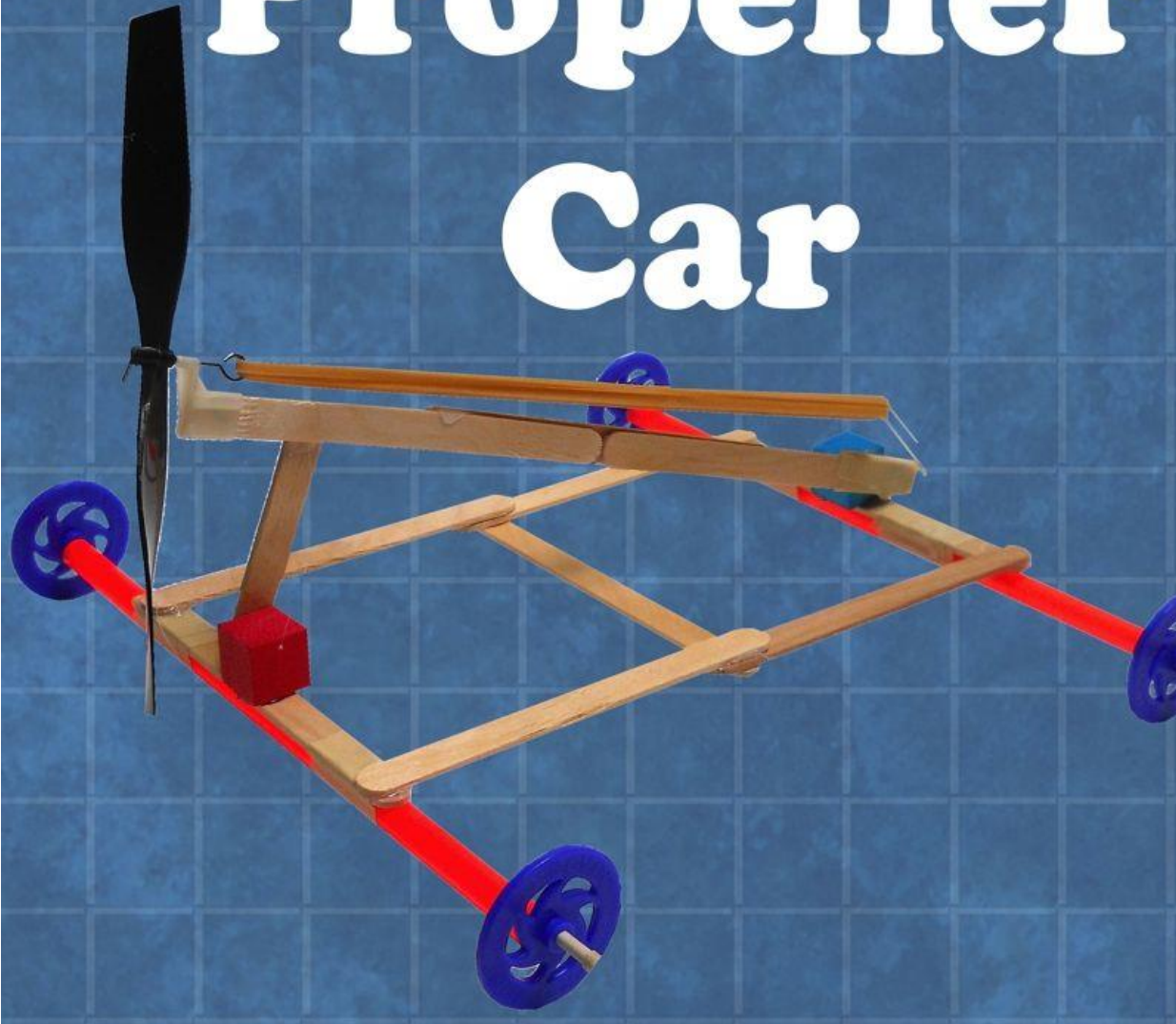


# Propeller Car



## The Lesson

Difficulty: 2/5

Prep work: 1/5

Setup: 2/5

Cleanup: 2/5

Begin by demonstrating how the car works. Explain how the propeller can pull air around its blades when it is spinning. As you wind up the rubber band, explain how energy is being stored in it that will be used to turn the propeller.

Briefly explain what inertia is. Basically, it is how much energy an object needs to begin moving. It's important to keep the car lightweight to have little inertia so the propeller doesn't have to work as hard to get the car going.

Next, I walk the students through how to build each component. I make one set of wheels in front of the students and just describe the other steps. Before allowing the students to begin building, I tell them to feel free to try new ideas and experiment :)

## Learning Objective

By building a propeller-powered car, students will comprehend three basic elements of a wheel assembly: the axle; the bushing; and the wheels. Students will also improve their fine motor skills by using a hot glue gun.

By operating a propeller-powered car, students will experientially comprehend: how energy can be stored; how to use potential energy to turn a propeller; and how the turning propeller creates propulsion.

### Materials

Propellers

Wheels

Straws

1/8" Bamboo skewers

Craft sticks

Craft cubes

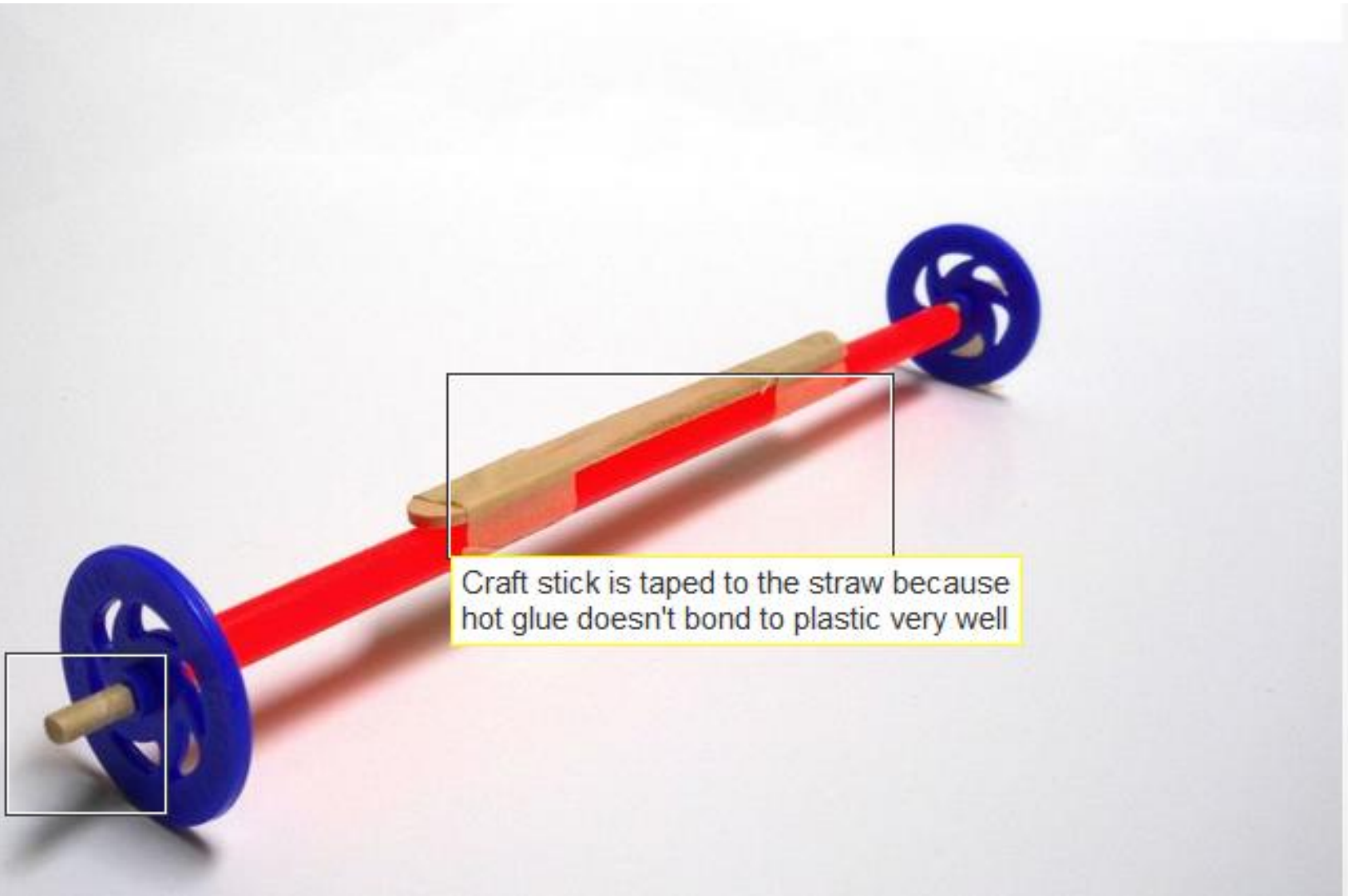
Long rubberbands

Paperclips

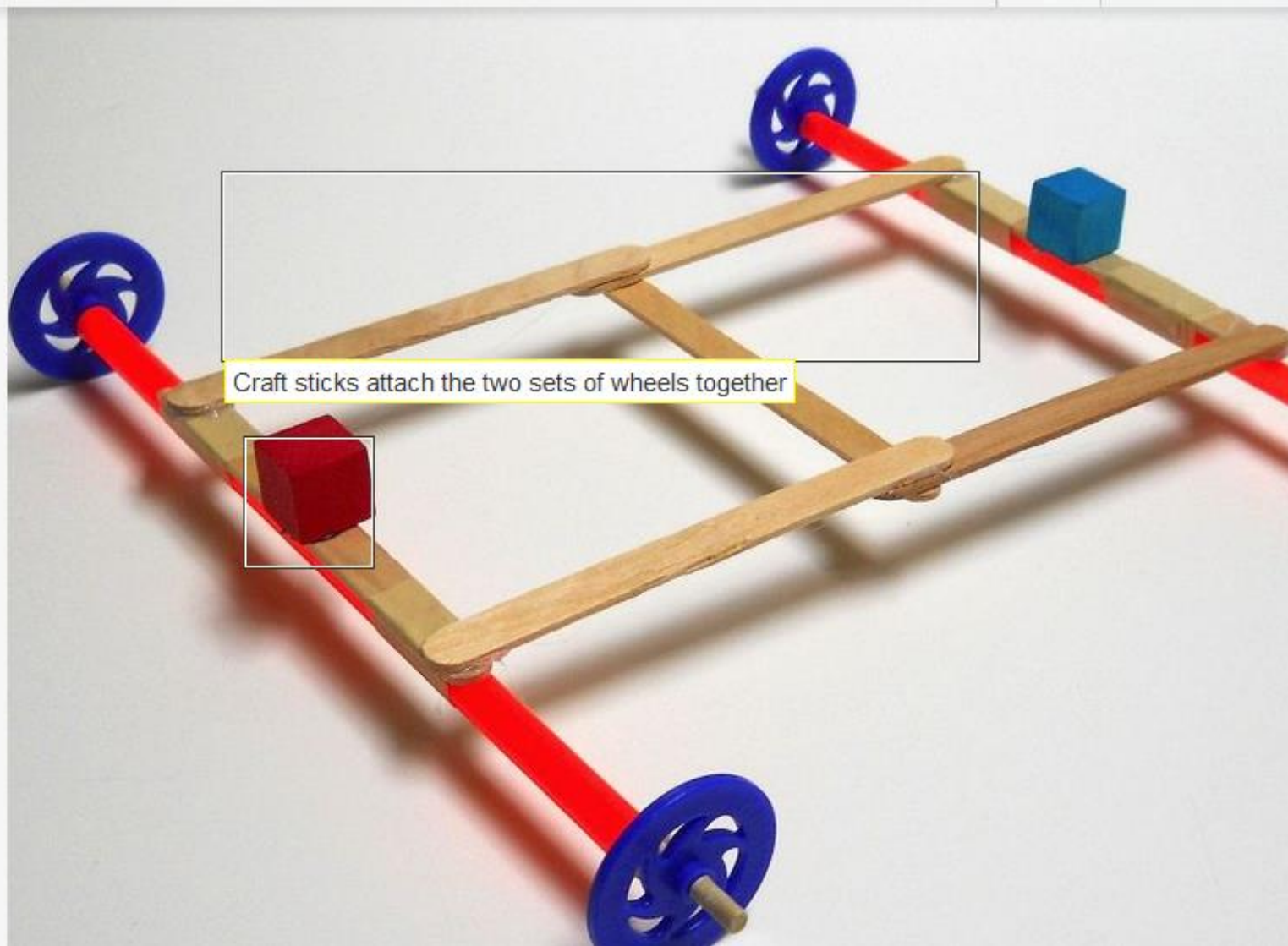
Masking tape

Hot glue

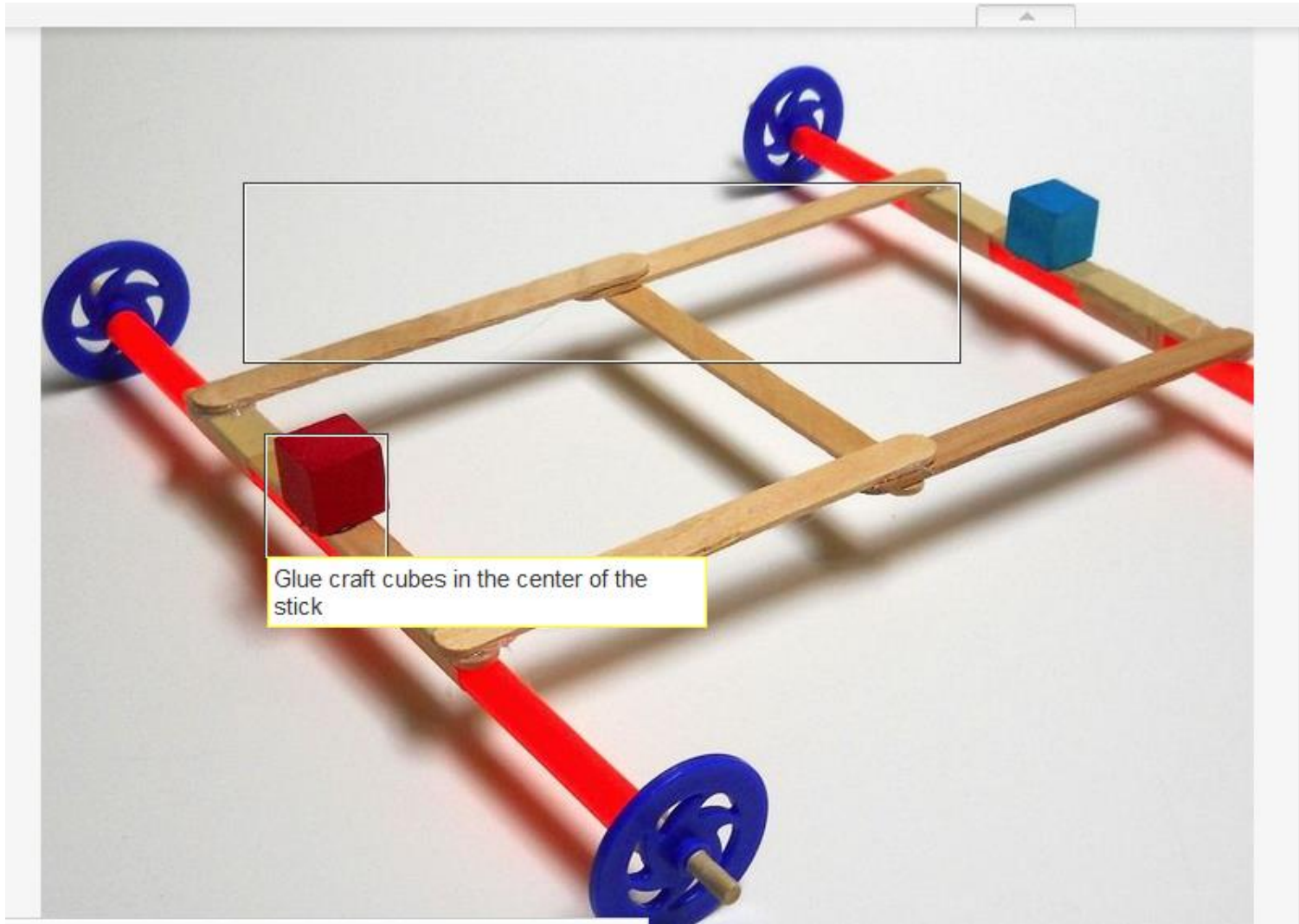
As always, please be sure to talk about glue gun safety with your students if they have never used glue guns before. I've found that kids as young as 7 years old can safely and confidently use a hot glue gun if given proper instruction and guidance



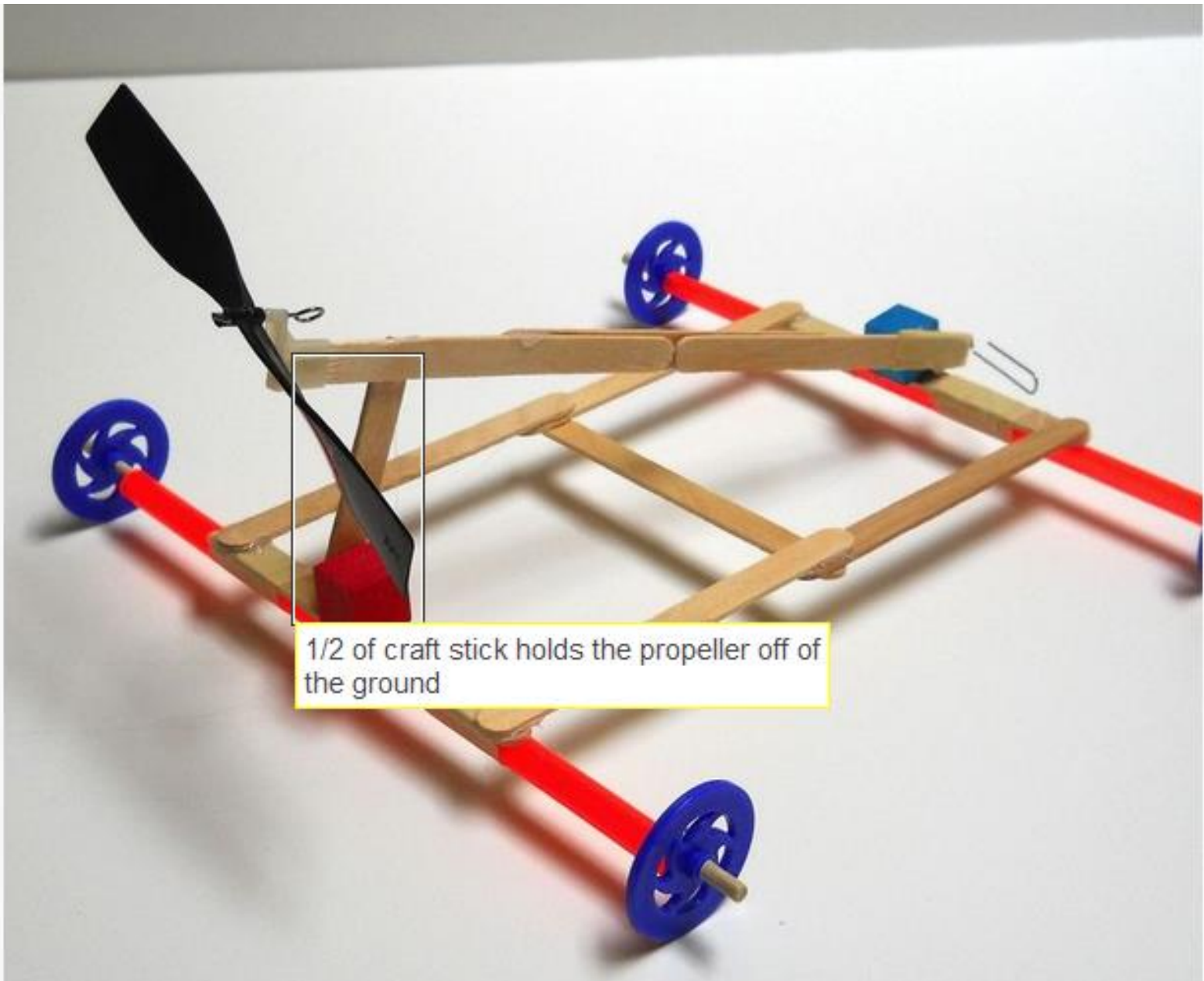
Craft stick is taped to the straw because hot glue doesn't bond to plastic very well



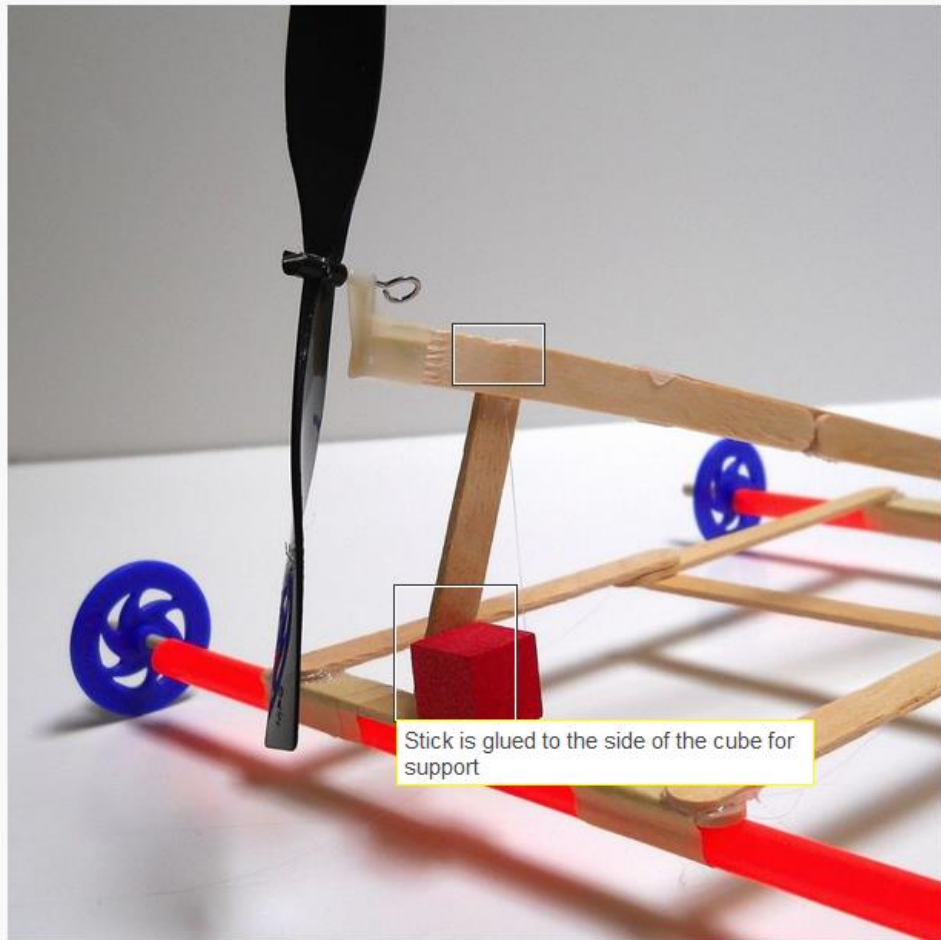
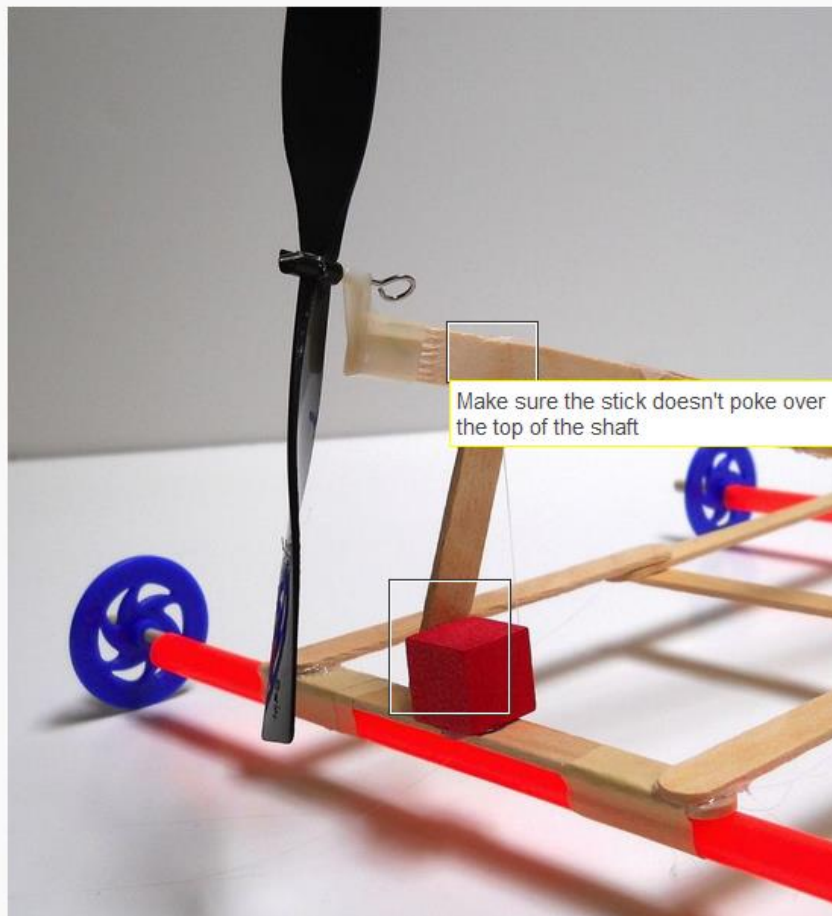
Craft sticks attach the two sets of wheels together



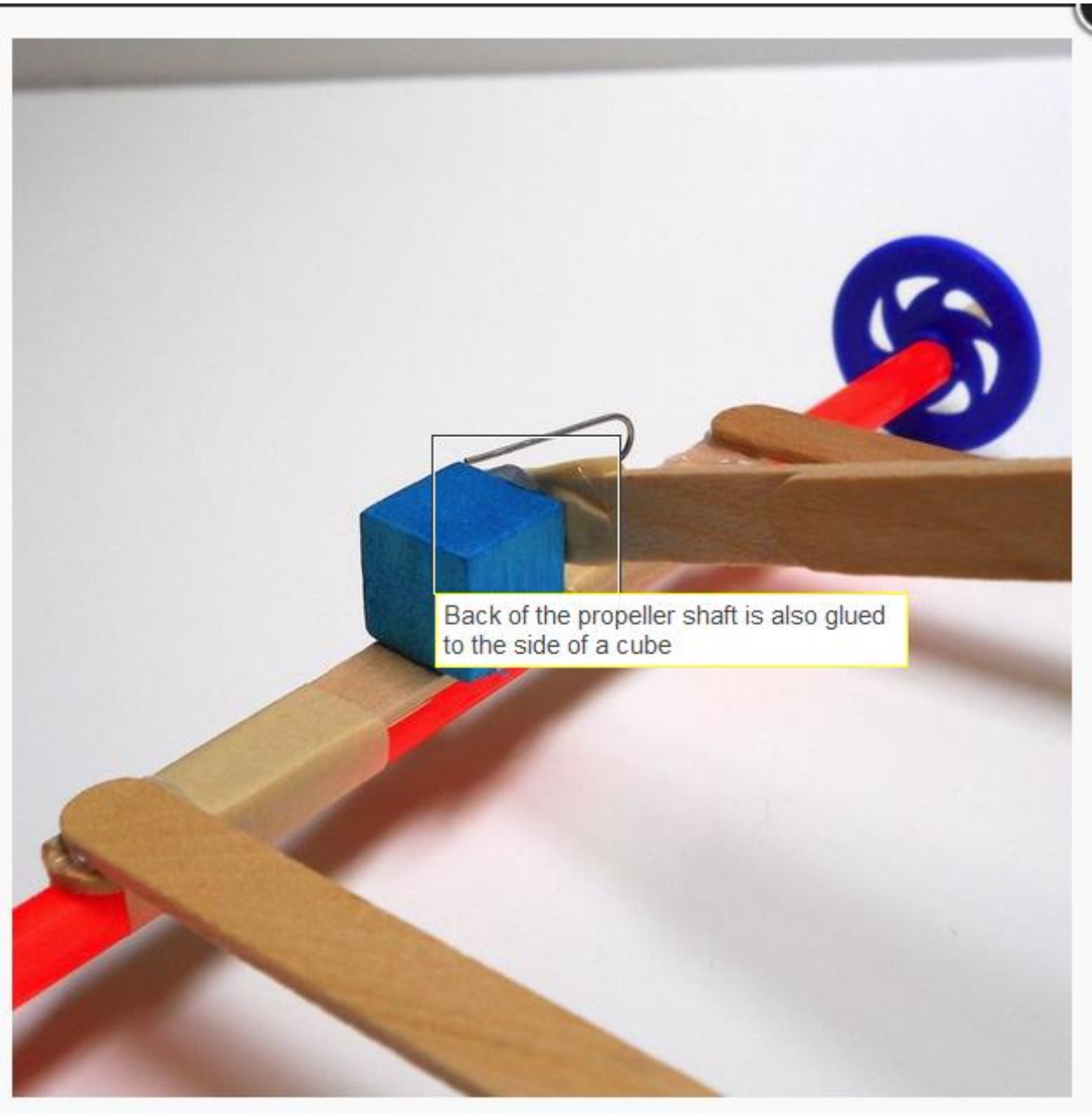
Glue craft cubes in the center of the stick

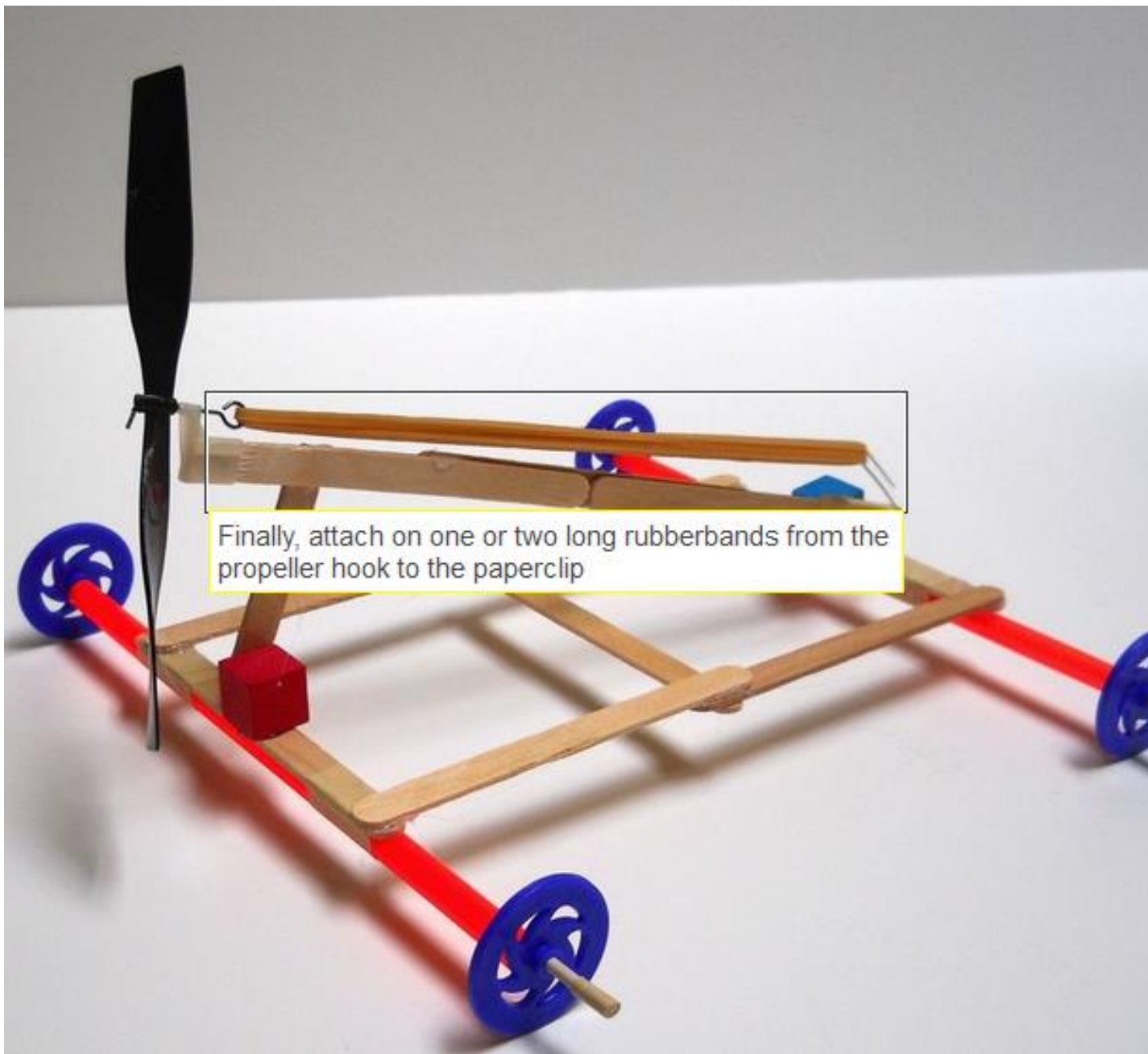


1/2 of craft stick holds the propeller off of the ground









Finally, attach on one or two long rubberbands from the propeller hook to the paperclip

## Step 4: Tips and troubleshooting

Remove any thin strands of dried glue before operating the car. "Hot glue strings" get tangled in the axle or propeller shaft.

Make sure the skewers (axles) are straight. These are mass produced and can be severely warped.

More rubberbands isn't always better. Too much energy can cause the car to spin wildly out of control.

Wide-set wheels are more stable than narrow ones. A narrow car may flip over from the torque generated by the rubber band.

The rubberbands may become loose over time. You can breath new life into old bands by unhooking them and tying one end into an overhand knot. Now the remaining band is shorter (and tighter) than before.

Please be sure to take video or photos if you do this project with your class and post it in the comments :)

Have fun teaching!