Workshop/Intervention, Grades 4-6

Inquiry and Exploration Cycle

The Inquiry/Exploration Cycle provides a scientific framework for inquiry, a routine driven by students' wonderings and conjectures. This cycle consists of recursive phases that guide the students through their research, with each phase repeated as many times as necessary. Each repetition of each phase will give rise to new questions and problems, helping students reevaluate and revise their conjectures, knowledge, needs, and plans.

Problem phase

Effective research is guided by and focused on problems, rather than on topics.

Purposes

1. To identify a research question or problem.
2. To form research groups which will seek solutions to the problem.

Students should

- Identify a question they wonder about or a problem they wish to understand.
- Form research groups with students who share their interests.

Conjecture phase

Conjectures will guide students' research, as students gather new information to test and revise their original conjectures.

Purposes

1. To form conjectures about a research problem or question.
2. To discuss conjectures with research groups.

Students should

- Think about possible answers to their research problems or questions and discuss these possibilities with classmates.
- Meet with their research groups to discuss and record their conjectures.

Needs and plans phase

Thinking carefully about resources and knowledge needs helps keep the research on track and focused.

Purposes

1. To identify research needs.
2. To formulate research plans.
3. To revise problems and conjectures.
4. To develop a calendar.

Students should

- Identify their knowledge needs based on their conjectures.
- Meet with their research groups to determine which resources to consult and to make individual job assignments.
- With the class, develop a calendar to provide a timeline for completing the phases.

Presenting findings

Purpose

1. To informally present findings.

Students should

- Meet periodically with teachers, classmates, and research groups to present their findings and, on the basis of these findings, revise their problems and conjectures.

Reevaluate problems and revise conjectures

Discussion, ongoing feedback, and constructive criticism are important in all phases of the research but especially in the revising of problems and conjectures.

Purposes

1. To reevaluate problem in light of new information.
2. To reevaluate conjecture in light of new information.
3. To discuss and incorporate feedback.

Students should

- Discuss problem and new information learned from their research.
- Discuss their conjectures with new knowledge in mind.

Presenting findings

Purpose

1. To informally and formally present findings.

Students should

- Meet periodically with teachers, classmates, and research groups to present their findings and, on the basis of these findings, revise their problems and conjectures.

Identifying new needs and making new plans

With each refinement of the problem and the conjecture, research needs change.

Purposes

1. To identify new research needs.
2. To revise research plans.
3. To revise problems and conjectures.

Students should

- Identify knowledge needs related to their new conjectures.
- Meet with research groups to determine which resources to consult and to make individual job assignments.

The inquiry/exploration routine is cyclical and, thus, essentially endless. Each new set of findings produces new problems, questions, and conjectures, which lead, in turn, to new cycles of research.