Environmental Dynamics I Strand Map

Lab Safety & Principles of Measurement

What are the major safety features of our lab space? What are the safety procedures we need to follow? What are some situations that could lead to danger? What are *scale models* and when can they be helpful? What does it mean to make an *accurate* measurement? How is *precision* relevant to a measuring instrument? How do we use *significant figures* when making measurements with a ruler? How do we record the error that is inherent in any measurement?

Painting a Picture of Fukushima 2015: Qualitative & Quantitative Data

What is the mission of Safecast, and why does it continue today? What is the role of a *citizen scientist* post-Fukushima? How do *qualitative* and *quantitative* data compare in three different ways? How do *qualitative* and *quantitative* data work together to tell a story? Explain the difference between a *base* and a *derived* measurement unit, and give an example of a radiation measurement unit. Describe a *half-life* and why ^{137}Cesium is concerning. Have any patterns emerged describing the radiation levels in Japanese foods since 2011? In your opinion, what are the two most pressing Fukushima-related environmental issues facing Japan in 2015? (Give evidence to support your answer) Explain how data collection, data organization and data interpretation can be *biased*. Describe two things you are learning in terms of reading critically for science.

Radionuclides in Fukushima Forests

What are *abiotic* and *biotic* factors in an ecosystem? How does an understanding of the natural cycles of matter and energy help us track radionuclides? Explain how radionuclides like ^{137}Cesium can remain in the environment beyond the length of their half-life. How do *elements*, *molecules*, and *compounds* compare? What is the difference between *organic* and *inorganic* materials? Name two common components that exist in all of Earth's spheres. Why is soil texture important for tracking ^{137}Cesium in forests? Give two reasons why Fukushima forests are nearly impossible to decontaminate in the immediate future. Explain a solution that Fukushima farmers and volunteers are trying in nearby fields. How do we calculate *percent composition* of a sample? What are safety symbols and how will we use them in lab? What would you like to improve when conducting a lab procedure such as the soil texture lab?

Flow of Matter, Energy and…^{137}Cesium?

How do organisms in an ecosystem relate to each other? What is the main source of energy in an ecosystem? How can the flow of energy through an ecosystem be depicted? What is the difference between a *food web* and a *food chain*? Find an image of a food web and identify the different *trophic levels* in the *food web*. Draw a labeled model or write an explanation of both *bioaccumulation* and *biomagnification*. Explain the purpose of the Minna-no-data projects and the two resources they are testing. Why are residents of Canada and the United States concerned about Fukushima four years later? What are 3 major reasons why species of Pacific tuna are at risk? Explain why the mercury cycle is overloaded, and the impact it is having on our seafood supply. Describe *irradiated food* and give 3 reasons why supporters feel this practice is safe. What are the four main *ecosystem services*? Explain *overfishing* and why it is considered an unsustainable practice.