it to someone else?
_____ Will the project actually "work" in the end?
_____ Encourage young people to share their results by drawing pictures and making posters.

Ensure Experiences are Meaningful

_____ Help young people understand, "why does this matter."
_____ Engage older kids in mentoring younger ones.
_____ Assist young people in seeing the relationship of the activity to everything around them.
_____ Does their project contribute to answering larger questions that are meaningful and relevant to them?

_____ Build in time to give young people a chance to critically reflect on their experiences.
_____ Encourage both group problem solving and time alone.
_____ Carry the activity out over a period of time, instead of only getting together with a group once.
_____ Talk about non-science or social issues in their lives, even in a science-oriented setting, as a way to connect with them.
_____ Start the activity with a community issue kids may have heard about.
_____ Encourage young people to keep a log or a journal.

Connecting with Others

_____ Work together to share ideas, work with partners; engage parents.

Active Learning

_____ Use hands on activities.
_____ Do they have something to manipulate, a chance to use instruments and tools, to create something? Take home something -- "make and take."
_____ Possibly mix things together and see what's going to happen?
_____ An opportunity to build something, and then take it apart? To design something?

Discovery/Experimentation

_____ Find out what happens "if."
_____ Learn something new, solve a mystery, test ideas.
_____ Will they do something they've never done before?
_____ Is it appropriate to teach controlled study set up and observation skills? (i.e. make gloop and make it again with vinegar to show effect of pH)
_____ What happens when materials interact together?
_____ Have a chance to invent their own thing? Work on something very new?

Engaging Youth in the Process

_____ Give young people responsibility in an area they enjoy.
_____ Allow young people to guide their own learning process.
_____ Ask them what they would like to explore.
_____ Build on what they already know.
_____ Set the context for the science learning objective in advance.

Fostering Respect / Positive Group Dynamics

_____ Create a sense of belonging.
_____ Let young people know what is expected of them.

_____ Interact with young people and seek their input into topics of interest.
_____ Encourage cooperation and group work.
_____ Help young people set achievable goals.
_____ Encourage two- or three-way communication -- leaders ask questions, young people converse, young people ask questions.
_____ Encourage young people to value other learning styles and approaches to learning.
_____ Discuss the value of what young people are doing.
_____ Encourage young people to observe their own learning style and preferences.
_____ Avoid intense competition among young people.
_____ Find out what skills young people have and what they already know about a topic.
_____ Make explicit what young people need to do to achieve learning objectives.

Creating a Supportive Environment

_____ Do you come across as committed, interested, helpful and motivated?
_____ Avoid demeaning comments.
_____ Emphasize what young people are doing right.
_____ Give young people praise for doing well.
_____ Provide appropriate encouragement to young people as they are working.
_____ Encourage a feeling of accomplishment when a project works.
_____ Try to be sensitive to young people's struggles.
_____ Emphasize mastery instead of grades.
_____ Take time to get to know them.
_____ Focus negative feedback on the process or activity, not the young person.
_____ Hold high but realistic expectations.
_____ Share some interesting facts or points.
_____ Give young people guidelines for when to seek help.

Approaches to Leading an Activity

_____ Have young people ask the questions and then find the answers.
_____ Keep activities interactive, ask questions.
_____ Demonstrate a clear connection between the activity and the concept.
_____ Is it possible for young people to better understand a process through some repetition?
_____ Will they have a chance to get deeply involved in a subject?

_____ Is there a way to ensure a successful outcome of whatever the activity is?
_____ Include food or snacks.

Characteristics of a Good Leader

_____ Be flexible, smile often and be enthusiastic.
_____ Familiar with the various ways in which young people learn.
_____ Well-organized.
_____ Know your audience.
_____ Provide feedback as quickly as possible.
_____ Have contingency plans when difficulties come up.
_____ Take your time, and not be rushed.
_____ Be familiar with what you're about to do.

Leader Facilitation

_____ Avoid doing all the talking.
_____ Know when to stop talking and start doing an activity.
_____ Be sure the activity is clear and makes sense.

Methods to Encourage Discovery

_____ Select activities that are thought-provoking and interesting.
_____ Try new things and ask questions that may not have one answer.
_____ Incorporate time for discovery and messing about.
_____ Engage as many senses as possible.
_____ Set up an activity as a discovery-oriented problem.
_____ Introduce open-ended projects that don't always have a "right" answer.
_____ Make games out of learning, and introduce an element of surprise.
_____ Begin a new subject with something experiential.
_____ Do role play to engage young people.

Strategies for Implementing Activities

_____ Allow young people to do as much as they can instead of describing it to them.
_____ Include a variety of activities and ask open-ended questions.
_____ Increase difficulty appropriately and avoid making tasks overly complicated.
_____ Stress concepts, not facts.
_____ Keep the process simple and easy to follow.
_____ Have fun so that young people are not aware that it's a learning exercise.
_____ Do an activity immediately to capture their energy.