A Model of Scientific Inquiry

Make Observations

Recognize and State a Problem

Design an Experiment

Hypothesize

Predict

Test New Conclusions

Interpret Results

Draw New Conclusions
SCIENCE PROCESS SKILLS
from Science A Process Approach (SAPA)

Basic Process Skills (introduced K-3)

Observation
Classifying
Using space/time relationships
Using numbers
Communicating
Measuring
Predicting
Inferring

Integrated Process Skills

Formulating hypotheses
Controlling variables
Experimenting
Defining operationally
Formulating models
Interpreting data
OUTCOMES OF INQUIRY-BASED SCIENCE EDUCATION

Children should:

- Believe that their observations have standing that can compete with the written word.
- Be able to explain their understandings of ideas and defend them against alternatives.
- Be able to translate an observation into useable data.
- Be able to marshal data into predictions.
- Modify individual concepts based on new data.
- Identify gaps in their understanding and pose questions to fill them in.
- Be disturbed by incongruent observations.
- Be able to recognize patterns in data in order to limit observations.
- Be able to recognize alternative explanations for observations.
- Be able to pose effective questions and design fair tests to distinguish between alternatives.
- Be able to persuade others that their observations, procedures, and explanations are valid.
- Be able to determine which course of action—collecting data, thinking about data, formulating an explanation, or asking about a new question—should come next.