Earth's crust versus the prep. room – why the differences?

Introduction

If you look at the amounts of the different elements found alone or in compounds in the **Earth's crust** and compare these with the amounts of the different elements found in the chemicals in your school prep. room, there are big differences. You may like to think about why this might be so.

What you will need

- The graph showing the composition of **Earth's crust.**
- The graph showing the 'composition' of the compounds in a typical school prep. room in terms of the different elements found in the compounds there.
- The graphs showing the compositions of the oceans and of the atmosphere.
- A copy of the Periodic Table.

Questions

The graphs show:

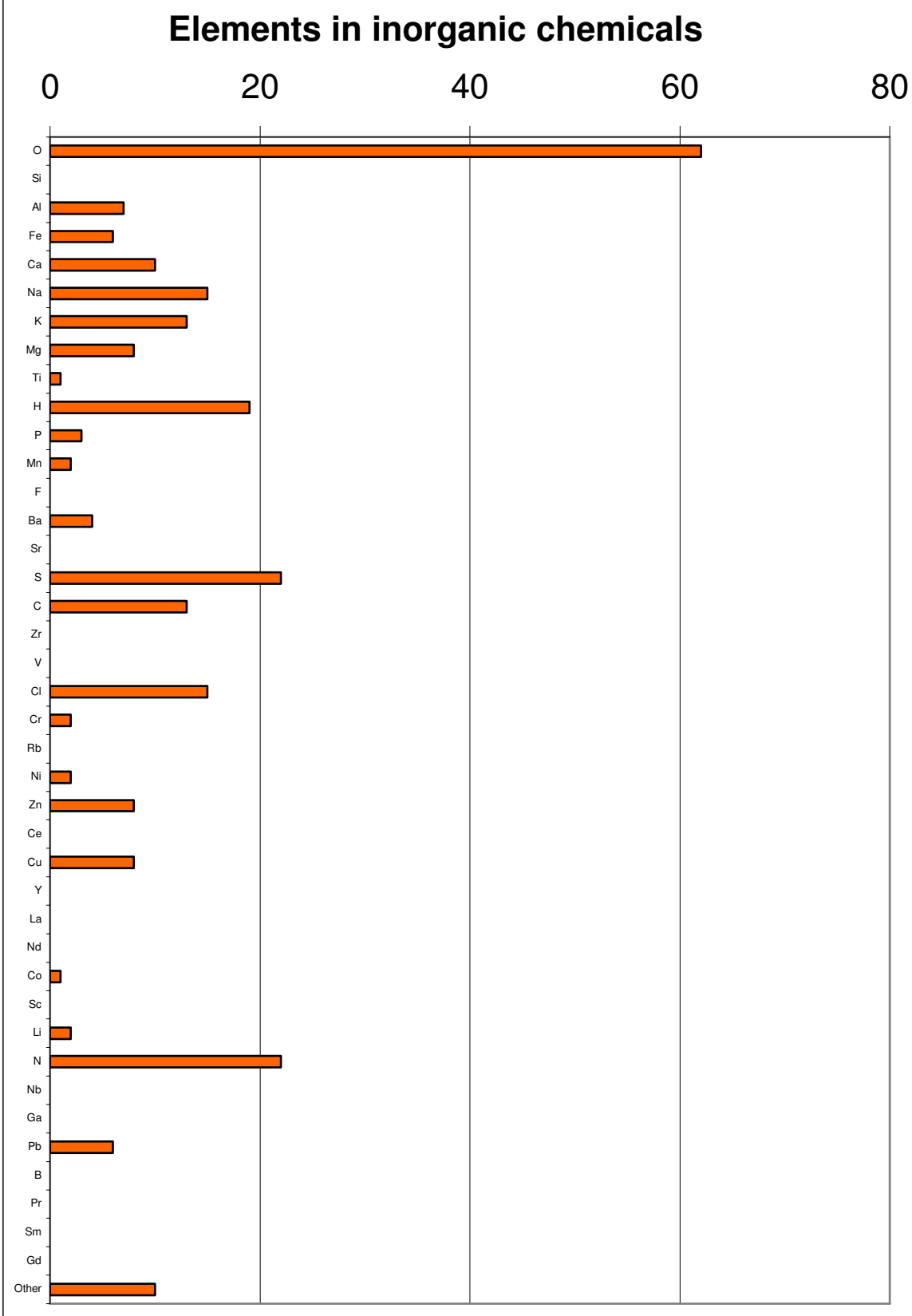
- The amounts of the elements we find in the Earth's crust (measured in grams per tonne).
- The 'composition' of the chemicals in a typical school science prep. room (measured by the number of times each element was found in the chemicals there).
- The composition of the oceans (measured in mg / dm^3).
- The composition of the atmosphere (measured in parts per million (ppm)).

Use the graphs to answer the questions below.

Q 1.	Which element is most common in both places (Earth's crust and prep. room)?
Q 2.	Which element is very common in the crust but does not appear in the prep. room? Suggest a reason for this.
Q 3.	Explain how the amounts of the element sodium and the element potassium differ in the crust and the prep. room. Suggest a reason for this. (Hint: what do you know about the solubility of the compounds of Group 1 elements?)
Q 4.	Name the two metals that are most abundant in the Earth's crust. What does this suggest about the possible long-term supply of these metals? Write down uses for each of the metals.
Q 5.	Suggest why there are large amount of copper, zinc and lead in the prep. room. Suggest why these metals should be recycled.
Q 6.	The high values for the elements nitrogen and sulfur in the prep. room are because they are present in nitrate and sulfate compounds respectively. Suggest why these elements are not common in the Earth's crust.
Q 7.	The survey of chemicals in the prep. room does not include compounds based mainly on the chains of carbon atoms (these are often called organic compounds). Suggest why these compounds might have been omitted.

Q 8.	Many of the elements found in the prep. room are of low concentration in the Earth's crust. Where do we get these uncommon elements from and how?
Q 9.	How does the 'composition' of the prep. room compare with the composition of the atmosphere?
Q 10.	How does the 'composition' of the prep. room compare with the composition of the oceans?

’Composition’ of prep. room



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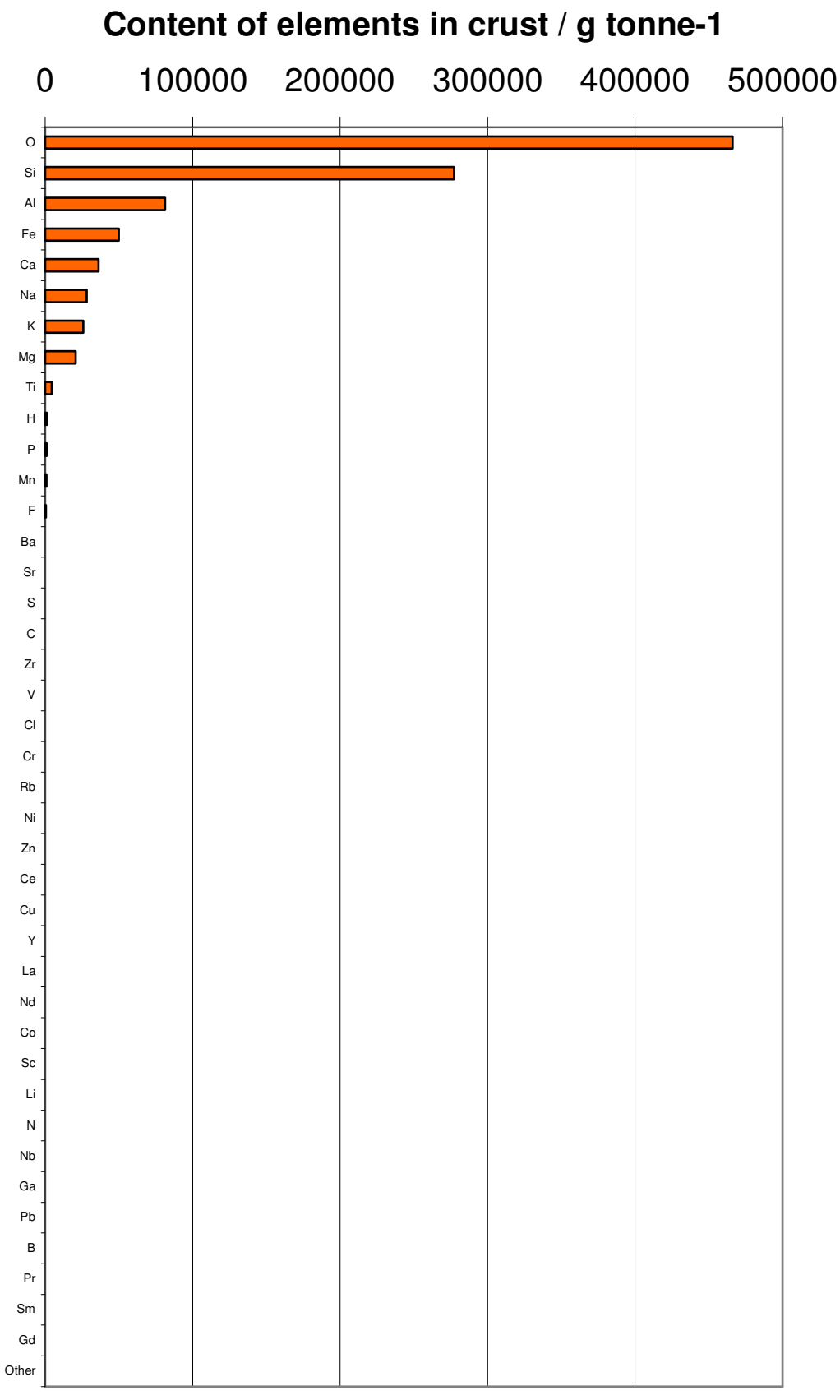
Composition of Earth's crust



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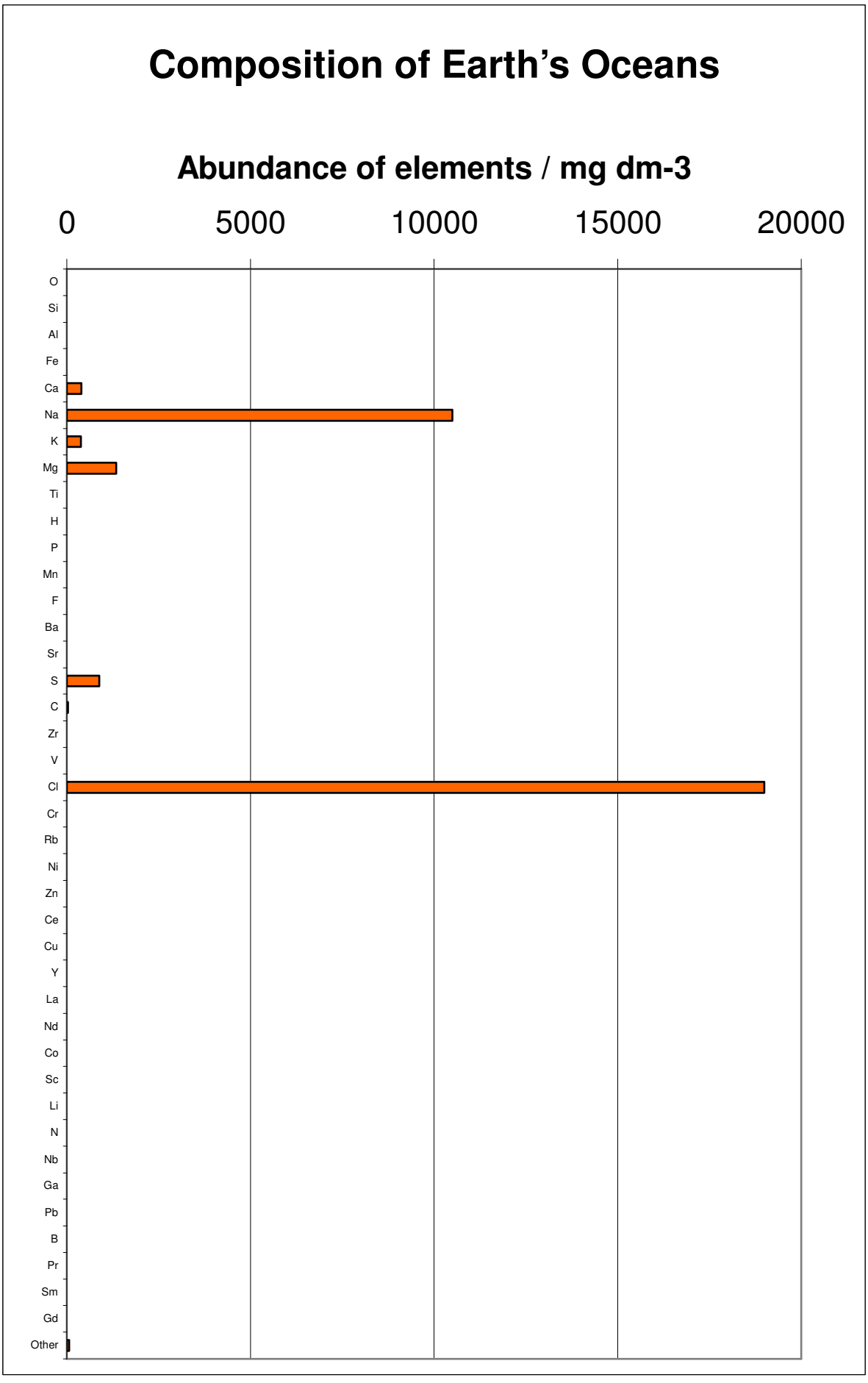
Composition of Earth's Oceans



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Composition of Earth's Atmosphere