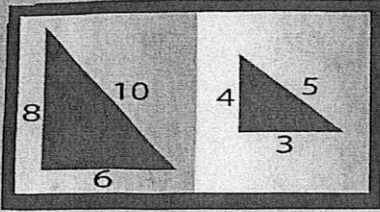




# Crosscutting Concepts

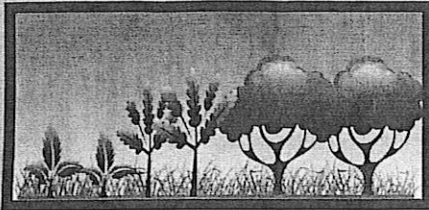
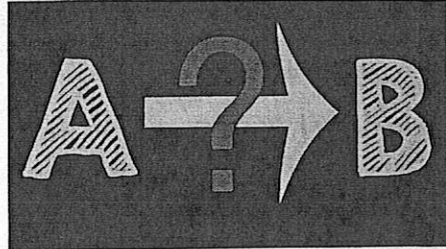


## SCALE, PROPORTION, & QUANTITY

Scientists must be able to recognize what is relevant at different sizes, times, and scales. They also need to recognize proportional relationships between categories, groups, or quantities.

## CAUSE & EFFECT: Mechanism & Explanation

Scientists are often interested in and attempt to identify causal relationships.

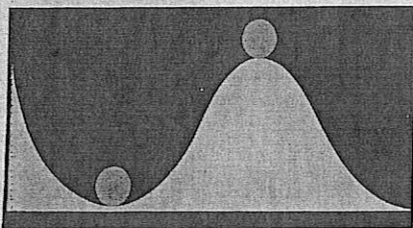
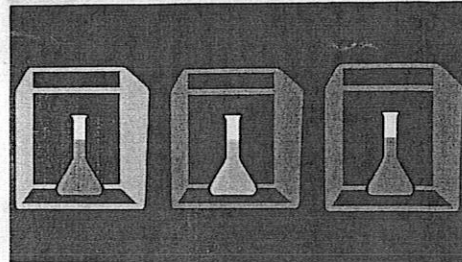


## PATTERNS

Scientists use observed patterns in nature to guide organization and classification systems. They also attempt to understand the underlying cause of these patterns.

## SYSTEMS & SYSTEM MODELS

Scientists often need to define the system under study and then make a model of it to understand it. Models can be physical, conceptual, or mathematical.

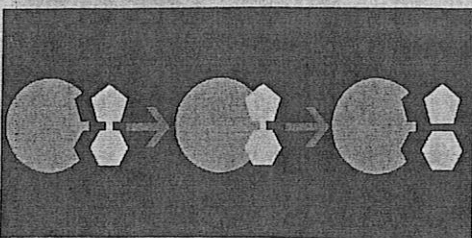
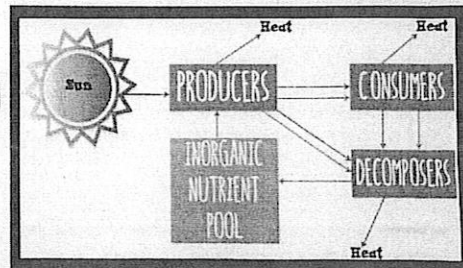


## STABILITY AND CHANGE

Scientists often need to understand what makes a system stable or unstable and what controls rates of change in a system.

## ENERGY & MATTER: FLOWS, CYCLES, & CONSERVATION

Scientists often need to understand how energy and matter flow, into, out of, and within a system in order to understand it.



## STRUCTURE AND FUNCTION

The structure of an object determines its function and places limits on what the object can and cannot do.