



# Hand Helicopter

Rolling isn't the only way to get around on other planets. Some crafts move through the atmosphere of other worlds, like Ingenuity, a helicopter-style drone currently exploring Mars. Use household items to make your own flying "helicopter" rotor.

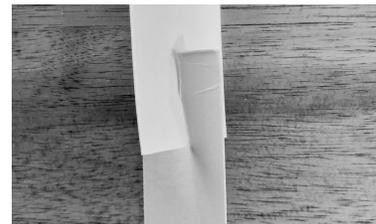
## Materials

- 1 thick paper plate or cereal box
- Scissors
- Tape
- A lightweight stick (pencil, chopstick, or straw)
- Holepunch (optional)



## Directions

1. **Cut** two 5-inch-long by 1-inch-wide strips of cardboard to make two "rotors."
2. **Cut** a half-inch slit at the top-center on both pieces of cardboard.
3. **Slide** the two cardboard strips together so the slits interlock. This will keep the cardboard strips from laying flat, which will help them move air and fly.
4. **Tape** the two cardboard strips together to make a single piece.
5. **Punch a hole** in the center of the cardboard strips where they are taped together.
6. **Push** a pencil, chopstick, or straw through the hole so that no more than half an inch pokes through, and **tape** it to the cardboard strips to secure it.



7. **Place** the stick between your palms and, pressing your palms together, quickly slide one hand forward and one hand backwards. Watch your craft fly!

## Challenges

- Spin the craft faster: Does it fly higher or lower? How high could you make it go? The hand helicopter works by moving air, so if you had enough energy, it could fly VERY high. Do you think it could go into space? Why or why not?
- Try shaping the strips/rotor blades differently, bending them, or using different materials to make them. Do any of these adjustments change the way it flies?
- NASA just landed a helicopter-style drone on Mars called Ingenuity, which uses blades like your hand helicopter does. Why would we use propeller blades on Mars but not in space?

## Extra fun

- [Check out this video series](#) of astronauts on the International Space Station experimenting with different toys in a weightless environment. Some toys work well, and some don't work at all!

