

Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Living Environment – Biomagnification & Bioaccumulation*

**PART I - RESEARCH:**

Watch the following videos and read the following articles in order to answer the corresponding questions below. Feel free to watch any other related interesting videos and/or read any fascinating articles you come across!

Videos: <https://www.youtube.com/watch?v=DxqDaTUh08o>  
<https://www.youtube.com/watch?v=85I7oPWUuak>  
<https://www.youtube.com/watch?v=E5P-UoKLxIA>

Articles: <https://student.societyforscience.org/article/uh-oh-baby-fish-prefer-plastic-real-food>  
<https://student.societyforscience.org/article/spidey-sense-eight-legged-pollution-monitors>

**PART II - NOTES:**

Define Biomagnification:

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Define Bioaccumulation:

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How does biomagnification start?

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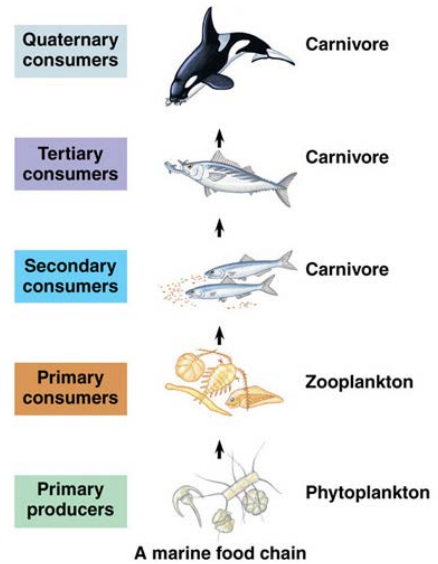
What are examples of biomagnification pollutants/toxins?

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In the following aquatic food chain, which species will have the greatest concentration of pollutant?  
*(circle the correct answer below)*

zooplankton → frog → snake → hawk

Which trophic level has the greatest concentration in the image to the right? *(circle the correct level)*



In the box below, create an image/diagram to demonstrate your understanding of biomagnification.

Now consider humans location in the food chain. Would human concentrations be higher or lower than that of the previous top predator? \_\_\_\_\_

This is happening today. Provide one example.

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What are the consequences of biomagnification:  
 to an individual species?

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to the health of an ecosystem?

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to humans?

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**PART III – THE COMPUTATIONAL MODEL**

Open the computation model titled *Biomagnification\_Bioaccumulation* and follow the instructions below, answering the questions as you go.

1. Press the **Setup** button in the upper left of the display window.
2. Change the upper most slider in the top gray bar two notches to the left, resulting in a label of “slower”.
3. Without changing any other settings, press the **Go** button next to the **Setup** button.
4. Observe the activity occurring in the interface to the right of the window along with the corresponding value and graphic changes in the monitors to the left of the interface.
5. Describe what you observe in the interface?

6. What do you notice about the values in the monitors to the right of the sliders:

No. Micropollutants \_\_\_\_\_

No. Larvae \_\_\_\_\_

No. Fish \_\_\_\_\_

No. Seals \_\_\_\_\_

No. Sharks \_\_\_\_\_

7. What do you notice about the values in the monitors to the left of the graph

Average Micropollutants per Larvae \_\_\_\_\_

Average Micropollutants per Fish \_\_\_\_\_

Average Micropollutants per Seals \_\_\_\_\_

Average Micropollutants per Shark \_\_\_\_\_

8. Using the values from #6 and the graph, what statement can you make regarding how the four trophic levels compare?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

9. Press the **Go** button to stop the program.
10. Press the **Setup** button in the upper left of the display window.
11. Change the upper most slider in the top gray bar two notches to the right, resulting in a label of “faster”.
12. Without changing any other settings, press the **Go** button next to the **Setup** button.

13. Stop the program by clicking the **Go** button when there are no fish or seals remaining.
14. Record the Average Micropollutants for each species below.

Average Micropollutants per Larvae \_\_\_\_\_

Average Micropollutants per Fish \_\_\_\_\_

Average Micropollutants per Seals \_\_\_\_\_

Average Micropollutants per Shark \_\_\_\_\_

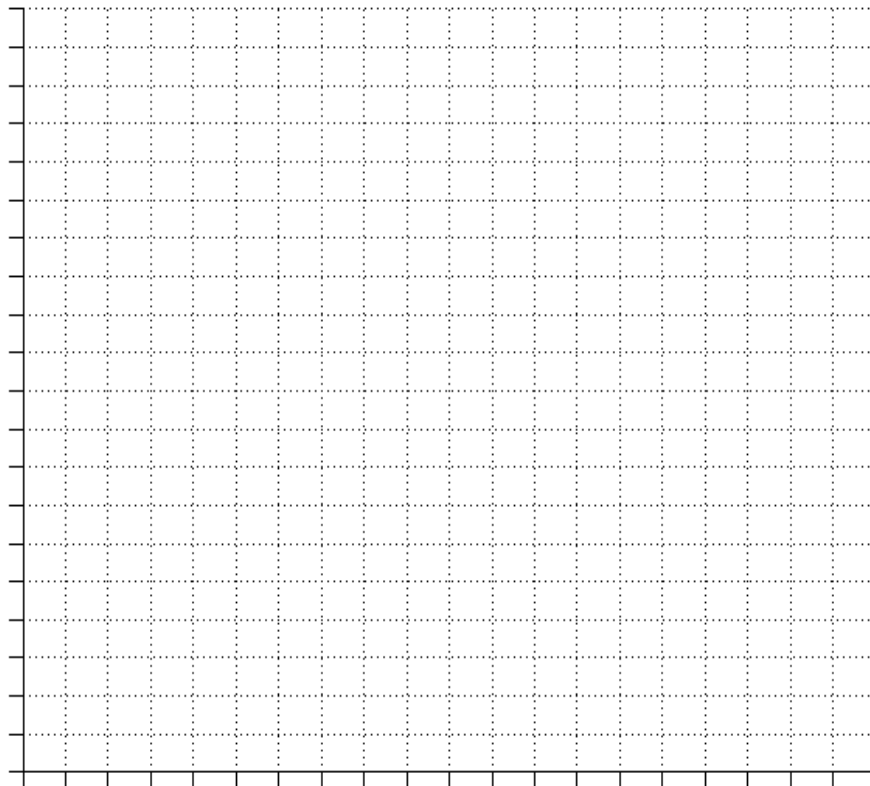
15. Due to program limitations, the line graph shown is not the best representation of your observations. How can this biomagnification be best represented graphically? Remember to explain and justify your answer.

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16. Use the Average Micropollutants for each species from above to create your graph. Remember to include a title, proper axis labels, scales, and a key.



17. Describe how this graph would change if it included humans?

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18. Press the **Go** button to stop the program.

19. Increase the number of micropollutants initially introduced by setting the *number\_micropollutants* slider to the maximum quantity of 1000.

20. Press the **Setup** button to restart the program.

21. Press the **Go** button and make sure the upper most slider in the top gray bar is at the “slower” setting, two notches to the left.

22. Press the **Add Micropollutant** button next to the *number\_micropollutants* slider multiple times to introduce more micropollutants to the environment.

23. What differences from the first run do you observe?

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24. What is the real life equivalent to your pressing the **Add Micropollutant** button multiple times with a greater *number\_micropollutants* each press?

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**PART IV – CONCLUSION**

Why is biomagnification a concern worth society’s attention?

