

# Communication In Science Inquiry Project (CISIP): A collaborative project between Science, Writing & English as a Second Language.

## Introduction:

Communication in Science Inquiry Project (CISIP) is an NSF-funded project designed to create and disseminate professional development materials for Science, English, ESL/bilingual faculty in middle schools, high schools, and community colleges. Science inquiry lessons in physics, chemistry, geology/earth & space sciences, life sciences are the foundations for these modules. From these model lessons, talking & writing to communicate and English language acquisition techniques will be added to enhance and enrich the lessons (Figure 1 illustrates the general model using an artist palette to represent the various components to be included in each lesson). Arizona State University (ASU) and an external evaluation team (M.J. Young and Associates) are working with CISIP to develop, pilot, field test, research and evaluate the materials.

## Vision & Goals:

The use of CISIP materials contribute to the resolution of a national problem: the acquisition of science content knowledge and the capacity of all students, especially English Language Learners, to learn and communicate their scientific understanding. The goal of CISIP is to create professional development materials in the context of science inquiry for faculty to integrate scientific writing and talking, writing-to-learn processes, and academic language acquisition techniques into their instruction.

## General Approach & Organization:

Handling this many different faculty and topics requires great organization and consistent communication. In order to stay on task and keep well informed we established a multi-phased plan (most of which occur concurrently, figure 2 shows the detailed process map for the first year of the 5 year project):

### Phase 1: Professional Development

We started the project with a core group of representatives for each discipline (Team Articulating Curriculum, Evaluation, and Research: TACER) and expertise area. We started with professional development in each major topic area: National Standards, Science Inquiry, Writing and Talking to Communicate, English Language Acquisition, Metacognitive Strategies, & Performance Expectations/ Feedback.

### Phase 2: Aligning Specifications, Research Base & Evaluation

After becoming well-acquainted with the research-base of each area, we then started to work with the ASU research team to align our specifications with their classroom observation protocol.

### Phase 3: Establish Prototype Modules

Once we had established a common goal, we then started to work with all participants of the project (Cross-Level Curriculum Development Teams: CLCD). We established a core group of prototype developers in each discipline area to create a prototype model before the summer institute.

### Phase 4: Summer Institute

This summer we will meet with the CLCD teams and share all of the prototypes in conjunction with professional development for each topic area originally established. By the end of the institute, we will have 6 modules for each discipline (2 at each level, see figure 1).

### Phase 5: Implementation in the Classroom

We will implement these modules in the classroom and work with the ASU Research team and the external evaluators to assure we are meeting the goals of our project.

### Phase 6: Dissemination

Eventually we will have materials for professional development packages to teach to other teachers nationwide. One possible avenue we are currently exploring is the notion of a "Dial-a-Method" cards (see figure 4) where teachers or professional development trainers can select their own methods for any given lesson and understand the research base behind that given method.

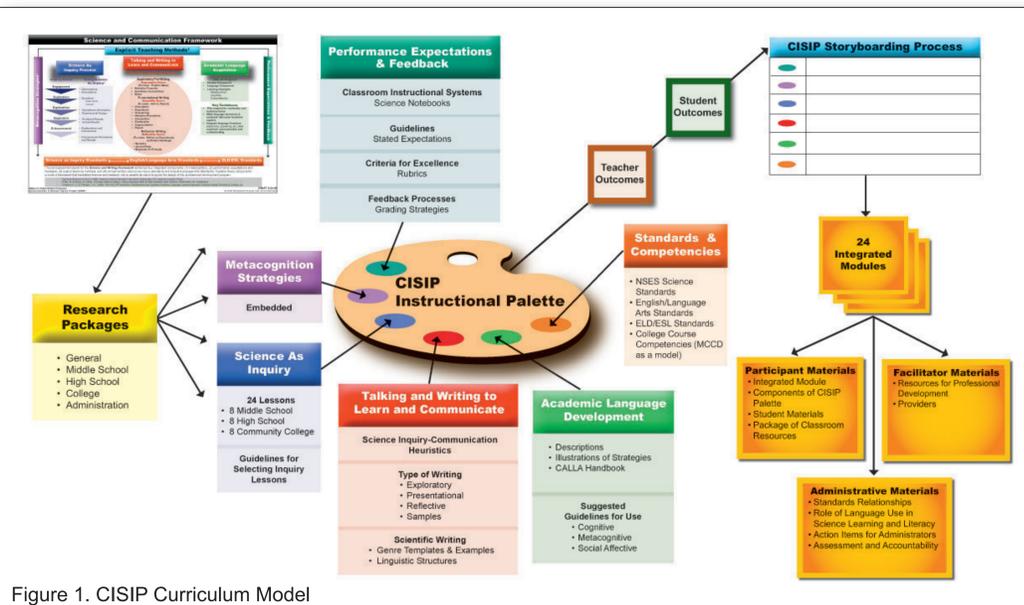


Figure 1. CISIP Curriculum Model

## What does a Lesson look like?

Some of our modules are designed to take place during one lesson, others are designed to be multi-week projects. The Earth Science prototype module is designed to take place in a Middle School Classroom. It is a 2-3 week project that covers all the standards affiliated with plate tectonics. Each lesson within the module is designed around the various phases of our inquiry model (Figure 3 shows the recursive aspects of inquiry, and highlights the continual assessment that is done throughout each lesson. Inquiry models are our building blocks to Academic Language Development). Each lesson is also aligned with what will be our future "Dial-a-Method" topics (Figure 4 shows how the Integrated Modules are scaffolded, and have all the different palette components included and referenced to the "Dial-a-Method" cards). Assessment is both summative and formative for each lesson.

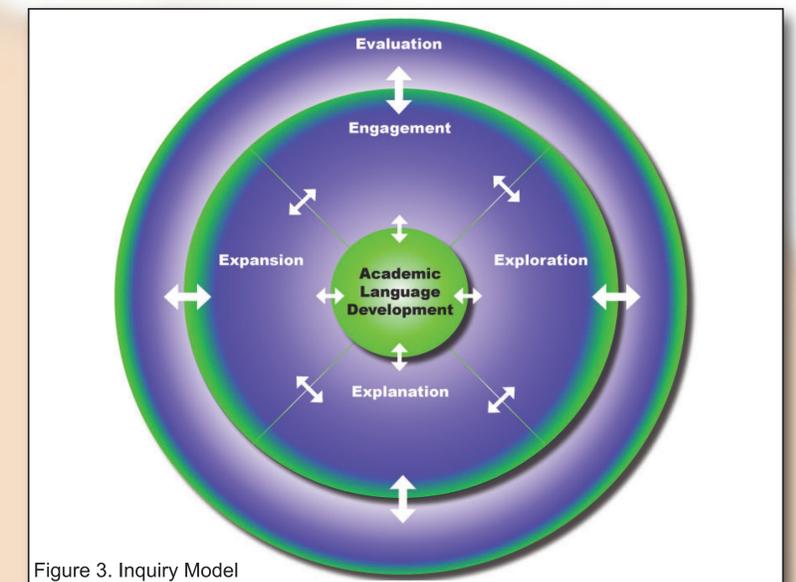


Figure 3. Inquiry Model

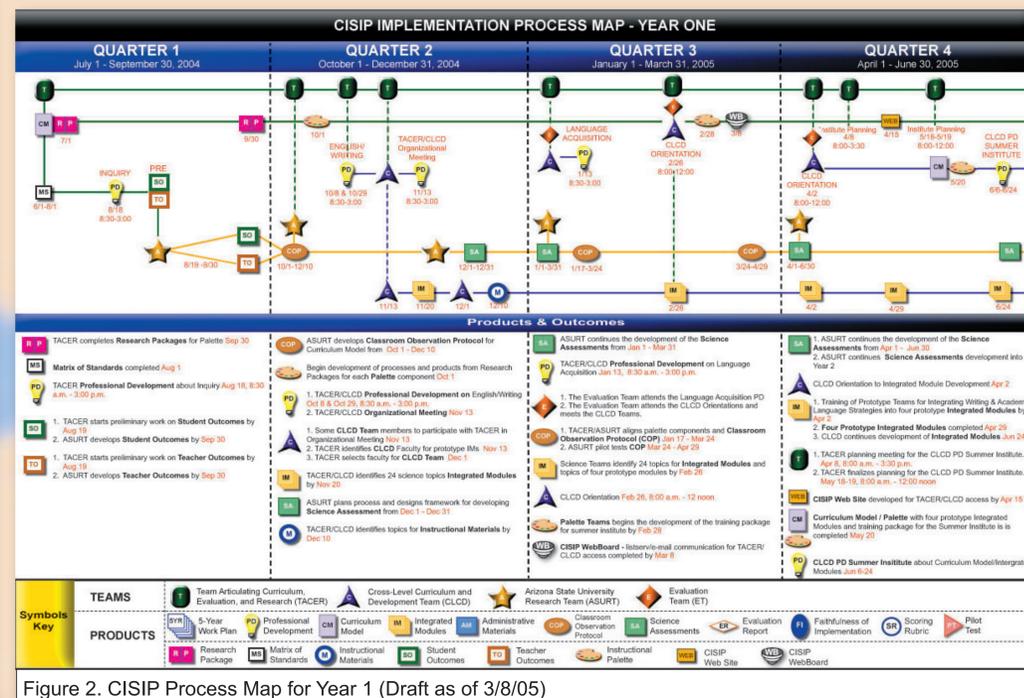


Figure 2. CISIP Process Map for Year 1 (Draft as of 3/8/05)

## Credits:

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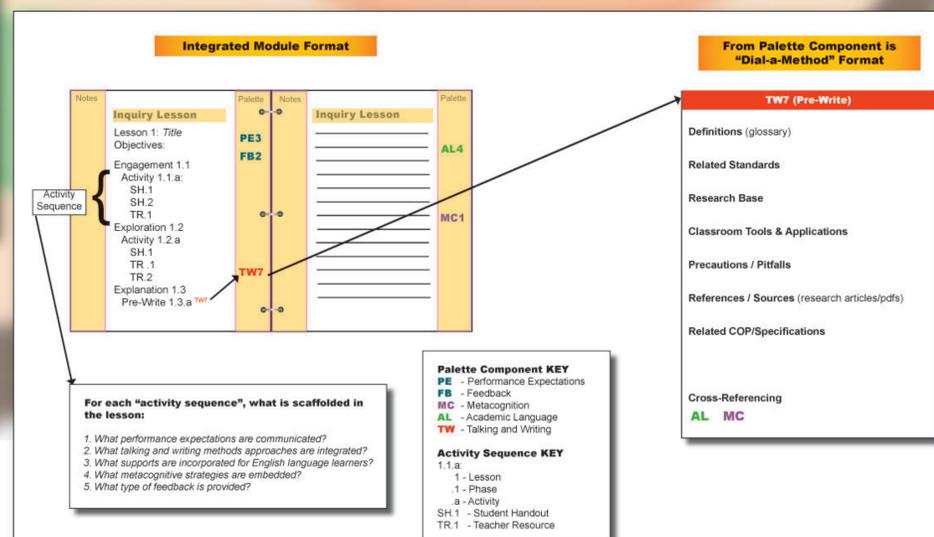


Figure 4. Integrated Module with Palette Components