

ACTIVITY 1:

Are microplastics found in the human body?

Casey was watching a video on social media when she saw an advertisement encouraging the purchase of personal care products (like shampoo and face wash) with the “zero plastic inside” label because they help reduce exposure to **microplastics**.



Casey realized that she uses a lot of products that could be a source of microplastics. She wanted more information, so she did an internet search. She found a research study that looked interesting.

The research team wondered if these tiny plastic particles could make their way into the human body. To answer the research question, the research team gathered samples of human tissue from deceased donors. The researchers sampled kidney, liver, and brain tissue from 91 individuals over several years. After obtaining the tissue samples, the research team used a tissue dissolving solution that dissolves the body tissue so that the only thing left from the sample was microplastics. The team counted the microplastics they found in each sample.

You have a sample of brain tissue from the research lab. Use the **Brain Tissue Sample** and the **Sampling Protocol** to determine if microplastics are present in this sample. Once you are finished with the protocol, complete the data table below:


Brain Tissue Sample	Presence of Microplastics		Are all microplastics the same size?		Are all microplastics the same color?		Are all microplastics the same shape?	
	YES	NO	YES	NO	YES	NO	YES	NO
EC09-02								

1. Based on your observations, do you think that the microplastics found in the brain tissue sample all came from the same source? Support your claim with evidence.

The research lab determined the weight of microplastic in one gram of each brain tissue sample. The data table below includes the data from sample EC09-02 as well as all the samples from 2016 observed in the lab.

Sample	Date of sample	Amount of microplastic in sample (µg microplastic/g of brain tissue)
EC09-01	2016	3454
EC09-02	2016	2509
EC09-03	2016	5526
EC09-04	2016	4512
EC09-05	2016	4268
EC09-06	2016	8861
EC09-07	2016	2811
EC09-08	2016	5014
EC09-09	2016	6519
EC09-10	2016	6018
EC09-11	2016	3215
EC09-12	2016	3621
EC09-13	2016	3715
EC09-14	2016	298
EC09-15	2016	2005
EC09-16	2016	3419
EC09-17	2016	8511
EC09-18	2016	8709
EC09-19	2016	8103
EC09-20	2016	3643
EC10-01	2016	8827
EC10-02	2016	3317
EC10-03	2016	1503
EC10-04	2016	3345
EC10-05	2016	7123
EC10-06	2016	1201
EC10-07	2016	3351
EC10-08	2016	2207
EC10-09	2016	3013
EC10-10	2016	3518

1,000,000 µg = 1 gram



1 paperclip = 1 gram

2. List two reasons that may explain why there is a wide range of microplastic amounts in the brain tissue samples.
3. Are there any brain tissue samples without microplastics?
4. Based on your answer to question #3, do you think we can conclude that everyone's brain contains microplastics? Explain your answer.
5. Microplastics are difficult to study because scientists may introduce microplastics into the sample during their research procedure. This creates error in the sample amount. Review the procedure you used to identify microplastics in the brain sample. Identify at least one source of microplastics that may add error to the sample amount.
6. Do you think the data from the research study should be ignored because there may be some error in the sampling procedure? Why or why not?