

# Building the JetToy Chassis

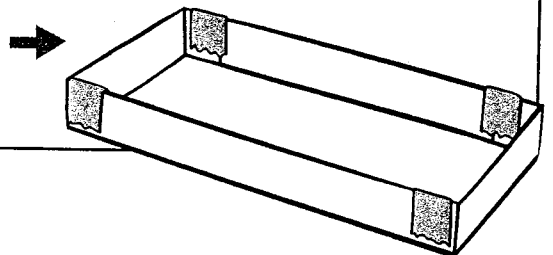
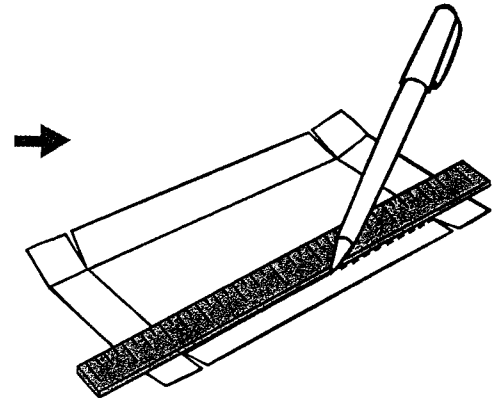
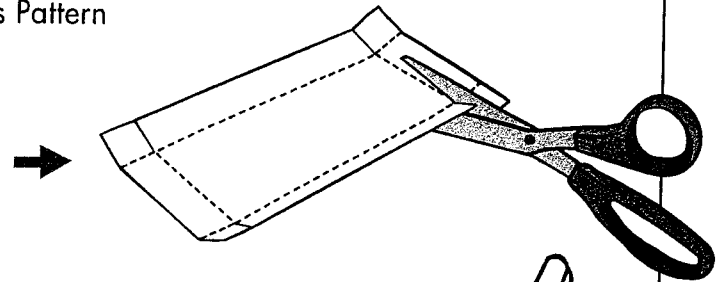
---

## Materials

- JetToy Chassis Pattern
- scissors
- ballpoint pen
- masking tape

## Procedure

1. Every other team, get a JetToy Chassis Pattern. Cut the two chassis apart and give one to another team.
2. Each team, cut out the JetToy Chassis Pattern outline along the solid outer lines.
3. Cut the "cut lines" at the corners. Be careful that you don't cut too far.
4. Use a ballpoint pen to draw a very heavy, deep line over each of the dotted fold lines. Press the pen hard back and forth to score the paper to make it easier to fold.
5. Fold down the four sidewalls on the scored lines. Make sure that the axle lines are showing on the outside of the chassis.
6. Use small pieces of masking tape to carefully attach all the flaps inside the chassis.

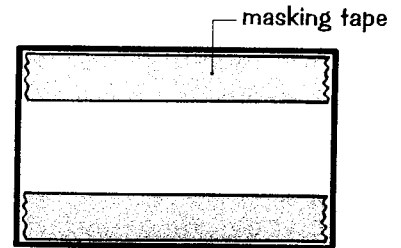


# Assembling the Axles and Wheels

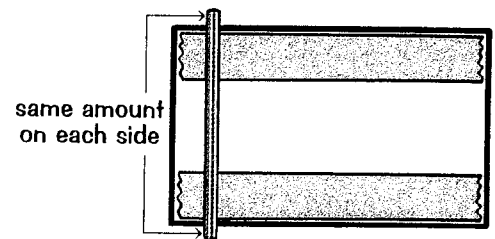
## Procedure

1. Cut 2 axle bearings from a drinking straw. Each bearing should be exactly 7 centimeters long. Make sure that the cut edges are straight and not jagged.

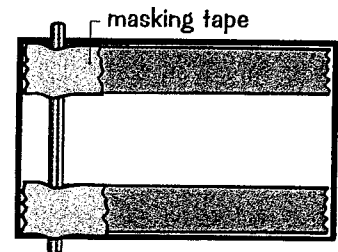
2. Put two strips of masking tape along the side of the chassis.



3. One team member can line up an axle-bearing with one of the axle lines. Center the bearing so the same amount extends on each side of the chassis.

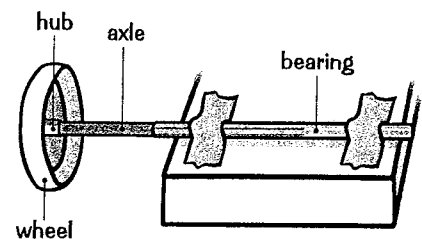


4. Another team member can tape the straw in place. Put the tape over the tape already on the chassis.



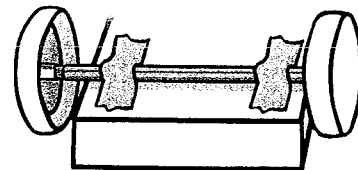
5. Repeat steps 3 and 4 to mount the other axle bearing.

6. Carefully push an axle stick into the hub of one wheel, then insert the stick into the axle bearing.



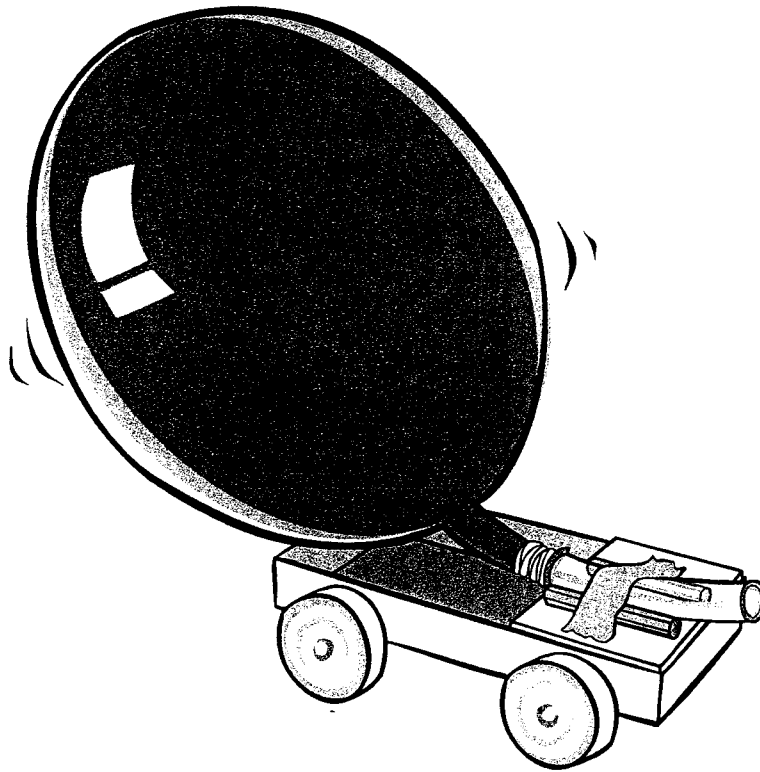
7. Carefully push a wheel onto the other end of the axle.

8. Repeat this procedure to make the other wheel assembly.



# JetToy Features

---



**A. Circle each change you think will make this balloon-powered vehicle go farther.**

making the vehicle heavier

making the vehicle lighter

making the tubing hole bigger

making the tubing hole smaller

inflating the balloon more

inflating the balloon less

other idea \_\_\_\_\_

**B. Circle each change you think will make this balloon-powered vehicle go slower.**

making the vehicle heavier

making the vehicle lighter

making the tubing hole bigger

making the tubing hole smaller

inflating the balloon more

inflating the balloon less

other idea \_\_\_\_\_

**C. On another sheet of paper, explain in as much detail as possible what makes the balloon-powered vehicle go.**

# JetToy Data

---

Test #: \_\_\_\_\_

1. Describe your vehicle. \_\_\_\_\_

---

---

---

---

---

---

---

---

2. How far did your vehicle go? \_\_\_\_\_

---

3. What problems did your vehicle have? \_\_\_\_\_

---

---

---

---

---

---

---

---

4. What changes will you make to your vehicle to improve its performance? \_\_\_\_\_

---

---

---

---

---

---

---

---

# Building the Skimmer Hull

---

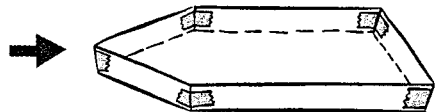
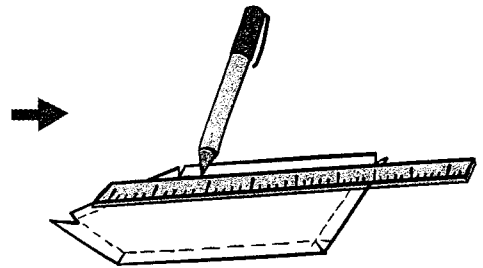
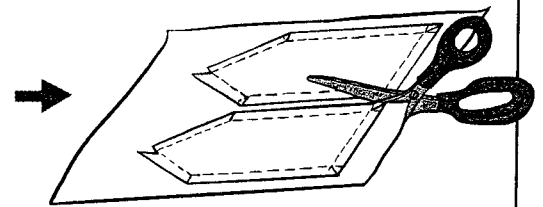
## Materials

- Skimmer Hull Pattern
- scissors
- ballpoint pen
- masking tape

**IMPORTANT:** To build a skimmer that performs well, be sure to work *slowly and carefully*.

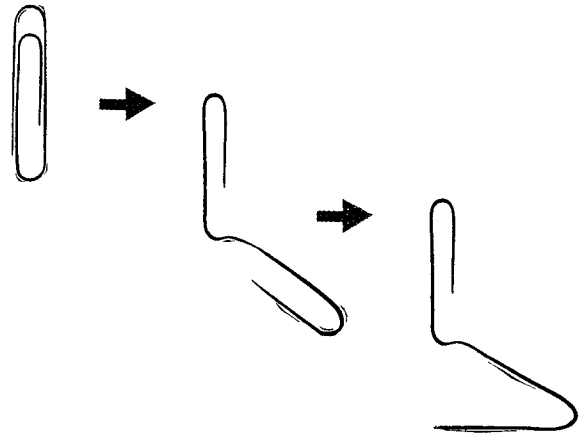
## Procedure

1. Every other team, get a Skimmer Hull Pattern. Cut the two hulls apart and give one to another team.
2. Each team, cut out the Skimmer Hull Pattern along the solid lines. Be especially careful at the corners.
3. To fold each dotted line:
  - a. Place a ruler on the dotted line.
  - b. Use a ballpoint pen to mark a heavy dark line over the dotted line.
  - c. Without moving the ruler, carefully fold up the skimmer's sides against the ruler.
4. Holding the skimmer flat against the table, use small pieces of masking tape to tape the flaps closed. Be sure that no tape is touching the bottom of the skimmer.
5. Check to see that the bottom of the skimmer is flat against the table. If it is not flat, tape the corners again.



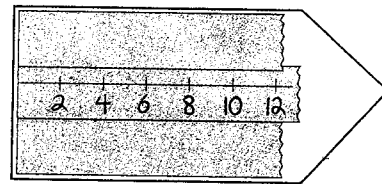
# Making a Sail Stand

1. Pull the two loops of a large paper clip apart so that they form an "L" shape.

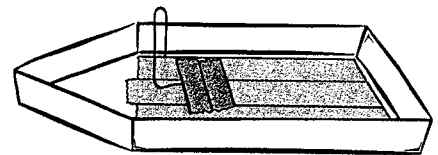


2. Open up the larger loop of the paper clip into a "V" shape.

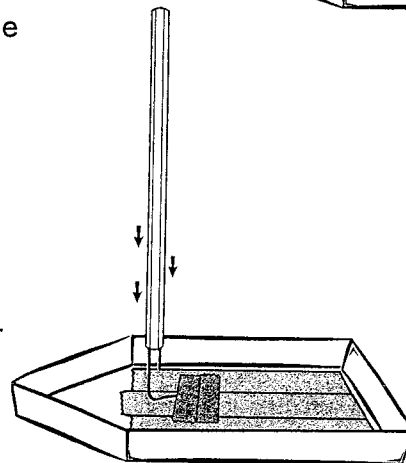
3. Put three lengths of masking tape in the hull lengthwise. Mark a centimeter number line like this on the middle piece of masking tape:



4. Use a piece of masking tape to attach the V-shaped part of the stand to the skimmer.



5. To mount a sail, push the straw over the loop of the sail stand.



# Skimmer Sail Drawing

---

1. Draw a sail that you think will make the skimmer move the farthest.  
Label the sail dimensions in centimeters.

2. Explain why you think this sail will help the skimmer go far.

---

---

---

---

---

---

---

# Making a Sail

---

1. Complete your own Skimmer Sail Drawing.
2. Share the sail drawing with your design team. Decide as a team what shape and size you want to make the sail to give your skimmer a long path.
3. Draw your sail on a piece of oaktag.
4. Cut out the sail.
5. Trace your sail outline on a sheet of centimeter graph paper.
6. Find the area of your sail in square centimeters.  
Write the area (or estimate) on the sail.
7. Use tape to attach the sail to a straw mast.

# Skimmer Test Log

.....

Characteristic We Are Testing:

Sail Drawing	Sail Area	Other Information

Trial	Distance	Observations
1		
2		
3		