

Curriculum Units and Learning Outcomes

Content Area: Science	Grade Level: 7
Unit Title: Systems	
Unit Summary: Students analyze systems and develop an understanding that systems interact with other systems, have subsystems and can be part of a larger complex system. Students also explore models as a tool used to represent systems and their interactions.	
Massachusetts Standards: 7.MSETS34(MA). Show how the components of a structural system work together to serve a structural function. Provide examples of physical structures and relate their design to their intended use. Clarification Statements: <ul style="list-style-type: none">● Examples of components of a structural system could include foundation, decking, wall, and roofing.● Explanations of function should include identification of live vs. dead loads and forces of tension, torsion, compression, and shear.● Examples of uses include carrying loads and forces across a span (such as a bridge), providing livable space (such as a house or office building), and providing specific environmental conditions (such as a greenhouse or cold storage). 7.MSETS35(MA). Use the concept of systems engineering to model inputs, processes, outputs, and feedback among components of a transportation, structural, or communication system. <ul style="list-style-type: none">●	
Enduring Understandings: Students will understand that: <ul style="list-style-type: none">● Systems may interact with other systems; they may have sub-systems and be part of a larger complex system	

- Models can be used to represent systems and their interactions- such as inputs, processes, and outputs- and energy, matter and information flows within systems.
- Models are limited in that they only represent certain aspects of the system under study.

Essential Questions:

- What is a system?
- How does change happen in a system?
- How can we model the components of a system?
- (How is one community impacted by changes in another community?)
- Why are models or simulations useful?

Students will demonstrate KNOWLEDGE of:	Students will be SKILLED at:
<ul style="list-style-type: none"> ● inputs and outputs are part of systems. ● Systems can interact with other systems or contain subsystems. ● Systems can be represented by models ● There are limitations to models 	<ul style="list-style-type: none"> ● Defining a system and explaining how energy, matter and information flow ● Identifying inputs and outputs ● Defining a model and explaining why it is important ● Identifying limitations of a model ● Identifying components of a system (i.e. a school as a system) ● comparing a school system to a different system ● using systems mapping as a tool to visualize the interactions between a human–nature-coupled system within their communities.

Estimated Duration: 3 weeks

