

# SCIENCE WORKSHOP

Preparing for Scientific Exploration



## PREPARING TO BE SCIENTISTS

**The same investigation or experiment can be used by an entire family with children of different ages by focusing each child on the level of exploration appropriate to his age.**

### **Grades K-3 (Ages 4-8): Science Practices: What scientists Do (exploration, investigation, and experimentation)**

Explore, Explore, Explore! – Use the myriad of science activity books available and explore anything and everything your child is interested in. Discuss investigations. Ask questions. Draw conclusions. Begin with nature studies and engineering projects.

### **Grades 3-5 (Ages 8-12): Scientific Method: How scientists think (process)**

Continue the scientific practices by adding the process. Document explorations with drawings, charts, graphs, lab reports). Use a science journal. Use the Scientific Method. Earth, space, environmental, and life science content emphasized. Use a basic science workbook to become familiar with science content and vocabulary.

### **Grades 6-8 (Ages 12-15): Science Core Ideas: What scientists Know (content)**

Integration of science and math using science practices and methods to drive more advanced content concepts emphasizing earth, life, and physical science. Use a strong science curriculum for content and activities. Spend more time evaluating the explorations in science journals and advanced lab reports.

## PREPARING FOR STATE TESTING

1. Students are Tested in Science in 5<sup>th</sup> and 8<sup>th</sup> Grade.
2. Do not teach the curriculum; teach the concepts!!! Use curriculum for assistance, do not be tied to it!! The science standards are more about scientific thinking than content.
3. **No “drill and kill” to be prepared for the State Test!** You just need to have a comprehensive science program which covers basic content and teaches students to think and explain what they have learned.
4. **There are two models for following the Next Generation Science Standards (NGSS):**
  - Discipline specific model – great for subject specific teachers, but not necessarily the best for student understanding of the whole nor for preparation for the science test.
  - Integrated model – studying topics incorporating all the scientific disciplines will better prepare 5<sup>th</sup> and 8<sup>th</sup> graders for the CAASPP test and give students a better understanding of the topic
5. DESMOS Calculator – a scientific calculator should be used in 8<sup>th</sup> grade: the tool will be used in the test and is provided online for the test.
6. Students need to be able to read the periodic table by 8<sup>th</sup> grade, but a Grade 8 reference sheet is posted online when testing; don’t need to memorize table or formulas. But will need to know how to use the formulas to answer the question!
7. NGSS standards include environmental concepts and standards. Environmental Education Initiative curriculum offers materials free online:  
<https://californiaeei.org/curriculum/>

## **TEACHING SCIENCE**

**\*Activity before Content!**

**Begin Lab Report during Activity, finish after Content is presented.**

### **ENGAGE**

1. Begin with Engagement activity (experiment)
2. Ask questions – what did you observe?
3. Create a conceptual Model – students draw it out, may use science journals
4. Think about cause and effect – what caused the differences? (students explain the model)

### **EXPLORE**

Introduce Informational Material:

1. teacher,
2. online,
3. textbook,
4. specialist, etc.

### **EXPLAIN**

1. Explain your model using informational text that learned so far
2. Incorporate new vocabulary learned and information into the model
3. Students discuss with others; explain to others; written or oral – lab report

### **ELABORATE**

1. Extend the activity: additional experiments
2. Try another approach, additional experiments,
3. Further questions

### **EVALUATE**

1. Individual communication, observations
2. Student Explanations, discussions
3. Study of one topic to become an expert & sharing with rest of group
4. Quizzes – teacher or student created
5. Write in science journal
6. Report out in lab report
7. Make a new experiment, predict & explain
8. Claim evidence reasoning (scientific process: hypothesis – do experiment for evidence – figure out why: reasoning)
9. Multiple expressions of mastery