FabMaker Project

Who Said It Had to be a Go-Cart?

Let's use Fab@School Maker Studio to design and build a balloon-powered vehicle.

Materals for Each Car

- 3 Sheets of Cardstock
- 2 Plastic Straws
- 1 Balloon
- 1 Wooden Skewer
- 8 Elastic Bands

Additional Supplies

- Scissors
- Glue
- Tape
- Duct Tape
- Makers

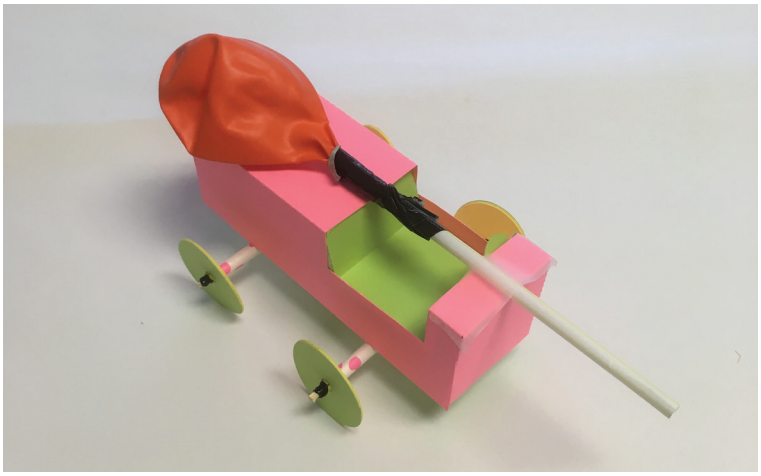
NGSS Standards

Engineering Design

- MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

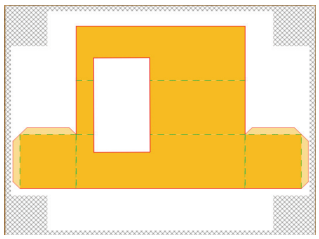
Energy

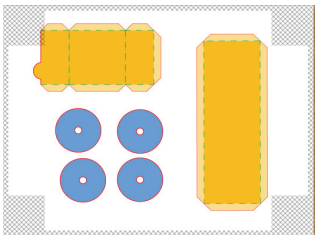
- MS-PS3-5. Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from that object.
- PS3.B. Conservation of Energy and Energy Transfer. When the motion energy of an object changes, there is inevitably some other change in energy at the same time.

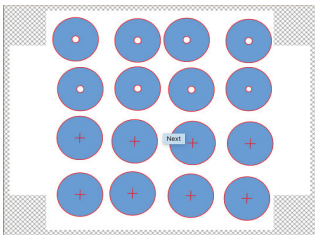


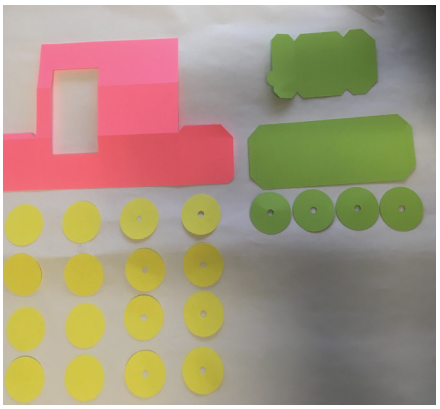
Construct Your Go-Cart

Step 1: Open Go-Cart Ready-Made project from the the 3D Stuff tab.









NOTE: This project is in three pages.

Page 1: Body of the Go-Cart.

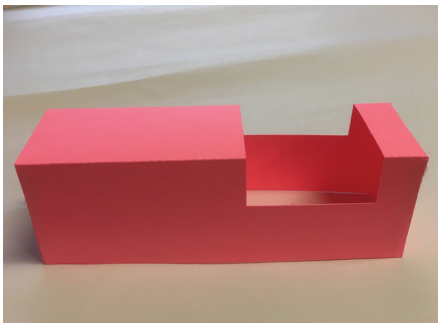
Page 2: Includes the seat, chassis, and outside wheels.

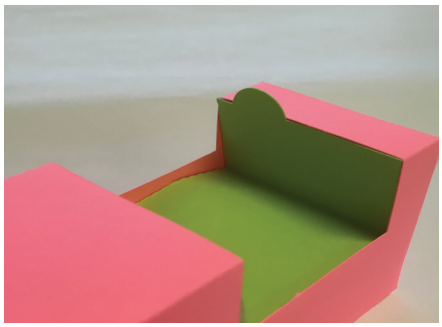
Page 3: Circles that, once layered and glued will create four wheels for the car.

Step 2: Send each page of the project to the digital fabricator.

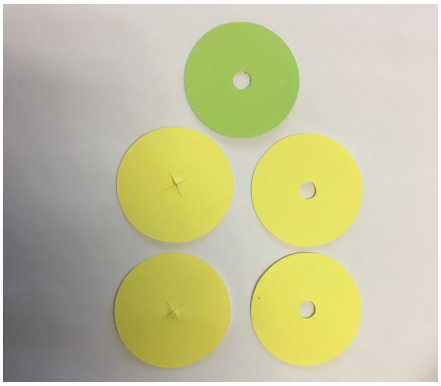
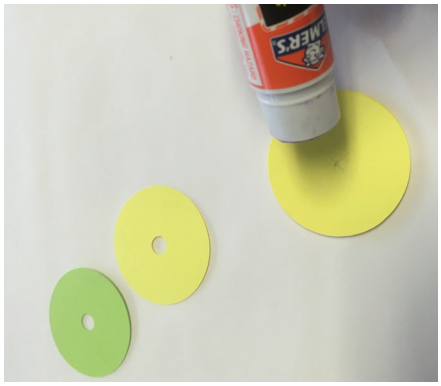
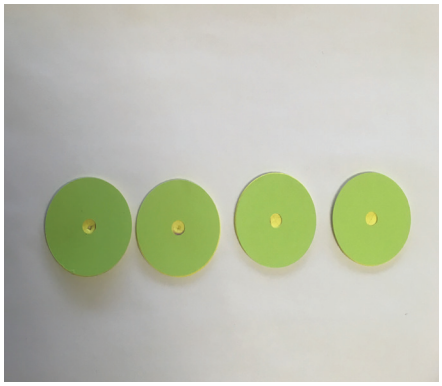
Step 3: Remove pieces from sticky backing.

Step 4: Assemble your go-cart.

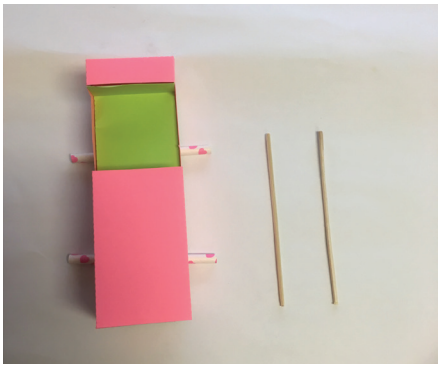
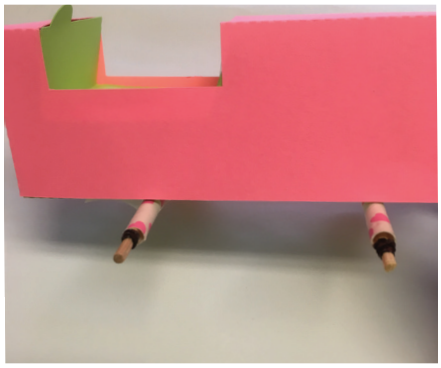
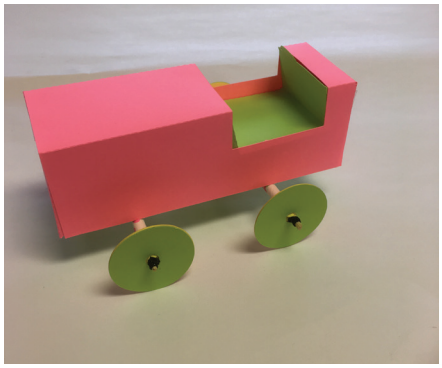




Fold body of car. Attach chassis to base. Add seat. Secure each piece using glue/tape on fold tabs.

Glue together circles to create four wheels.

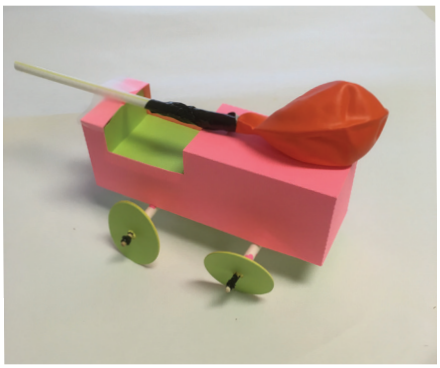
Cut one straw evenly. Using tape, attach the two straw pieces to the bottom of the car.

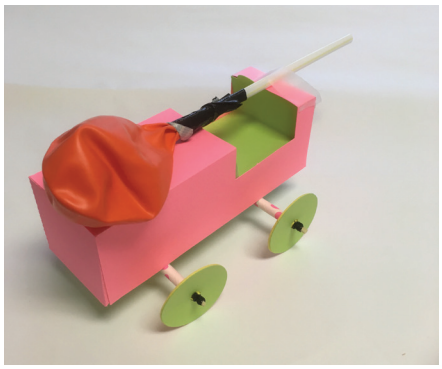
Cut wooden skewers slightly larger than the straws to allow room for the wheels. Push one skewer through one straw and the second piece through the second straw. You have now created your cart's axles.

Wrap one elastic band around each side of the skewers leaving enough room to attach the layered wheel. Once wheel is in place, use the final elastic bands to secure. Continue with the other wheels.

Place cart on a flat surface and give it a push.

Step 5: Add the balloon power.





Using duct tape, secure the neck of the balloon around one end of a straw. Wrap the tape very tightly so the connection is airtight.

Tape the straw to the top of the go-cart, making sure the balloon is resting directly on the top.

Fully inflate the balloon by blowing through the straw. Place your finger over the tip of the straw to trap air. Place car on flat surface and release your finger.

Watch the car move!

What's Happening?

You are watching Newton's Third Law of Motion in action.

The third law states: For every action, there is an equal and opposite reaction.

Action is the air rushing from the straw.

Reaction is the movement of the car.

What's Next?

Using Fab@School Maker Studio, can you build a different balloon powered vehicle? What would happen if you change the shape or size of the go-cart?