Sacramento Area Science Project
Statement of Purpose

The following statements were formulated by a group of SASP Fellows and the project Directors. A Draft of this statement was sent to all Fellows for reactions and input. The feedback of the fellows was then incorporated in the statement. This statement of purpose represents the current thinking of the project and will evolve as the project evolves.

What we believe is right for all kids in science:

- Active Learning--Students see a purpose for what they are doing in science. That purpose closely matches the teacher's purpose. Hands-on activities involve active mental engagement beyond figuring out "what we're supposed to do". The hands-on activities fit logically into a sequential plan toward the development of conceptual understanding and are not isolated activities done without meaningful connection to the larger picture. Students and adults are available for the learner to confer with and the adult is seen as a partner in the learning experience.

- Student Centered--The student controls the learning for her/himself. The teacher's role is to facilitate the learning rather than control and direct. Although learning objectives are planned by the teacher the actual learning is shaped by what the student knows and their perceptions of the content area being addressed.

- Time--There is adequate time to experiment, construct meaning, and process the outcomes and questions resulting from the experience. This will mean a large degree of flexibility on the part of the teacher and development of a strong sense of patience and comfort with the idea that the end of each lesson may not have complete closure. This also means support on the part of administrators for extended time periods to accomplish experiments and to enable students to construct for themselves the big ideas and connections.

- Follow the Learner--Teachers carefully observe where the students are and where they are going and respond in constructive ways.

- Connections--Connections are made between the scientific disciplines (earth, life and physical), across the disciplines, and to the students' lives. Teachers may help highlight connections but students are encouraged to make their own connections.

- Access to Experiential Base--What the students bring with them to a learning experience is the basis for what they will get out of it. Students' preconceptions, prior knowledge, alternative frameworks, and naive ideas are the source for access to meaningful learning. These ideas must be exposed and confronted for it is in comparison to these prior notions that students will begin to notice discrepancies or incongruities and upon which re thinking and development of conceptual understanding will take place. These prior ideas must be revisited frequently in order for students to (re)construct their own understanding. The learning process is nonlinear.

- Contextualized Clues--Teachers will use the ideas students begin with along with other real world tangible connectors to provide contextualized clues relating to the concepts. Students will not engage in activities that have no explicit or implicit connection to their worlds.

- Science is developmentally appropriate to encourage the development of thinking skills.

- Students must have the opportunity to work in cooperative groups, in partners, in cross-age settings and as individuals. The organization should remain flexible and is dependent upon the purpose for the activity.

- Respect--The classroom climate is one of respect, sensitivity, and support. Respect for language and culture is of primary importance. This is critical in order to allow the ideas and perspectives of all to be considered and used to help others develop understanding.

- Openendedness--Learning experiences must encourage divergent and convergent thinking, must facilitate the development of problem solving skills, higher level questioning, and critical thinking. Students work toward providing evidence for their ideas through open-ended prompts. Students are not required to return factual information in the same form they received it. Instead they are expected to be able to use the factual information within a more meaningful and perhaps creative context.

- Metacognition--Students are given opportunities to think about their own thinking an to learn from others' thinking. Teachers model thinking about thinking and provide a structure through which students can debrief their thinking and learning outcomes. There is public acknowledgment of the importance of what each learner thinks and contributes.

- Communication--Students must talk about and negotiate their ideas. Communication between students about their ideas is an indicator that a constructive learning environment is present. This must start at the beginning of the school year and must be ongoing.

- Problem solving--Students are expected to tackle complex problems.

- Integrated Assessment--Activities that naturally occur as part of the instructional process serve as the basis for student assessment, rather than relying solely on end of unit tests.

What we believe is right for LEP learners in science:

All of the above and a teacher who. . .

- demonstrates sensitivity, enthusiasm, and high expectations for students and their achievement;
- understands the language learning process (for first, second, and subsequent language acquisition);
- is a keen listener (good eavesdropper) and teacher of listening skills;
- has an awareness of the cultural differences represented in the classroom'
- amplifies (not simplifies) input through providing rich oral and visual language experiences (i.e. pictures, paraphrasing, dramatics, animation, contextulized clues).

What we believe is right for teachers learning about science:
TEACHERS ARE NOT TRAINED. Webster's dictionary definitions of the verb "to train" include:
1. to trail or drag
2. to guide the growth of as by tying, pruning, etc.
3. to subject to certain action, exercises, etc. in order to bring about a desired outcome

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We do not believe in training teachers. Instead teachers need opportunities to:

- experience the process of learning scientific concepts as their students will be learning them;
- grow to understand a more effective way to teach science and incorporate this into what they already have and do. Teachers are presented with learning situations (such as a summer institute) during which they may challenge their own assumptions about learning, teaching, and science and will construct for themselves a philosophy of teaching science. They will then tackle the challenges of implementing that philosophy tin their own classrooms and schools;
- reflect on their own progress, assumptions and goals and adjust their actions based on this reflection;
- be like their students, be active learns.