

Introduction Page

Powered Air Vehicle

The electric motor turns the propeller which in turn produces a jet of air that drives the vehicle along.

To use switch on the **3 volt battery switch** and let it run on a **smooth flat surface**.

It can be steered by adjusting the front wheels (slide on backwards)

Activity

- Assemble the model
- add two AA battery cells
- test on smooth floor
- make any adjustments to ensure it runs well

Competition

- Race against others as supplied
- Make own changes to see if you can improve speed it can go.
- Devise a way to measure speed over a distance



Size 21cm long x 18cm high

SAFETY

Test in a safe area where movement of car the propeller cannot cause you or objects any problems or damage.

The safety propeller has an annular ring to make it safer but like all all moving parts be careful and keep behind the direction of vehicle travel so it cannot hit you.

To stop vehicle let hit a object or a wall or lift vehicle up then turn power off. **DON'T touch propeller with fingers.**

Keywords / Knowledge

Electricity, energy conversion, kinetic energy, jet of air, aerodynamics, rolling resistance, testing, efficiency, power, voltage, current and speed.

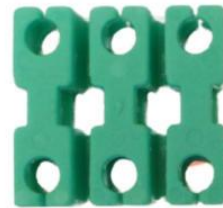
Structural Parts



14 x Kre8 5mm dia. blue tubes 200mm long



1 x strip Kre8 cross pieces strip (20 cross parts)



1 x Kre8 green connector



4 x Kre8 band long

Propeller Drive



1 x fast electric motor 3Volts



1 x kre8 propeller

Wheels for Vehicles



4 x screws
(nos 6 x 19mm)



2 x Kre8
28mm wheels



2 x Kre8 40mm wheels

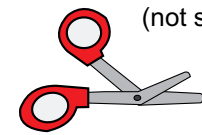


1 x Kre8 3.9mm grey tube

1 x battery holder 3V
(needed 2 x AA battery)



Tools



snips

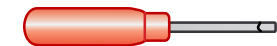
(not supplied)



abrasive
paper



pencil



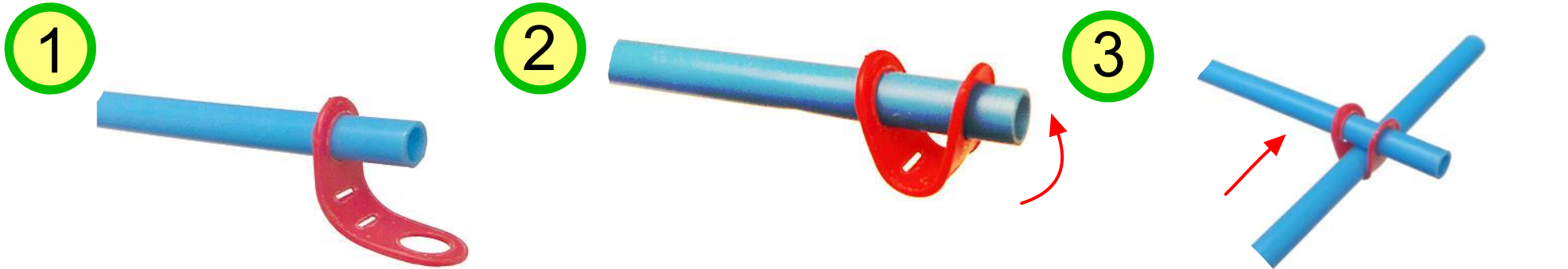
small screwdriver



ruler



Making a Joint



Slide **cross piece** on the **tube**

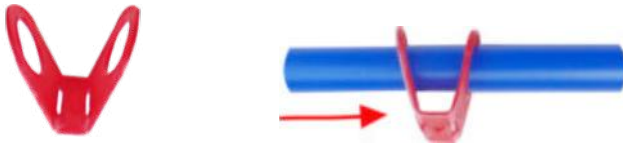
Fold it over to make a **loop**

Slide the **second tube** into the **loop**

Fold Cross Piece

Assembly is easier if the **cross pieces** are folded as shown below before sliding along the tube

Fold ready to use

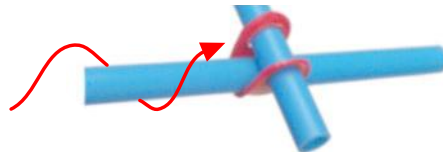


Leave 'Cross Pieces' on strip until needed



Twist and insert Tube

Twisting the tube while inserting makes assemble easier



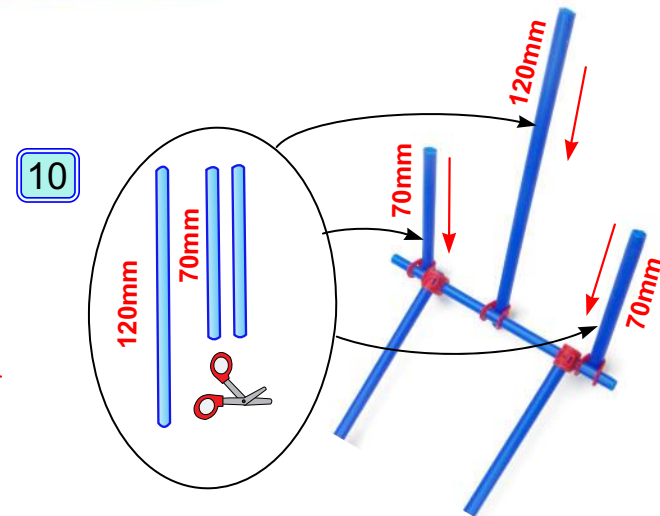
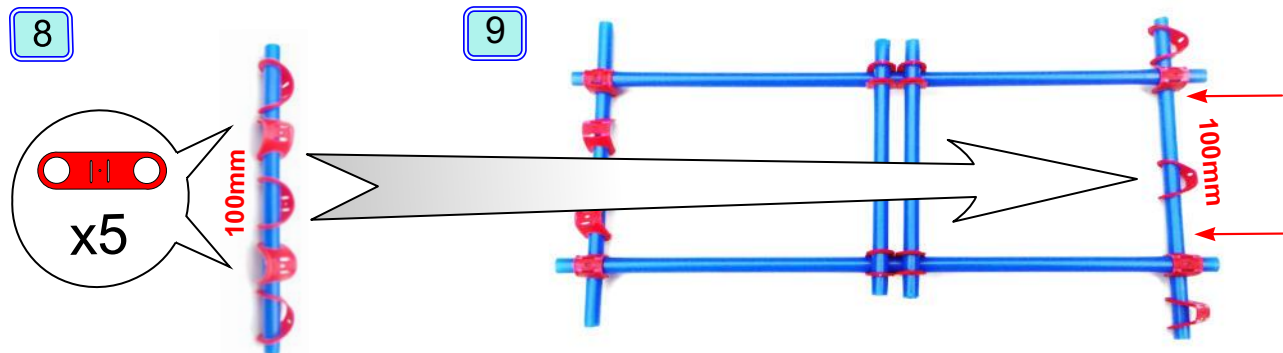
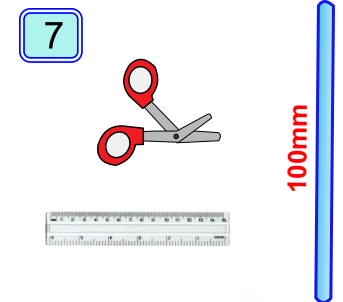
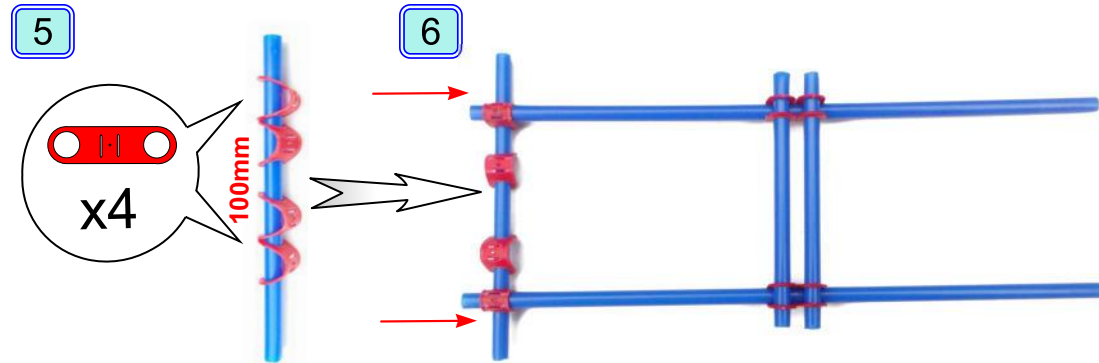
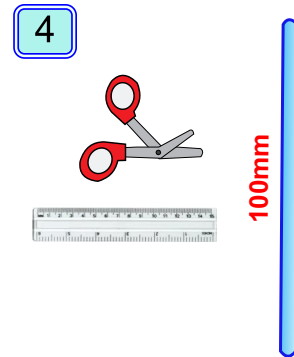
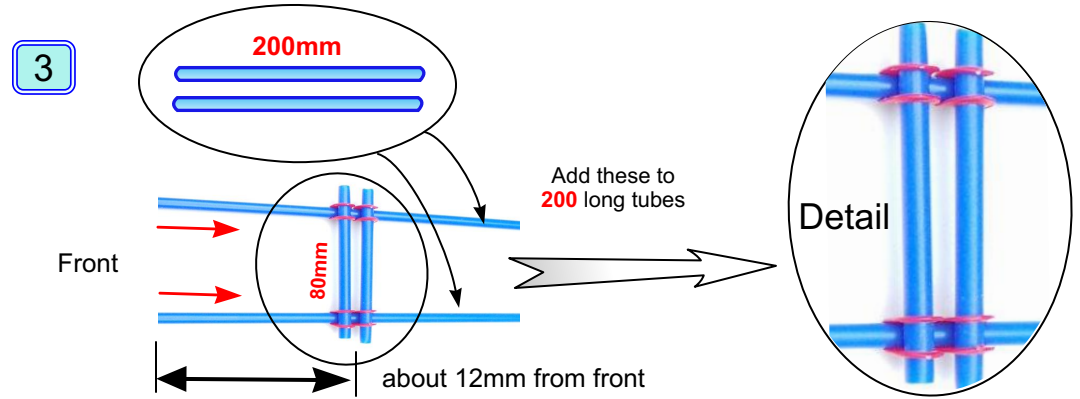
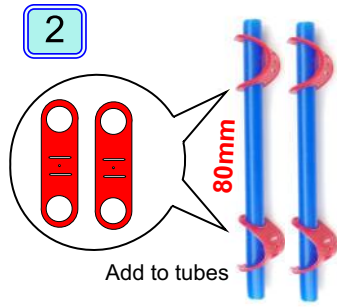
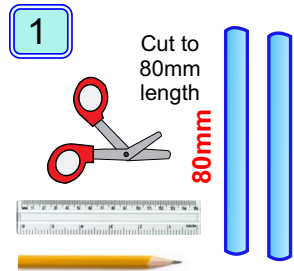
angle

Cutting tubes at an angle can makes assembly easier



Air Vehicle

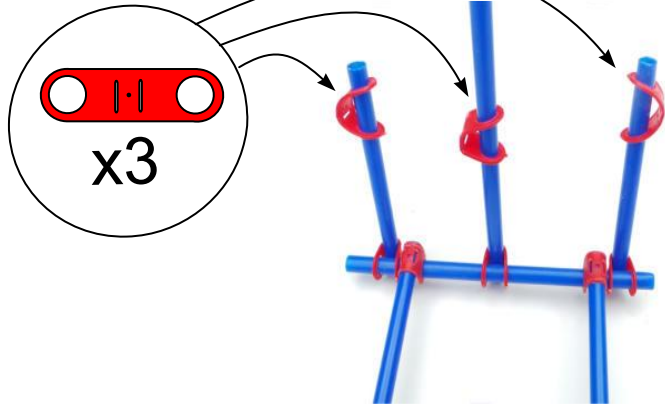
Frame Making - Step by Step 1 of 4



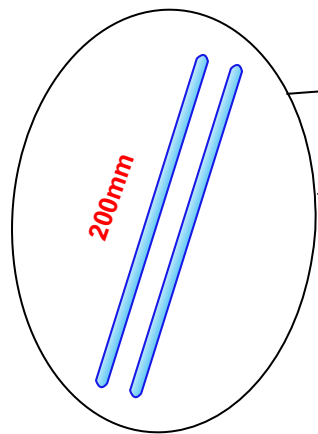
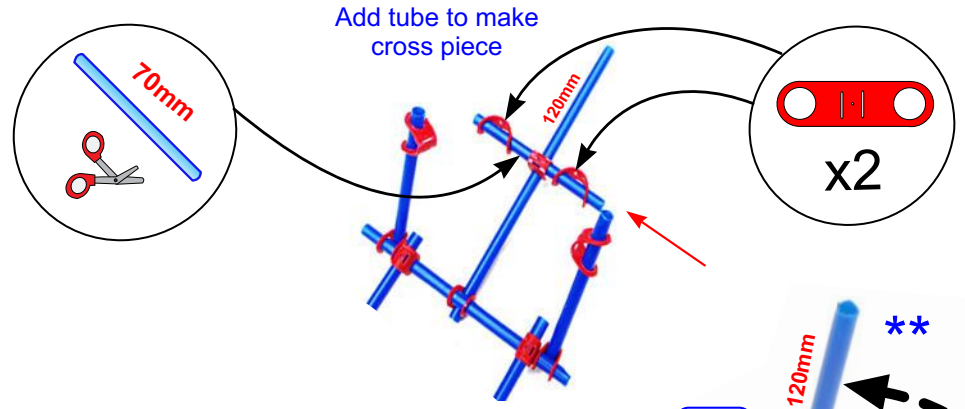
Air Vehicle

Making Step by Step 2 of 4

11



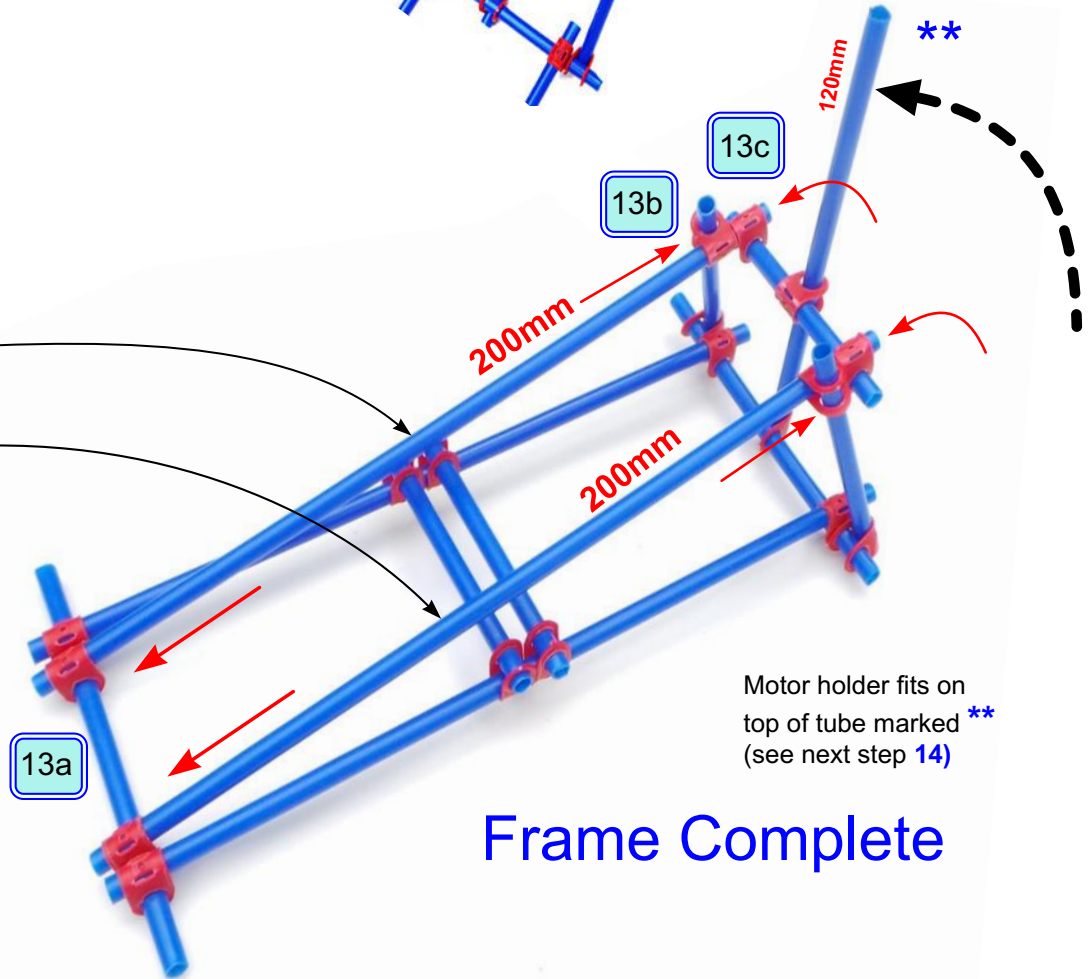
12



13a

13b

13c

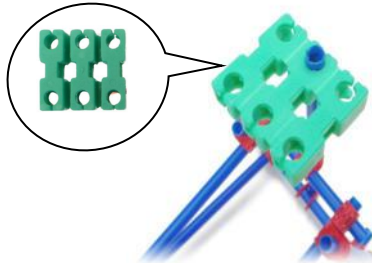


Motor holder fits on top of tube marked ** (see next step 14)

Frame Complete

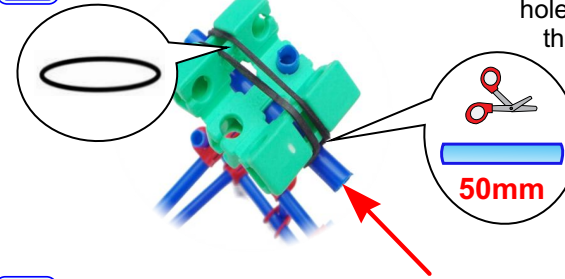
14

Add motor holder on end of the long tube marked ** in step 13c



15

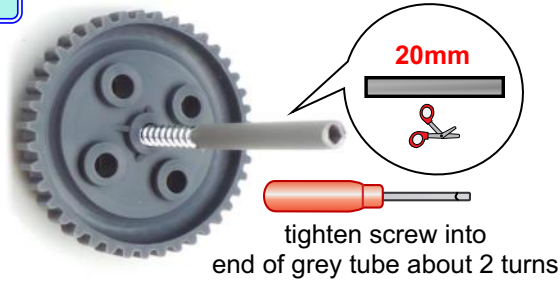
fold connector sides up so you can push the blue tube i hole in centre underneath then add rubber band



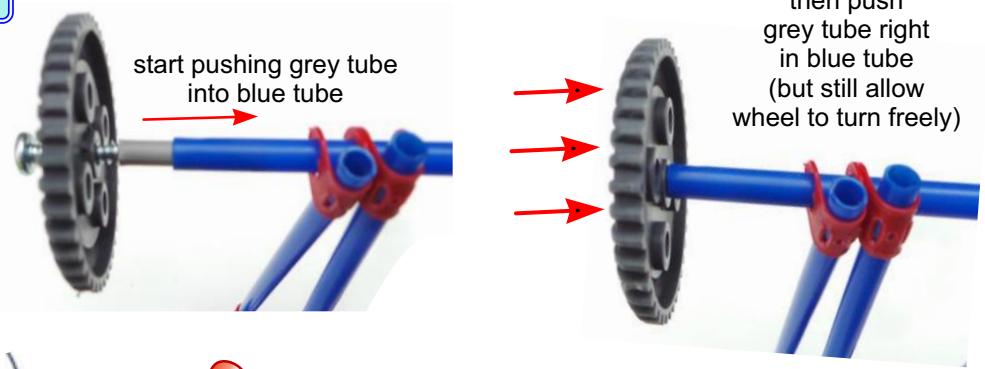
16



17



18



then push grey tube right in blue tube (but still allow wheel to turn freely)

19

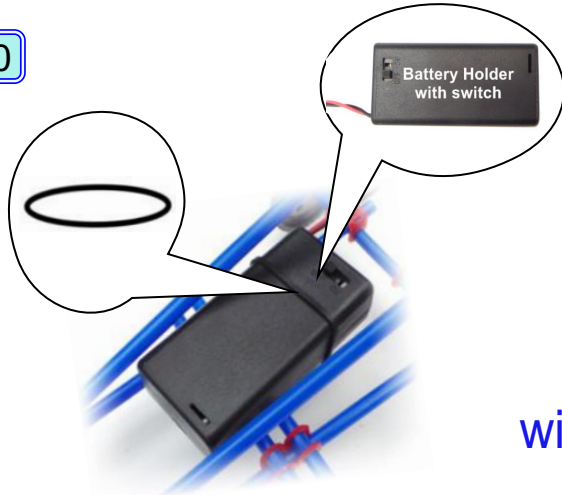
Add the 4 Wheels

Tip - lay vehicle on its side to push grey tubes into blue tubes



Adjust so wheels just spin freely using screwdriver

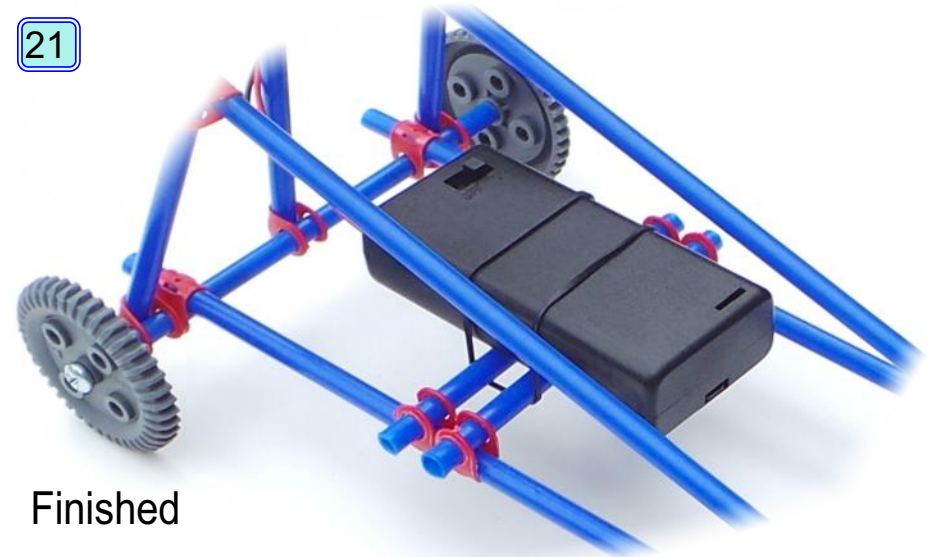
20



Start

Holding
battery holder
with a rubber band

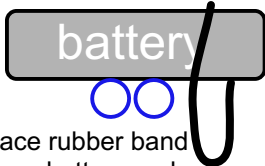
21



Finished

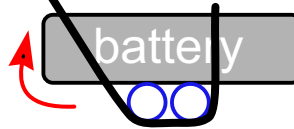
Steps by Step Help - Holding battery with a rubber band

1



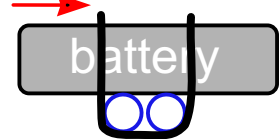
Place rubber band
over battery end

2



Pull it over the blue tubes and
then over the battery holder

3

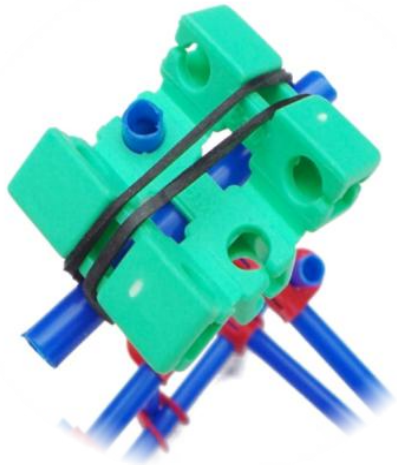


Adjust so rubber band
holds battery holder neatly

Air Vehicle

Adding motor then wiring it

22 Add Motor

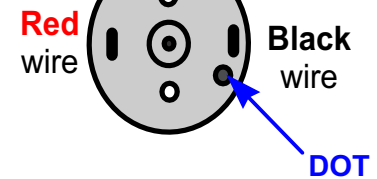


Lift rubber band up so that you can add motor



23 Add wires

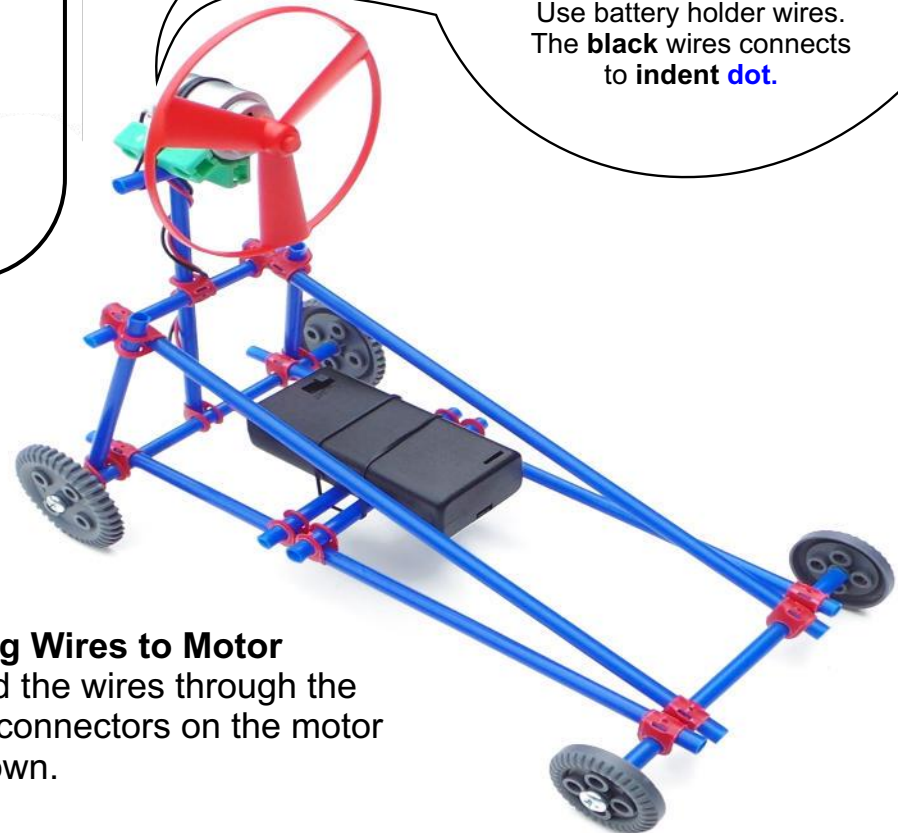
Back of Electric Motor



Use battery holder wires. The black wires connects to indent dot.



Adding Wires to Motor
Thread the wires through the metal connectors on the motor as shown.

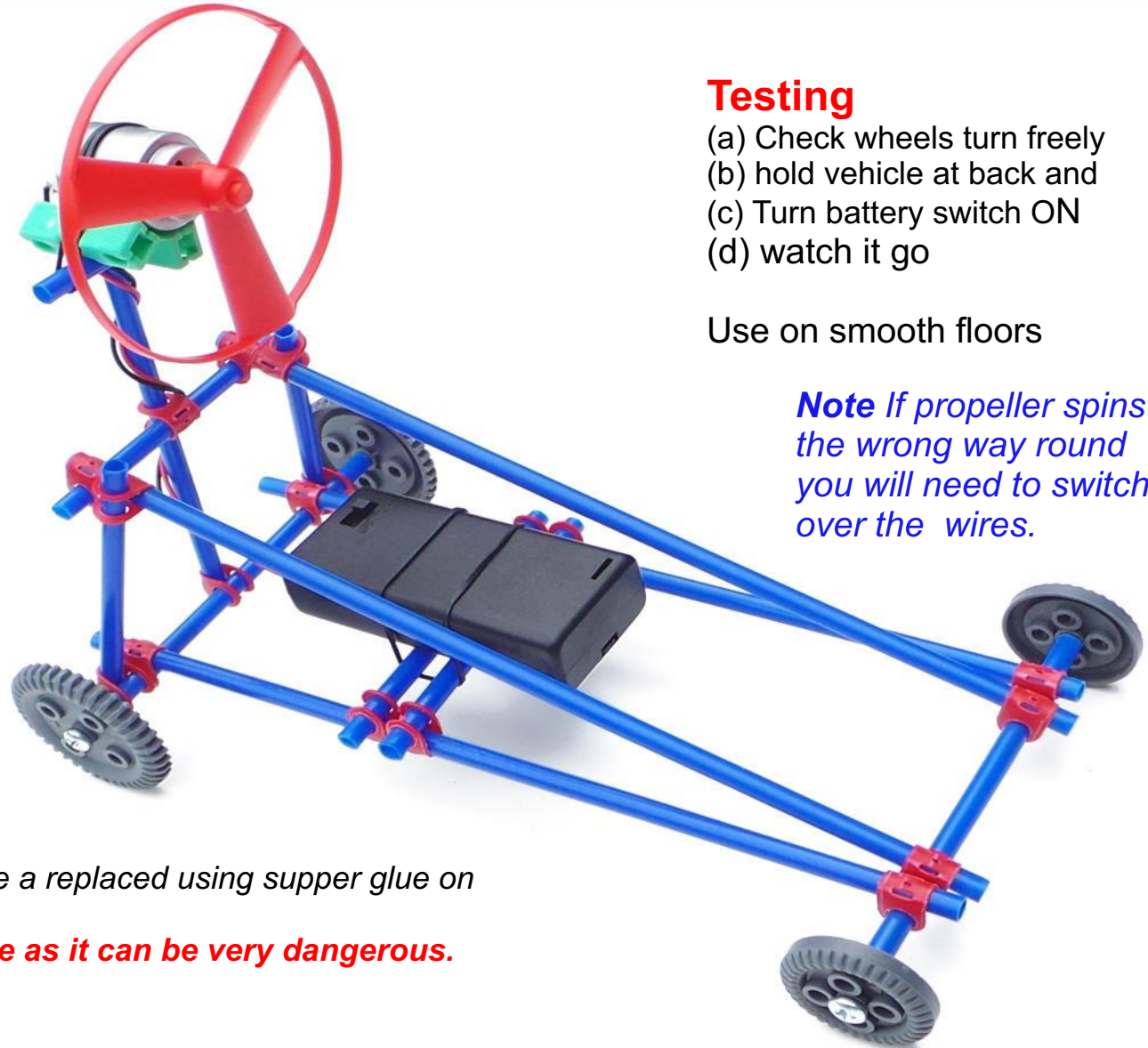




HOPowered AirVeh6

Air Vehicle

Complete and ready to use



Propeller Safety

Keep behind the vehicle direction of travel when turning on the power.

Testing

- (a) Check wheels turn freely
- (b) hold vehicle at back and
- (c) Turn battery switch ON
- (d) watch it go

Use on smooth floors

Note If propeller spins the wrong way round you will need to switch over the wires.

Note

If the propeller is removed it can be replaced using super glue on the end of the motor spindle.

ADULTS ONLY to use Super Glue as it can be very dangerous.

BATTERY SAFETY

Remove battery cells from battery holder when not being used.