

Half-a-Hundred
(Scientific Creativity: Where Does It Come From?)

This field exercise is designed to assist students in posing and evaluating ecological research questions.

Each student should have a clipboard (or notebook) and pencil or pen.

In the field, the group splits up and each student is told to write 50 questions in 50 minutes. The students may walk around, stay still, stare into space, or whatever – but they cannot talk to anyone. The students should be told that they should expect it to be fairly easy at first, but then become more difficult as time passes. Thus, they should not screen questions – write down every one that comes into their mind (even the apparently dumb ones). You might want to suggest that chains of questions are often quite interesting, and that each question in the chain can count as a separate question.

At the end of the 50 minutes, the group reassembles to discuss the questions. First, have each student simply read without comment (or judgment) every third (or fifth or whatever) question to the group. To reduce ego-strain, go around the group quickly (e.g., Joe reads his question 3, then Jill reads her question 3, and so on).

After all the questions have been read, ask the group leading questions:

- 1) What prompted your questions? (Something nearby? Past experience? Change in perspective – location, scale, angle, direction? Looking at the same thing as everyone else and “seeing” something different?)
- 2) Did you notice clusters of similar questions? Why do you think this occurred?
- 3) What makes a question “interesting”? What makes a question uninteresting? Why?
- 4) Which questions are “scientific” questions? Why?
- 5) How could you test this question? Experimental design? Hypothesis formation? Data analyses?
- 6) What would you expect is the answer to this question? Are there alternative explanations?
- 7) Who “owns” the questions (intellectual property)? If you heard an interesting scientific question from someone else, do you think it would be ok to conduct your own research to try to answer it?
- 8) What is “critical thinking”? How does it relate to “creative thinking”?

There is no real follow-up to this exercise – the discussion is the message. However, if a student is interested in pursuing a question, they should be encouraged.