Voyager: Water Rocket Instructional Guide

Materials Needed:

- 1 x 2-litre Tesco lemonade bottle (empty and label removed)
- Super glue or hot glue
- 3D-printed nose cone or corrugated plastic
- Weight (~27-28 grams)
- Fin sleeve (3D-printed or made from corrugated plastic)
- Tape or glue
- Micro: bit or altimeter (optional)
- Bottle cap
- Drill or file
- Gardena Profi system hose nozzle
- Epoxy resin

Step-by-Step Construction Instructions

1. **Prepare the Bottle:**
    - Purchase a 2-litre Tesco lemonade bottle.
    - Empty the contents and remove the label to reduce drag and for better aesthetics.
2. **Create the Nose Cone:**
    - If using a 3D-printed nose cone, apply approximately 27-28 grams of weight into the tip using super glue or hot glue. This ensures the rocket flies in a straight path.
    - If you do not have access to a 3D printer, you can cut and assemble a nose cone from corrugated plastic. Shape it to a conical form and use tape to hold it together.

3. **Install the Fin Sleeve:**
    - If using a 3D-printed fin sleeve, slide it over the bottle near the base and fix it in place with tape or glue.
    - **Making a Fin Sleeve (Without a 3D Printer):**
        - Cut a strip of corrugated plastic to fit around the bottle.
        - Cut out three or four equally sized fins from the same material.
        - Attach the fins evenly spaced onto the sleeve using glue or strong tape.
        - Slide the finished sleeve onto the bottle and secure it.
4. **Attach the Nose Cone:**
    - Carefully slip the nose cone over the bottom of the bottle (which acts as the front end during flight).
    - Ensure it is snug and aligned correctly for aerodynamic stability.
5. **Micro:bit or Altimeter Installation (Optional):**
    - If using a Micro:bit or altimeter to record flight data, install it before attaching the nose cone:
        - Use a small foam or 3D-printed mount to hold the device inside the nose cone.
        - Secure it using zip ties, tape, or additional padding to prevent movement.
        - Ensure sensors are exposed as needed and the weight remains balanced.
6. **Create the Nozzle:**
    - Take the bottle cap and drill or file a hole in its center to fit the Gardena Profi hose nozzle.
    - Apply epoxy resin to glue the cap securely into the threaded side of the hose nozzle.
    - Let it dry completely before screwing the assembled nozzle onto your rocket.