We All Need Water Demonstration Document

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We will be focusing on the SEEd Standard 5.3.3 which states,” Develop and use a model to describe the movement of matter among plants, animals, decomposers, and the environment. Emphasize that matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Examples could include simple food chains from ecosystems such as deserts or oceans or diagrams of decomposers returning matter to the environment. Complex interactions in a food web will be taught in Grades 6 through 8. (LS2.A, LS2.B)” We will focus on how a pollution will cycle thought the eco system. The main scientific concept will be diffusion. In Chemistry 2e, defines diffusion as the, "process by which molecules disperse in space in response to differences in concentration." (section 9.4) Very simply stated, diffusion is the movement of particles from area of high concentration to low concentration. The next concept that is in line with the SEEd standard 5.3.3 is that after a plant absorbs a solute, if that plant is consumed by either a consumer or a decomposer then the consumer will absorb the solute. One journal reported, "The enrichment level of heavy metal in fish tissues depends on exposure time, exposure concentration, and heavy metal types. It is also affected by chemical properties of water, fish species, characteristics of fish tissues and organs, physiological metabolic activity of fish and other factors" ( ZHONG, Y., ZHENG, Q., et. al, 2015, pg. 64). This is the basic science behind our experiment and what we hope your students will understand diffusion because of this experiment.

Supplies

* Clear plastic cups (1 per experiment)
* Grape juice (about 4 oz per experiment)
* Celery (3-4 in. per experiment)

All these supplies can be found at a local grocery store and there are no special precautions with these supplies.

Procedure

1. Fill cup half full of warm water
2. Fill rest the of cup full of grape juice and observe
3. Taste and observe color of celery and record it in data table
4. Place celery in water grape juice mixture wait at least 30 minutes
5. Remove and taste celery and observe color
6. Dispose of supplies in garbage and down the sink

**References**

Flowers, P., Bott, S., Carpenetti, D., Eklund, A., El-Giar, E., Frantz, D., . . . Blaser, M. (2019). *Chemistry 2e*. Ann Arbor, MI, Texas: OpenStax, XanEdu. Retrieved December 10, 2020, from https://openstax.org/details/books/chemistry-2e

ZHONG, Y., ZHENG, Q., HAN, C., WEN, R., & ZHANG, H. (2015). Determination and Evaluation of Heavy Metal Content of Freshwater Economic Fish in Northeast Guangdong. *Asian Agricultural Research*, *7*(1), 61–70.