Supplies
There are many pieces of equipment that make the lives of mycologists easier, and one can easily spend thousands of dollars on the hobby. Fortunately, online vendors sell pre-prepared substrates and cultures, allowing one to grow mushrooms without owning their own equipment. As with most things, the more money you invest, the more you can do yourself and the cheaper it becomes down the road. We will take a hybrid approach in this lesson, showing how you can utilize some cheap equipment to prepare substrate, but also linking to sites where you can buy pre-made substrate.

Pressure cooker
The most fundamental piece of equipment needed in this hobby is a pressure cooker for reliable sterilization of substrate. There are other sterilization techniques, such as tyndallization, but these take more time and are less reliable. If you decide to get more serious about mushroom cultivation, I would strongly recommend investing in one. My preference is the electric pressure cooker, because it is more energy efficient and has a built in timer, but stovetop varieties work as well.

We use pressure cookers for sterilizing substrate. Sterilization is important in this hobby. The whole point is to make a nutritious, moisture rich environment to promote fungal growth. That part is easy. But you don’t want just any fungi to grow, you want YOUR fungi to grow. That is hard. You must give your fungal culture enough of a head start to outcompete all of the other fungi and bacteria that will inevitably get into your substrate. For this, we need to sterilize the substrate.

The culture
To start growing, we will need a mushroom culture. This is a bit of mycelium or spores to use as our starting point. There are many ways to start your mushroom colony, such as grain spawn, an agar dish, a spore print or even just a part of a mushroom. However, most of those techniques require a sterile environment, like a flow hood, to avoid contamination. In this lesson, we are going to focus on syringe techniques, using either a liquid culture (LC) or a spore syringe. LC is a nutrient rich broth that contains active, growing mycelium. A spore syringe is simply a syringe filled with water containing ungerminated spores. I recommend a LC syringe, as they are more reliable than spore syringes. Spore syringes are usually only sold for psilocybin producing species, as it is legal to sell spores but not mycelium. Regardless of which you choose to purchase as a starting point, in this lesson we will show you how to propagate your own LC for use later on.

The substrate
The last piece of the puzzle is the substrate itself. This is the media that the mycelium will grow on. It is important to note that this is species dependent. Different mushrooms thrive on different media. However, there are some media that do well for most species that people typically like to cultivate. We also break up the incubation phase into two parts - the spawn and the bulk.

Typically a grain is used for the spawn phase, hence the name “grain spawn”. Many types of grain can be used. Rye berries are probably the most popular, but wheat berries, popcorn and even birdseed can be used. These substrates have a high nutrient content for the mycelium. Because of it’s high nutrient availability, there will be lots of competition among microorganisms, and it is important to fully sterilize the grain. This is where a pressure cooker comes in handy. Fortunately, short of a pressure cooker one can buy pre-sterilized grain, or even pre-colonized grain spawn. You should note that it is much cheaper to buy and prepare your own grain spawn, if you have a pressure cooker. My recommended source for raw grain is breadtopia.
Once colonized, the grain spawn is used like seeds to inoculate a larger amount of less-nutritious “bulk” substrate. Bulk substrate is high in carbohydrates and holds plenty of moisture for the growing mycelium. There are many suitable materials to use, and the choice depends on what is available and what species you are growing (though many substrates are suitable for a wide array of mushroom species). Mixtures often work better than a single media. Look up “bulk substrate recipe” for the species you are growing, and see if you can find one that utilizes readily available material.

Below is a quick reference of tried and true substrates, but again, this is a great place to experiment.

- **Hardwood species (reishi, shitake, lions mane, oyster)**
  - Hardwood sawdust
  - Hardwood woodchips
  - **Hardwood pellets** (sold for use in smokers)
  - Logs (requires a different method of inoculation, called “plug spawn”)
- **Oysters** are very aggressive and eat just about any woody-organic material, so here are some additional substrates known to work
  - shredded paper
  - shredded cardboard
  - straw
  - coffee grounds (recommended to mix with other substrates)
- **Other substrates commonly used with “exotic” species**
  - coconut coir
  - horse/cow poo
  - brown rice flour/vermiculite mixture

Just a quick note on the term hardwood - This is a category of wood that comes from, you guessed it, **hardwood trees**. Think oak, maple, hickory, and pretty much any other tree that loses its leaves in the winter. Pine trees (and trees that look like pine trees) are not hardwoods, and should not be used.

**Other supplies**

- **Glass widemouth 16oz jars**
- A drill and a 1/8th and 1/4th bit
- **clear silicone caulk**
- pillow stuffing
- optional: a styrofoam cooler (consider looking for used medicine coolers)
- clear plastic bags or containers (consider reusing bread loaf bags or take-out containers)
- A large clear bin or grow tent for fruiting chamber
- optional: a butane torch or alcohol lamp for flame sterilization
- rubber gloves
- 70% isopropyl alcohol
- a kitchen with the usual kitchen supplies