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Discovery Kids 1017789

Discovery Bionic Hand Robotics Kit - Instruction Manual

Model: 1017789 | Brand: Discovery Kids

INTRODUCTION

The Discovery Bionic Hand Robotics Kit is an 87-piece do-it-yourself (DIY) STEM kit designed to introduce users to the principles of robotics, hydraulics, and engineering. This kit allows for the construction of a wearable robotic hand that mimics natural movement through a system of pulleys and hydraulic mechanisms. It features an adjustable design to fit various hand sizes and includes a targeting light for enhanced interaction. This manual provides detailed instructions for assembly, operation, maintenance, and troubleshooting to ensure a successful and educational experience.

SAFETY INFORMATION

- Recommended for ages 8 and up. Adult supervision is advised during assembly and initial use.
- This kit contains small parts which may pose a choking hazard for young children. Keep all components out of reach of children under 3 years old.
- Handle all tools and components with care.
- Do not modify the kit components or use them for purposes other than intended.
- Ensure all connections are secure during assembly to prevent parts from detaching during use.
- The targeting light requires 2 AAA batteries (not included). Ensure batteries are inserted correctly and dispose of used batteries responsibly.

PACKAGE CONTENTS

Verify that all components listed below are present before beginning assembly.



Image: All components of the Bionic Hand kit, including the main hand frame, finger segments, hydraulic syringes, tubes, and various connectors.

- Main Hand Frame (clear blue plastic)
- Finger Segments (white and blue, multiple pieces)
- Hydraulic Syringes and Tubing
- Finger Rings and Control Levers
- Targeting Light Module
- Various Connectors, Pins, and Screws
- Foam Pads
- Instruction Guide (this manual)
- Screwdriver

ASSEMBLY INSTRUCTIONS

Follow these steps carefully to assemble your Discovery Bionic Hand. Refer to the included full-color engineering guide for detailed diagrams.

Step 1: Prepare the Finger Segments

Connect the individual white and blue finger segments according to the diagrams in the instruction guide. Ensure all pivot points are correctly aligned and secured.



Image: Partial assembly of the bionic hand, showing finger segments being connected with the instruction manual visible.

Step 2: Attach Fingers to the Main Frame

Carefully attach the assembled finger units to the main clear blue hand frame. Pay close attention to the orientation of each finger (thumb, index, middle, ring, pinky) as specified in the guide. Secure them using the provided pins or screws.

Step 3: Install Hydraulic System

Connect the hydraulic syringes and tubing to the corresponding finger mechanisms and the control levers. Ensure the tubing is securely attached to prevent leaks and allow for proper hydraulic function. The thumb mechanism uses a separate hydraulic system for its unique movement.

Your browser does not support the video tag.

Video: A demonstration of the assembly process and the bionic hand's functionality, including the hydraulic system and finger movement.

Step 4: Mount the Targeting Light

Install the targeting light module onto the back of the hand frame. Insert 2 AAA batteries (not included) into

the battery compartment. Test the light by pressing the activation button.

Step 5: Final Adjustments and Wear

Attach the foam pads to the inside of the hand frame for comfort. Adjust the wrist strap and finger rings to fit your hand. The kit is designed to be worn on either the left or right hand, depending on how it is assembled.



Image: The completed Bionic Hand, ready for use, displayed alongside its packaging.

OPERATING INSTRUCTIONS

Once assembled, the Bionic Hand is operated by inserting your fingers into the control rings and manipulating the hydraulic levers.

Controlling Finger Movement

- Place your fingers into the corresponding rings on the control mechanism.
- To close a robotic finger, pull the associated finger ring towards your palm. This action activates the hydraulic system, causing the robotic finger to bend.

- To open a robotic finger, release the finger ring. Springs within the mechanism will return the finger to its extended position.
- The thumb operates similarly but may have a slightly different feel due to its unique hydraulic design.



Image: The bionic hand gripping a water bottle, showcasing its functional grasp.



Image: The bionic hand holding a tennis ball, illustrating its grip on a round object.

Using the Targeting Light

- Press the button located on the top of the hand frame to activate the targeting light.
- The light is designed to assist with aiming and focus during play.
- To conserve battery life, turn off the targeting light when not in use.



Image: The bionic hand with its targeting light activated, emitting a green beam.

MAINTENANCE

- Keep the Bionic Hand clean by wiping it with a dry or slightly damp cloth. Do not immerse in water.
- Regularly check all connections and pivot points for looseness. Tighten screws as needed.
- If finger segments detach, reattach them by carefully aligning the pins and pressing firmly until they click into place.
- Replace AAA batteries for the targeting light when it dims or stops working.
- Store the kit in a cool, dry place away from direct sunlight to prevent material degradation.

TROUBLESHOOTING

Fingers Not Moving Smoothly or Detaching

- **Issue:** Fingers pop off or do not stay locked.
- **Solution:** Ensure all finger segments are fully clicked into their respective slots. Check for any debris obstructing the connections. Re-insert detached fingers firmly.
- **Issue:** Fingers are stiff or do not retract properly.

- **Solution:** Verify that the hydraulic tubing is not kinked or obstructed. Ensure the finger rings are not too tight on your fingers, allowing for full range of motion.

Thumb Mechanism Malfunction

- **Issue:** The hydraulic thumb does not actuate or hold position.
- **Solution:** This may indicate a vacuum leak in the syringe or tubing. Check all connections for the thumb's hydraulic system to ensure they are airtight. Re-seat the tubing if necessary.

Targeting Light Not Working

- **Issue:** The targeting light does not turn on.
- **Solution:** Check if the 2 AAA batteries are inserted correctly with the correct polarity. Replace with fresh batteries if needed. Ensure the battery compartment cover is securely closed.

SPECIFICATIONS

- **Product Dimensions:** 10 x 2.75 x 11 inches
- **Item Weight:** 1 pound
- **Model Number:** 1017789
- **Manufacturer Recommended Age:** 8 years and up
- **Batteries Required:** 2 AAA batteries (for targeting light, not included)
- **Number of Pieces:** 87
- **Key Features:** Wearable design, hydraulic operation, adjustable fit, targeting light.

WARRANTY AND SUPPORT

For questions regarding the Discovery Bionic Hand Robotics Kit, please refer to the contact information provided on the product packaging or the official Discovery Kids website. Please retain your proof of purchase for any warranty claims. Specific warranty details are typically included with the product packaging.