# Required Components

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| *Diagram of components. 1: Spinning Wand Toy. 2: 3D printed base. 3: 3d printed base cover. 4: 3.5 mm mono jack. 5: 2 lengths of 20 cm long wire.* | **BOM**   1. Spinning Wand Toy 2. 3D Printed Base 3. 3D Printed Base Bottom Cover 4. 3.5 mm Mono jack 5. 2X 20 cm 26AWG multi-core wire or stranded wire (24-26 AWG) |

# Required Tools

* #0 Phillips Screwdriver
* Flat head screwdriver
* Soldering Iron
* Hot Glue Gun
* Solder
* Hot Glue Sticks
* Super Glue

# Required Personal Protective Equipment (PPE)

* Safety Glasses

# Assembly Instructions

## Step 1

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| Loosen the screw and remove the battery cover and batteries.  **CAUTION!** The springs on the battery contacts may cause the batteries to be ejected forcibly. | Picture of spinning wand showing single screw on the bottom battery cover. |

## Step 2

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| Unscrew the four (4) screws on the back of the Spinning Light Wand. Reference the image below. Store the screws for later reassembly.  CAUTION! Don’t lose the screws. | Picture showing location of 4 screws that hold wand handle together. |

## Step 3

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| Gently pry apart the two halves of the handle along the seam using a flat head screwdriver. | Picture showing wand handle separated into two halves. |

## Step 4

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| Remove the screw holding the motor down. marked in photo and remove the piece of metal contact. Keep the screw for later reassembly.  CAUTION! Don’t lose the screw or the metal contact. | Picture showing location of single screw holding down metal motor contact. |

## Step 5

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| Gently pry the clear globe free from the button half of the handle The motor and the clear globe is part of the same assembly, carefully lay all the part out, and try and avoid putting strain on any of the solder joints. | Picture of half of the wand showing a screwdriver being used to gently pry the clear globe off the plastic base.Picture showing the two halves of the wand separated and the globe assembly removed. |

## Step 6

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| De-solder the wires at points marked on the photo. For the bottom red wire, it may be easier to you unscrew and remove the metal clip from the plastic shell first | Picture showing the location to de-solder wires from the battery terminals. The lower terminal on the side with the button and the upper terminal on the other side.Picture showing the screw holding down the lower terminal on the button side being removed. |

## Step 7

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| Unscrew the screws attached to the yellow piece shown below. Remove and discard the entire button assembly. They are no longer needed. | Picture showing the two screws that hold a plastic bar to retain the switch being removed. |

## Step 8

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| Split 5 cm of the wires. If you are using multi-conductor wire, strip the red wire. | Picture of two pieces of wires being stripped with a wire stripper. |

## Step 9

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| Solder the red wire to the bottom metal clip and route the wire as shown below. | Picture showing the red wire soldered to the lower battery terminal on the button hole side. |

## Step 10

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| Trim back the black wire, the length of black wire should reach the battery clips in the middle of the handle. Strip the black wire. | Picture showing the black wire being trimmed to length. |

## Step 11

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| Solder the black wire to the battery clip. | Picture showing black wire solder to battery terminal on non-button side. |

## Step 12

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| Thread the wires through the hole that the button occupied. Avoid leaving too much slack on the wires inside as it might interfere with the moving bits. | Picture showing the wires soldered to the battery terminals being threaded through the button hole and outside the wand. |
| Route the wires through the inside of the handle as shown. | Picture showing the inside of the button-side of the wand. The wires from the battery terminal are routed to the left of the motor contact screw boss, to the upper left of the wand and then through the button hole. |

## Step 13

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| Apply hot glue to fill up space between the wire and the hole, to add strain relief to the wire | Picture showing hot glue gun being used to add hot glue to button hole around wires to provide strain relief. |

## Step 14

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| Start reassembling the wand by putting the globe and motor assembly back into the half of the handle with the button hole. Note the alignment of the motor and the clear globe. See photos. | Photo showing globe being reinserted into wand handle. Looking down into the button-hole side of the wand, with the button-hole oriented to the top, the flat portion of motor is oriented to the left.Photo showing globe being reinserted into non-button side of wand. A small gap in the globe portion fits into a matching portion on the wand handle. |

## Step 15

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| Reattach the L-shaped metal contact. Replace the screw. | Photo showing L-shaped motor contact being reattached with screw into boss. |

## Step 16

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| Snap the handle closed, being careful not to pinch any wires inside. Replace all four screws. Re-insert the battery and tighten the battery cover screw. | Photo showing the wand being reassembled and the 4 screws being reinserted to connect the two halves of the wand. |

## Step 17

Test the switch adaptation.  
Strip the other end of the wire and touch them together. If all goes well, the motor should spin and the light would come on. If not, re-open the handle and check:

* wiring: no cold solder joints or frayed/pinched wires
* mechanical interference: now wires are rubbing on the axle
* the L-shaped metal piece is making good contact against the spring on the motor axle.

## Step 18

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| Slide the wand into the stand. Make sure the battery cover is lined up with the opening in the stand. | Photo of wand being inserted into the base. The battery cover in the wand should line up with the hole in the base.Photo of wand inserted into the base. The battery cover in the wand should line up with the hole in the base. |

## Step 19

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| Thread the wire through the opening of the stand. Solder the wires to a mono jack as shown in photo. The wires should attach to the tip and sleeve contacts on the jack. | Picture showing the wires coming out of the button hole being routed down through the hole in the base.Picture showing the wires being soldered to the jack. |

## Step 20

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| Insert the jack into the hole in the base. Thread on the nut to secure the jack in place. | Picture showing the jack inserted into the base with the nut attached. |

## Step 21

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| Superglue something heavy like two hex nuts to the Base Bottom Cover to weigh the stand down. | Picture of the base bottom cover with two nuts being superglued on either side of the coin protrusion. |

## Step 22

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| Assemble the base bottom cover into the base. |  |