MANUAL

Open Bug Farm: *Mealworm Kit Beta*

A Tiny Farms product

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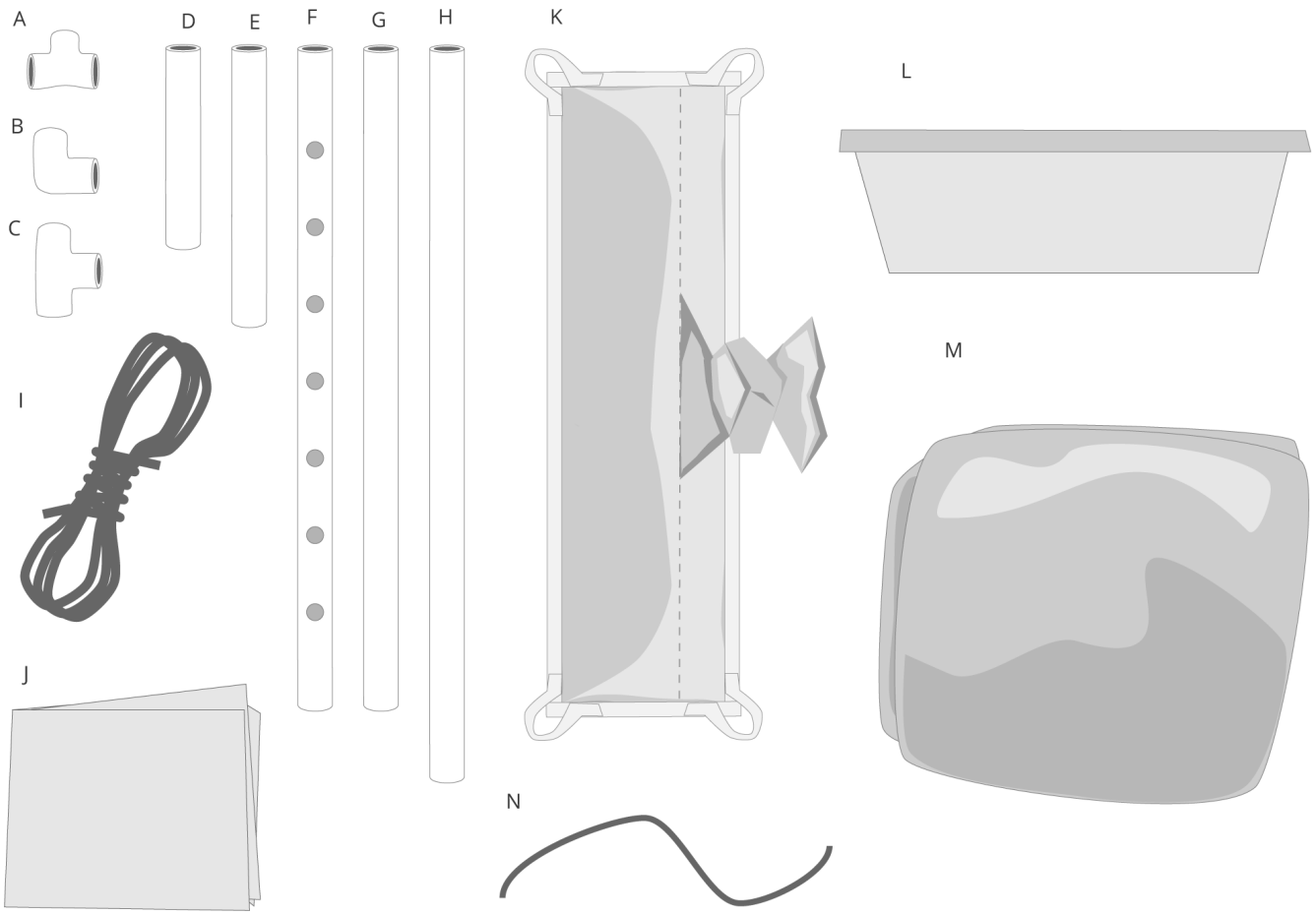
www.openbugfarm.com

Parts:



A - Corner Fitting 4x

B - Elbow Fitting 4x

C - T Fitting 4x

D - 5” Pipe Segment 4x

E - 7” Pipe Segment 4x

F - 17 3/4” Pipe Segment Drilled 2x

G - 17 3/4” Pipe Segment 2x

H - 21 3/4” Pipe Segment 4x

I - Rope Shelf 1x

J - Frass Collection Liner 1x

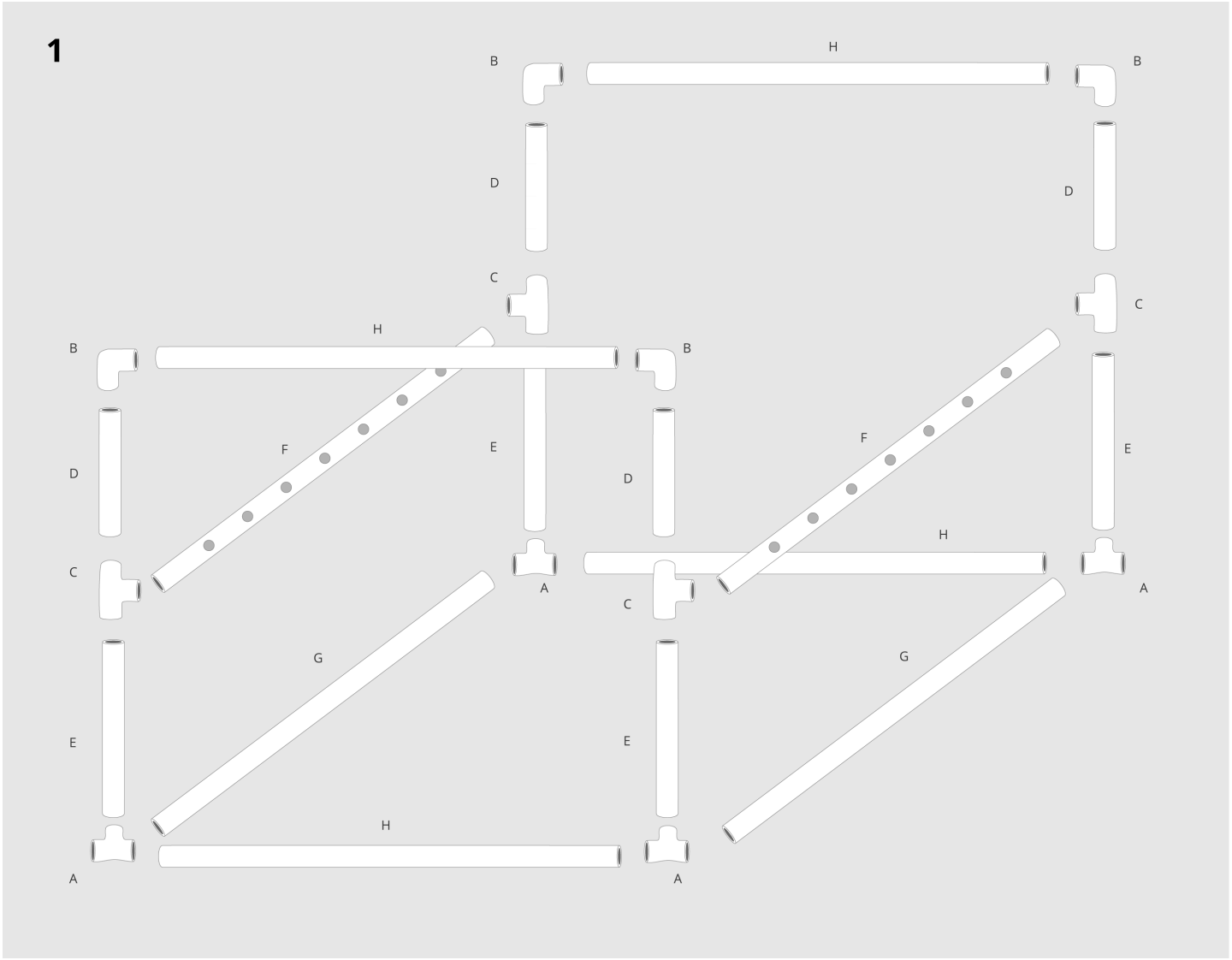
K - Mealworm Grow Bag 2x

L - Mealworm Breeder Bin 2x

M - Mealworm Farm Tent 1x

N - Grow Bag Mounting Ties 8x

Step 1:



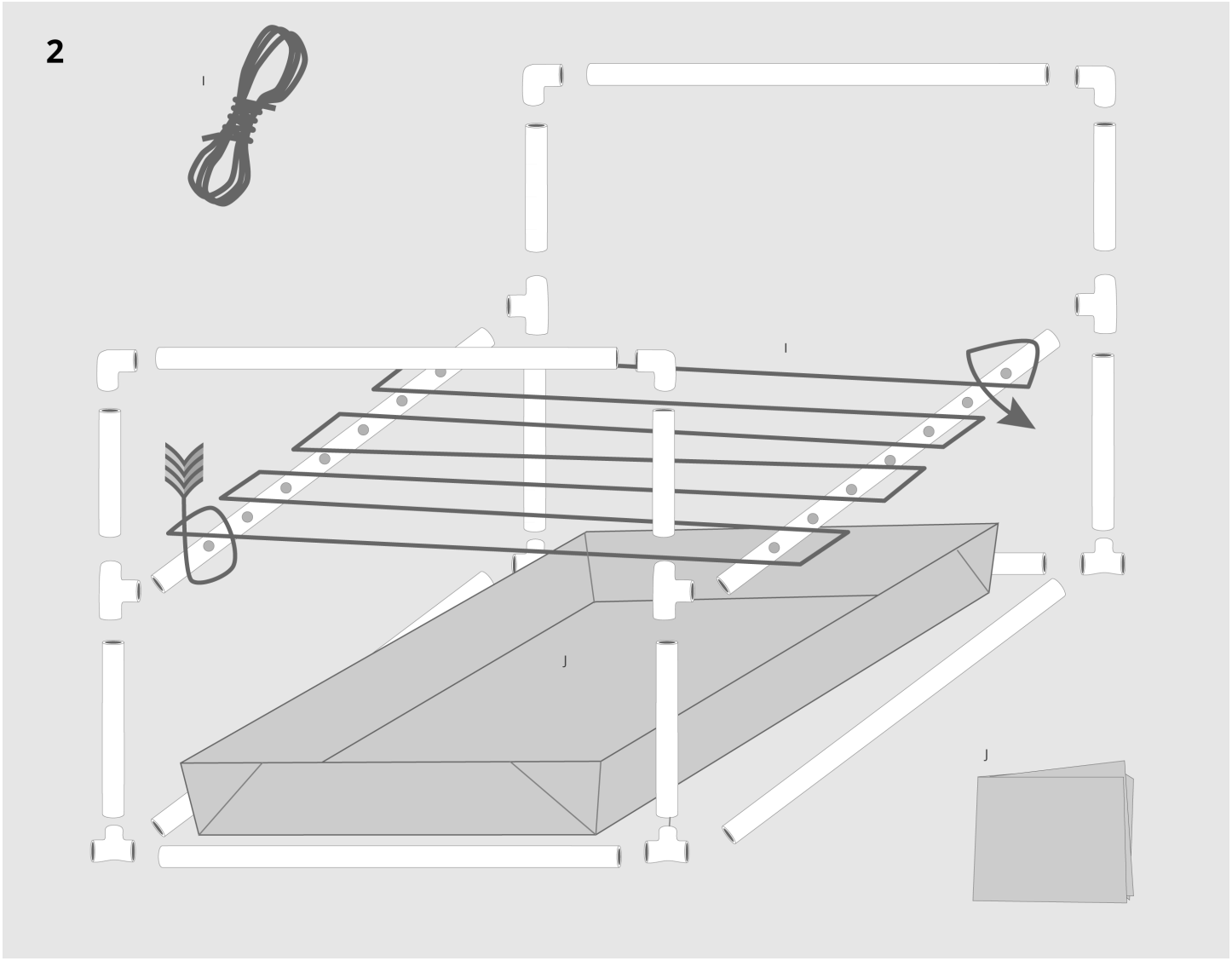
Assemble the Mealworm Farm Frame as shown above.

Be sure that pipe segments are pushed all the way into the fittings. A rubber or wood mallet can be used to help tap the frame tightly together. Using your body weight to press sections of the assembled frame firmly against the ground should be sufficient to fully fit the pipe segments.

The holes in the drilled 17 3/4” (F) segments should be parallel to the ground.

NOTE - The rope shelf may already be threaded and fastened to the two (F) segments. When assembled, this shelf should be stretched tightly across the frame. If the shelf is loose, follow the directions in Step 3 to re-fasten the shelf.

Step 2:



Form the Frass Collection Liner by folding the corners up where marked on the plastic, and then tape or staple the triangular flap to the side wall of the liner as seen in the illustration above.

If the rope shelf is not already strung between the drilled pipe segments (F) or is loose, feed one end of the rope through one of the end drilled holes. Feed the rope through the first hole, wrap twice around the pipe and tie tightly. Feed the rope through the remaining holes, weaving back and forth as show in the illustration above to form the shelf. Pull the rope tight one length at a time, starting at the knotted end until the entire shelf is taut, and the remaining length of rope is pulled firmly through the last drilled hole, in the opposite corner from the starting knot. While holding the tension, wrap the remaining length of rope twice around the pipe, and tie it off tightly.

Step 3:

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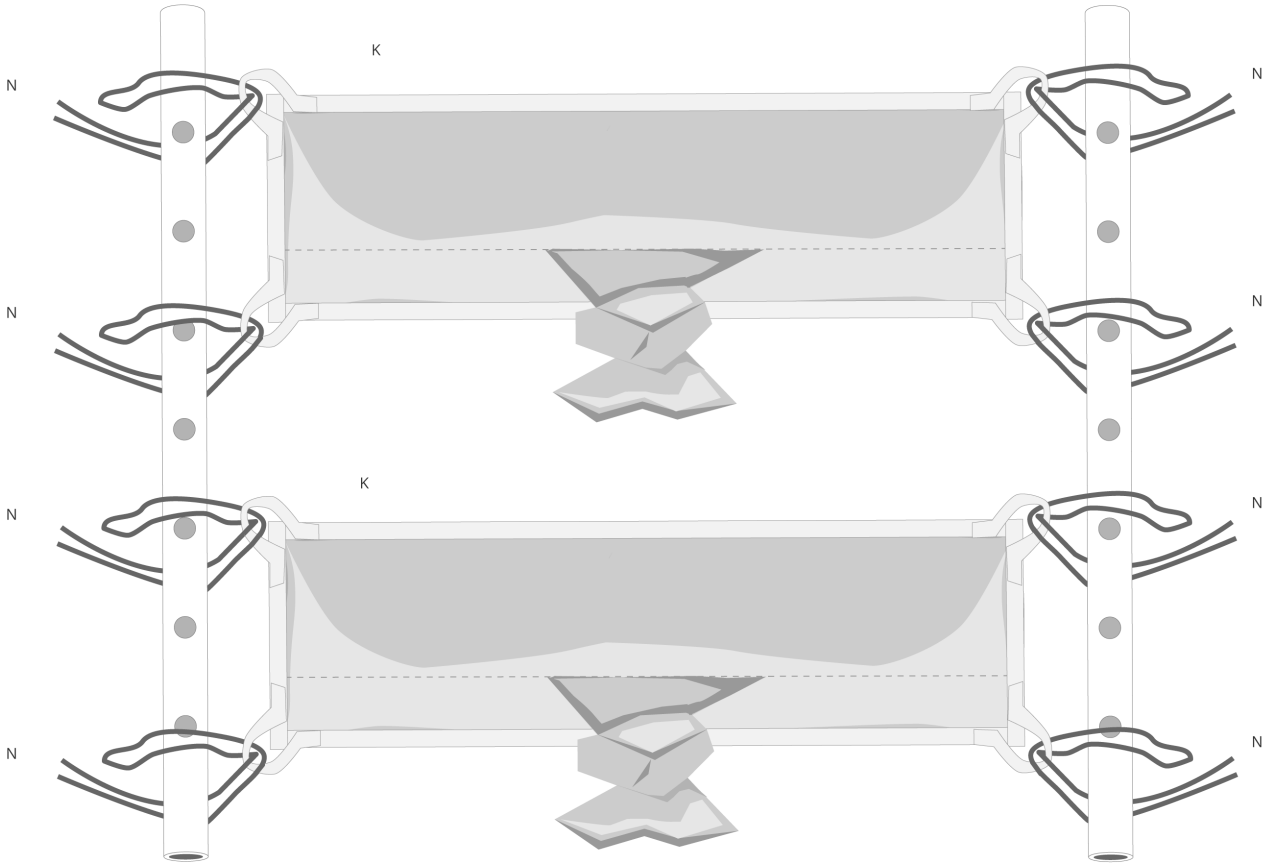
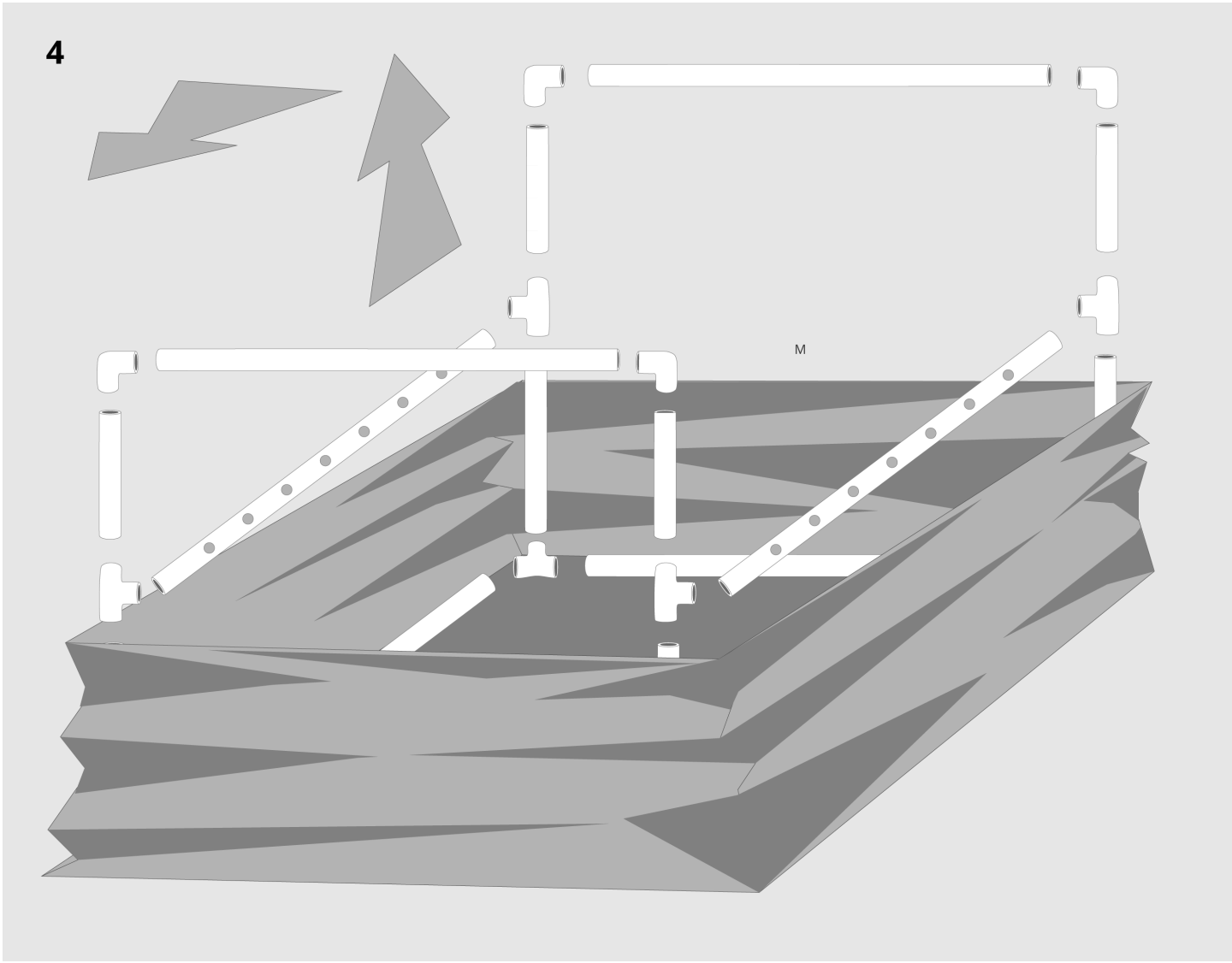


When you are ready to fill and hang your Mealworm Grow bag (per the general usage instructions), fill with bedding (i.e. wheat bran), and add your young worms. Gentle brush down the inner sides of the access sleeve to clear any worms that are clinging. Twist the sleeve closed and fasten shut by tying, or use string or a rubber band .

To hang the bags, double over lengths of Mounting Tie (N). One corner at a time feed the tie through the corner loop of the bag, and tie to the mid-height horizontal drilled pipe segments (F). The bags should be suspended fairly taut, avoid the top of the bag sagging.

Step 4:



To fit the tent around the kit, carefully set the assembled frame into the unzipped opening in the tent. Note that the frame and tent are not square, so you need to align the proper dimensions of the tent opening to the frame. Gently pull the sides of the tent evenly up around the frame, being careful not to catch the tent on fittings. The tent opens at the top for easy access to the breeder bins and the Grow Bag access sleeves. Fold over the top flap and use the zipper to close the tent. The tent does not necessarily need to be kept fully closed at all times. Partially opening the top flap can be used to manage airflow and temperature/humidity.

Description:

The Mealworm Kit v1.0 Beta is a complete setup for breeding and rearing a continuous production of up to 1kg of mealworms every 26 days given optimal conditions. The kit contains the following components:

Breeder and Nursery Bins (2x) - Simple, food safe plastic bins that provide a safe enclosure for your breeding adult beetles and subsequently a nursery for their eggs and the tiny hatchlings that emerge

Mealworm Grow Bag (2x) - The mesh habitat bags are your “pastures” where thousands of miniature worms are provided the space, bedding, food, and airflow necessary to grow up into large, healthy and harvestable mealworms. The hanging mesh bag design allows 360 degree airflow to prevent the buildup of growth-inhibiting carbon dioxide, and allows frass to passively filter out of the habitat, maintaining good hygiene for the contained worms.

Mealworm Farm Frame - The durable, light-weight frame constructed from PVC and polyethylene rope provides the structure from which to hang your Mealworm Grow Bags, and space to house the Breeder and Nursery Bins. The frame also comes with a frass collection liner to contain sifted frass and enable easy cleanup

Mealworm Farm Tent - Optional containment sleeve fits neatly around the Mealworm Farm Frame for improved humidity and temperature control, containing dust and keeping pests and curious pets away from your worms. There is an access sleeve available for air venting, or to allow power cords in for heating devices. The tent is made of high quality and durable rip-stop nylon with DWR (Durable Water Repellent) coating. This is the same material used for a modern camping rain-fly, rain jackets and wind-breakers. The water repellent coating protects against accidental liquid spills, and helps maintain the internal humidity level within the farm system.

Usage:

Breed your first stock:

The first step to starting up your farm is to breed your first harvestable generation. You will need about 200 adult beetles. You should buy a small starter stock of medium or large mealworms, they will soon be ready to pupate and turn into beetles. Buy some extra because not all pupae survive the transformation, particularly if the humidity is too low.

Place your mealworms in a Breeder and Nursery Bin with about 2 inches of bedding (organic wheat bran) and several slices of organic carrot/potato/apple/cabbage for moisture. Keep them at a steady temperature between 72 and 86 degrees Fahrenheit, and a relative humidity between 50-75%. Replace the moisture sources regularly to avoid mold growth. After a short time you will see the worms start to transform into pupae, which look like small, motionless white tear-drop shaped creatures. Over the course of 6-8 days the pupae will darken to a golden brown color, and then a lightly colored adult beetle will emerge. The adult beetle will darken over the next 4-7 days to a dark brown or black and after that time will be ready to breed. When raised in proper conditions, mealworm populations will tend to evenly distribute male/female, so any given sample should provide an appropriate breeding group.

Allow the adult beetles to mate and lay eggs for 1 week. The females lay small white eggs, about the size of a grain of sand, and each female will lay several hundred eggs if the humidity is maintained right around 75% RH. Be sure to provide fresh sources of moisture for the adult beetle to prevent cannibalism of the eggs (softer feeds like radishes and potatoes are particularly suitable for the adult beetles). After the allotted egg laying period, harvest the beetles and euthanize in the freezer to feed chickens or fish, or allow to continue their lifecycle in another breeder bin to seed a parallel population. The adults can live and breed for as long as 1-2 months.

NOTE: to start a continuous cycles, you will need a second batch of breeders starting 24 days after the initial batch, and a third batch starting 24 days after the second batch. You will harvest your first batch 24 days into the third batch's initial breeding cycle and reserve breeders for the next cycle. At this point the system's three parallel populations will be able to support continuous production.

Incubate the eggs:

After removing the beetles, incubate the bin with the eggs close to 86 degrees Fahrenheit, and 80% humidity. Eggs will hatch after 6-8 days, and the tiny hatchlings should be allowed to grow within the breeder bin for an additional week or so before transferring to the Mealworm Grow Bag. Check the size of your worms before adding to the bag to make sure they are large enough to be contained by the fine mesh.

Larval Growth:

Transfer the baby mealworms into a Mealworm Grow Bag that has been filled with bedding (organic wheat bran) and provide a small amount of moisture source (organic carrot/apple/potato/ etc.). In the bag habitats, carrots are a preferred source of moisture because they have a higher resistance to mold growth than potatoes and apples. Monitor mealworm growth and check for signs of mold growth. If any is detected, remove the surrounding area of bedding and replace with fresh meal. Mold can be avoided by regularly replacing moisture sources and avoiding over-feeding such to the young worms.

Maintain temperatures around 80-86 F and humidity close to 75%. As the worms grow they will consume greater quantities of moisture source quickly, and they will also generate more heat as they move through their bedding and past each other. You should monitor closely the temperature within the habitat if possible, to avoid local over-heating if the ambient temperature is too high to disperse the local heat generated by the worms' movement.

If during the course of their development, the worms consume all or most of their bedding, replace with additional bedding. The worms require the bedding as food, and as a medium to move around without too much direct contact with each other.

Harvest:

The worms should reach a harvestable size after about 35 days in the Mealworm Grow Bag. At this point the worms can be sorted from any remaining bedding and the exoskeleton skins that they have shed throughout their growth. Keep about 200 of your newly harvested worms and move to a Breeder Bin to seed your next generation. Your harvested worms may be euthanized and stored in the freezer, or fed live to pets and chickens. Mealworms may also be kept dormant around 40 degrees Fahrenheit (about the temperature in your refrigerator), and they should be removed from the fridge about once a week, allowed to warm up, and then fed with bran and moisture source (carrot/ potato/apple..) for about 12 hours before returning to the fridge. This tactic may also be effective for seeding your initial 3 generations from a single order of mealworms, but it should be noted that prolonged dormancy due to cold may also significantly delay pupation even after returning to normal temperatures.

Resources and Support:

Full support is available through the Mealworm Kit Support topic on the Open Bug Farm forum*, available at - **http://www.openbugfarm.com/forum.html#/categories/mealworm-kit-support**

These usage instructions and additional resources are available on the Open Bug Farm project wiki, available at - **https://github.com/TinyFarms/OpenBugFarm/wiki**

**To save time, please review the existing questions and discussions before posting a new question. There is a good chance someone has already asked your question and you can find the answer without waiting for us to respond.*

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