

1. Phosphorus is a critical resource and is a disappearing nutrient. Therefore, scientists say phosphorus cycle is a broken biogeochemical cycle. Please explain why phosphorus is an important resource. Please plot and explain the phosphorus cycle on earth. Please give a strategy on how we can try to mend the broken phosphorus cycle. (15 分)
2. Ecologists assign organisms in an ecosystem to different trophic levels, and the energy and material flow among trophic levels is basically sustainable in the natural ecosystem. If we consider the city as an urban ecosystem, currently the energy and material flow in urban ecosystem is not sustainable. Please plot and explain the trophic levels in the natural ecosystem. Please consider the city as an ecosystem and assign the components in the city to different trophic levels. Please provide your idea on how to create a sustainable urban environment in terms of the energy and material flow. (15 分)
3. Kidneys are vital to our health, and filter our blood to remove waste and fluid. Scientists say wetlands are often referred to as "Earth's kidneys" because wetlands provide similar functions for our environment. Environmental engineers use the similar principles of wetlands to create constructed wetland to clean up the aquatic environment. Please list the components in the constructed wetland. Please provide detailed mechanisms on how each component in the constructed wetlands can help clean up the aquatic environment. (10 分)
4. Please give a detailed explanation on what natural capital is. (10 分)
5. How to promote the biodiversity of an area besides conservation of endangered species. (10 分)
6. Due to intended protection of mangroves in Hsiang-san Wetland (香山溼地) the coverage of mangroves has been expanding continuously, which makes the mud plain reduced significantly. The Hsin-chu City government adopting the suggestion of some experts is planning to remove some mangrove trees. This decision is under protest by some ecologists, who support biodiversity and believe the mangroves are still endangered. Do you agree the action (removal of mangrove) planned by Hsin-chu City? (20 分)
7. Toxic substances including PCBs and heavy metals from illegal burning of electronic wastes have been accumulated in the sediments of Er-jen River. Please explain (1) the assessing indexes or targets, (2) the technical tools used and (3) the interest groups involved for ecological assessment of the contaminated sediments of Er-jen River. (20 分)

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