Creating a Seed Library for the Meadville Public Library



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The diverse and immense seed populations that once ranged this globe are dwindling rapidly. Seed saving is the term used to describe the act of taking seeds from one harvest and saving them for use until the next season. The end goal of this project is the installation of a Seed Library in the Meadville Public Library. This seed library will provide organic, open pollinated, or heirloom seeds to the community as well as the resources to enable seed saving, and a guidebook for the Meadville Public Library. Library members will check out seeds just as they would a book, grow the seeds during the season, save the seeds, and return at least the same amount they borrowed back to the library. This will create a set of locally adapted seeds available to the community and create a space where people are able to share their own varieties of saved seed. This paper includes a guidebook for the seed library caretakers, a children's program instructions, and a simple maintenance sheet.

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Introduction

Seed saving has existed since the birth of agriculture in 8000 BC, but the climate of the agricultural system has shifted greatly since then (Seed Savers). Congress has passed a series of acts that made it possible for seed companies to place patents on their unique seed stock and make it illegal to save those seeds (Newman). The Green Revolution focused so intently on hybrid rice and wheat varieties in developing countries, resulting in native farmers replacing their genetically diverse native crops with monocroppings of these genetically narrow varieties (Fitzgerald-Moore). The movement towards patented hybrid plants resulted in a loss of 90 percent of native US varieties (Bodenstab). Seed libraries are community organizations that take historical, non-hybrid varieties, and supply the seeds and seed saving knowledge to the community. They are trying to bring the focus back to growing historically important and varied seeds for consumption by the greater community. A diverse seed population still exists within community members who hold cultural ties to different varieties, and a seed library provides a resource for sharing those seeds and spreading the knowledge. All of the ideas presented above will be explained more in-depth and at a greater length in the following chapters.

I became involved in the creating of a seed library through my work at Allegheny College. The Edible Allegheny Campus Club was founded in the later part of my first year at school. Edible has a small garden plot located in a corner on campus and is devoted to learning about and explaining local foods issues. I spent that summer weeding in the afternoons and enjoying the fresh produce. Through the following years of club involvement I began to notice a yearly stress of purchasing seeds. It is difficult to know which crops will grow well with little supervision or what the students will actually use. At the same time, I spent my rising Senior summer as a student gardener at the new Carr Hall Garden. This is a much larger and organically grown production garden for our dining halls. It amazed me how much money is spent on purchasing enough seeds to fill a garden for an entire season, the Edible garden spent $96 on seeds this year alone.

Concurrently with all of my gardening projects, I was also deeply involved in the local community. I spent a summer and an academic year as a Davies Leader, a volunteer leader position in the local community. Active Aging was my assigned site, and I spent my days talking to people from all over the community and with all sorts of different backgrounds. I worked with

a wonderful master gardener, who was just as excited about gardening as I was. I also regularly spoke with a couple who planted 100 tomato plants a year. This combination has inspired me to create a senior comprehensive project that combines both passions: the community and gardening.

The creation of this project took two forms, one part was understanding and researching seeds and their saving, and the other in creating physical seed library. In order for this seed library to function properly it must work both in and with the community as well as serve to conserve genetically viable seeds for the community. In an effort to work in and with the community I met with the Master Gardeners of Crawford County to assess the need for a seed library in the Meadville community. The Master Gardeners also gave me suggestions that helped me to determine the final location of the Meadville Seed Library in the Meadville Public Library. As a result of this meeting I attended a Meadville Public Library Board meeting to present my project goals and ideas. It was through these meetings that I was able to shape what the actual project would look like and how it would function in the Meadville community.

Seed libraries require a startup seed population in order to function, without initial seeds there would be no initial interest. I saved my own seeds from this past year, put a call out for seed donations through Craigslist and freecycle, accepted donations, and worked with Seed Savers Exchange. I applied through the Herman's Garden fund through the Seed Savers Exchange, an organic seed company that focuses on saving seeds, for an initial donation. This fund donated 50 seed packets for a ten-dollar donation to cover shipping and handling. This will be enough seeds for the initial year of the seed library, and numerous people have expressed interest in donating seeds after the next season. Saving my own seeds has given me insights on the kind of knowledge people need to know before saving their own seeds as well as hands on knowledge about the actual task.

Project Goals:

1. To create and implement an open pollinated seed library in the Meadville Public Library, where members can borrow and return seeds throughout and after the season.
2. To create a press release, brochure, policy paperwork, and blog post to gain interest and participation.

3. To work with the library staff as a community project to ensure all library needs are met.
4. To include seed saving informational packets on tomatoes, peas, beans, lettuce, and peppers as well as sources to find other seed saving information.
5. To set up a maintenance plan to ensure the longevity of the project.

Chapter One: Why is Seed Saving Important?

Terms:

Genetic diversity: Different traits and genome sequences apparent in each individual plant of a species, higher genetic diversity increases higher resistance to total crop failure. Genetic diversity can also mean the number of difference varieties with genetic difference present in the world.

Heirloom/ heritage seeds: Seeds that have been saved from open-pollinated plants predating WWII, or at least 50 years old (West Coast Seeds).

Hybrid: Two or more plant parents crossed to create seeds for a combination of traits available in the parent plants. Saved seeds will not mirror the original hybrid plant (Saving Tomato)

Monocropping: The practice of planting only one variety of a crop over a large area of land.

Open-pollinated: Varieties that pollinate themselves through insects, or the wind and generate seeds that mirror the parent plant. All heirloom seeds are open-pollinated.

Organic: Grown without the use of synthetic chemical herbicides, pesticides, or fertilizers. Pesticides and fertilizers from natural sources, such as garlic spray, are allowable. (EPA).

Roguing: The practice of taking out under performing or non-desirable plants before they go to seed, this helps to ensure the viability of the seed crop.

Seed bank: A place where seeds are stored, as a form of ex situ (not in the native place) preservation, in order to maintain the genetic biodiversity of seeds (Seed Savers).

Seed library: A community organization that lends seeds to gardeners at no cost in hopes that the gardener will return seeds at the end of the season.

Seed saving: The act of saving seeds from one generation of open-pollinated plant growth to the next.

Species: This is the type of plant, like tomato or pepper.

Variety: This is the specific kind of plant, like Cherokee purple tomato or Ring-O-Fire Cayenne Pepper.

Historical Seed Saving:

Seed saving has been around for as long as agriculture has existed. The Seed Savers Exchange company writes that, "seed saving is not a revolutionary idea, humans have been saving and regenerating seeds and passing them on to successive generations since 8000 BC" (Seed Savers). People grow their own produce to save money, have fresh and better tasting vegetables, for food safety, and overall quality, and seed saving is a an extension of this process (Butterfield). Seeds are saved from the best performing, healthiest populations of a variety, helping to ensure that next year's crop will be equally well adapted to the conditions of that particular microclimate. Seed saving allows farmers to remain independent from the large seed manufacturers who do not carry the seeds for the microclimatic needs of every farmer. Farmers are also in control of how many seeds they will save, often saving far more than they plan to crop, helping to ensure there will be enough seed in times of flood or disaster (Mascarenhas).

Historically seed saving created a closed loop gardening system, purchasing or borrowing the initial seed investment and savings seeds every year to continue the same garden production. Cathy Cooke writes that "many of the early colonists brought seeds from their homelands and adopted crops from the native peoples they found in North America." Seed producers cannot charge exorbitant prices for seed or the farmers purchasing seeds would just revert back to traditional seed saving practices. Farmers purchase seeds when the price is low enough to compete with the added hours of self-seed saving. On very large scale farming operations, seed saving takes time, and time takes money, so if the seed prices are low enough it makes economic sense to purchase the seeds. The seed industry developed at different times in different parts of the country. According to Cooke, only 6 merchants sold seed in 1767 Boston, and it wasn't until 1825 when the seed industry spread to Connecticut. Between 1850 and 1854, two hundred new seed stores opened up nationwide. This marked a dramatic shift from home-saved seeds to stored purchased seeds. Seed saving allows farmers to step away from the seed market, and this creates a sort of price check for the seed market. The Hatch Act of 1887 gave federal funcing to land-grant colleges to help create experimental agricultural stations. These stations eventually evolved into the Extension Offices offered in many states through state colleges. This helped to test new

methods and practices and pass along the information. One of the results of this act was the push for purchasing seeds that have been inspected by the government, it created a set of regulations that seeds had to pass become becoming available for the consumer. It limited the amount of weed seeds that could be present and tested for germination, so purchasing seeds was a more uniform process for the buyers. By the late- nineteenth century the differentiation of what made a seed "good" changed. Prior to that date, the seeds size, character, and disease levels helped determine if the seed was good enough for planting. With this new, inspected seed importance, much more stock was being put into "varietal purity", or the "underlying hereditary composition of their stock" (Cooke). Along with this shift towards varietal purity in seeds, there was a shift towards experimental seeds, and with the experimental seeds came the distribution of seeds for profit. The new experimental seeds are now called hybrid seeds. Hybrid seeds are seeds that are a result of one parent plant being manually crossbred with a different variety of parent plant to create a completely new combination of the two. These seeds were marketed as pest or disease resistant or predisposed to a higher yield, and are impossible to save seeds from which creates a dependency on the seed industry.

In more recent history, Congress passed many acts which determined that companies had the right to ban seed saving on their name brand products. This worked to make seed saving even less likely, if farmers were dependant on this purchased and copyrighted seeds there was nothing they could do. The Plant Variety Protection Act of 1970 allowed seed companies to receive a 17-year patent for seed varieties they created. Then again, in 1980 the court ruled on Diamond v. Chakrabarty that genetically modified materials were patentable. Further complicating the seed saving era was the 1985 Patent and Trademark Office's Board of Appeals and Interferences decision of Ex parte Hibberd, which concluded that patients could be issued for all "seeds, plants, plant parts, plant genes and tissue cultures". Seed companies put millions of dollars into research on genetic materials in plants, often inserting a terminator gene, ensuring that the seed will not be viable to save, regardless of efforts. The result of this genetic manipulation is called a GMO or genetically modified organism and would not normally occur in nature (Shand). Once these patents are in hand, the seed companies refuse the right for the consumer to save seed, making it impossible for the consumer to continue to purchase and save their own seeds. In 2005, it was estimated by the ETC Group that 10 corporations control over half of the global seed market. These court and board decisions mark the shift from seeds being a closed loop

system, with farmers growing and saving their own seeds, to a system entangled in intellectual property rights (Mascarenhas). The use of hybridized seeds instead of traditional seed saving has left the farmers "dependent on, and legally accountable to, corporate agribusiness, while witnessing a tragic loss of genetic diversity" (Fatal Harvest).

The Green Revolution

The 1950s brought the development of high yielding and modern plant varieties for growth in developing countries. This development of engineered plants for these countries has become known as the Green Revolution. It was initially focused on bringing in new varieties of wheat and rice for higher production yields (Davies and Evenson). Genetic diversity is reduced because these high yield varieties of rice and wheat are from a very narrow gene pool, and often were planted at the sole crop. This replaced the traditional and native rice and wheat populations what existed before (Fitzgerald-Moore). The shift towards a few large industrial seed producers has resulted in over 90 percent of the US vegetable crop varieties becoming extinct in the last century (Bodenstab). Lenore Newman writes that, "the loss of biodiversity within human food crops is a quiet but dire and largely irreversible environmental crisis." She also estimates that among the seventy-five thousand edible plants available, all humans survive on only about two-dozen different varieties (Newman).

As varieties continue to diminish due to a push for the mechanization of agriculture, push for high production, and a push for cost efficiency, it is important to remember the reasons for biodiversity in crops. Monocropping in one genetic variety has been known to cause widespread crop failure in times of blight or disease. Cooper attributes this as a cost of the 'Green Revolution', because traditional varieties are replaced by modern and improved hybrids and worked to greatly narrow the pool of genes the major crop seeds are able to draw from. This in turn creates a greater crop vulnerability to natural or manmade stressors and disasters (Cooper et all.). For an important lesson about monocropping, although Prior to the Green Revolution, look to the Irish potato famine of the 1840s. At this time, socio-economic pressures led a densely populated low income area to mass produce the most prolific variety of potato rather than the most nutrient rich or flavorful. A massive potato blight hit the already unstable area for three years in a row and because of a lack of diversity in the potato crop, none of the potatoes survived and an estimated 2 million people lost their lives or were displaced (Fraser). In another telling

example of American history, the 1970s brought a $1 billion disaster to the corn industry, when almost all of the commercially grown corn shared the same genetic make-up and was extremely vulnerable to the southern leaf blight (Bodenstab). Collins and Hawtin write that species and variety diversity help create a buffer between pests, disease, climatic changes, and environmental events and the total loss of a crop yield.

Bringing seed saving back into the equation will allow seed varieties close to extinction to be brought back into gardens and dinner plates around the world. Peter Raven writes that "today's farmers rely on such a narrow range of crop varieties that many valuable ones just aren't being cultivated any more. If they're not saved in a gene bank, they may be lost forever" (Hembree).Seed banks or gene banks are institutions who collect and preserve seeds from around the globe for food security and biodiversity reasons, and are explained in the subsection entitled "seed saving now". Genetic engineering and hybridization of varieties is shrinking the pool of open pollinated seeds available to the public. Ken McMullen writes that "backyard and community gardens hold this biodiversity in their hands as they plant seeds passed from generation to generation, as they value their unique food traditions, and as they participate in seed saving programs" (Baker).

Cultural Importance of Seed Saving

The cultural importance of seed saving derives from two different sources. One of which is immigrant people who grow and save culturally specific vegetables for personal or market use. The other looks at the historical influences of specific geographic areas, such as the importance of seed saving in an area of Iowa that is known for growing a specific heirloom variety of tomato. The seed library is meant to assist in both of these functions through providing a resource to share and regain the sometimes lost seed saving information.

In the case of immigrant gardeners, there is an emphasis of culturally specific foods allowing immigrants to retain that part of their place of origin. In a community garden in Ontario, New Canadians miss the fruits and vegetables from their home countries, so they bring the seeds and growing knowledge to Canada, and because no commercial seeds are available for what they want to grow, saving seed is imperative (Mandel). A community garden in Toronto works to "bring the participant's pasts to the present, they create a personal identity within a new landscape" and it allows them to feel more at home (Beckie et al.). Along with creating a way for

immigrants to grow their culturally specific foods, it diversifies the foods available in the community. One gardener brings a Lebanese herb, mulikhia, and gives seeds to anyone who is interested (Johnson). Others bring their culturally specific vegetables to market and allow the greater community to broaden their food sources. In Canada, this would allow Canadians to experience new foods, and New Canadians a local outlet to purchase culturally specific foods.

These culturally specific foods are not only limited to immigrants, but also to food rooted in family traditions or preferences. In one study about heirloom tomatoes "Italian gardeners insist that one has better taste than another or is more suited for preparing a certain time-honoured recipe, or because they fulfill aesthetic requirements" (Galluzzi). In time, the Meadville Seed Library will expand enough to include seeds that have been saved for generations by Meadville residents.

In historically agricultural areas like Iowa, small-scale diverse farming was the regional norm around the 1930s. Small local canning facilities allowed small farms to contribute their goods and still make a profit. These farms canned "sweet corn and tomatoes, but also green beans, peas, asparagus, pumpkin, squash, spinach, beets, carrots, kidney beans, pickles, and sauerkraut" (Fitzgerald). These canneries only operated for about thirty days out of the year, but still provided important preservation practices and seasonal work. Because of the changing markets, farmers felt the pressure of keeping up with an international market rather than a local one, and the push towards mechanization began. After WWII, the food preservation shifted from the small and local canning facilities to larger frozen food facilities. In the late 60s, a chemical herbicide 2,4-D, drifted from its original spray sites and became an issue with non-commercial growers. 2,4-D is a synthetic herbicide particularly prone to drift from spray application getting caught in the wind and volatilization, when the herbicide evaporates and is transported (Save Our Crops). After the shutdown of the cannery and shift towards large-scale commercial farming, many small farms closed their doors. Recently, there has been another shift, one towards reintroducing the small-scale farm. These new farmers are typically "comprised of younger growers, many of whom have fled urban life, and recent immigrants looking to make a fresh start" (Fitzgerald). It is this call back to historical forms of agriculture that makes heirloom seeds especially important and relevant in the greater community. (Fitzgerald). Heirloom seeds are dependent on seed saving to preserve and reintegrate them into the larger agricultural sphere. In historically agricultural areas, or areas where seed saving was once prevalent, it is possible to

obtain some geographically relevant heirloom varieties. This would help ensure that the varieties will prosper, but also help foster the cultural history in certain areas. At a tour of the Davenport Apple Orchard, outside of Meadville, Mr. Davenport mentioned that some of the apple trees on his property are over one hundred years old. It is these older varieties that the older generations remember; they remember which historical variety is best for making apple sauce and which is ripe early in the year. These historical and cultural implications make seed saving and important part of a community.

Seed Saving Now

There are three movements in seed saving including self-saving, seed banks, and seed libraries. Through self-saving, individual farmers and gardeners still save seeds on a regular basis. For some it is the only way they are able to fully control what they wish to grow. Seed banks are located all over the world and seek to save and preserve seeds from a vast range of diverse sources, but do not give seeds out to average farmers. Seed libraries are community organizations who seek to allow community members access and knowledge to seed saving.

There are about 1,500 seed banks all over the world whose overarching missions are to save the genes and preserve biodiversity in case of global emergency (Luntz). The Greek Gene Bank works very hard to preserve diverse seeds from all over the Greek countryside. However, the bank is failing. The limited number of seeds creates an imperative need to grow out seed varieties to replenish the seed stock, but farmers are unable to keep up with the demands. The researchers in charge of this bank are very wary about giving out seeds, and this is creating a system failure with too many old and unviable seeds and no one working to preserve new ones (Cohen). The Svalbard Global Seed Vault is a steel building that is tunneled 500 hundred feet into the side of a mountain, and houses 740,000 seed samples from across the world. The vault stores duplicates of the same seeds local seed banks all over the world hold, “insuring against seed loss in the event of a local or global catastrophe. It functions like a safety deposit box” (Anderson 2012). Local seed banks can access their seeds, but researchers or plant breeders must source seeds from the original seed bank. These seed banks are for the preservation of seeds in general and are not limited to heirloom or organic varieties and are also not for the average home gardener to borrow seeds from.

There are currently thirty-four public Seed libraries open across the nation, and the network is ever expanding, according to Prima County Public Library. Seed libraries focus on building a sense of community and trust around seeds. They garner seeds from donations all over the city and keep it in one location in the library, and community members essentially check out seeds for the growing season and return them at the end. This approach is about sharing stories, growing knowledge, and pride in gardens. If one person is extremely proud of the white eggplants they have been growing for generations, they are able to share that seed and that growing knowledge to an equally passionate person in the community. Seed saving and sharing opens the door to broadening what people grow in their annual gardens.

Chapter One Summary

Seed saving stopped being a viable option for food production when the seed industry moved towards hybridization, genetic engineering, and was taken over by large commercial organizations. Despite this historical shift away from seed saving, it still remains important for preserving seed biodiversity and heirloom varieties. Over 90 percent of US vegetable crops varieties have gone extinct, this is in part due to the movement towards hybrid varieties, and can be stymied through regaining seed saving knowledge and practices. Maybe people save seeds on their own, sometimes with a variety from their home country or passed down through the generations, and they are an important key in preserving variety biodiversity. Seed libraries will work to gather those individual varieties and equip the library participants with the knowledge and skills to begin to save their own seeds and it will build a larger community storehouse for seed biodiversity.

Chapter Two: It's all about the seeds

Terms:
Annual Crop: A species the requires one growing season to fulfill an entire reproductive cycle.
Biennial Crop: Species that require two years with vernalization to complete full life cycle.
Cross Pollinate: When one plant takes pollen from a different variety and the resulting seeds are a mixture of the two parent plants.
Dioecious: Half of the plants will house female flowers and half of the plant will house male flowers.
Dry Processing: Varieties that only require the seeds to separated from non seed material and drying to save seeds.
Inbreeding: Self pollinating plants less likely to cross pollinate.
Monoecious: All plants house both kinds of reproductive flowers, both female and male.
Outbreeding: Plants require other plants to pollinate- most likely to cross pollinate.
Wet Processing: Varieties that require a soaking and rinsing, or fermentation as well as drying to save seeds.
Vernalization: Exposure to temperatures below 50F for at least 8 to 10 weeks.

In this chapter, I will explain a number of topics including: where I obtained the original seeds, why those varieties are present in the seed library, how to save seeds, and how to maintain genetic variability in saved seeds. This is the information needed to preserve the viability of seeds in the seed library, the technical information is represented in a brochure for seed library members. The information about where the seeds came from and which seeds are originally present is for starting future seed libraries.

Seed Library Seeds

Where were the seeds sourced?

I originally intended to put a call out to the Meadville community to garner regional specific seeds. However, I put the call out about a month after people had already prepared their gardens for winter, and no local seeds were available. I saved some of my own seeds from the Carr Hall Garden, and the Allegheny Student Garden. A family member donated three seed packets. Katherine Leary donated a substantial amount of bean and pepper seeds, but due to mold issues and cross-pollination risks with the peppers, only three of her varieties will be present in the seed library. The majority of my seeds are from a program called Herman's Garden through Seed

Savers Exchange. Seed Savers is “a non-profit organization dedicated to saving and sharing heirloom seeds” (Seed Savers).

What varieties are present? Why?

I chose to organize the seeds into five groups. Box one is tomatoes, eggplant, and peppers, these are all relatively easy to save seeds from and also belong in the same species. Box two is flowers, greens and herbs, chosen because of the similar seed saving techniques. Box three is beans and peas, because they are the easiest seed to save. Box four contains melons, cucumbers, and gourds, because they are a more challenging to save from and belong to the same species. I organized the seeds in these groups to keep similar seed saving techniques in the same group and for ease of finding the seeds. I chose the varieties and species because they all are easy or moderately easy to save seeds. I chose not to include plants that are biannual, or require two years of growing to produce seeds, corn, or very unusual seeds. Corn is a very high cross pollinator, meaning it pollinates very easily with other varieties, and without a very strong understanding of seed saving techniques, the resulting seed would most likely be a hybrid. For the scope of this project, I began the library with easy and well-known seeds; this will help ensure that a seed crop will be returned to the library and ensure the longevity. If people plant something like kohlrabi and have no idea how to use the plant or save the seeds, those seeds would not have been useful and will be lost to the library. People know what a tomato is and it is moderately easy to save tomato seeds, so it is likely that the seeds returned to the library will be true to type and numerous.

How to Save Seeds

Saving the seeds for season after season was once a common practice, but now requires a bit of relearning. Meadville residents may already know how to save seeds from previous experience, but it is important to include clear seed saving instructions. This standardized format should make seed saving for the seed library more reliable and increase the viability of the saved seeds. There are two main ways to save seeds: wet processing and dry processing. With information about which varieties fall into which category, the seed saver should be able to successful save their own seeds. For a list of population sizes and isolation distances, check Table A in the section entitled “Population Size Importance”.

When to Harvest Seeds

The following list is a representation of the list given to seed library members. It includes all of the seeds present in the seed library, and equips the seed library members with the knowledge to harvest mature seed. It is important to harvest mature seed because immature seeds are not viable seeds, they will not grow into a healthy productive plant.

Beans/ peas: When bean pods turn yellow and are dry
Cucumber: Grow until pale yellow and soft
Eggplant: When eggplants are dull brown and seeds are dark
Lettuce/Spinach: When 30-80% of seed clusters have feathered (look soft and downy)
Melon: Allow fruits to stay on the vine until a bit soft
Peppers: When their color development is complete (when red peppers are at their final red)
Spinach: When 60-70% of seed is a brownish color
Summer Squash: When fruits are very large and hard
Tomato: When fruits are a bit soft but not rotting
Winter and Fall Squash: Leave the fruits on the vine until right before frost
Watermelon: Allow to remain on the vine until softened slightly (Seed Saving)

Wet Processing

Tomatoes, Cucumbers, melon, and squash varieties require wet processing to separate seeds from a gel coating and non-seed material. Only tomatoes and cucumbers require fermentation, others can simply be rinsed and dried (Colley). This following information is also represented in a note card given to seed library members. Correct seed processing helps inhibit disease, mold, or mildew from forming. Wet processing is also a more involved process than dry processing, so clear instructions are important for successful seed saving.

Soaking:

Place seeds, pulp in a container full of water, and allow soaking for no more than 8 to 12 hours. This process makes cleaning the seed easier.

Fermentation:

Fermentation is only required for two seed crops, tomatoes and cucumbers. Fermentation removes the germination-inhibiting gel that coats each seed and makes cleaning much easier. To ferment the seeds, scoop tomato seeds into a container and add enough water to cover the seeds with about a quarter inch of room. Then allow the mixture to sit in a warm location for 48 to 72 hours, stirring at least once a day. The mixture will smell terribly during the fermentation process, so it is important to put it in a location where it is not at risk of tipping over. The mixture is done fermenting when the gel coating is completely removed from each seed. When the seed is still covered in a gel coating, it looks like something is surrounding the seed, when it is removed, the seed is bare. If the seeds start sprouting, the mixture has been fermenting far too long and the seeds are damaged. When the fermentation is complete, follow the next two steps. (Organic Seed Alliance).

Rinsing:

Place seeds in a strainer with holes smaller than the seeds being rinsed. Run water through the seeds in the strainer, stirring occasionally. This helps to remove pulp and other unwanted materials from the seeds.

Decanting:

Decanting is what separates the good and bad seeds. Good seeds sink to the bottom, and unviable seeds float to the top. To decant, place seeds in a large container that is able to hold 10 times as more water than the volume of seeds present. Then water is added in a one part seeds to four parts water ratio. Allow seeds to settle for 10 minutes, and then pour the top layer of debris and seeds off; continue adding water and pouring off until the water runs clear. (Organic Seed Alliance).

Once wet processing seeds have been wet processed, they are then dried using the following drying technique listed under dry processing techniques.

Dry Processing

Dry processing is used for all seeds that do not fall into the tomato, cucumber, squash, and melon categories. Lettuce, peas, beans, eggplant, and many more are dry processed. Dry processing is separating the seed from non-seed material, like stalks or shells, and then drying the seed thoroughly. Again, it is important to dry the seeds completely to inhibit mold, disease, or mildew.

Threshing:

Threshing is how the seed is separate from non-seed materials. In the small scale operation, which the seed library will be using, it is simple enough to rub the seed and chaff with your hand on a rough surface. This breaks the seeds out of their seed pods, and allows them to be collected with further steps.

Winnowing:

Winnowing is the use of an air current to blow the non-seed particles away from the seeds. This is a bit challenging for the small scale seed saving methods, because a large set up with a fan and variable speeds is unnecessary.

Screening:

This is an alternative step to winnowing, when seeds are screened away from non-seed materials based on size. Place seed mixture on top of a screen with holes the same size of the seeds, and gently shake the screen until the mixture has pass through. People can purchase either seed screens from a store, or create their own. Hardware cloth, window screens, and wire mesh can also be used as screens for seeds. (Organic Seed Alliance).

Drying:

This step is important for dry processed as well as wet processed seeds. Thinly spread seeds on a hard, non-stick surface. Occasionally stir the seeds until they have fully dried. Fully dried seeds snap instead of bend when bent in half. It is important to ensure complete drying because not dry seeds are more susceptible to mold, mildew, or rot. (Organic Seed Alliance).

How to Overwinter Biennial Crops

As mentioned in the terms section, biennial crops do not mature to seeding stage until they have gone through vernalization in the cold. None of the seeds currently in the seed library require vernalization to produce seeds. However, this is an important information for future growth of the seed library. A temperature below 50 degrees for at least 8 weeks signals the plant to grow and send out seeds. Biennial crops include leeks, parsnips, carrots, beets, turnips, celery, salsify, and most brassicas. In warmer temperatures, where the temperature does not drop below freezing for much of the winter season, the crops should be left in the ground. Carrots, beets, and kohlrabi should be dug up, trimmed ½ inch above the crown, and brushed off. The rest should be dug up with the soil dusted off, and storage. If the roots of biennials remain in the ground through frost season, the roots will rot and not grow in the spring. The ideal storage for biennial crops is in a cool and humid area, like a root cellar. Cover the crops with a layer of clean wood shavings to maintain optimal humidity level. If a root cellar is not possible, dig a hole below frost level, layer non-decomposed leaves, the biennials, and another layer of leaves. Cover these layers with a sheet of plywood and top with the soil that was removed to dig the hole. After the danger of frost has passed, replant the stored biennials. (Wildfong).

Maintaining Genetic Variability in Saved Seeds

Why is Genetic Variability Important?

Maintaining genetic variability in saved seeds is extremely important in ensuring the success of future generations of each variety. Understanding how each variety pollinates and interacts with pollinators is important to understanding how to keep each variety pure. If a variety cross-pollinates the saved seeds will yield a hybrid or far different crop than the parent variety. Even within varieties, it is important to save enough seeds from a variety of plants to ensure enough diversity within the variety. If genetic diversity is limited, a whole host of issues like genetic drift and inbreeding depression start appearing. Genetic drift results from over selecting particular characteristics when saving seeds and creates a weak seed crop. Inbreeding depression is a result of a failure to source seed from enough fruits and different plants of a variety, and there is a lack of genetic diversity creating a weak seed crop. Maintaining proper genetic diversity and isolation can help a variety stay true to type.

Maintaining Genetic Variability in Inbreeding Crops

Inbreeding crops include beans, peas, tomatoes, and lettuce. Inbreeding plants all possess both the male and female reproductive parts within each flower, so pollination occurs within each flower. The flowers are also shaped in a way that makes it difficult for cross-pollination to occur. For example, "in the flowers of modern tomato varieties, the anthers form a cone around the pistil, effectively sealing off the flower's stigma from any pollen besides its own" (Organic Seed Alliance).While this sealing of the stigma makes crosspollination less likely to occur, it may still happen. A particularly rigorous bee may force the petals open or wind might disturb the shape and allow crosspollination. (Maintaining Varietal Purity). The Organic Seed Alliance reminds that under certain climactic conditions the flower can open while still able to pollinate, and accept pollen from other plants creating a cross pollination.

Maintaining Genetic Viability in Outbreeding Crops

Outbreeding crops require cross-pollination in order for pollination to occur. Outbreeding crops include melons, pumpkins, gourds, squash, corn, broccoli, cabbage, brussel sprouts, and spinach. A single outbreeding plant cannot self-pollinate and produce fruit, it must come from another plant of the same species. Outbreeding increases the amount of genetic mixing within the generations, and increases the likelihood that at least a few future plants will house enough genetic variability to withstand changes in the environment (Organic Seed Alliance). Isolation practices are important in maintain a pure variety in outbreeding crops. Without isolation practices, plants of the same species will cross-pollinate and the resulting seed will be a first generation hybrid. (Maintaining Varietal Purity).

Isolation Methods for Outbreeding Crops*:*

Isolation methods ensure that the saved seed from each outbreeding variety stay true to type. It is important to know the scientific name of the crop, because outbreeding crops of the same species will cross-pollinate, and the environmental factors surrounding the planting area. Outbreeding plants that share the same genus and species will cross-pollinate and should be isolated if saving seeds. It is important to also recognize what types of weeds are growing in the surrounding area, Queen Anne's Lace will cross with carrots and wild hickory will cross with cultivated hickory. A species grown in one garden plot can also cross with the same species

being grown in a neighboring one. Intra-garden crossing, wild species crossing, and proximity crossing are important considerations when saving seeds. The easiest way to maintain genetic purity is to plant one variety per species in an area. (Organic Seed Alliance).

In Meadville, the seed library will serve people with small home garden plots. When planning a home garden and intending to save seeds, a quick walk around the neighborhood could prove useful. If one house is growing pumpkins and their neighbor is growing a different variety of pumpkins, then the resulting seeds will be some combination of the two different kinds of pumpkins. Along with understanding what is being grown in the neighborhood, it is also good to note the amount of wind, birds, insects, or bees active in the area. These are all different pollinators, and an area with very little wind and no pollinator action requires fewer isolation methods than a high wind area with a very active bee colony.

Isolation with Time:

It is possible to plant two different varieties of the same species in a garden, but it is important to ensure that one variety has completed pollination before the other variety flowers. If a gardener wants to plant corn, but their neighbor also grows corn, an early or late flowering variety is important to maintain purity. (Organic Seed Alliance). This can be challenging to estimate if the gardener is unsure what varieties are present in the area.

Geographical Isolation:

Geographical isolation is the practice of using mountains, bluffs, large buildings, or trees to block cross-pollination. These large barriers make it unlikely for pollinators or wind to cross the spaces to pollinate. This allows different varieties grown at the same time, in different geographical locations, to maintain genetic purity. Again, this is where it is important to know the area when planning a seed saving garden. Some varieties cross-pollinate very readily, including peppers and corn. Corn can cross-pollinate from up to a ½ mile away. This mixing of genes makes the seed crop undesirable. (Maintaining Varietal Purity).

Isolation with Physical Barriers:

Isolation with physical barriers is the practice of covering a variety with very fine mesh, row cover, or bags to prevent pollinators from cross pollination. The use of bags and other

physical barriers requires hand pollination for each plant. If proper pollination does not occur, the plant will not fruit. Tenting a population of carrots would require fly larvae released inside the tent to pollinate. If growing two varieties of the same species, it is only important to create a physical barrier over one population. (Organic Seed Alliance).

Isolation with Distance

The distance required to maintain varietal purity differs on each species and specific environmental conditions. Corn pollen can cross-pollinate from over a half mile away. Inbreeding plants, like tomatoes varieties can be planted much closer without worries about isolation distances. Areas with high wind, a large bee population, or other factors may need to increase isolation distances. (Organic Seed Alliance).

Population Size Importance:

Planting an adequate population size ensures that the variety maintains genetic variability. Genetic variability is the genetic differences present in plants of the same variety. One plant of Cherokee Purple Tomato might vary from another in taste, vigor, drought tolerance, pest and disease resistance. Different species require a different population size to maintain genetic variability because of the way species pollinate and have evolved over time. Extreme inbreeders, like tomatoes, peas, beans and lettuce only require 5 to 10 plants to save seeds. Moderate inbreeders, like okra, eggplant, and hot peppers, require 20 to 40 plants. Outbreeders like cabbage, kale, beets, broccoli, cabbage, and brussel sprouts require 40 to 80 plants. Outbreeders sensitive to inbreeding depression like corn, onions, and carrots require 100 to 200 plants. Outbreeders not sensitive to depression, like squash, melons, and gourds, require 5 to 10 plants (Olson). The following, Table A shows suggested isolation distances and population sizes for different varieties. Seed Savers Exchange suggests that for home growers, the population size can be cut in half and still maintain proper population size. (Organic Seed Alliance).

Crop Specific Chart:

Know the information to manage pollination, isolation and population sizes

Common Name	Scientific Name	Pollination	Life Cycle	*Inbreeder/ Outbreeder	Minimum isolation distance for home use	Minimum isolation distance for commercial production	Minimum Population Size for Genetic Maintenance	Comments
Arugula	*Eruca sativa*	insects	A	VO	1600 ft	1 mi	80	
Basil	*Ocimum basilicum*	insects	A	VO	1600 ft	1 mi	80	
Bean, Common	*Phaseolus vulgaris*	self	A	PI	10 ft	20 ft	10 - 20	
Bean, Fava	*Vicia faba*	self, insects	A	BIO	800 ft	0.3 - 0.6 mi	40	Includes bell beans
Bean, Lima	*Phaseolus lunatus*	self, insects	A	PI	40 ft	160 - 320 ft	40	
Bean, Runner	*Phaseolus coccineus*	self, insects	A	BIO	800 ft	0.3 - 0.6 mi	40	
Bean, Cowpea	*Vigna unguiculata*	self, insects	A	BIO	160 ft	320 - 640 ft	40	Crosses w/ asparagus bean
Beet	*Beta vulgaris*	wind	B	VO	3200 ft	1 - 3 mi	80	Crosses w/ chard, mangels & sugarbeets
Broccoli	*Brassica oleracea*	insects	A or B	VO	1600 ft	1 - 2 mi	80	Crosses w/ all *B. oleracea* crops
Brussels Sprouts	*Brassica oleracea*	insects	B	VO	1600 ft	1 - 2 mi	80	Crosses w/ all *B. oleracea* crops
Cabbage	*Brassica oleracea*	insects	B	VO	1600 ft	1 - 2 mi	80	Crosses w/ all *B. oleracea* crops
Carrot	*Daucus carota*	insects	B	PO	1600 ft	1 - 2 mi	200	Crosses w/ Queen Anne's Lace
Cauliflower	*Brassica oleracea*	insects	B	VO	1600 ft	1 - 2 mi	80	Crosses w/ all *B. oleracea* crops
Celery	*Apium graveolens*	insects	B	VO	1600 ft	1 - 2 mi	80	Crosses w/ celeriac
Celeriac	*Apium graveolens*	insects	B	VO	1600 ft	1 - 2 mi	80	Crosses w/ celery
Chard, Swiss	*Beta vulgaris*	wind	B	VO	1600 ft	1 - 3 mi	80	Crosses w/ beets, mangels & sugarbeets
Chicory, Witloof	*Cichorium intybus*	insects	B	VO	1600 ft	1 - 2 mi	80	Crosses w/ wild chicory, radicchio, and Italian dandelion
Cilantro	*Coriandrum sativum*	insects	A	PO	1600 ft	1 - 2 mi	80	
Collards	*Brassica oleracea*	insects	B	VO	1600 ft	1 - 2 mi	80	Crosses w/ all *B. oleracea* crops
Corn	*Zea mays*	wind	A	PO	1600 ft	1 - 2 mi	200	
Cucumber	*Cucumis sativus*	insects	A	PO	1600 ft	1 - 2 mi	10 - 20	Armenian cucumber is *C. melo*
Dill	*Anethum graveolens*	insects	A	PO	1600 ft	1 - 2 mi	80	
Eggplant	*Solanum melongena*	insects	A	PO	1600 ft	1 - 2 mi	80	

Common Name	Scientific Name	Pollination	Life Cycle	*Inbreeder/ Outbreeder	Minimum isolation distance for home use	Minimum isolation distance for commercial production	Minimum Population Size for Genetic Maintenance	Comments
Endive	*Cichorium endivia*	self	B	VI	10 ft	20 ft	10 - 20	
Escarole	*Cichorium endivia*	self	B	VI	10 ft	20 ft	10 - 20	
Kale, European	*Brassica oleracea*	insects	B	VO	1600 ft	1 - 2 mi	80	Crosses w/all *B. oleracea* crops
Kale, Siberian	*Brassica napus*	insects	B	VO	1600 ft	1 - 2 mi	80	Crosses w/ rutabaga and canola
Leek	*Allium ampeloprasum*	insects	B	PO	1600 ft	1 - 2 mi	80	
Lettuce	*Lactuca sativa*	self	A	VI	10 ft	20 ft	10 - 20	Crosses w/ wild lettuce
Melon	*Cucumis melo*	insects	A	PO	1600 ft	1 - 2 mi	10 - 20	Crosses w/ Armenian cucumber
Mustard greens	*Brassica juncea*	insects	A or B	VO	1600 ft	1 - 2 mi	80	
Okra	*Abelmoschus esculentum*	self, insects	A	BIO	800 ft	0.3 - 0.6 mi	40	
Onion	*Allium cepa*	insects	B	PO	1600 ft	1 - 2 mi	200	
Parsley	*Petroselinium crispum*	insects	B	PO	1600 ft	1 - 2 mi	80	
Parsnip	*Pastinaca sativa*	insects	B	PO	1600 ft	1 - 2 mi	80	
Pea	*Pisum sativum*	self	A	VI	10 ft	20 ft	10 - 20	
Pepper, Hot	*Capsicum spp.*	self, insects	A	BIO	800 ft	0.3 - 0.6 mi	40	Must isolate equally from hot and sweet peppers
Pepper, Sweet	*Capsicum annuum*	self, insects	A	PI	160 ft	320 - 640 ft	10 - 20	Must isolate from hot peppers using hot pepper isolation distances
Pumpkin, Halloween	*Cucurbita pepo*	insects	A	PO	1600 ft	1 - 2 mi	10 - 20	Most Jack O'lantern vars are *C. pepo* and will cross w/ *C. pepo* squash
Pumpkin, Other	*Cucurbita spp.*	insects	A	PO	1600 ft	1 - 2 mi	10 - 20	Learn the species of each variety
Radicchio	*Cichorium intybus*	insects	B	VO	1600 ft	1 - 2 mi	80	Crosses w/ wild chicory, radicchio, and Italian dandelion

Common Name	Scientific Name	Pollination	Life Cycle	*Inbreeder/ Outbreeder	Minimum isolation distance for home use	Minimum isolation distance for commercial production	Minimum Population Size for Genetic Maintenance	Comments
Radish	*Raphanus sativus*	insects	A	VO	1600 ft	1 - 2 mi	80	May cross w/ wild radish
Rutabaga	*Brassica napus*	insects	B	VO	1600 ft	1 - 2 mi	80	Crosses w/ Siberian kale and canola
Spinach	*Spinacea oleracea*	wind	A	VO	3200 ft	1 - 3 mi	80	
Squash, Summer	*Cucurbita pepo*	insects	A	PO	1600 ft	1 - 2 mi	10 - 20	
Squash, Winter	*Cucurbita pepo*	insects	A	PO	1600 ft	1 - 2 mi	10 - 20	
Squash, Winter	*Cucurbita maxima*	insects	A	PO	1600 ft	1 - 2 mi	10 - 20	
Squash, Winter	*Cucurbita moschata*	insects	A	PO	1600 ft	1 - 2 mi	10 - 20	
Squash, Winter	*Cucurbita argyrosperma*	insects	A	PO	1600 ft	1 - 2 mi	10 - 20	Formerly *Cucurbita mixta*
Tomato, modern	*Solanum lycopersicum*	self	A	VI	10 ft	20 ft	10 - 20	If multiple tomato types are present use the greatest isolation distance
Tomato, Potato Leaf or Heirloom	*Solanum lycopersicum*	self, insects	A	PI	40 ft	160 - 320 ft	10 - 20	If multiple tomato types are present use the greatest isolation distance
Tomato, Currant	*Solanum pimpinellifolium*	self, insects	A	BIO	160 ft	320 - 640 ft	40	If multiple tomato types are present use the greatest isolation distance
Turnip	*Brassica rapa*	insects	B	VO	1600 ft	1 - 2 mi	80	Crosses w/ many Asian greens
Watermelon	*Citrullus lanatus*	insects	A	PO	1600 ft	1 - 2 mi	10 - 20	

** very inbreeding (VI), primarily inbreeding (PI), very outbreeding (VO)*
both inbreeding and outbreeding (BIO), primarily outbreeding (PO)

Table A: Table from the Organic Seed Alliance describing pollination type, suggested isolation distance, and suggested population size. Population size determines how many plants of each variety to save seeds from to maintain genetic diversity. Seed Savers Exchange suggests that for home growers, the population size cut in half while still maintaining genetic variability. Annual (A), Biannual (B).

Genetic Risks in Saved Seeds

These risks are important to understand when creating instructional material for the seed library. I had to create instructions for the seed library members for saving a whole host of seeds without overwhelming them with information. I covered the genetic risks issue by providing a note care that included population size for seed saving, or how many plants to save seed from, and instructions about saving seeds from a variety of shapes, sizes, and colors of fruits. This information is still important for future reference, if the seed stock becomes unstable seven years from now, perhaps clearer instructions on the following information is necessary to protect the viability of new seeds.

Inbreeding Depression:

If population size is not large enough for a few generations of seed saving, the resulting plants will become less vigorous, lower yielding, and more susceptible to pests and diseases. Strong outbreeder plants are the most susceptible to inbreeding depression because "they are adapted to a constant mixing of genes through cross pollination." Strong inbreeders are less susceptible because "they have adapted to the inbred condition through thousands of generations of self-pollination" (Organic Seed Alliance). (Olson).

Genetic Drift:

If the population is not large enough, the resulting generations are susceptible to genetic drift. This references an overall change in gene frequency over time. If the initial population had a 50/50 split of genes for a certain characteristic, like primarily white or purple eggplants, but a very small population of seed was saved, over time that shift might be 25/75 or even 0/100. This would make the recessive white gene the only option present in the seed population, and a whole host of other unknown recessive genes would be released. This makes recessive genes or other plant weaknesses more prominent over time. (Olson).

Over-Selection:

Over selection is the process of seed saving when a person only saves seeds from a specific ideotype, or idealize appearance of a variety. This could mean someone only saving seeds from the largest eggplants, rather than a variety of shapes and sizes. When a variety is bred

only for a certain characteristic, it creates a genetic bottleneck where other traits are selected unknowingly. This could mean that the biggest eggplant in a garden is also the most susceptible to pests, disease, or weather fluctuations. (Olson).

Chapter Two Summary:

The seed saving process involved many steps, from harvesting the correct number of mature fruits all the way through drying the seeds for storage. It is important to ensure that each of these steps is correct, in order to create a stable and viable seed library. Seed library patrons will be from a varied level of knowledge about seed saving, but everyone is supplied with the same information to ensure consistency. This will help create an easier experience with the seed library, if all of the seeds are processed and grown the same way, then the patrons will know what to expect and truly understand the process.

Chapter Three: Why is the seed library in the library?

There were many aspects of the final decisions to locate the Meadville Public Seed library in the Meadville Public Library. It is important to understand these decisions for future reference in creating seed libraries and so the library will be able to look back and understand if they choose.

Potential locations for the Seed Library

The location of the seed library is important for ensuring the longevity and impact of the program. Ideally, the project would be located in a space with good record keeping and a large patron base. The goal of the seed library is to disperse organic or heirloom seeds to Meadville residents, and because of that, it had to be in a location easily accessible by the majority of the public.

There were three original ideas for the location of the seed library including Carr Hall, the Allegheny Library, and the Meadville Market House. Each of these places has its own benefits and drawbacks. Placing the seed library on the Allegheny Campus limits the availability of seeds to people on campus. The number of students on campus during the growing season is rather limited, and very few have access to a garden. The means if the seed library were located on campus it would primarily serve the campus faculty and staff rather than the Meadville community. The Meadville Market House is another logical location, as it already houses the farmers market and markets local products. However, the Market house is already packed full of products and the seed library would most likely get lost in the hubbub and would not be as easily accessible.

At a loss for an effective location, I attended the local Master Gardeners monthly meeting. At this meeting, I facilitated a conversation about the potential locations. The Master Gardeners suggested three locations including the Market House, the PennState Extension office, or the Meadville Public Library. I then broke into a discussion with two interested gardeners, Janice Pless and Laurie Peyronel. We discussed each location and they agreed that the Markethouse is already overwhelmed. While the PennState Extension office already houses the Master Gardner meetings and center, it is located in a remote place and removed from the town center. The office would not be an ideal candidate for the education aspect of the project, as the Master Gardeners are already familiar with saving and growing seeds. Janice Pless is on the

board for the Meadville Public library and she was very excited about the prospect of having the Seed Library and related programming located there.

Libraries are a very interesting location possibility, as they are already spaces where knowledge and information is ready to be checked out. Libraries innately also have a very specific cataloguing system built into their daily use, and this would serve to keep the Seed Library organized and catalogued. Libraries also work with a wide range of ages, from children to adults, and this provides an immense number of programming opportunities and potential growers. Libraries, unlike museums, give out books, videos, and other sources and allow people to learn from the source. This combination of assets makes any library an ideal place to house seed libraries. There are thirty-four public Seed libraries open across the nation, and the network is ever expanding according to Prima County Public Library, a seed library located in Tuscon Arizona.

Why choose the Meadville Public Library?

The Meadville Public Libraries' institutional goal as listed on their website reads that, "the Meadville Public Library provides members of our community with materials in a multitude of formats that meet their educational, informational, and recreations needs," (Meadville Public Library). A seed library would work to meet the education, information, and recreational needs of the community members. Members will learn about the importance of seed saving, the technical skills for seed saving, as well as access to seeds for recreational gardening. The seed library serves all of the institutional goals as well as increasing food and seed security and independence in the area. The library is also already working on diversifying the items available for checkout. They offer e-books, xbox games, and weekly dog therapy sessions at their location. The library is working on expanding their children programming, and there are multiple ways to have children involved in the seed library. Children could color and design seed packets for patrons to take home seeds, they could have a plant-your-own seed day, or the library could have a small seed garden for the kids. Look to Chapter 4 under the subheading "programming" for my lesson plan for a seed starting event.

The seed library, located at the Meadville Public library, will include a physical structure containing the seeds, seed saving cards, informational posters, press releases, brochure about the program, a blog write up about the program, policy writing, and program planning.

Chapter Four: What is in the Seed Library other than Seeds?

The creation of the seed library was about more than just sourcing seeds; it was also about ensuring the long-term success of the project. This chapter outlines every aspect of the seed library, from the actual structure all the way through a lesson plan for the grand opening of the project. It is important to have a record of original intent when establishing a project that is overseen by other people and will hopefully last many years. Once I graduate and leave Meadville, my connection with the project will be lost and the seed library will be in the hands of the Meadville Public Library. This document and the resulting guidebook are a way for the library to look back and understand the decisions that went into the final project.

Physical Structure:

This is the structure that keeps the seeds organized. The seed library has been given access to six cubic feet of shelving within the library on a few shelves. The seeds will be organized in boxes both by type of plant (such as tomato, lettuce, or pepper) as well as by ease of seed saving. The easiest seeds to save will have green labels on their drawers to help growers distinguish which seeds are in their skill level. Organizing by type and ease of saving helps ensure that the growers are borrowing seeds they are able to grow and return. It also helps with the ease of finding the types of seeds the growers are looking for, if they are able to quickly browse and locate the seeds it will encourage more people to utilize the library. The Richmond Grows Seed Lending Library organizes seeds ranging from super easy, easy, and difficult (Richmond Grows). They only allow members to borrow from the super easy drawer before allowing access to the more difficult levels of seeds. This helps ensure that seeds will be returned to be used again next season. The Prima County Seed Library differentiates between easy and advanced seeds for members to choose. They state that, “if certain precautions are not taken the next grower will not get the same plant. We want to ensure that the seeds that you return to the library are indeed what they claim to be” (Prima). They ask that participations only, “save seeds from "advanced" plants only after you have learned about isolating plants to prevent cross-pollination” (Prima).

The Meadville seed library will also include a binder with a sheet of paper for each seed variety and grower notes as each grower returns the seeds. These sheets of paper will help build

the stories of each seed, what grew well one season or had an interesting and tasty fruit or other information. The Manitou Seed Library instructs all borrowers to return seeds in an envelope including "species and variety, location and year grown, and any details on production- how did the plant produce? Early fruits or late? Did the plant seem to resist pest or was it constantly under siege" (Manitou Seeds). Manitou does this to help ensure that varieties stay true to type and future growers know what to expect from the saved seeds. Look in the guidebook for an example of the seed information sheets.

Seed Saving Cards:

Resting on top of the shelves, in a paper organizer, there will be note cards about how dry process and wet process seeds. They include clear step-by-step instructions for seeds to ensure that all participants have access to the same information. Along with the seed processing note cards, there is a note card that outlines when the seeds are ready for harvesting in the varieties present. This will give growers the knowledge that eggplants must stay on the plant far after normal harvest, and beans stay on the plant until they are rattle dry. These note cards are important for the population who is just starting to garden. Perhaps these seeds are the first they have planted and they have no idea about seed saving. Having clear instructions for growing and seed saving helps ensure the maintenance of genetic and seed viability. Maintaining genetic and seed viability helps ensure that the plants stay true to type without hybrids and protect against mold or unviable seeds. The seed cards are compiled from information given by the PennSate Extension office on seed saving, various heirloom and organic seed companies, as well as other seed library productions.

I chose to limit the amount of note cards to three because I did not want to overwhelm the growers with a note card for every species present in the seed library. That would be overwhelming and hard for the library to manage. These are easy to understand representations of the information necessary for saving all seed present in the seed library. Minimizing the amount of note cards also limits the redundancy of a person saving tomato, cucumber, and melon seeds. All three are processed the same way, and instead of a person taking three different cards, they are able to just take the wet processing seeds. The Concord Seed Lending Library only gives instructions for seed saving through their blog, and I wanted to ensure that everyone in

Meadville would have equal access to the information. Representations of these cards can be found in the Guidebook for the Meadville Seed Library located in the appendix.

Educational Posters:

These posters serve multiple purposes. They show passerby how to get involved with the seed library, some answers to common questions, as well as a guideline for seed library use. This is a draw people into learning more about the seed library and ensuring that they use it properly. The guidelines for use are extremely important in ensuring the longevity of this project. Some of the guidelines include an agreement that people who borrow seeds will do everything in their power to maintain the genetic purity of the seeds and return seeds. It also functions as a way for people to donate seeds from other sources. The seed library will expand its seed holdings, as the seasons pass, and it is important to ensure that seeds all follow the same organic, open-pollinated guidelines and provide enough information to the growers. All posters are in the Guidebook for the Meadville Public Library located in the appendix.

All of these posters and guidelines were determined through the use of other existing seed libraries. The Manitou springs Seed Library has a wonderful Frequently Asked Questions page, and blog about their lending library. Richmond Grows also has a website devoted to seed lending libraries. Much of the information on the poster came from reading both of these sources and matching up the most important information people should know. This includes how to get involved initially as well as how to use the seed library and return seeds. The Westcliffee Seed Lending Library has a set up that looks very much like the set up Meadville will use. The Westcliffee Library keeps one eye-catching poster, one guideline for use, and one FAQs poster at eye level. Below that are seed saving instructions in the form of a brochure, forms to fill out for donations, and relevant books. Finally, there are the seeds organized by easy of saving. This use of posters makes the most sense for the space available in Meadville.

Press releases, brochure about the program, blog write up about the program:

These documents were requested by the Meadville Public Library board when I attended the libraries board meeting. The library will send out the press release to various press groups in Meadville, including the Meadville Tribune. They are all located in the Guidebook in the appendix.

The brochure is a write up about the program, frequently asked questions, and instructional section, to acquaint potential members with the seed library. This brochure will sit in the front of the library, where all of the libraries services are advertised. It is a quick way for potential growers to determine if they are interested of not in the program. It highlights all steps in the seed saving process so there are no surprises. The seed saving techniques in chapter two informs it.

The blog write up will go on the library's website; it is a slightly more detailed description of the program and how to get involved. It is designed to present a bit of seed saving history, importance, and information all at once. This is to gain interest from people who believe in the history of the practice, the greater ecological impacts, or the local foods aspect. It also contains information for people to donate their own seeds from the very beginning. It is important for people to know that seed library is not a stationary object with the same seeds every year, but rather something that evolves and encourages new additions.

The news article is a 200 word shorter version of the blog write up. It is to advertise the seed libraries existence and encourage all people to get involved. Not all people who would use the seed library have access to the internet, or check the libraries blog, so it is important to have the information present in print media as well. In order for the seed library to be effective, people must first know about its existence.

Policy writing:

This is another request from the Board of Directors. It is a write up of who is allowed to use the library, who is not, a brief overview of the maintenance section, and potential limitations. This document will go back out to the board of directors for their record keeping. All of this information is located in the Guidebook in the appendix. The need to control for seed age and mold or disease greatly informed the maintenance instructions. The Ohio State extension office recommends that most seeds, aside from parsnips, onions, and shallots, remain viable for three to five years. While none of the short lived seeds are present in the seed library, regular yearly maintenance is important.

The seed library is a seasonal service; growers borrow seeds in the spring and return seeds in the fall. The seeds are with slips containing all of the necessary growing information and in sealed baggies. These returned or donated seeds are kept separate from the other pre-processed

seeds. This is to help ensure that all seeds are filed where they need to be filed. The seeds are given an initial look over when the growing season is over. The baggies that contain wet or mislabeled seeds should be removed. The other seeds are left in this "returned seeds" box until January. In January, the seeds are inspected for dryness or any sort of mold or mildew. Any seeds that are found with disease or mold are removed. At this point, all seeds of the same age and variety are mixed into the same bag. Volunteers or staff should label seeds that are three years old and push them to the front of the boxes. They also highlight those seeds so growers use them first, much like an almost expired jug of mix. Seeds that are four years old are removed from the seed stock. This is to ensure that growers will receive their expected germination rates and remain confident in the seed library.

Any adult with a library card is eligible to use the seed library. Seed saving can be a family affair, and children can pick out and sort through the seed types, but parents must check out the seeds. This is to ensure that the seeds are planted and are more likely to be returned. In the future, this rule can be removed if there is other sustainable seed return.

Programming:

I will be hosting a children's program on April 12, 2014. This event will take place in the beginning of April, and will serve as a kickoff program for the seed library. We will be planting calendula and marigold seeds for the library window boxes and to decorate the library. Children are welcome to keep their own seeds, or save them for the library use. The future flowers will have a placard stating that they are from seeds in the seed library as well as information to get involved.

During the event, I will try to cover two aspects of gardening. We will first use a large poster sized sticky note to draw all parts of a flower as the audience tells me what belongs. This will include the flower with petals and pollen, stalk, leaves, and roots. We will then brainstorm what each of these parts is responsible for, pollination, water and nutrients, gathering sunlight for energy. Once that activity is complete, we will move onto the next aspect, outlining what plants need to grow and what they will create. Plants need water, sunlight, and carbon dioxide to grow and they create seeds, oxygen, flowers, or vegetables. This lesson plan is a result of two home schooling blogs (Kids, Crafts, and Cameras) and (Erbhart's Explorers). I wanted this lesson to be as interactive as possible so the kids are more involved and excited about the process. After the

lesson, we will plant seeds in old egg cartons and soil. Each child will receive a handout about how to make their plants grow nice and strong. This is the grand opening for the seed library, and hopefully families will go and check out the seed library offerings after the event. Look in the appendix, after the guidebook for posters, take home sheets, and program guide.

Chapter 5: Where does it go from here?

After creating this project and equipping the library with all of the information they requested, I feel confident that the seed library will succeed. The grand opening is on April 12, 2014 and I will plant seeds with children and families in a celebration of this new resource. It feels strange, giving these seeds and resources to the library and then just letting go, but that is the only way for the project to succeed. I cannot run the seed library from wherever I end up, and I know that Meadville is home to many people passionate about growing good produce and sharing their knowledge, so it will be in good hands. I hope that the seed library grows after this season and everyone who borrows seeds returns them. I hope that neighbors tell their neighbors and the seed library collects seeds that are important to the people of Meadville.

When I began this process, I was hoping to collect seed donations from people who have been saving seeds for generations or have special heirloom varieties they love. Unfortunately, I should have asked for seed donations in May or April, so people could plan their gardens around the knowledge that they would be saving more seeds than normal. Now that the seed library is established, I will put another call out on all of the mediums I used before to encourage people to use the seed library or make new donations.

The seed library has room for expansion and improvement. In future years, as people become confident with the seed saving process, it could expand to more challenging species like corn or biannual varieties. The community members are the ones donating seeds and efforts in the future, so they will control what varieties are present. I think that is the most exciting part, the seed stock is not a static catalogue of seeds but something that fluctuates with the needs of the community. I know what the seed library looks like right now, but who knows what it will look like in a year or five years.

If you have any questions regarding the seed library opening in the Meadville Public library or about starting your own, please do not hesitate to contact me. My e-mail address is Iafrate.brittany@gmail.com and I look forward to answering any questions!

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Guidebook for the Meadville Area Seed Library Caretakers



Created By: Brittany Iafrate, Allegheny College 2014

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1. Purpose of the Seed Library

What does it do?

The seed library is a depository of seeds available to members of the Meadville Public Library. It contains the information and the seeds necessary to allow members to borrow, save, and return seeds for years to come. This process allows members access to organically grown, open-pollinated, or heirloom varieties to plant. These seeds increase access to fresh and local food and teach people the historic art of seed saving. The education aspect is twofold, one part is about the physical seed saving and the other is about the importance of seed saving.

The seed library is equipped with the instructional seed saving note cards, brochures, and resources to accommodate beginning seed savers and experts alike. People have been saving seeds since 8000 BC, but because of shifts in markets, hybridization, and demographic shifts seed saving has become a less known skill (Seed Savers). About 1,500 seed banks all over the world preserve local biodiversity in case of global emergency (Luntz). Around 34 public seed libraries are open across the nation, these libraries are community oriented and based (Prima County). Public seed libraries reinforce and support the local foods systems in a community, while also increasing local and reliable seed availability.

Benefits of Seed Libraries:

-they increase locally adapted varieties of fruits and vegetables
-they are free and allow everyone equal access to seeds and information
-they encourage preservation and sharing of heirloom and historical varieties
-they restore knowledge about seed saving.

Whom does it serve?

The Meadville Seed Library seeds are available for adults with library cards to check out. This can be a great family process, so children are encouraged to look through and learn about all the seeds, but a parent's consent is necessary to ensuring a returned seed crop.

2. Maintenance Instructions

Seed Returns and Donations

All growers will have access to note cards with blank spaces available to fill in all of the information necessary for the next season of growers to plant the seeds. This includes plant name, species, row spacing, sun requirements, and special notes. The special notes section can include anything from a story about where the seeds came from, an assessment of flavor or performance, or how the plant grows. These note cards should be filled out for every batch of seeds returned to help keep the information consistent. Once the note card is placed in the bag of seeds and the bag is securely closed, then the bag goes into the box labeled “Seed Returns”.

Maintaining the Seed Stock

Once the season has ended and all of the seeds have been returned, library staff or volunteers will go through the returned seeds. All unlabelled or severely incomplete labels and the accompanying seeds will be removed from the seed stock. All seeds that have all of the information complete and are properly dried will be added into the seed library by type and variety. It is important to keep these in their original bags until a later date in time. In January, staff will go through the seeds again and inspect for mold or growth. Seeds with any type of fungus or mold will be removed. After this point, seeds of the same species, variety, and age are into the same bag.

All of the seeds available through the seed library will maintain germination rates and viability for three to five years. During the January integration of returned seeds, it is also the important to sort seeds based on age. At that time, highlight all seeds that are 3 years old and remove all seeds that are older than 4 years old. Highlighting the seeds should encourage growers to use those seeds before any of the others, and removing the old seed should help maintain germination rates. Ensuring germination to the best of the seed libraries ability will help growers gain confidence in the seed and ensure longer participation.

3. Media Outreach

Blog Write Up

This piece is for the Meadville Public Library blog, it is to gain interest and knowledge about the program. The easier it is for people to understand how this program works, the more likely that it will survive for more than one season.

The Meadville Public Library will be opening its very own seed library on April 12th Participants borrow seeds as they would a book, plant, grow out the vegetables, then harvest and return seeds at the end of the season! Anyone with a library card is welcome to come check-out seeds, we just ask that at the end of the season you return as many or more seeds as were originally borrowed.

Worried that you don't know how to save seeds? The seed library is equipped with the instructional seed saving note cards, brochures, and resources to accommodate beginning seed savers and experts alike. People have been saving seeds since 8000 BC, but because of shifts in markets, hybridization, and demographic shifts seed saving has become a less known skill (Seed Savers). About 1,500 seed banks all over the world preserve local biodiversity in case of global emergency, but these seeds are not accessible to local gardeners (Luntz). Around 34 public seed libraries are open across the nation, and these libraries are oriented around and for the community (Prima County). Public seed libraries reinforce and support the local foods systems in a community, while also increasing local and reliable seed availability.

> To restore our freedom over food, it is essential that every community have access to a collectively owned treasure chest of seeds. Seed Libraries represent our best hope for reclaiming this independence. As an added benefit they boost regional biodiversity by encouraging the cultivation of new crop varieties adapted to local conditions. - Bill McDorman from Native Seeds

Benefits of Seed Libraries:

-they increase locally adapted varieties of fruits and vegetables
-they are free and allow everyone equal access to seeds and information
-they encourage preservation and sharing of heirloom and historical varieties
-they restore knowledge about seed saving.

To get involved, just stop by the library and check out some seeds! Take all of the information you need and enjoy growing your own food. We have nine types of tomatoes, five kinds of eggplant, ten kinds of beans and peas and tons of other seeds. There is something tasty for everyone, young or old, in the seed library! If you would like to donate seeds, just fill out a returned seeds slip, and put the fully closed baggie into the returned seed box.

News Piece

This piece is to go out to local publications to gain interest and knowledge about the program. These publications include the Meadville Tribune and the library newsletter

The Meadville Public Library will be opening its very own seed library on April 12th. Participants borrow seeds as they would a book, plant, grow out the vegetables, then harvest and return seeds at the end of the season! Anyone with a library card is welcome to come check-out seeds, we just ask that at the end of the season you return as many or more seeds as were originally borrowed.

Worried that you don't know how to save seeds? Don't worry about it! The seed library has super popular and easy to save seeds as well as all of the information necessary for proper seed saving. We have tomatoes, beans, cucumbers, eggplants, lettuce, and more seeds just waiting to grow! All of the seeds are also open-pollinated and organically grown, no hybrids or chemicals here!

If you would like to donate seeds to the library, you can fill out a "returned seeds" slip, and drop off the seeds in a sealed baggie. This is the perfect way to share seeds with like-minded gardeners and a fun way to try out growing new varieties! Participation is free and exciting for all ages.

3. Print outs for use a Seed Library

Page 7: Poster to Gain Interest

Page 8: Poster to Gain Interest

These two posters should be used to post around the community. They will help make people aware that the seed library exists and how to get involved.

Page 9: Informational Poster on preparing the garden

This poster is designed to teach seed library members how to lessen the chance of cross-pollination.

Page 10: Note Cards to be printed out and cut

These note cards tell members when to harvest mature seeds and how to process the seeds for storage.

Page 11: Box Labels for the seed boxes and return sees label

Page 12: Inside of informational and interest brochure

Page 13: Outside of brochure

The brochure holds all of the information necessary to participate in the seed library, members can take a brochure or note cards. It is a way for potential members to quickly view all aspects of the program.

Seed Library to open in the Meadville Public Library!



Check out seeds like you would check out a book! Borrow seeds from the seed library, grow the plants, save the seeds, and return some of them to the library! Seed growing and saving instructions are provided, just bring your own bag to take some seeds home!

It is free to participate. All seeds were donated by Seed Savers Exchange and community members.

Meadville Public Library's Seed Library is Opening!

Why are seed libraries important?

Seed libraries:

- -seeds are local
- -seeds are free
- -develop regionally appropriate varieties
- -encourage heirloom seed saving
- -teach an important skill: seed saving
- -fun for the whole family



To get involved in the Meadville Public Library's Seed Library:

Stop by the library and check out some seeds. Grow the plants and learn how to save the seeds! Return at least as many seeds as you borrow, and start again next year!

Prepare your garden for seed saving!

1. Take a tour of your neighborhood. Are your neighbors growing the sweet peppers and you are growing hot peppers?

2. Squash, melons, gourds, pumpkins, and cucumbers will cross with each other. Peppers will cross with any other pepper. Make sure there is only one of each of these species present within 1/4 of a mile.

3. Some plants, like lettuce, take up almost double the space when seeding. Others like cucumbers and squash stay on the vine much longer than usual, so account for that!

4. Save seeds from at least 2 healthy plants per seed selection. If you take more than 15 seeds, save from more than 2 plants. This is to help ensure genetic diversity in the seeds!

5. **Take all of the information you need to grow and save seeds! Handouts and brochures are available (and a lot of books!)**

6. To return seeds, completely fill out a returned seeds slip, and place the slip in a fully closed baggie with the seeds in the "returned seeds" box.

When are the seeds ready for harvest?

Beans: When bean pods turn yellow
Cucumber: Grow until pale yellow and soft
Eggplant: When eggplants are dull brown and seeds are dark
Lettuce: When 30-80% of seed clusters have feathered
Melon: Allow fruits to stay on the vine until a bit soft
Peppers: When their color development is complete
Spinach: When 60-70% of seed is a brownish color
Summer Squash: When fruits are very large and hard
Winter and Fall Squash: Leave the fruits on the vine until right before frost
Tomato: When fruits are a bit soft but not decaying
Watermelon: Allow to remain on the vine until softened slightly (Seed Saving)

Wet Processing: This process is for tomatoes, cucumbers, and squash varieties. (Only cucumbers and tomatoes require fermentation).

1. Place seeds and pulp in a container full of water. Soak for no more than 8 to 12 hours.
2. Tomatoes and Cucumbers: Place seeds in a container with enough water to cover the seeds. Place in a warm location and allow to sit for 48 to 72 hours, stirring occasionally. The mixture is done when the gel coating is completely gone from the seeds. (Do not allow to sprout or spill the mixture).
3. Scoop out the seeds that have floated to the top of the seed mixture and any non-seed materials. Add water, allow to settle for 10 minutes, and scoop off floating and nonviable material. Continue until the water runs clear.
4. Drain seeds, and spread thinly on a nonporous surface and allow to dry until brittle. If seeds are very wet, stir occasionally to ensure complete drying.

Dry Processing: This is used for all non-wet processed seeds. Some examples are lettuce, flowers, herbs, peppers, peas, etc.

1. Separate seed or seed pod from plant. If the seed is incase in a pod, like lettuce seeds, crush the pods above a container to release the seeds.
2. Then separate the non-seed material from the seeds. You can use a screen with holes the same size of the seeds or try to blow the non seed particles away from the seeds. Try to return the least amount of non-seed material to the seed library.
3. Spread seeds on a hard nonporous surface and allow to dry until brittle. Make sure seeds are completely dry before storage, this helps protect against mold or mildew.

Seed Box Labels

Tomatoes, Peppers, Eggplant **(Easy/Medium)**	Greens (Lettuce, spinach, etc.) **(Easy)**
Melons, Squash , and Cucumbers **(Medium Easy)**	Herbs and Flowers **(Easy)**
Beans and Peas **(Super Easy)**	**Returned Seeds**

Returned Seeds Slip:

Meadville Public Library Seed Library
Plant Name:
Variety:_____ Year harvested_____
Growers Name: _____
Garden Location:_____
Seed Collected from how many plants? _____
Description (How did it grow, did you like it…)_____
_____
_____
_____
_____
_____

Meadville Public Library's Seed Library

Wet Processing:
This process is for tomatoes, cucumbers, and squash varieties. (Only cucumbers and tomatoes require fermentation).

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4. Drain seeds, and spread thinly on a nonporous surface and allow to dry until brittle. If seeds are very wet, stir occasionally to ensure complete drying.

How to prepare your garden for seed saving:

1. Take a tour of your neighborhood. Are your neighbors growing the sweet peppers and you are growing hot peppers?
2. Squash, melons, gourds, pumpkins, and cucumbers will cross with each other. Peppers will cross with any other pepper. Make sure there is only one of each of these species present within 1/4 of a mile.
3. Some plants, like lettuce, take up almost double the space when seeding.
4. Save seeds from a number of healthy plants to maintain genetic variety.

If you borrowed seeds, write down the number of seeds and each variety. This will help you keep track of what seeds you are growing and how many you should return!

#	Name of Variety

Dry Processing:
This is used for all non-wet processed seeds. Some examples are lettuce, flowers, herbs, peppers, peas, etc.

1. Separate seed or seed pod from plant. If the seed is incase in a pod, like lettuce seeds, crush the pods above a container to release the seeds.
2. Then separate the non-seed material from the seeds. You can use a screen with holes the same size of the seeds or try to blow the non seed particles away from the seeds. Try to return the least amount of non-seed material to the seed library.
3. Spread seeds on a hard nonporous surface and allow to dry until brittle. Make sure seeds are completely dry before storage, this helps protect against mold or mildew.



Why are seed libraries important?

Seed libraries:

-seeds are local
-seeds are free
-develop regionally appropriate varieties
-encourage heirloom seed saving
-teach an important skill: seed saving

To get involved in the Meadville Public Library's Seed Library:

Stop by the library and check out some seeds. Grow the plants and learn how to save the seeds! Return at least as many seeds as you borrow, and start again next year!

Free to participate

Seed Library FAQ:

1. How many seeds can I take?

You may take as many seeds as you intend to grow. If that is three seeds, than take three seeds. If that is more, than take more. Just be sure to return the seeds at the end of the season!

2. I have never saved seeds before, how do I do it?

There are instructions for seed saving located close to the seed catalogue. If you are till unsure, choose seeds that are labeled easy to save. This will help you get the hang of the system.

3. How many seeds do I need to return to the library?

At least the same amount of the same variety you checked out, if not more. This is to help make sure the seed library is around for another season!



Meadville Public Library's Seed Library



Check out seeds like you would check out a book! Borrow seeds from the seed library, grow the plants, save the seeds, and return some of them to the library! Seed growing and saving instructions are provided, just bring your own bag to take some seeds home!

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From Seed to Seed

A seed planting event for families.

Come learn all about plants and take home a plant of your own!



Saturday, April 12th at 1:00 PM

At the Meadville Public Library

Water:
Keep the potting mix moist while the seeds are germinating. A spray bottle to water the surface gently without washing the potting mix out of the containers may be useful!

Sunlight:
Keep the seeds in direct sunlight, but away from cold drafts!



Planting the seeds outside:
You will be able to see a sprout after four or five days, but wait until the plant has two true leaves before moving it outside. True leaves are the leaves that appear after the first two skinny smooth leaves appear. It is important to let the plants get used to being outside before transplanting them. After the true leaves have appeared, take the plants outside for an hour or two for the first day and increase the hours until the plants are ready for planting!

Water:
Keep the potting mix moist while the seeds are germinating. A spray bottle to water the surface gently without washing the potting mix out of the containers may be useful!

Sunlight:
Keep the seeds in direct sunlight, but away from cold drafts!



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Keep the potting mix moist while the seeds are germinating. A spray bottle to water the surface gently without washing the potting mix out of the containers may be useful!

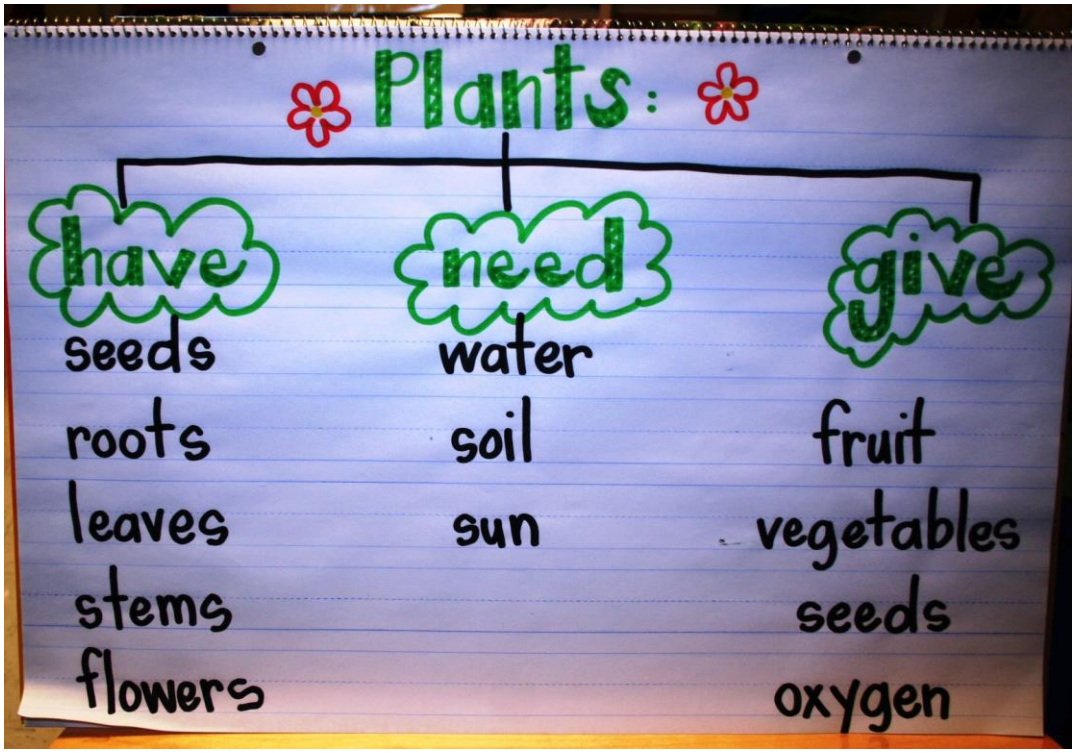
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Reference Diagrams for Children's Programming

From Ebhart's Explorers, explaining what plants have, need, and give when growing.



From Kids, Crafts, and Cameras



One Page Caretaking Sheet Instructions

- All returned seeds should be sealed in a ziplock bag with a completed "returned seeds" sheet and located in the returned seeds box.

In December or January:

- Open returned seeds box and inspect bags of seeds for mold or growth. Remove any seeds that are rotting, moldy, or incompletely labeled.
- Mix the remaining viable seed together by species and variety in a baggie labeled for that year. For example, put all Cherokee Purple Tomatoes from 2014 together in the same bag. Then sort all seeds back into their correct boxes.
- Remove seeds older than three years old from the seed library, these are too old and will not germinate effectively.

Throughout the year:

- Ensure that there are enough posters, brochures, seed labels, and baggies available at all times.
- Periodically inspect seeds for mold, growth, or organization.
- Keep new donations with fully filled out returned seeds slips, in returned seed box to be filed for the following year.

Other options:

- Host programming for children to gain interest
- Host programming for adults to learn more about seed saving
- Post about the seed library in newspapers, blogs, and newsletters to invite use and donations.

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