**ENVIRONMENTAL HEALTH\*INTERIM 2025**

**“Materials in the Environment“**

**Chemical Compounds and their Characteristics**

What do we mean when we say a chemical is volatile?

Lipophilic? Hydrophilic? (Why do we care?)

What does it mean when we say a chemical is persistent?

What is the difference between bioconcentrate, bioaccumulate and biomagnify? Some of you may already have heard of bioaccumulate and biomagnify but how are those two different from bioconcentrate?

What are the three classic “routes of exposure”?

How does absorption differ between the skin, inhalation and ingestion? Which “route of exposure” is/are less “protected”?

What is the difference between dose and absorbed dose?

Now think about the possible fate and transport of materials in a body.

*Materials or chemical compounds need to be absorbed into your body, after that them may be metabolized (changed chemically by your body) and distributed (moved around to some parts of your body-like if it is lipophilic it might end up in your fat, if it is a mineral like lead it might end up in your bones or teeth). Once that material is distributed to a body part it might be stored (might stay for a while in that body part) but might also be moved out of that body part and excreted (leave your body through various processes).*

What is a metabolite?

What is the difference between acute exposure, chronic exposure and why are we worried about synergistic effects in particular?

*There is a link to listen to a quick 7 minute blurb on “mixtures” in the wordpress site for class. That material connects to the concept of synergistic effects between two different materials. Imagine that if you were exposed to particulates from fossil fuel combustion and asbestos. It is often the case that exposure to two different materials is more than additive in terms of effects and is synergistic (indicating they are working together to make a condition much worse-essentially the relationship might be multiplicative rather than additive).*

What is a dose response relationship? How might we summarize this relationship using graphs?

What do we mean the dose makes the poison?

What is the threshold when talking about exposure? Again how do we represent this in graphs?

What is the LD50 of a material refer to?

How often do we figure out toxicity by directly exposing humans and measuring the effects? 😐

FYI: In the next section of the course we will talk about “different kinds of studies”!

**Air**

What are temperature inversions and how might they affect air quality?

How might the topography of a landscape or a city affect how air moves or does not move?

What was the U.S. Clean Air Act? What six major (conventional or criteria pollutants) were listed in that act? (Note these are the pollutants where maximum ambient air levels are mandated.)

Check in on particulate sizes in the context of air pollution. How do different particles affect us and where can they go?

Check in on the structure of the lungs and your alveoli.

**Groundwater and Surface water**

What is groundwater and what is surface water?

What is an aquifer? An unconfined aquifer? A confined aquifer?

Leachate is….

Think about the possible fate and transport of materials in the environment (if you google those words you should find some imagery to help you think holistically).

How can sediments in rivers and lakes be places contaminants are stored? (you might google heavy metals and stormwater runoff or something like that)