

Asking the Right Questions

Projects, in school or out, are driven forward by questions and a sustained pursuit of inventive, evidence-based answers. Creative questioning is the motive force and the fire that will light your path forward as a self-directed learner. A quote attributed to Albert Einstein is, “It is not that I am so smart, it is just that I stay with the questions longer.” An inclination to persistently question, explore alternative explanations, seek answers for oneself, and communicate solutions are key job skills.

If asking the “right question” is a key to achieving meaningful results, what is the right question? One starting point is that the “right question” is one that interests you, connects to your life, and relates to significant real world processes, events, phenomena, or relationships. This is a prime opportunity for exercising your voice and choice to shape your learning and our society.

The next section (adapted from Rothstein and Santana’s *Question Formulation Technique*) provides a strategy your group may use to organize your questioning in order to launch your investigation.

- 1. Design a question focus:** Take this project’s Challenging Question as posed and rewrite it as an assertion or a statement. Then reverse engineer (pick apart) the challenging question as a starting point to develop your own focus question. You will notice that the question as it is stated has implicit assumptions, clear goals, and a target audience. Decide for yourself what part of the question intrigues you and suggests a focus for further questioning. However, you should question the question before adopting it as a guide for your learning.
- 2. Produce questions:** Begin developing “need-to-know” questions to guide your research into the Challenging Question. Use these rules to brainstorm:

Ask as many creative and probing questions as time allows. Feel free to riff off one another to keep things moving. For now, more is better; in a later step you will work to prioritize your questions.

Do not stop to judge, edit, answer, or respond to any question during question generation.

Have one group member write down each question exactly as posed. You may wish to rotate this task as it can inhibit the scribe’s creativity.

Change all assertions or statements into questions.

- 3. Work to refine questions:** Seek to convert closed questions (yes/no) to open ended questions that will require more thought and investigation. Aim for higher-level thinking questions that require analysis, synthesis, and

application of knowledge. Do you notice any patterns to the questions? Is there a way to investigate each question, and if not how can that question be restructured?

4. **Prioritize and classify questions:** You are being asked to investigate a complex issue. First, prioritize and narrow down your list of questions. Next, broadly categorizing the questions, for example, according to the group role (science, engineering, or policy) that will be leading each question's investigation.
5. **Plan how to investigate the questions:** What knowledge will be needed? Find out what is already known so your creative questioning will have the potential to explore new ground. The real skill lies in recognizing what data and information is valid, free of bias, and relevant to the question being asked.

What will you be doing? Think carefully about what science, engineering, and policy practices will lead you to significant answers to the various questions. Observation, research, interviews, fieldwork, experiments, surveys, data mining, or a combination of approaches? Be sure to consider how you will obtain, evaluate, and communicate about these complex subjects.

What will you be thinking about? Big ideas! Patterns, cause and effect relationships, policies that lead to stability or change. Models, of many system types: climate, transportation, communication, ecological, financial, or physical. How do the systems interact and function? What are the boundaries? Where do varied systems intersect? What are the component parts and what limitations exist?

6. **Commit to Next Steps:** This is an ideal time to finalize your learning contract and begin designing your investigation. See Student Checklist.
7. **Student Reflection:** Consider in your project notebook what steps you might take to improve your questioning skills. When does it feel most challenging to ask questions? How might you control circumstances that make you nervous? Consider setting a goal to ask a question every day.

Students of the art and science of questioning are doing far more than setting the learning agenda for themselves; they are training themselves in a new way of thinking that leads to innovation, career success, and mental habits that may be applied across subject areas, lifestyles, and geography. Author and poet Harvey Oxenhorn illustrates the ultimate positive outcome for questioners: "Being mindful...To notice everything, to make that level of awareness so habitual that it became unconscious...To get in the habit of asking questions was to get in the habit of answering them for yourself. What you gain in the process, when allowed to make your own mistakes, is self-reliance, ability, and independence."