

**Questions:**

1. Describe what the three types of ecological pyramids measure.

Number pyramid: numbers of individual organisms at each trophic level

Biomass pyramid: weight (usually dry weight) of all organisms at each trophic level

Energy pyramid: energy content of all organisms at each trophic level

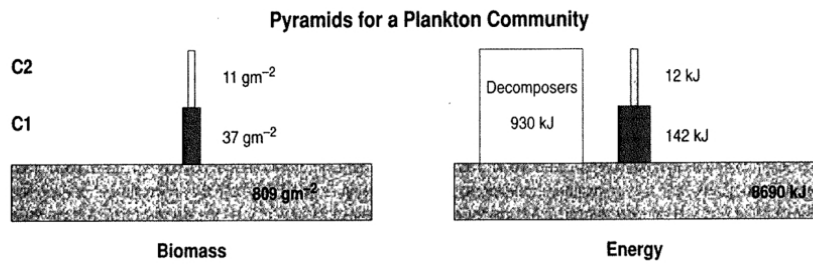
2. Explain the advantage of using a biomass or energy pyramid rather than a pyramid of numbers to express the relationship between different trophic levels

Biomass or energy pyramids usually more accurately reflect the energy available to the next trophic level than pyramids of numbers. Pyramids of numbers can be misleading because a small number of producers may represent a large amount of biomass or energy

3. Explain why it is possible for the forest ecosystem to have very few producers supporting a large number of consumers

Producers include the large trees. These have a large biomass and energy content per individual.

Use the following information to answer the next set of questions



The pyramids of biomass and energy are virtually identical. The two pyramids illustrated here relate to the same hypothetical plankton community. A large biomass of producers supports a smaller biomass of consumers. The energy at each trophic level is reduced with each

progressive stage in the food chain. As a general rule, a maximum of 10% of the energy is passed on to the next level in the food chain. The remaining energy is lost due to respiration, waste, and heat.

4. Determine the energy transfer between trophic levels in the plankton community

Example between:

- producers and the primary consumers  $8690 \rightarrow 142 = 8548 \text{ kJ} = 1.6\%$
- primary consumers and the secondary consumers  $142 \rightarrow 12 = 130 \text{ kJ} = 8.5\%$