



Inquiry Learning and Scientific Inquiry

Theory by Richard Suchman

Development of the Theory

- Richard Suchman (1962) worked on the development of inquiry learning strategies.
- His purpose was to develop miniature versions of the kinds of problems that scholars and creative research scientists use to help students learn independently – a strategy they will need in future endeavors.

Development of the Theory

- Like Bruner (discovery learning) and Taba (inductive learning), Suchman believes that students can become increasingly conscious of the process of inquiry.
- All people are inquisitive, but our thinking skills improve when we are conscious of them.

Development of the Theory

- All students must be aware that all knowledge is *tentative*. The 'right' answer is often pushed aside over time and replaced with a new 'right' answer.
- Students must be made aware that another person's point of view can enrich their own thinking.
- Tolerance of alternative points of view is required.

What are Inquiry methods?

- Inquiry methods are designed to present a discrepancy or problem for the students to explore or solve.
- The purposeful creation of "forks in the road" for students to explore will reinforce the concept that is learned.
- Decisions, critical thinking, and problem-solving are key elements.

What are Inquiry methods?

- Inquiry methods are divided into 5 phases:
 - Confrontation (*challenge the problem*)
 - Verification and
 - Experimentation (*gather data*)
 - Organize and Explain (*solving the problem*)
 - Analyze (*the strategy in their work*)

Why use Inquiry methods?

- Inquiry is a way for learners and teachers to handle the rapid growth of knowledge.
- The organization required to solve the inquiry creates a structure for the knowledge that helps students remember the content for longer periods of time.

Why use Inquiry methods?

- Inquiry provides a *purpose* for learning by engaging students in the processes of "finding out."
- Children who learn through inquiry methods in school become well-equipped for autonomous investigation and decision-making in other situations.
- Inquiry prepares students for employment where inquiry skills are highly valued.

Tips for using Inquiry

Rule	Procedure
Rule 1: Questions	Questions should be phrased so that they can be answered with a 'yes' or 'no.'
Rule 2: Freedom to ask questions	A student may ask as many questions as desired once they begin.
Rule 3: Teacher response to statements of theory	When students suggest a theory, the teacher should refrain from evaluating it. Recording or questioning it are okay.
Rule #4: Testing theories	Students should be allowed to test their theories at any time.
Rule #5: Cooperation	Students should be encouraged to work in teams in order to confer and discuss their theories.
Rule #6: Experimenting	The teacher provides materials that help students explore their ideas.

INQUIRY BOX

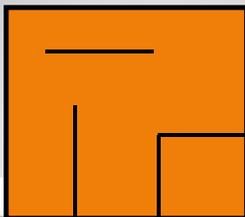


- Examine the inquiry box and tell us as much as you can about the inside.
- Use all of your individual senses and use your imagination.
- Each group member should draw what you think the inside of the box looks like.
- Compare your drawing to the drawings of the other group members, and come to a consensus.

INQUIRY BOX



- What does your pattern look like?



RATES OF WEATHERING



- *After learning basic terminology for weathering (below) students could work on the deductive inquiry in the following activity.*

Weathering: the break-down of rock due to exposure to the atmosphere.

Physical weathering: the breaking-down of rock without altering the chemical composition of the rock.

Chemical weathering: the break-down of rock by altering the chemical composition of the rock.

RATES OF WEATHERING



After receiving teacher instruction...

- The 4 effervescent tablets represent rocks.
- The beaker and other materials can be used to recreate conditions in our environment that cause weathering.

RATES OF WEATHERING



- Before each experimental trial, formulate a hypothesis for the results – will the conditions you impose on your rocks create a fast, moderate, or slow rate of weathering?
- Are the conditions physical, chemical, or both?

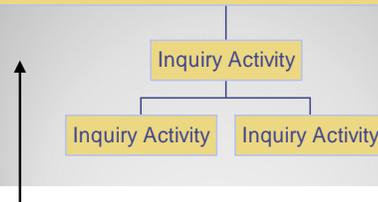
RATES OF WEATHERING



- Find at least 3 ways that you can vary the rates of chemical weathering for your "rocks."
- Groups should compare their trials and the results that they obtained in their experiments.
- Students will then apply their results to real-life conditions that change the rate of chemical weathering in nature.

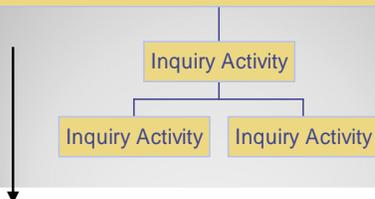
Inductive Inquiry

Concept or principle is "discovered" by the student



Deductive Inquiry

Concept or principle is presented by the teacher



How can you evaluate inquiry learning?

- There are 3 main areas for evaluation when using inquiry methods:
 - *Application of the Content*
 - *Formulation of the Question*
 - *Design of the Investigation*

**See attached rubric sheet for more details.*

**Take a few minutes to think
of your own inquiry-based
lesson plan.**

