Temperature and Monitoring the Compost Pile

An effective composting process is often described as a 'self-heating' process able to itself raise temperature from ambient to above 60 °C in a short space of time. If maintained at above 55 and below 70°C for a number of days under aerobic conditions, this will kill human and plant pathogens. After this initial phase of about 14 days the temperature of the heap will start to drop as the readily degradable organic material is broken down. Trials show that most seed in a compost pile is also killed when compost is held at 55°C for 3 days[1].

There are two broad categories of microorganisms which decompose the wastes in your compost pile - mesophiles and thermophiles. Mesophilic microorganisms are most active at temperatures of 10°C – 45°C and thermophilic between 45°C – 70°C. Therefore, creating the right compost mixture and conditions is important to ensure that both categories can play there part and the 'self-heating' process kill pathogens.

When measuring the temperature in a compost pile (ideally at least $1m^3$ to get the temperature up) it is important to use the correct tool. If you need to dig into the pile to insert a small, conventional thermometer you lose heat as you open the pile, so your reading is not accurate. Instead, try to use a good ergonomic compost fork for turning the pile and an accurate and temperature probe.

If your project is one which has been approved and regulated by the Animal Plant Health Agency (APHA), because it uses animal by-products (e.g. meat) from kitchen and canteen waste, and exceeds the score provided in guidance, then the pile will need maintain temperature above 60°C for 48 hours (it is recommended that community composting projects avoid the need to be regulated in this way).

In practice, some community composting projects may not reach the above temperatures because of small scale, slow feeding rate or the underlying process- this should be considered when planning which waste streams are going to be composted and where the final use will be. An example of a project that could consider these factors is a wormery at a school. Worms thrive at lower temperatures (below 30 Celsius) than most composting projects will be aiming for and suitable for certain kitchen scraps (meat is not recommended). The process can be quite slow, but can produce some very high nutritional and homogenous compost.

[1] https://www.permaculturenews.org/2013/06/04/different-degrees-of-compost/