C4.2 Transfers of energy and matter: data-based questions

What the Cell · DP Biology · data-based questions

Name _____ **Date** _____ **Total** _____ / 8

Read the data carefully before you answer. The number of marks shows how many separate points to make. Show your working in calculations.

1 How fast are nutrients recycled?

8 marks



Image: Bernard Spragg. NZ from Christchurch, New Zealand, Public domain, Wikimedia Commons.

The mean residence time (MRT) is the average time a nutrient stays in dead organic matter, such as leaf litter, before decomposers release it back to the soil for plants. The table shows MRTs in four biomes.

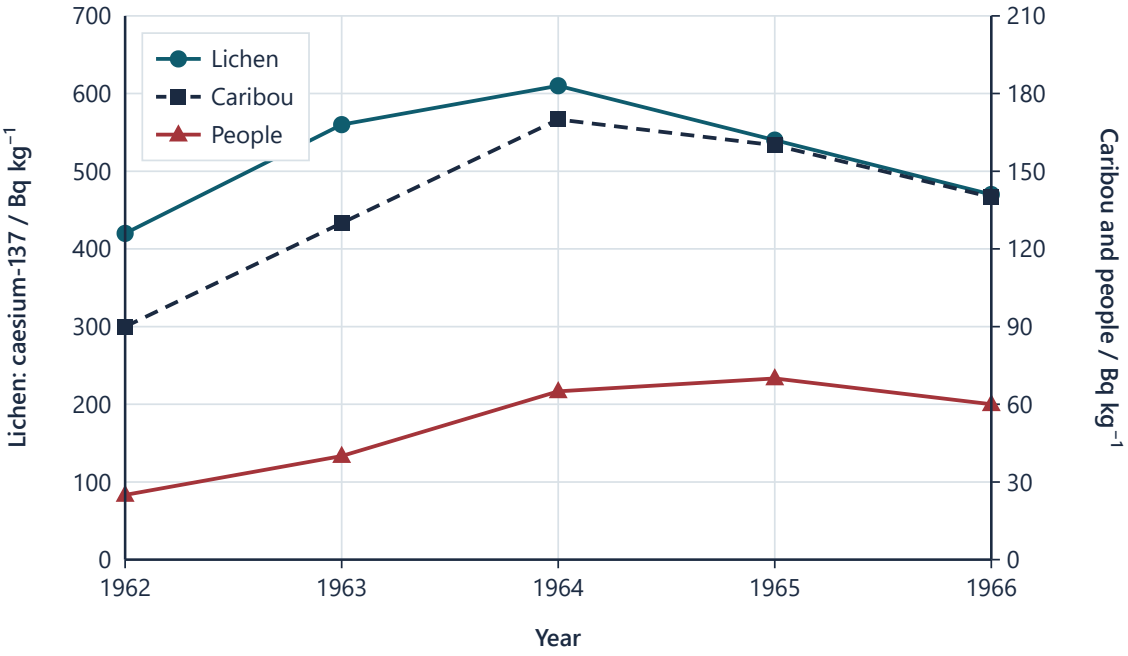
MRT / years	Boreal forest	Temperate forest	Chaparral (scrub)	Tropical rainforest
Nitrogen	230	5.5	3.8	0.4
Phosphorus	320	5.8	3.6	0.6
Potassium	94	1.3	1.4	0.2

a **Identify** the biome in which nutrients are recycled fastest. **[1]**

b **Compare** the MRTs in the temperate forest and the chaparral. **[2]**

c **Suggest** two reasons for the very long MRTs in boreal forest. **[2]**

Radioactive caesium-137 from weapons tests settled on Arctic land in the early 1960s. It was measured in lichen, in caribou (which eat lichen) and in people who eat caribou.



d **Deduce** the trophic level of the lichen and of the people. **[2]**

e **Suggest** why caesium-137 in people peaked a year after it peaked in lichen. **[1]**