TOY DOGHOUSE

Submitted By

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Justifications

Aesthetics

Why construct it so?

I shaped the toy doghouse like a house is important because it makes our playtime more realistic and fun. It helps children imagine what it would be like to have a real dog and take care of it in a home setting. When the doghouse looks like a house, it is easier to play and organize our toys inside. We can pretend to be responsible pet owners and create different stories and adventures. It just makes playtime more exciting and allows us to use our imagination in a cool and enjoyable way.

Why use paint?

Using paint when making a toy doghouse out of plywood is a promising idea for a few reasons. First, paint helps protect the plywood from damage like moisture and sunlight. It makes the doghouse look nicer and more colorful too. You can choose your favorite colors and make it unique. Paint also makes it easier to clean and keep the doghouse looking good. So, painting the plywood doghouse makes it last longer, look better, and adds an individualized touch.

Materials

Why use plywood? 

Using plywood to construct a toy doghouse is an excellent choice for a few reasons. First, plywood is strong and durable, so it can handle rough play and last a long time. It won't easily break or get damaged, which means the doghouse will stay in decent shape for a while. Second, plywood is a safe material for toys because it does not have harmful chemicals. This means you can play with the doghouse without worrying about getting sick.

Why use acrylic for the mechanism?

Acrylic is an excellent choice for the mechanism in a toy doghouse because it is lightweight, durable, and transparent. It allows for smooth and reliable movement, while also supplying visual engagement. Acrylic is easy to shape, resistant to moisture, and safe for children to play with. Overall, it enhances the durability, functionality, and safety of the toy doghouse.

Skills

What skills do you need?

I need to Design ,plan ,sand, glue, solder, paint to create the toy dog house and make sure I keep in deadline when my project is due.

Sustainability

The wood is Easily pliable and can be used in future projects.

The door mechanism can be reused in later projects.

Functionality

The mechanisms used less time to create when putting them together when I designed it like this.

This gave more room for the dog to move in and out of the toy dog house.

Electronics

I used a parallel circuit when powering a mechanism is useful because it allows for independent operation, stable voltage supply, balanced current distribution, easy troubleshooting, flexibility for expansion, and enhanced safety.

Manufacturing sequence

Body of the doghouse

1. Design and Planning:
   * I start by visualizing and sketching the design of the toy doghouse
   * I determine the size of the roof, additional features, and any other components based on my intentions
2. Material Preparation:
   * I gather plywood sheets with a thickness of 10mm.
   * I measure and mark the dimensions of the side panels and floor on the plywood sheets.
   * Using a straight edge or ruler, I ensure accurate marking.
3. Cutting with a Scroll Saw:
   * Using a scroll saw, I carefully follow the marked lines to cut out the side panels and floor.
   * I pay close attention to the cutting line, ensuring precision and accuracy.
4. Sanding:
   * I use a sander or sandpaper with appropriate grit to smooth the cut edges and surfaces of the side panels and floor.
   * I sand both sides and the edges, ensuring the removal of any rough spots or splinters.
   * My goal is to achieve a smooth and even finish on the panels and floor.
5. Assembly:
   * I start by applying wood glue to the edges of the side panels.
   * Aligning the side panels with the edges of the floor, I press them together firmly.
   * I allow sufficient drying time for a strong bond.
6. Roof Installation:
   * I measure and mark the dimensions of the roof on a separate piece of plywood, considering the overall design.
   * Using a scroll saw, I carefully cut out the roof panel, following the marked lines.
   * I use a sander or sandpaper to smooth the cut edges and surfaces of the roof panel.
   * Applying wood glue to the top edges of the side panels, I carefully place the roof panel on top.
7. Finishing Touches:
   * I look at the toy doghouse for any imperfections, rough edges, or splinters.
   * If needed, I use sandpaper to further smooth any rough spots.
   * Depending on my preference, I apply paint, stain, or sealant to protect and enhance the appearance of the wood.
   * I follow the instructions provided with the chosen finish and allow it to dry completely.

 Door’s mechanism

1. Gather Materials:
   * I gather the materials needed for the project: two 360-degree motors, door panels (previously cut from plywood), hinges, super glue, wires, plug, soldering iron, solder, glue gun.
2. Prepare the Door Panels:
   * I check that the door panels are the correct size and fit properly within the frame of the toy doghouse.
   * If needed, I use sandpaper to smooth any rough edges and surfaces of the door panels.
3. Attach Hinges:
   * I determine the desired position for the doors within the toy doghouse.
   * I Applied a small amount of glue to one side of each hinge with a glue gun, I carefully position them on one side of the door panels.
   * I press the hinges firmly against the door panels and hold them in place for a few moments to allow the glue to bond securely.
4. Install Motors:
   * I choose a suitable location on the doghouse frame to mount the motors.
   * Applying a small amount of super glue to the motor mounting points, I carefully position and press the motors onto the frame.
   * I hold the motors in place for a few moments to allow the super glue to bond securely.
5. Connect Wiring:
   * Using wires, I connect the positive and negative terminals of each motor to the battery snap connector.
   * I ensure the connections are secure and well-insulated, using solder if necessary.
6. Test the Door Mechanism:
   * I turn on the power source to activate the motors.
   * I observe the movement of the doors as the motors rotate.
   * I ensure that the doors open and close smoothly without any obstructions or interference.
7. Adjustments and Fine-Tuning:
   * If needed, I make any necessary adjustments to the motor positions or hinge alignments to improve the door movement.
   * I ensure that the doors open and close symmetrically and align properly within the dog house frame

Quick return mechanism

1. Gather Materials:
   * I gather the materials needed for the project acrylic, screws, a motor, a screwdriver , a cylindrical piece of wood and a few blocks of wood to elevate the motor.
2. Prepare the Acrylic:

* I determine the size of my acrylic by the width of the doghouse and make it around the same size since it’s a quick return mechanism I find the measurements of two parts of acrylic.
* I use the scroll saw to cut out the longer piece of acrylic.
* I use the CNC router to cut out the other piece of acrylic with a hole that can fit on the motor.
* I use the pillar drill to drill holes on to both pieces of acrylic only on one side in the shorter piece of acrylic but on both sides for the longer piece of acrylic.
* I use the sander to smoothen out any rough surfaces on the acrylic.

1. Attach the Pieces of Acrylic and cylindrical piece of wood:

* I attach the long piece of acrylic to the short piece o acrylic using nuts and bolts.
* I attach the long piece of acrylic now secured to the short piece acrylic to the cylindrical piece of wood.

1. Attach the Motor:
   * I identify the location where I want to attach the to the base of my doghouse.
   * I glued three to four blocks of wood around the same size of my motor and placed it where I want my motor to be.
   * I attached the motor to the blocks of wood which was attached to the base of my project.
2. Connect the Motor to the Quick Return Mechanism:
   * I connect the motor's rotating shaft to the end of the short acrylic piece
   * I ensure a secure connection that allows the motor's rotation to transfer to the quick return mechanism.
3. Attach the Toy Dog:
   * I determine the desired position of the toy dog on the quick return mechanism.
   * Using pen, I mark the area where my dog is going to be attached.
   * I align it together, using super glue I attach the toy dog to the cylindrical piece of wood.
   * I press down on it for the an appropriate amount of time for it to bond securely.
4. Test the Quick Return Mechanism:
   * I activate the motor and observe the movement of the quick return mechanism and the toy dog.
   * I make any necessary adjustments or modifications to ensure smooth and efficient movement.
   * I test the mechanism multiple times to ensure its functionality and stability.

Evaluation

The body of the toy doghouse

* I got a few measurements off on the side panel of the doghouse when graphing the size on the plywood and cut off more than needed off, but I used a few scrap pieces of plywood and attached it on.
* The roof attachments had a clean finish of a dark green one of the signature colours of Pluto the dog and the measurements were precise.
* When I cut some pieces of wood some of the edges had a slight curvature but I used the sander to straighten the edges.

The door mechanism

* I changed the position of the motors to be against the wall, so it had more structural support and doesn’t move.
* I used the glue gun instead of screws to attach the hinges of the door since screws were hindering the movement of the doors.

The quick return mechanism

* The toy dog was not moving in a straight vertical line, so I put down two pieces of wood on both sides of the quick return mechanism.
* The quick return mechanism was jammed due to the length of the shorter piece of acrylic I used the scroll saw to shorten it down for a more smooth movement.