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| - | Materials       * This chart shows the effect of EMF on the plant height * This chart shows the control group height which got no EMF * This chart shows the root system width with EMF present * This chart shows the control group width which got no EMF     Procedure  A. List Materials  1.Scour your own dwelling and the dwellings about you for materials available for acquisition   * 1. Make complete list of materials that you already have obtained from you home   2. Obtain rest of materials from local hardware distributor   3. Lay materials in large area (garage) to determine if all necessary items are present      * 1. Getting Started   2. Make sure you have all necessary tools and safety items to ensure safe construction.   3. Make sure that a 120 V outlet is readily available for later use.   4. Terrarium Construction   Building Frame   * + 1. Take the 8ft. oak     2. Using the measuring tape mark off four 1í sections and two 2í sections with sharpie pen on oak boards     3. Secure wood in table vice     4. Cut wood on marks made using medium detail saw     5. You should now have six individual sections     6. Sand pieces using rough grain and the fine grain to make smooth surface   **Building Supports**   * + 1. Take 4ft. Pine     2. Mark off into four 1í sections for legs     3. Secure wood in table vice     4. Cut wood on marks using fine tooth saw, because softness of the pine a fine tooth saw was used to prevent it from splintering     5. Sand pieces first using the rough grain and then the fine grain to make smooth surface   **Combining Frame**   * + 1. Separate pieces into 2 different terrariums each consisting of two 1í oak sections, one 2í oak section, two 1í pine pieces     2. Lay down oak pieces in "U" shape with O" side facing ground and 2í section as base     3. Temporarily secure pieces in that shape using wood glue   **Attaching Lexan**   * + 1. Lay lexan over "U" shape(on both sides of both terrariums)     2. Should be a close fit     3. Using drill and 1/8" bit pre-drill 3 holes in each 1í oak piece and 4 holes in each 2í piece (be sure to do this on each side), the drill will subsequently drill through the lexan as well, this will prevent cracking     4. Use drill and Phillips bit to attach lexan to oak with wood screws in the pre-drilled holes that were just formed     5. The result is 2 long, tall, thin troughs with lexan sides to hold your experimental and control group   **Attaching Supports**   * + 1. Because of the relative instability of the terrariums, supports must be made perpendicular to base for support     2. Secure terrarium inverted in the table vise     3. Attach two 1í pine supports on opposite ends of terrarium using two deck screws for each support.     4. Now there are two completed terrariums   1. Adding Electromagnet (the following steps are for the experimental terrarium only)   **Creating Electromagnet**   * + 1. Take foundation studs and wrap 12ga. Insulated wire around it, make sure to leave 6in. loose wire on each end of bolt     2. Strip 1í of each end with stripper   **Placing Electromagnet**   * + 1. Using drill and 3/16í bit drill two holes in the base of each terrarium in the center for the wire to exit     2. Place bolt in terrarium and thread wire through holes drilled     3. Glue may be drizzled on magnet to hold it in place     4. Magnet is secured and centered in terrarium with two wires exiting the bottom   **Hooking Up Transformer, Magnet, and Timer**   * + 1. Move terrariums to growing area where conditions are optimal for growing of beans(direct sunlight)     2. Locate 120 V outlet within extension cords reach of growing area     3. Plug cord in to outlet and attach opposite end of cord to timer     4. Attach transformer to timer and set timer for 5 hours intervals daily for peak sunlight hours (9am-2pm)     5. Attach the two bare wires from terrarium to the two terminals of the transformer using the Phillips screwdriver     6. Set transformer to half power to keep from overheating     7. Now current will flow through the electromagnet * This photo shows the Transformer hooked up to the electromagnet that is imbedded under the soil in the terrarium   E. Vegetating Terrariums   * + 1. The following steps are for both terrariums     2. Add potting soil up to 3í from top of terrarium using trowel     3. Sprinkle fertilizer in terrarium as soil is added, Put in as much as the package says to add     4. Place 12 evenly slaced seeds in each terrarium against lexan so roots can be easily observed after germination     5. Place the seeds about one inch to two inches into the soil and cover them with soil     6. Moisten soil using water canister regularly   1. Collecting Data      1. Collect average length of central root every 5 days in cm. for both experimental and control groups until 40 day term is over      2. Collect average height of plants every 5 days in cm. For both control and experimental groups until 40 day term is over      3. Collect average with of root system every 5 days in cm for both control and experimental groups until 40 day term is over      4. Use camera and camcorder to record the progress of the experiment to help compare data sets            * We noticed the greatest root system deviation in this data set | |
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