JSD 3D Learning Activity Template

Grade:6th	**Title:** Cycling of Matter through an ecosystem

Utah Science with Engineering Education Standard (SEEd): 6.4.3 Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. Emphasize food webs and the role of producers, consumers, and decomposers in various ecosystems.
Examples could include Utah ecosystems such as mountains, Great Salt Lake, wetlands, and deserts.

Key crosscutting concept(s) (CCC): System Models, Stability and Change, and Cause and Effect
Key science and engineering practice(s) (SEP): Obtaining, Evaluating and Communicating Information, and Analyzing and Interpreting Data

Materials: 1 computer per 2 students, Utah ecosystem slips of paper (see attached) cut up and put in a paper bag, poster paper.

Time: 1.5 – 2 hour

Teacher background, key content information and hints: Previous lessons and notes (see attached)

Prior knowledge that students need: previous lessons

Learning Activity Plan

These three aspects of a lesson should be identified in your learning activity.		
Gathering: *(Obtain Information, Ask Questions/Define Problems, Plan & Carry Out Investigations, Use Models to Gather Data and Information, Use Mathematics/Computational Thinking.)*	***Reasoning:*** *(Evaluate Information, Analyze Data, Use Mathematics/Computational Thinking, Construct Explanations/Solve Problems, Develop Arguments from Evidence, Use Models to Predict & Develop Evidence.)*	***Communicating:*** *(Communicate Information, Argue from Evidence (written & oral), Use Models to Communicate).*

Phenomenon:

Phenomena: Fact or Nonsense: If Phytoplankton died life as we know it would end.

- Have the students move to the right side of room if fact or left of the room if nonsense.
- Then have them do 10 minutes of research.
- Discuss.
- Allow students 10 minutes to research.
- They can then move to left or right.

Learning Activity:

Gathering:

- **Students will pair up and draw an ecosystem of Utah that was drawn from a paper sack.**
- **Students will use a computer to research the Utah ecosystem they drew.**

Reasoning:

- **They will need to draw the food web that exists in that ecosystem with 10 different organisms on their poster paper and the abiotic features of the ecosystem as a background.**

Communicating:

They will present their food web drawings to class.

Use the Table below for the next activity.

The table below lists the 17 endangered and threatened animal species believed to or known to occur in the state. The word "entire" after a name indicates that the species occurs throughout the state.

[hide]**Endangered animal species in Utah**	
Status	**Species**
Endangered	Ambersnail, Kanab Entire (Oxyloma haydeni kanabensis)
Endangered	Chub, bonytail Entire (Gila elegans)
Endangered	Chub, humpback Entire (Gila cypha)
Endangered	Chub, Virgin River Entire (Gila seminuda (=robusta))
Endangered	Flycatcher, southwestern willow Entire (Empidonax traillii extimus)
Endangered	Pikeminnow (=squawfish), Colorado Entire, except EXPN (Ptychocheilus lucius)
Endangered	Sucker, June Entire (Chasmistes liorus)
Endangered	Sucker, razorback Entire (Xyrauchen texanus)
Endangered	Woundfin Entire, except EXPN (Plagopterus argentissimus)
Threatened	Cuckoo, yellow-billed Western U.S. DPS (Coccyzus americanus)
Threatened	Lynx, Canada Contiguous U.S. DPS (Lynx canadensis)
Threatened	Owl, Mexican spotted Entire (Strix occidentalis lucida)
Threatened	Prairie dog, Utah Entire (Cynomys parvidens)
Threatened	sage-grouse, Gunnison entire (Centrocercus minimus)
Threatened	Tortoise, desert Entire, except in Sonoran Desert (Gopherus agassizii)
Threatened	trout, Greenback Cutthroat Entire (Oncorhynchus clarki stomias)
Threatened	Trout, Lahontan cutthroat Entire (Oncorhynchus clarkii henshawi)
Source: *U.S. Fish and Wildlife Service*, "Listed species believed to or known to occur in Utah"	

Gathering/Reasoning:

Allow student pairs to select one of the animals. Allow them to research for 20 minutes and answer the questions: What will happen if this animal goes extinct? What are it's limiting factors? What are the biotic and abiotic features of its ecosystem that it needs. Be specific to explain what the "trickle-down effect" will be on 3 other organisms and why.

Communicating:

Present 5 slide google slides on their findings (include at least 5 pictures, a graph and answers to the questions)

Assessment of student learning

Did students create an accurate food web with arrows pointing in the right direction for the ecosystem they drew. Did students create 5 slides in google slides with 5 pictures, answered questions and a graph)