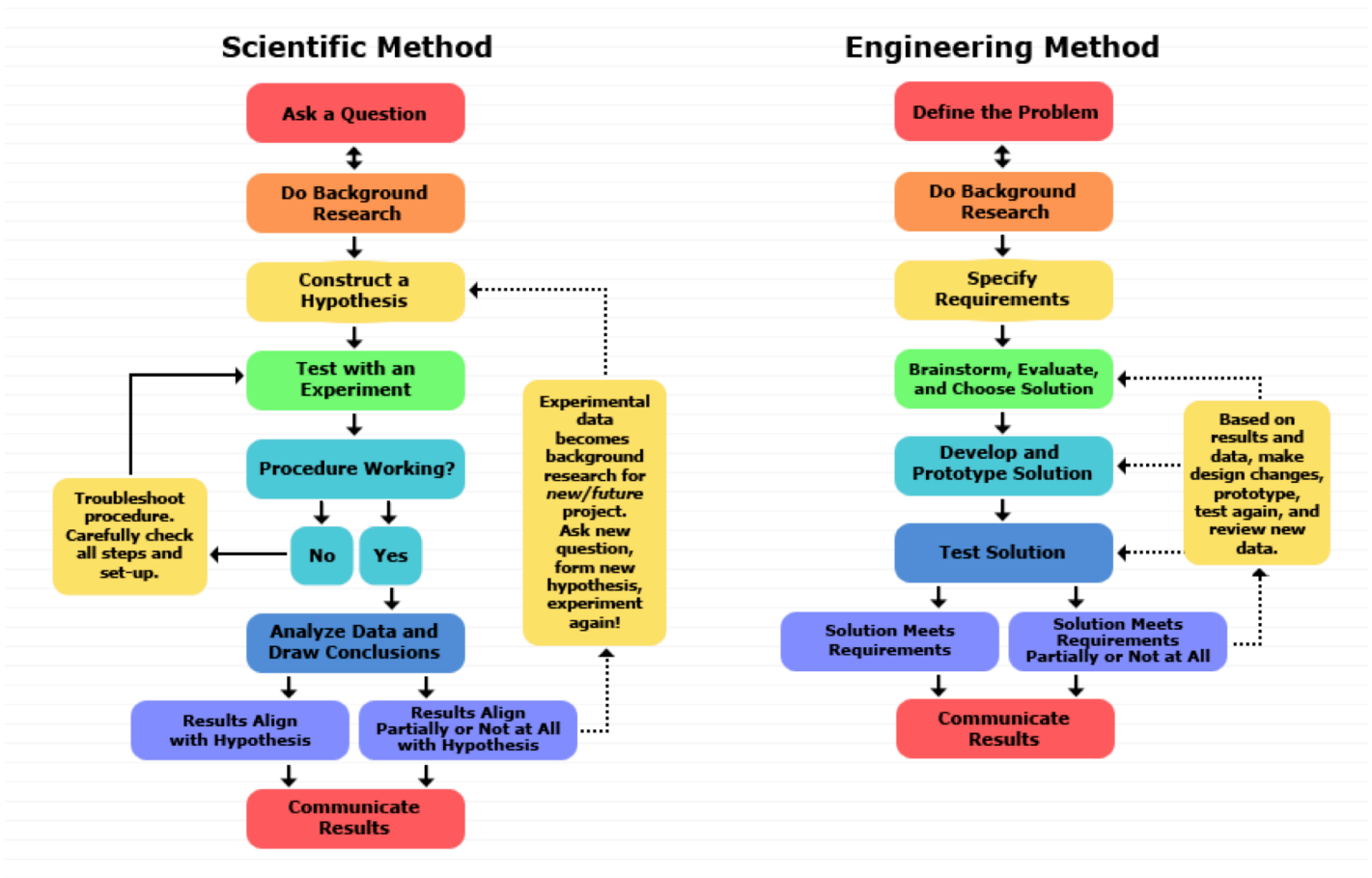# Comparing the Scientific Method to the Engineering Design Method

While scientists study how nature works and discover new knowledge about the universe, engineers create or construct new things, such as products, websites, environments, and experiences. Because engineers and scientists have different objectives, they follow different processes in their work. Scientists perform experiments using the **scientific method**; whereas engineers follow the creativity-based **engineering design** process.

You can see the steps of each process in these flowcharts:

The Scientific Method	The Engineering Design Process
• State your question	• Define the Problem
• Do Background Research	• Do Background research
• Formulate your hypothesis; identify variable	• Specify requirements
• Design experiment, establish procedure	• Create alternative solutions, choose the best one and develop it
• Test your hypothesis by doing an experiment	• Build a prototype
• Analyze your results and draw conclusions	• Test and redesign as necessary
• Communicate results	• Communicate results

Although the steps above are listed in sequential order, as you are working on your project, you will likely return to previous steps several times while conducting your investigation or design. It is often necessary to revisit stages or steps in order to improve that aspect of a project.

What is the Difference Between the Two Processes?

Scientists and engineers contribute to the world of knowledge in different ways. Scientists use the scientific method to make testable explanations and predictions about the world. A scientist asks questions and develops an experiment, or set of experiments, to answer that question. Engineers use the engineering design process to create solutions to problems. An engineer identifies a specific need: **Who** needs **what** because **why**? And then he/she creates a solution that meets that need.

However, in real life, the distinction between science and engineering can overlap. Scientists can often do engineering work and engineers frequently apply scientific principles, including the scientific method. Much of "computer science" is actually a form of engineering – programmers create new products.

Which Process should You Use?

Your project may fall in between science and engineering, and that's okay. Many projects, even if related to engineering or computer science, can and should follow the scientific method.

However, if the objective of project is to invent a new product, computer program, experience, or environment then it makes sense to follow the engineering design process.

(Information from Science Buddies https://www.sciencebuddies.org/science-fair-projects/engineering-design-process/engineering-design-compare-scientific-method)