* **Using a thermometer:** \* Temperatures can be measured cheaply by means of the bending of a strip of 'bimetal', made by rolling different metals together, choosing metals which have very different degrees of expansion on being heated. The same bending can be seen if a strip of sticky tape is fastened to a strip of aluminium foil. The foil expands when it is heated, but the tape prevents the stretching of that side of the foil, so the 'bimaterial' bends, with the sticky tape on the concave side.

Various thermometers are used in different situations. For instance, mercury thermometers are the standard equipment at surface weather stations, and bimetallic thermometers are used in radiosondes. Thermocouples are used for *in situ* observations at locations wired to a computer network. Radiometers are used for remote observations.

Figure 1: A comparison of thermometer types[[1]](#footnote-1)

|  |  |  |
| --- | --- | --- |
| Type | Advantages | Disadvantages |
| **Mercury thermometer** | * Cheap,
* durable,
* accurate,
* easy to calibrate
 | * Display is harder to read, expensive,
* does not work below -38.83°C (Freezing pt of Hg), cannot be used for thermograph,
* slow response,
* fragile,
* vapor is poisonous
 |
| **Alcohol thermometer (compared to a mercury thermometer)** | * lower temperature b/c freezing point is -115°C
* larger coefficient of expansion, regular expansion therefore measures temperature more precisely, because it has a large expansion coefficient
* less hazardous
 | * less durable (alcohol evaporates), can’t measure a high temperature b/c the boiling point is 78°C
* alcohol can polymerize
* fluid loss by evaporation hard to avoid
 |

1. http://www-das.uwyo.edu/~geerts/cwx/notes/chap03/thermometer.html [↑](#footnote-ref-1)