Yeast Mobile Kit

TeacherGeek.com™

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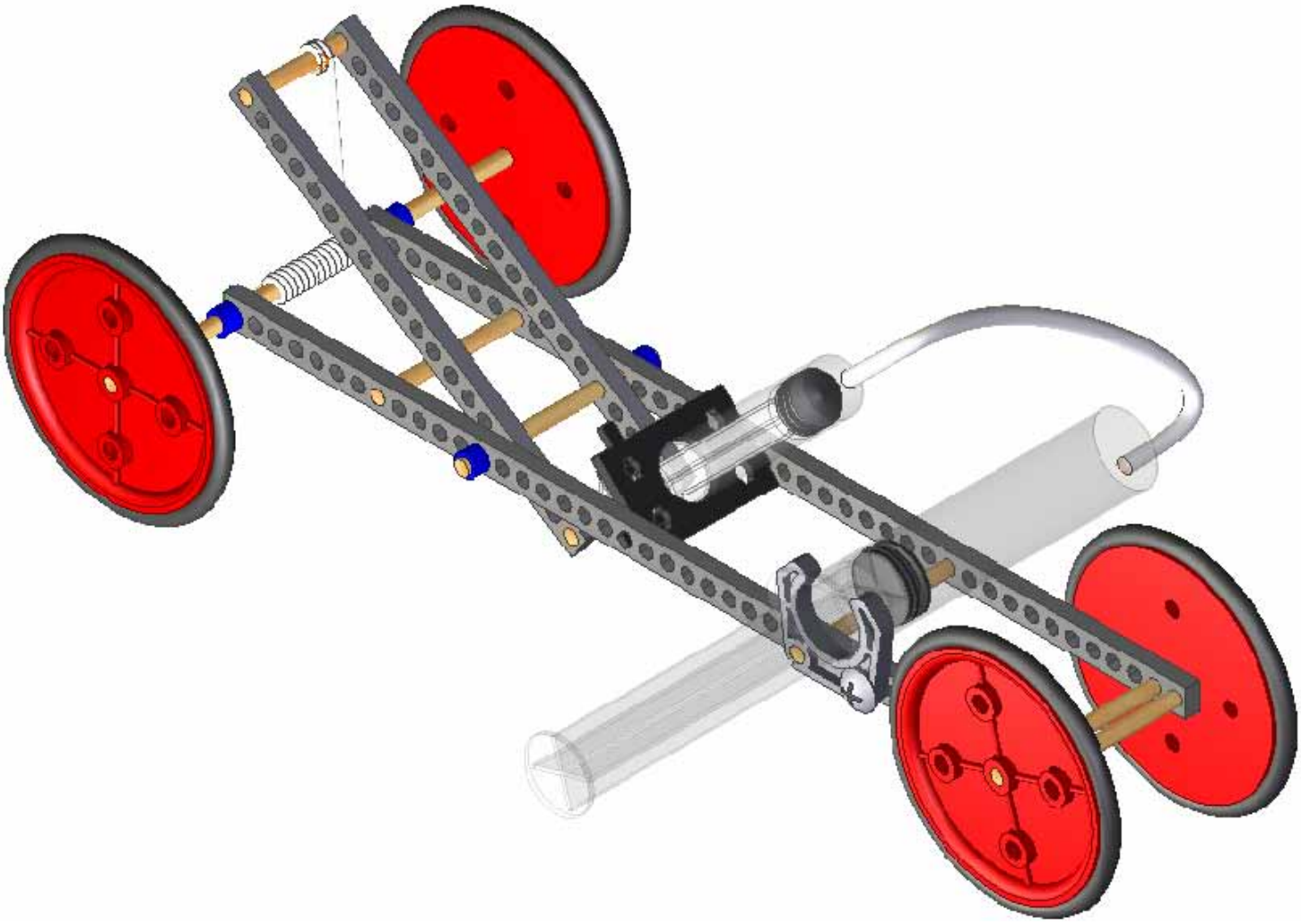

Unleash Your Creativity!

10 Pack- Yeast Mobile Kit parts List

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"Kit" Can Be a Bad Word:

Don't think of this as a kit. Think of it as a bag full of endless solutions. Although the end of this guide contains step-by-step instructions for creating a Yeast Mobile, we encourage you (your students) to try and develop new and different designs.

Because, in design and engineering, there is never one right answer…

TeacherGeek Easy Engineering Series products are designed to encourage innovation and alternative designs. We encourage you to use the Easy Engineering Components to create your own brilliant solutions.

Because, your first idea is rarely your best…

TeacherGeek Easy Engineering Series products are designed to be redesigned; they allow you to quickly change and evolve your designs.

Because, possibilities are endless…

TeacherGeek Easy Engineering Components can be easily combined with other materials and products (Raid the recycling bin, wood, metal, broken toys, etc.)

Suggested Tools

Pliers

Cutter: Multi-cutters, pruning shears or a saw

Safety Glasses

Reamer or 15/64 / 6mm drill bit

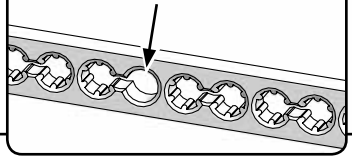
Screw Driver

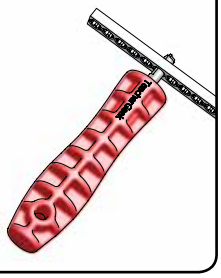
When to Ream Holes

Only ream holes indicated with this icon: ⊕

Do not ream any other holes.

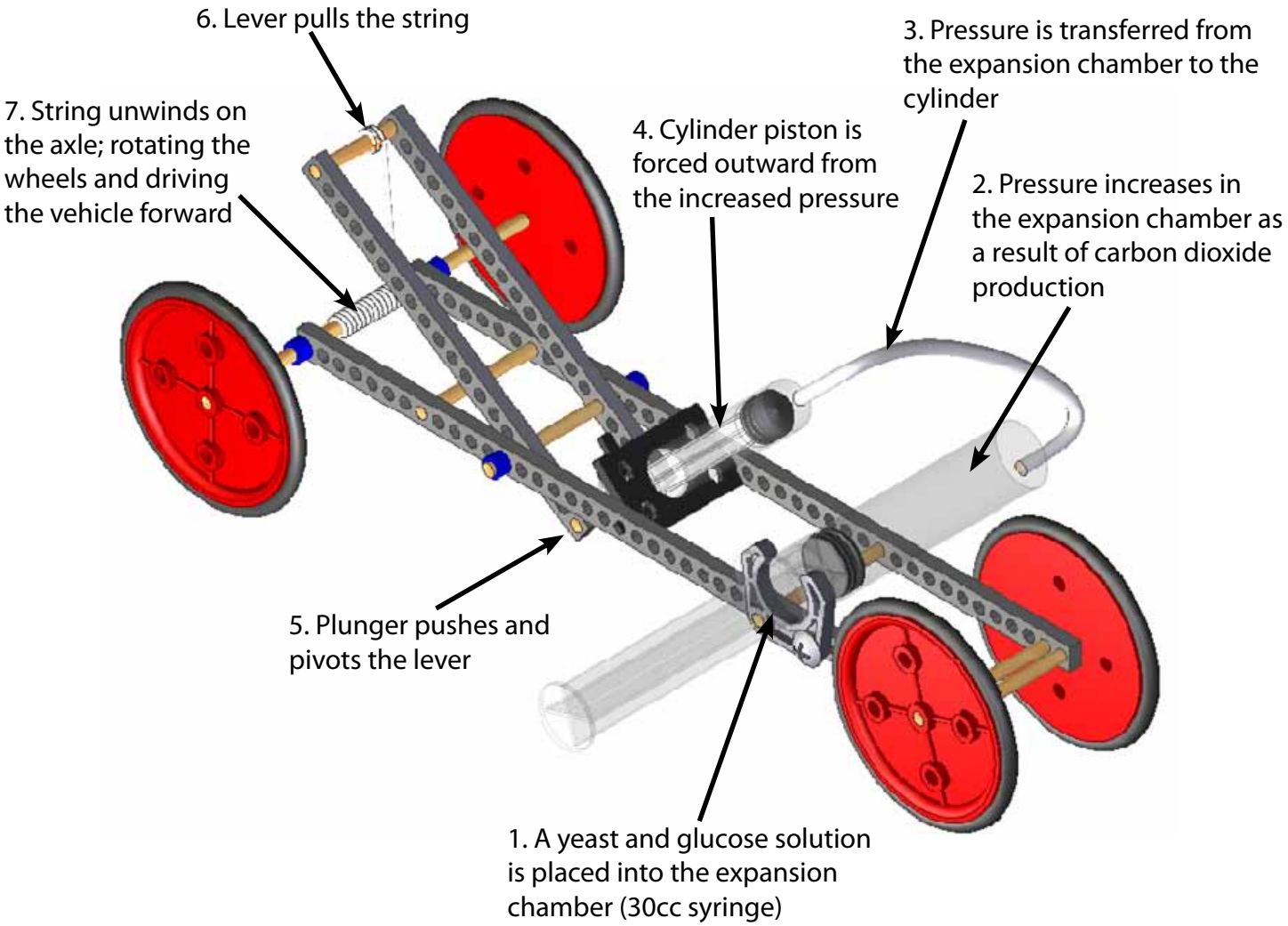
Reamed holes provide a loose fit for dowels





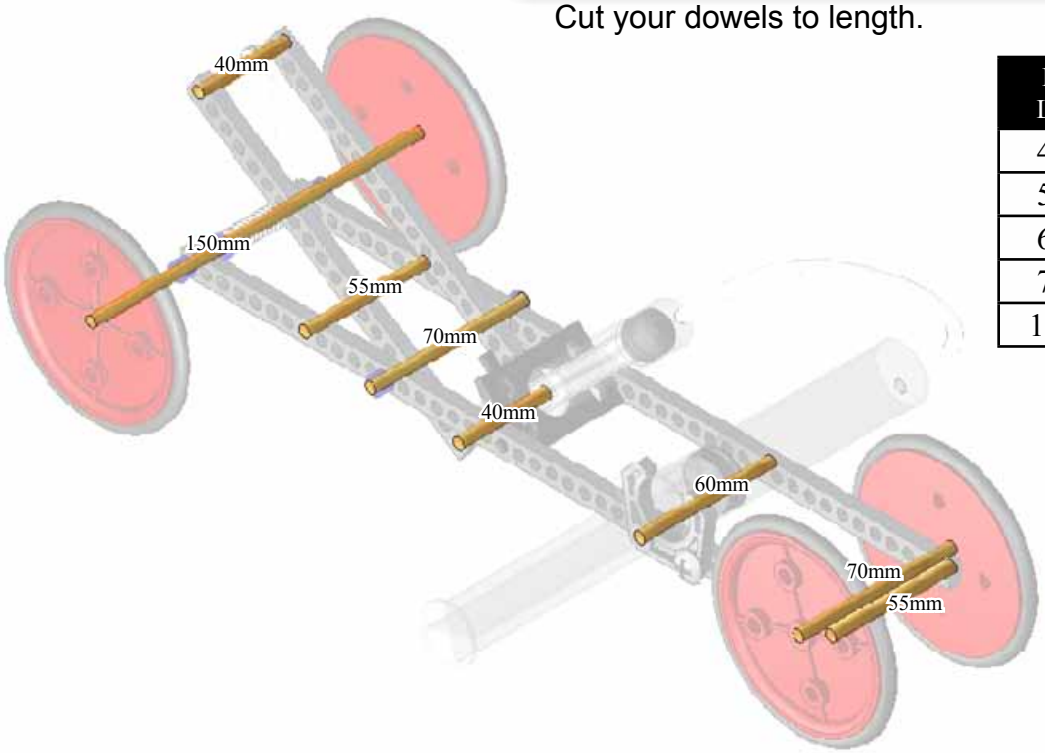
An enzyme contained in yeast converts a sugar (glucose) solution into carbon dioxide and alcohol (ethanol). The carbon dioxide generated by the yeast creates the pressure to power the vehicle.

glucose + yeast = carbon dioxide + ethanol



Step 1: Cutting Dowels

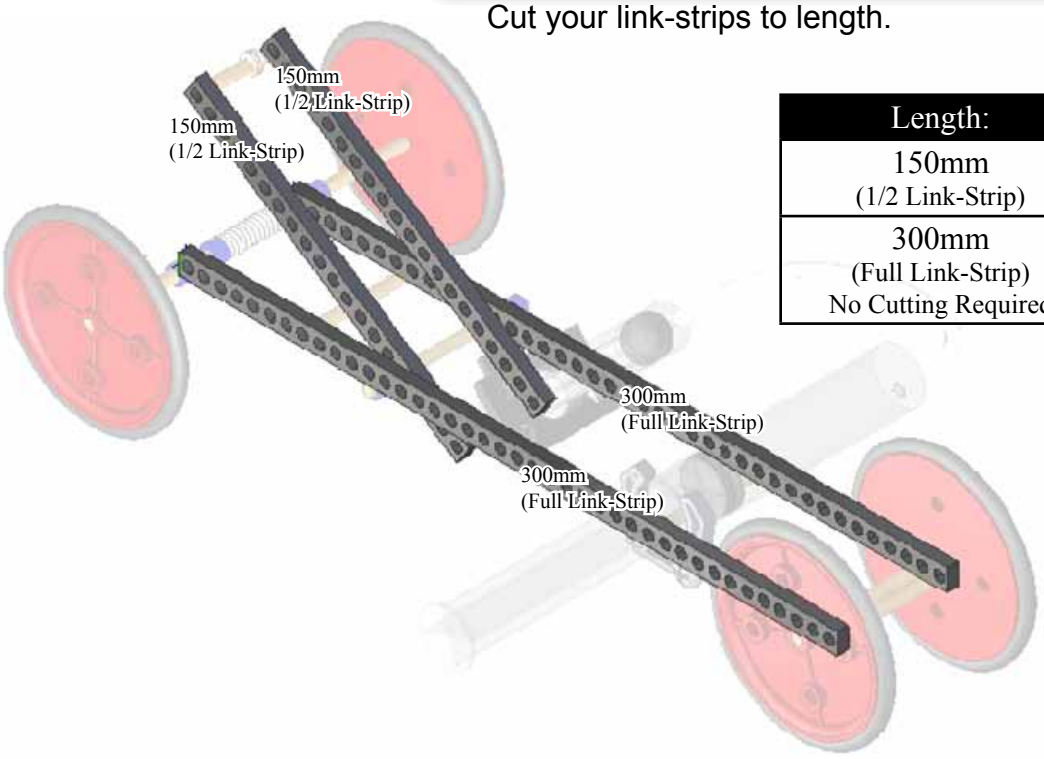
Cut your dowels to length.



Dowel Length:	Dowel Quantity:
40mm	2
55mm	2
60mm	1
70mm	2
150mm	1

Step 2: Cutting Link-Strips

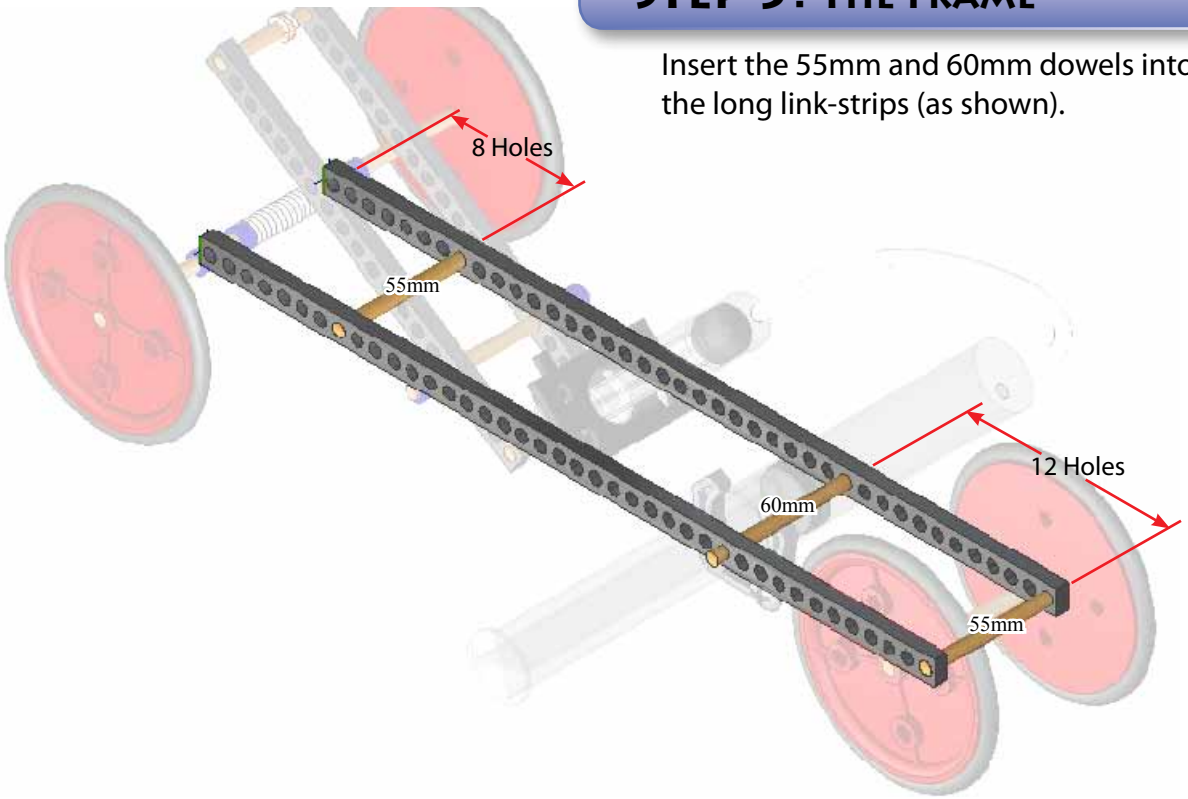
Cut your link-strips to length.



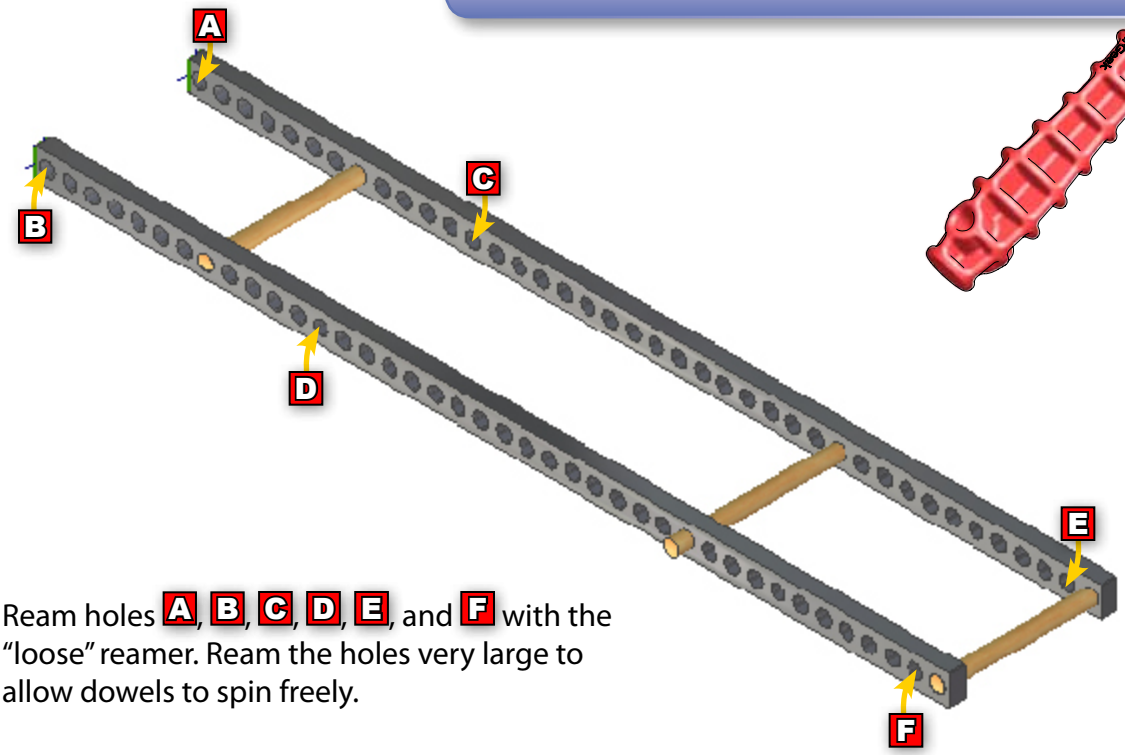
Length:	Quantity:
150mm (1/2 Link-Strip)	2
300mm (Full Link-Strip) No Cutting Required	2

Step 3: The Frame

Insert the 55mm and 60mm dowels into the long link-strips (as shown).



Step 4: Ream The Frame

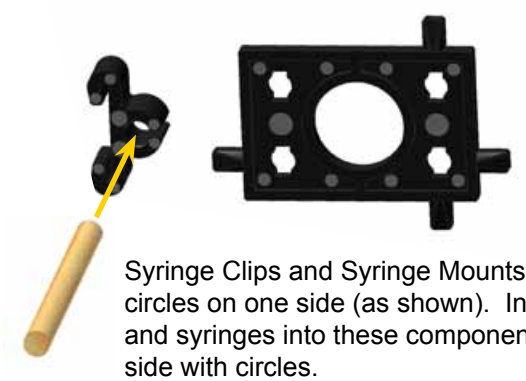


Ream holes A, B, C, D, E, and F with the "loose" reamer. Ream the holes very large to allow dowels to spin freely.

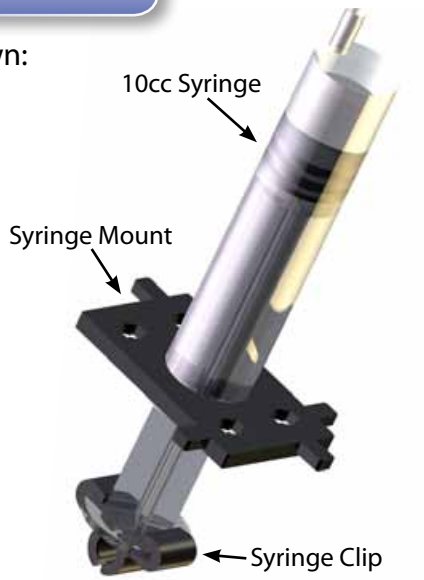
A

Step 5: The Cylinder

Assembly the cylinder as shown:

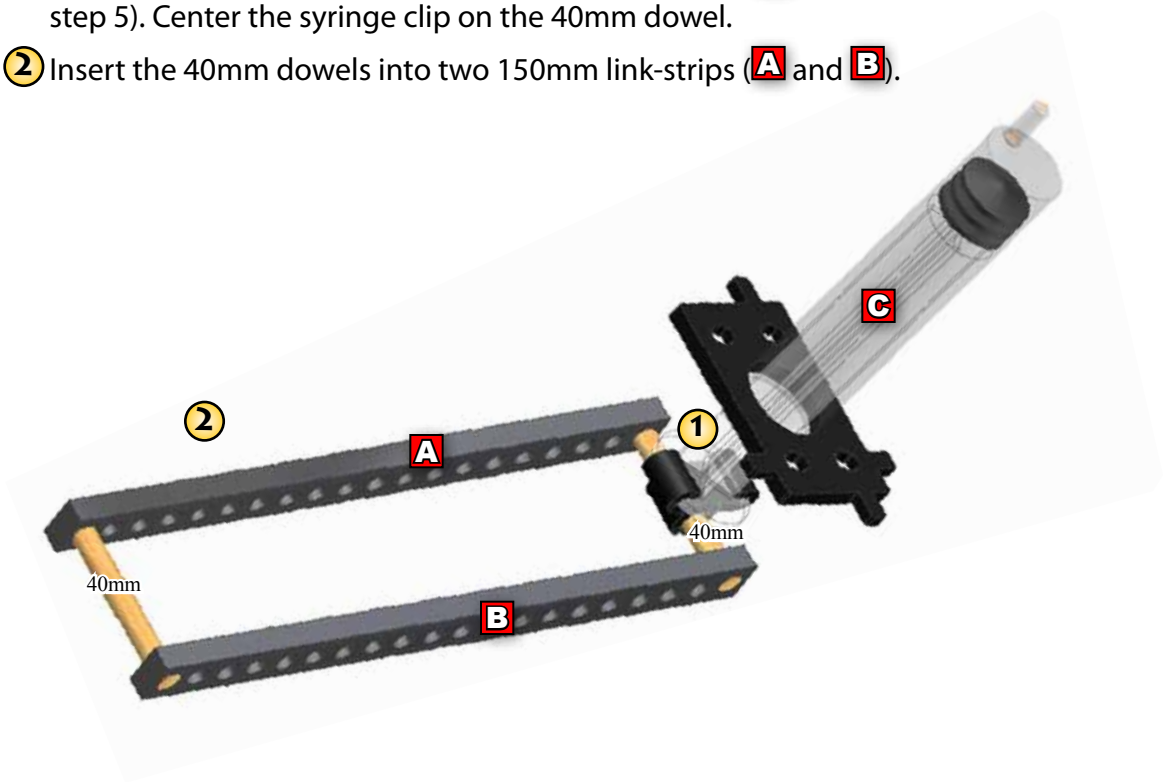


Syringe Clips and Syringe Mounts have circles on one side (as shown). Insert dowels and syringes into these components from the side with circles.

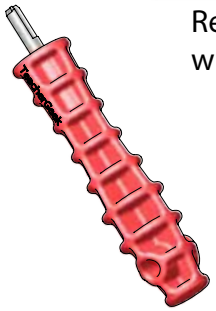


Step 6: The Lever Assembly

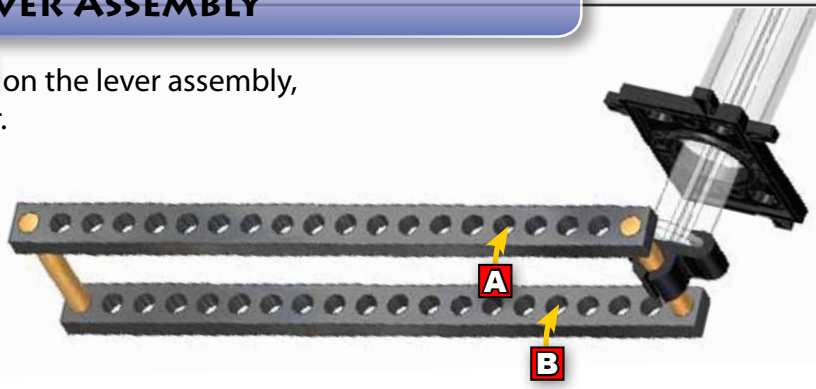
1. Place a 40mm dowel into the syringe clip on cylinder C (from step 5). Center the syringe clip on the 40mm dowel.
2. Insert the 40mm dowels into two 150mm link-strips (A and B).



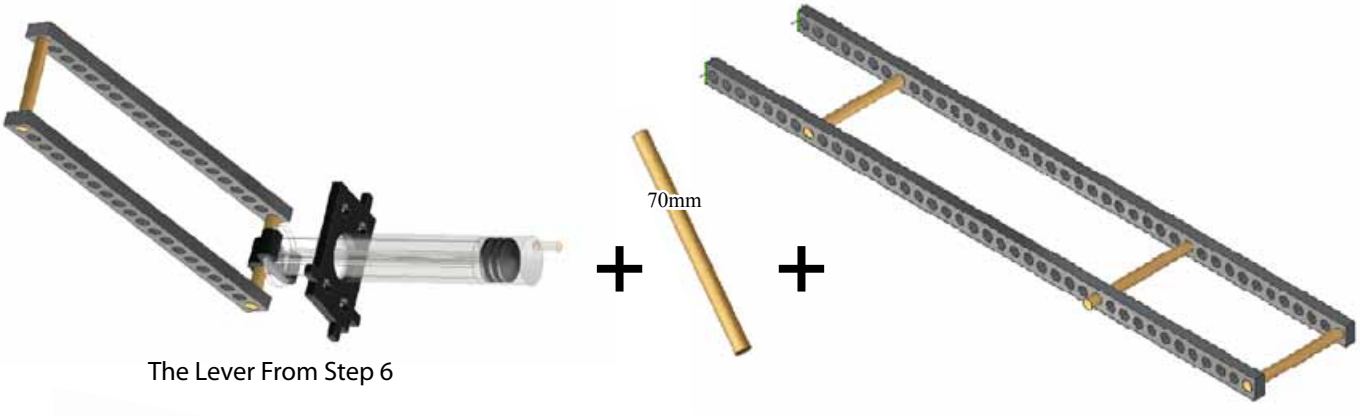
Step 7: The Lever Assembly



Ream holes A and B, on the lever assembly, with the "loose" reamer.

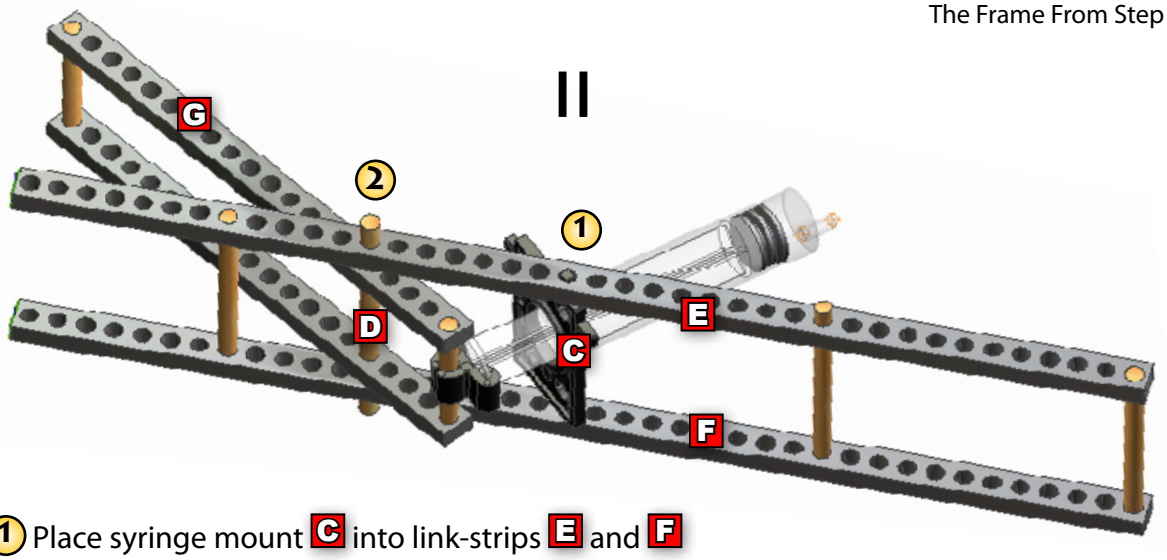


Step 8: Attaching The Lever Assembly



The Lever From Step 6

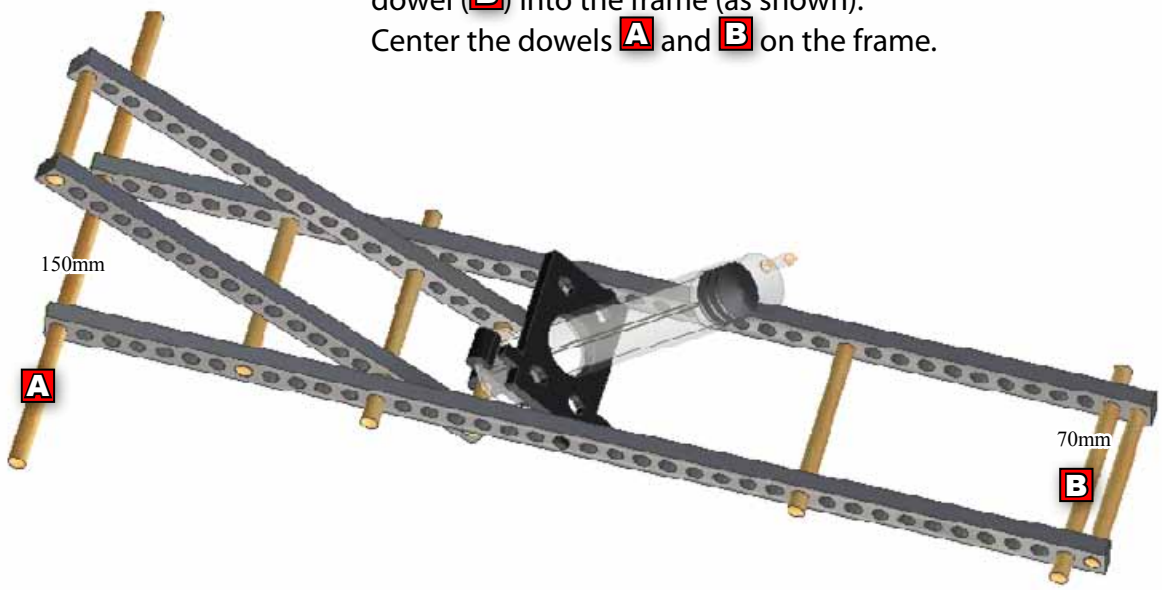
The Frame From Step 4



1. Place syringe mount C into link-strips E and F (spread link-strips apart to get the syringe mount in)
2. Attach lever G to the frame using dowel D.

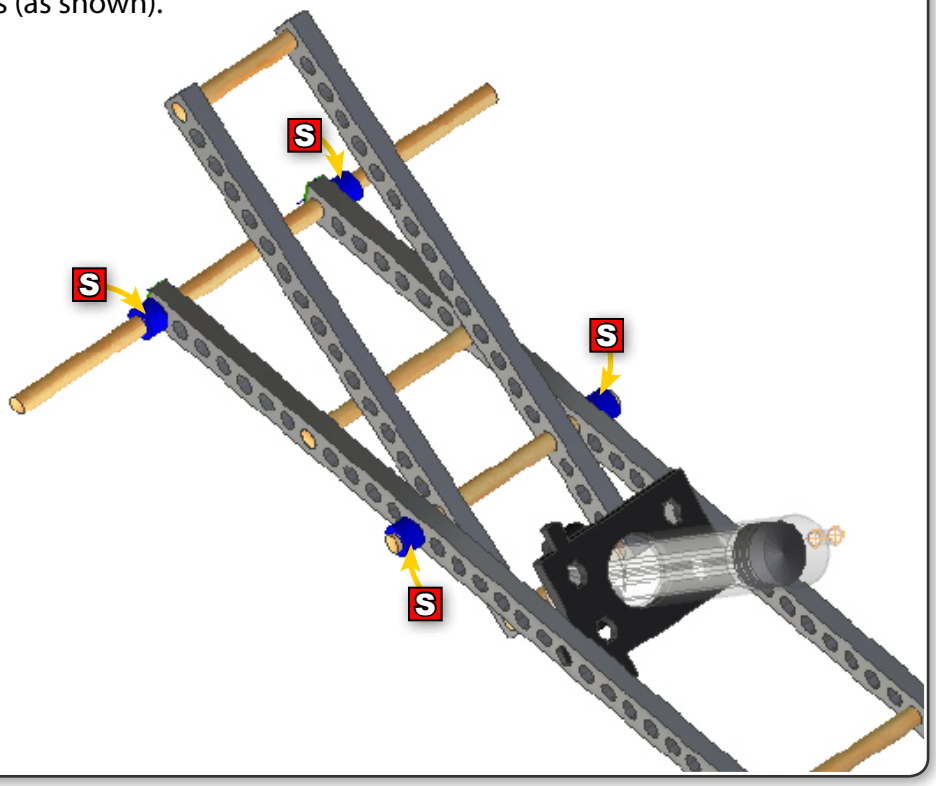
Step 9: Axles For Wheels

Insert the 150mm dowel (A) and 70mm dowel (B) into the frame (as shown).
Center the dowels A and B on the frame.



Step 10: Slide Stop Material

Cut four 6mm sections of slide-stop material.
Place sections (S) on dowels (as shown).

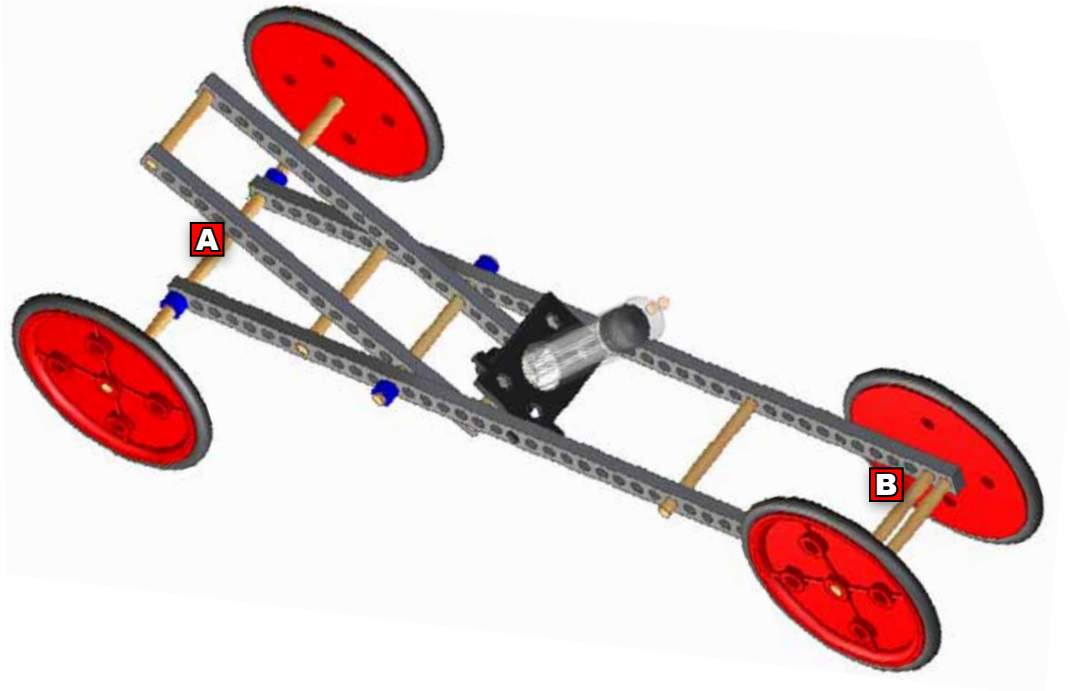


Step 11: Wheels

Stretch tires around 4 wheels.

Step 12: Let It Roll...

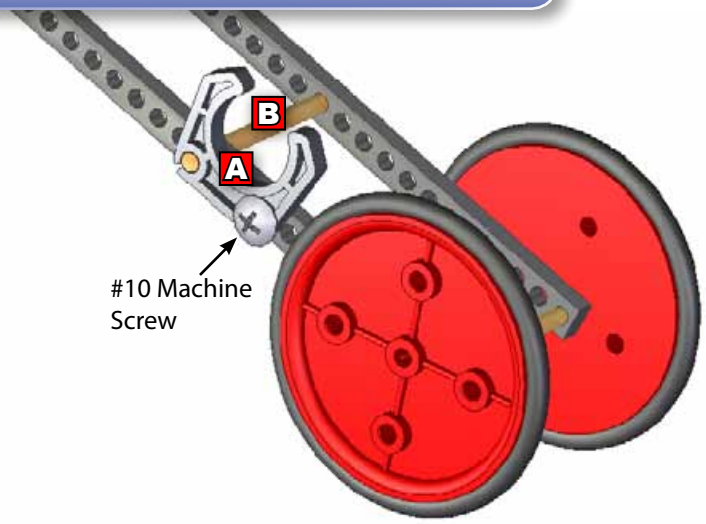
Place the wheels from step 11 onto the ends of dowels A and B.



Step 13: The Large Syringe Mount

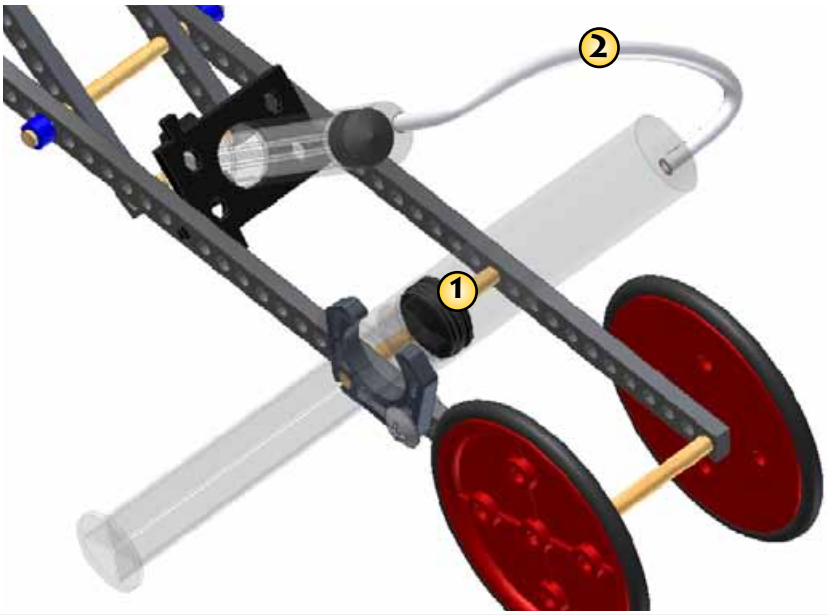
Place the 30cc syringe mount (A) onto dowel B. Screw the other side of the 30cc syringe mount (A) to the frame.

Note: The Large Syringe Mount included in your kit looks like this.



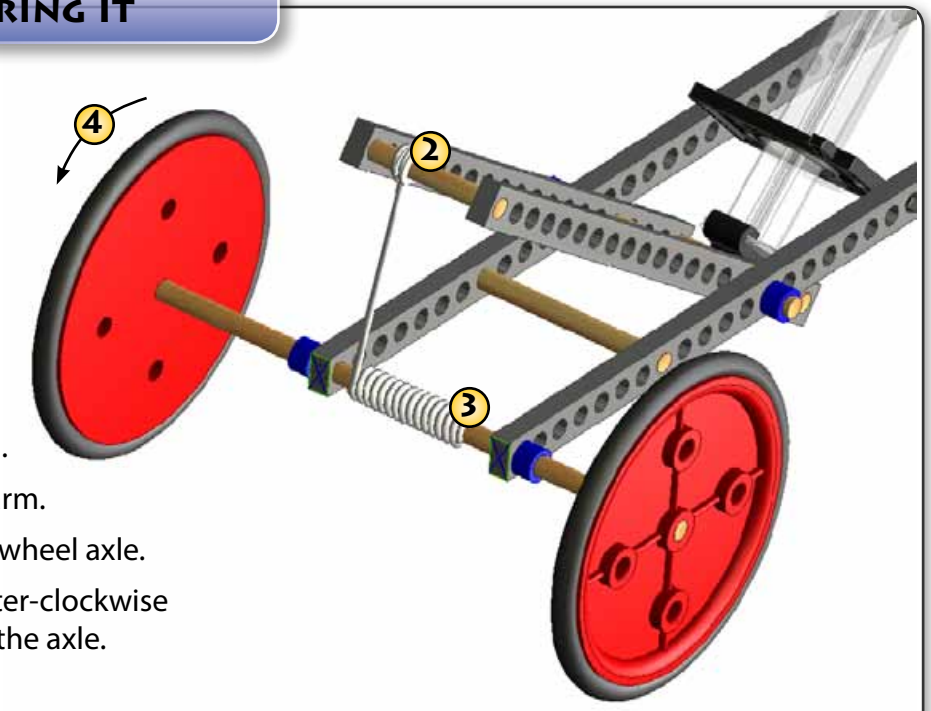
Step 14: Tubing

1. Place the 30cc syringe into the 30cc syringe mount.
2. Use tubing to connect the syringes (cylinders) together.



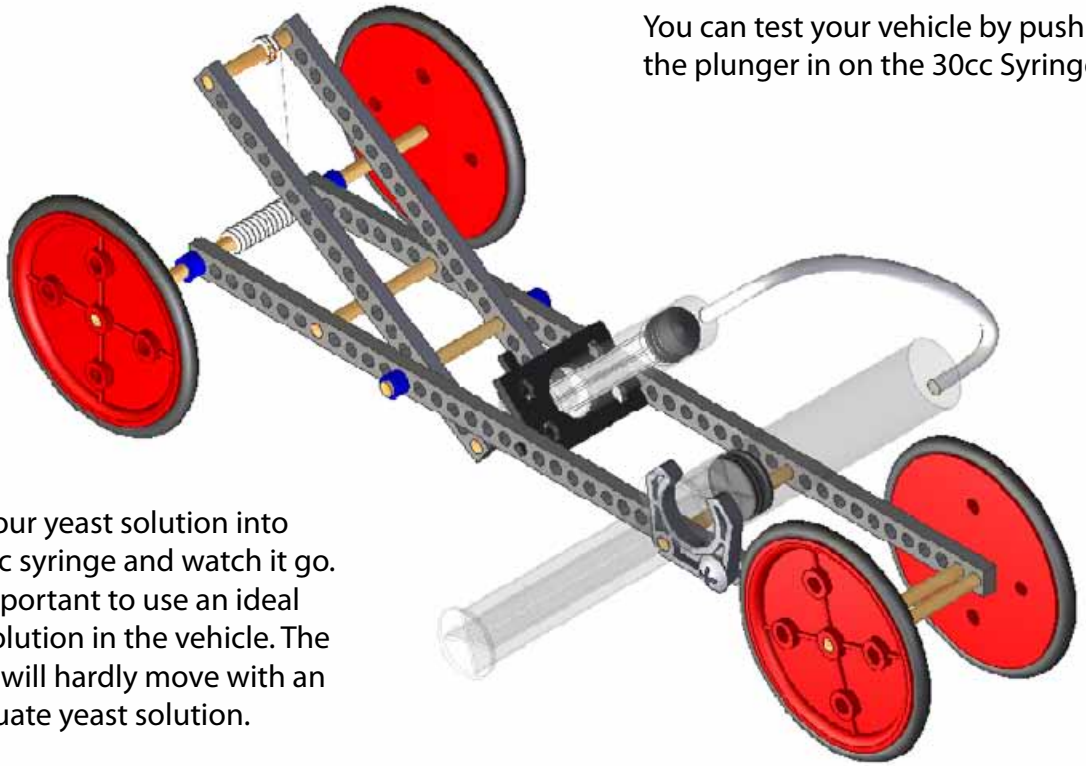
Step 15: String It

Note: String is not included in the yeast mobile kit.



1. Cut 300mm (~1ft) of string.
2. Tie the string to the lever arm.
3. Tape the string to the rear wheel axle.
4. Turn the rear wheels counter-clockwise to wrap the string around the axle.

You're Done!!!!

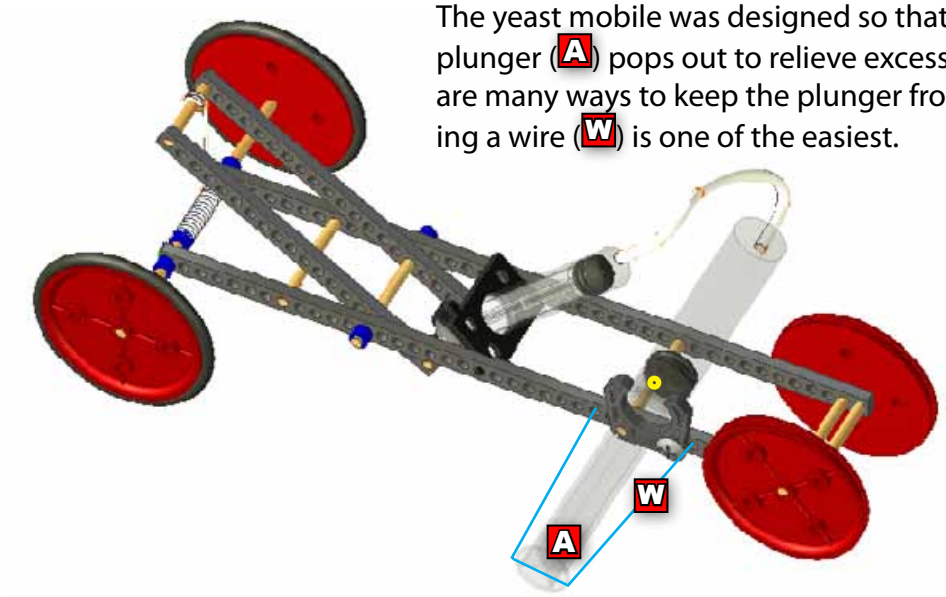


You can test your vehicle by pushing the plunger in on the 30cc Syringe.

Place your yeast solution into the 30cc syringe and watch it go. *It is important to use an ideal yeast solution in the vehicle. The vehicle will hardly move with an inadequate yeast solution.

"Popping" plunger

The yeast mobile was designed so that the 30cc syringe plunger (A) pops out to relieve excessive pressure. There are many ways to keep the plunger from popping out. Using a wire (W) is one of the easiest.



Warning: Yeast solution may spray from your vehicle.

Wear safety glasses when working on or using your Yeast Mobile. Lines and syringes can pop under pressure.

Modifications and Improvements

Ideas For Modification and Improvement:

Perfect the yeast solution to provide the greatest reaction and most carbon dioxide.

The Lever: change where the string and/or wire attach, move lever fulcrum, change the lever length, create a compound lever, get rid of the lever

The Gear Transmission: change gears to pulleys, change the gear ratio (different size gears, additional gears, eliminate gears)

The Frame: elongate it, shorten it, change the shape, eliminate a wheel, make it change shape as it moves

The String: lengthen string, shorten string, devise a release mechanism so it releases from axle after unwinding

*Some of the ideas above require innovation components (extra components)

Remove the 30cc syringe from its mount and place a ~5ft section of tubing between it and the 10cc syringe. Replace the air in the cylinders and tubing with water. You now have a hand powered/remote controlled hydraulic racecar.

