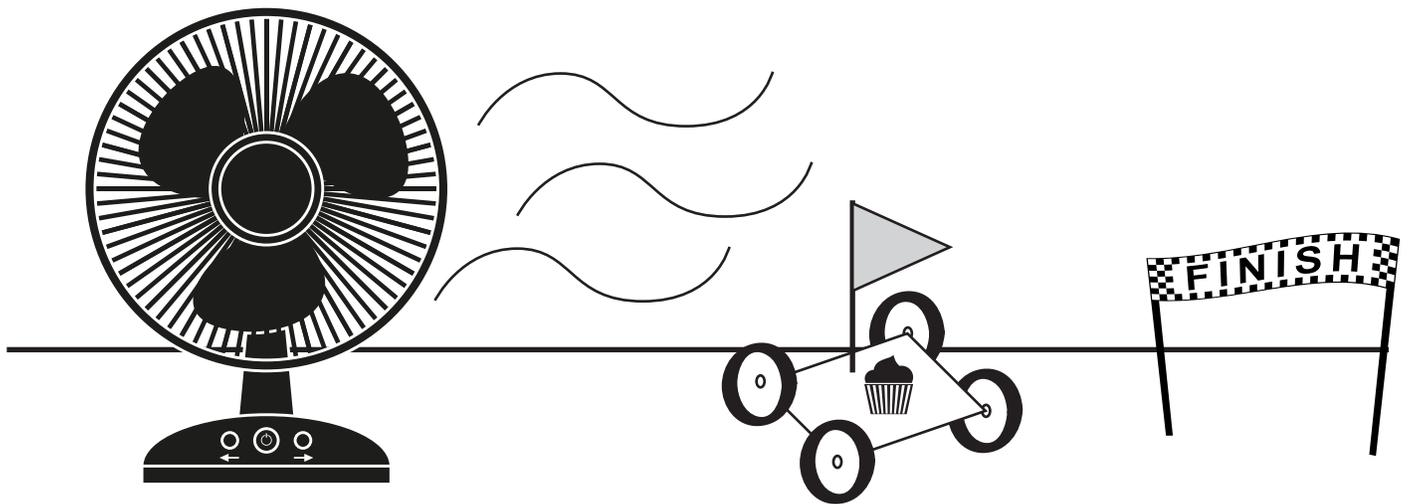


Do try this at home!

Who says all the fun has to happen at The Tech? This DIY engineering activity can be put together with cheap store-bought materials or objects you find around the house!

Cupcake Delivery Design Challenge Activity



Introduction

In this design challenge, you will create wind-powered contraptions to transport a load. At The Tech, we use 3D-printed cupcakes as our load, but you can use just about any small object. This activity is a great introduction to hands-on engineering for children 6 and up. While the activity can be completed in around 20 minutes, don't be surprised if you find yourself spending 45 to 60 minutes perfecting your creation.

Materials

All kinds of items can be used to construct a wind-powered vehicle. Use whatever materials you have on hand!

Before you start hunting for materials around your house, it's helpful to consider the goals of your design challenge. Think about what qualities you want your contraption to have, and what you might use to create them.

Here are some questions you might ask during the material hunt:

- Name some types of vehicles. What parts do they have?
- What do you need to hold the load and keep it safe?
- What can you use to hold everything together?

Subject: Hands-on engineering

Age: 6+

Time: 20+ minutes

Key terms:

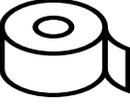
friction
surface area
balance

Video resource:

[learnxdesign.org/
learnxdesign_record/
cupcake-delivery/](https://learnxdesign.org/learnxdesign_record/cupcake-delivery/)

Things you can use

Don't limit yourself to the items on this list. Use whatever you have on hand — be creative!

Items with large surface area that could be made into a sail	Long and skinny items, that could provide structural integrity for flexible sails, or be used as wheel axles
<ul style="list-style-type: none"> • Fabric • Cardstock paper • Cardboard scraps • Recycled paper • Foam sheets 	<ul style="list-style-type: none"> • Straws • Popsicle sticks • Chopsticks 
Round/circular/spherical items that could be used as wheels	Items that could be used as the base/body of a vehicle
<ul style="list-style-type: none"> • Cardboard tubes • CDs • Bottle caps • Plastic lids • Paper plates 	<ul style="list-style-type: none"> • Strawberry baskets • Fry baskets • Paper cups • Pipette trays • To-go food containers 
Other miscellaneous items	Fasteners and fixers
<ul style="list-style-type: none"> • Reclaimed scrap plastic parts that could be used for weight balance 	<ul style="list-style-type: none"> • Masking tape • Twist ties • String • Rubber bands 
Equipment and tools	Something to deliver!
<ul style="list-style-type: none"> • Scissors • Supply bins (to organize supplies) 	<ul style="list-style-type: none"> • Marbles, matchbox cars, paper clips, leaves, marshmallows

Instructions

Set up your testing area



Find a spot that has a smooth surface — it could be a table, your driveway or even a piece of cardboard. Place a fan on one end of your track and a finish line at the other.

Create and test



Once you've gathered your materials and set up your test track, it's time to build! Let your imagination run wild. Try out as many different designs as you can think of.



Don't be discouraged if your first attempts don't perform as you imagined. Talk out what's happening — what do you observe when you test? Maybe your creation is too heavy on one side, or creates too much friction when traveling across the track? Test and retest!



Don't forget to personalize your design! Craft supplies are a fun way to create a vehicle that represents you.



Here are some exploratory questions to ask yourself as you work on your contraption:

Why do you think your design is ...

- tilting?
- falling forward?
- getting stuck?
- not moving?

How might you make it travel faster? Slower?

What do you think would happen if you adjusted an angle on your design?