|  |  |  |  |
| --- | --- | --- | --- |
| **Type of**  **pyramid** | **Advantages** | **Disadvantages** | **Examples** |
| Numbers | * Quick overview * Comparing numbers in different seasons | * No account for size, so pyramids with large producers are inverted. For example, one large tree would count the same as one single-celled diatom in a pond. | http://media.tiscali.co.uk/images/feeds/hutchinson/ency/0013n049.jpg |
| Biomass | * Takes size of organisms into account | * Difficult to measure * Kills organisms * Seasonal variation leads to inverted pyramids * Bone or shell can distort numbers | biomass upright pyramid in terrestrial ecosysteminverted pyramid of biomass in aquatic habitat |
| Productivity | * Most accurate system * Shows energy transfer over time * Easy to compare ecosystems * Never inverted * Energy from solar radiation is added | * Data is difficult to collect over time as rate of biomass production over time is required * Many species feed at more than one trophic level so hard to assign species to a particular level | https://ibenvironmental.wikispaces.com/file/view/pyramid_of_productivity_image.jpg/45435595/569x378/pyramid_of_productivity_image.jpg |

Ecological Pyramids

Practice Problems

The total solar energy received by grassland is 500000 kJ m–2 y–1. The gross production (energy) contained in the grassland is 600 kJ m–2 y–1. The total energy passed on to primary consumers is 60 kJ m–2 y–1. Only 10% of this energy is passed on to the secondary consumers.

a. Calculate the energy lost by plant respiration.

b. Construct a pyramid of energy for this grassland.

c. Define the term *biomass*.

d. The diagram below represents an energy pyramid and four trophic levels.



Calculate the approximate amount of energy in kilojoules transferred in kJ m–2 yr–1 from trophic level I to trophic level II.

e. Label pyramids I and II as either pyramids of energy, biomass or numbers for the food chain below

tree → small insects → birds

