CRS
COMMUNITY RESOURCES FOR SCIENCE
practical support for great science teaching

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Practices that Build Science Knowledge

Start from Student Ideas and Encourage Exploration

- Use open activities with varied results,
- Give value to any speculation and investigate with real evidence,
- Allow for and encourage unexpected results or wondering;
- Follow up on all possibilities right or wrong
- Select productive questions appropriate to student skills and activity:
    - Focus attention *(Did you notice…)*
    - Improve observation *(How many? how long? How are they alike or different?)*
    - Prompt exploration *(What happens if? Can you find a way to determine..?)*

Foster Confidence and Participation

- Connect lessons to student experiences, relevant issues
- Make it easier with clear directions *(say it, write it, show it)*
- Keep your hands "in your pockets" - don't take over
- Answer questions with questions that promote thinking
- Expect everyone to think – somebody will share
- Be equitable in student selection (*class sticks, sharing stick)*
- Use 3-second wait time after questions, after sharing, after instruction
- Make clear distinction between presentation/instruction and sharing/discussion
- Allow students to respond to each other during sharing
- Listen and prompt during discussions

Build Science and Communication skills

- Provide multiple opportunities to share results
- Teach how to give and receive constructive questioning and feedback,
- Grow skills by building up to group conversation *(think, pair, share)*
- Ask students to write down observations and thoughts
- Use science process words consistently
- Make new science vocabulary a tool rather than a barrier *(don't use "science" words until they're needed)*

Help Students Connect Experiences to Ideas

- Conclude every activity with a discussion
- Build ideas from direct experiences with questions that reveal meaning
- Allow all students to participate in higher level thinking
- Provide opportunities to apply ideas to new situation*. Experiences are fixed memories, but ideas are transferable.*
- Connect back to original thinking and hypothesis to build memory pathway
- Refer to experiences and vocabulary in later lessons where possible;
- Map ideas