1. Match the definitions above with the correct term.

2. Look at the food chain. The arrows show the direction of the flow of energy from the producers along the food chain. Calculate the percentage efficiency of the transfer of energy between the following trophic levels and fill in the table.

<table>
<thead>
<tr>
<th>Trophic Level</th>
<th>Energy available at each trophic level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producer</td>
<td>42000 kJ m(^{-2}) year(^{-1})</td>
</tr>
<tr>
<td>Consumer</td>
<td>6300 kJ m(^{-2}) year(^{-1})</td>
</tr>
<tr>
<td>Decomposer</td>
<td>1250 kJ m(^{-2}) year(^{-1})</td>
</tr>
<tr>
<td>Trophic Level</td>
<td>250 kJ m(^{-2}) year(^{-1})</td>
</tr>
<tr>
<td></td>
<td>50 kJ m(^{-2}) year(^{-1})</td>
</tr>
</tbody>
</table>

Energy available at each trophic level
Primary consumers and secondary consumers

Energy available after the transfer
(i.e. Available to frogs) = 1250 kJ m\(^{-2}\) year\(^{-1}\)

Energy available before the transfer
(i.e. Available to grasshoppers) = 6300 kJ m\(^{-2}\) year\(^{-1}\)

Percentage = \((1250 \div 6300) \times 100\) = 19.84%

Tertiary consumers and quaternary consumers

Energy available after the transfer
(i.e. Available to birds of prey) = 50 kJ m\(^{-2}\) year\(^{-1}\)

Energy available before the transfer
(i.e. Available to snakes) = 250 kJ m\(^{-2}\) year\(^{-1}\)

Percentage = \((50 \div 250) \times 100\) = 20%

Producers and quaternary consumers

Energy available after the transfer (i.e. Available to birds of prey) = 50 kJ m\(^{-2}\) year\(^{-1}\).

Energy available before the transfer (i.e. Available to the grass) = 42000 kJ m\(^{-2}\) year\(^{-1}\)

Percentage = \((50 \div 42000) \times 100\) = 0.12%

Why is such a small percentage of energy transferred at each trophic level? Where does it go?

Some of the organism is not eaten. Some parts are not digested and so are lost as faeces. Some energy is lost as excretory materials. Some energy is lost as heat, sound and light.