How to Build a Vine Robot: The 1-Minute Vine Robot

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How to Build a 1-Minute Vine Robot

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Step 1: Prepare the Robot Body

1. Cut 2 feet of plastic from the roll

2. Using a permanent marker, mark straight line at 1” from both ends. One of the ends must be marked all around (as shown by the right end in Figure 2).

Quality Check:
- Make sure your 1” pocket is actually sealed completely (must be airtight)
- You can inflate the tube to check, if necessary
Step 2: Attach the Air Supply Tubing

1. Insert the air supply tube into the unsealed end of the robot (~1 inch into the plastic).

2. Wrap tape around the end of the robot body to create an airtight seal and secure the air supply tube.

3. Increase the air pressure to about 1 psi to inflate the tube and make it easier to inflate.

Warning:
- If the plastic roll inflates too much and seems like it will pop, reduce the pressure applied.
Step 3: Add Turns

Adding a turn works by shortening one side of the robot. This allows the robot to turn in the direction of the shortened side.

1. Create a 1 inch (~2.5cm) fold in the outstretched and deflated robot body.
2. Cut a piece of red tape and place it as shown in Figure 2.
3. Lay the fold flat and tape it down. Make sure the tape has a firm grip.

General Advice:
- The red tape is double sided, so the non-stick protective side may come off during eversion and stick to the inside of the robot.
- Before applying the tape to the robot, apply the tape to a piece of the spare plastic roll to make that side “non-stick” and cut the desired length. One side should now have the plastic stuck to it and the other side the removable red cover (use this side to join parts in the robot).
Step 4: Invert the Robot

1. Fold the tip of the robot into itself.
2. Use a rod to fully invert the robot.
Step 5: Grow the Robot

1. Evert the robot.
2. Increase the pressure to ~1-2psi to grow the robot.
3. You now have a turn!

Alternative:
- You can also inflate the robot, enforce the bend you would like by hand, and apply the tape to hold the robot in that shape.
- This method works for when you do not know where to place a turn.