 Modelling modified exponential decay using a cup of boiling water

Resource required:

* Thermometers
* Kettle (to boil water)
* Cups
* Risk assessment (for using boiling or heated water)

Activity:

1. Boil water and place it in a cup in the classroom (or fridge or freezer) Record the initial temperature and the temperature of the environment (room, fridge or freezer).
   * Note: The room temperature represent the fixed quantity, P, in the modified decay model.
   * Note: The difference between the room temperature and the initial temperature of the water represents, A, in the modified decay model.
2. Record the temperature of the water given time intervals until the temperature of the water.
3. Each student who rolls an even (or other condition to represent decay) leave the population, they decay.
4. Record the population into the table after each time period (each roll of the dice)

| Time | Temperature |
| --- | --- |
| 0 |  |
| 5 |  |
| 10 |  |
| 15 |  |
| 20 |  |
| And so on |  |

Room temperature =

1. Graph the temperature (dependant variable – y axis) verse time (independent variable – x axis)

Teaching note: The temperature tends to the limit P, the room temperature as t→∞.