**Matter and Energy Cycles** Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Task 1 – graphing the carbon cycle**

Referring to the data tables, complete graphs showing the number of carbon atoms in each reservoir for both the pre-industrial and present-day rounds. Use a different colour for each reservoir if possible. Make a line graph rather than a bar graph.

**Pre-Industrial Round**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Reservoir** | **Start** | **1** | **2** | **3** | **4** | **5** | **6** |
| **Atmosphere** | 7 | 6 | 7 | 6 | 5 | 8 | 6 |
| **Ocean** | 6 | 7 | 6 | 8 | 6 | 4 | 7 |
| **Marine plant** | 2 | 2 | 2 | 2 | 3 | 3 | 2 |
| **Marine animal** | 2 | 2 | 3 | 2 | 2 | 2 | 2 |
| **Land plant** | 4 | 4 | 3 | 3 | 3 | 4 | 4 |
| **Land animal** | 3 | 3 | 2 | 5 | 4 | 3 | 2 |
| **Soil** | 2 | 2 | 3 | 3 | 3 | 2 | 3 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Present Day Round**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Reservoir** | **Start** | **1** | **2** | **3** | **4** | **5** | **6** |
| **Atmosphere** | 5 | 6 | 6 | 7 | 7 | 8 | 8 |
| **Ocean** | 4 | 5 | 5 | 4 | 4 | 4 | 5 |
| **Marine plant** | 2 | 1 | 2 | 2 | 2 | 3 | 2 |
| **Marine animal** | 1 | 2 | 1 | 1 | 2 | 1 | 2 |
| **Land plant** | 3 | 2 | 3 | 3 | 3 | 4 | 3 |
| **Land animal** | 2 | 2 | 1 | 2 | 3 | 2 | 2 |
| **Soil** | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| **Fossil fuels** | 10 | 9 | 8 | 7 | 6 | 5 | 4 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

*Based on your graphs and the classroom activity, answer the following questions in complete sentences:*

1. In the pre-industrial round, what happened to the number of carbons in each reservoir (a general statement is fine, you do not need to re-state all the actual numbers)?
2. Did a particular person (representing a carbon atom) stay in one reservoir throughout the whole six cycles (pre-industrial round)? If not, how did the numbers remain relatively constant?
3. Did each person move through each reservoir during the simulation (pre-industrial)? If not, why not.
4. What was the main difference between the pre-industrial and present day rounds?
5. Some scientists refer to the burning of fossil fuels as using “ancient sunlight”. How can fossil fuels be considered “ancient sunlight”?
6. What are some of the effects of the increased levels of carbon dioxide and other greenhouse gases in our atmosphere?
7. Think of your favourite meal containing meat of some sort (if you are a vegetarian, use your imagination). Describe the processes that transfer energy and carbon from the sun to your meal. Include the names of the molecules (eg. Carbon dioxide, sugar, protein, etc.) that are present in the different stages.