

### HANDOUT

# Dynamic Systems

When we hear the word *system* we may think of mechanical systems, like a computer or a car. Mechanical systems do not grow or evolve. They are built in a certain way and stay that way until someone replaces a part. On the other hand, dynamic systems can change and grow. The rainforest, your body, a family, and even your classroom are dynamic systems. One way to see the difference between these types of systems is to observe how the parts are connected. Most mechanical systems are built to work—and be fixed—in straightforward ways. When a machine stops working, there's usually a trained repairperson who can find the cause and fix the problem. There is usually a straight line between a problem and its solution.

Dynamic systems, on the other hand, rarely operate in such straight-line fashion. Instead they're composed of patterns of connections and interactions that better resemble webs, loops, and networks. Although these patterns are not always visible to the naked eye, we know they're capable of producing breathtaking synergy in nature, and can present some of the most puzzling and stubborn challenges we face as humans.

Health and friendships involve dynamic systems, as do wars and climate change. Dynamic systems can include, among other types, ecological, biological, economic, political, and social systems. When we look carefully, we see such systems all around us and on all scales, from the smallest plankton to the planet as a whole.

Understanding dynamic systems can help us solve many problems, because they can be self-healing and self-renewing, but they also challenge us to think differently, because, unlike mechanical systems, they can't be easily controlled.