

Instructions 2 - Fairground Ride



Renewable Energy Project

Follow this step-by-step guide on how to build a solar powered fairground ride.

Associated resources:

- Renewable energy lesson plan
- Presentation 2 – Fairground ride
- Worksheet 2 – Fairground ride

You will need:

Parts included in class kit

- 1 motor mounted on stand (completed in blog 1)
- 1 solar panel & stand (completed in blog 1)
- 1 foam sheet
- 1 card disc
- 1 motor pulley
- 4 pompoms
- 2 crocodile leads
- 1 battery holder

Other parts, tools and consumables

- Ruler
- Pencil
- Felt tip pens
- Large scissors
- Transparent sticky tape
- Low melt glue gun
- Sheet of card
- Pair of compasses
- 1 AA zinc cell

Step 1

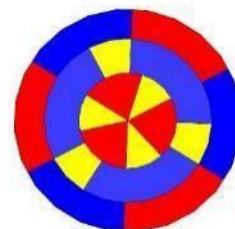
Remove the propeller from the motor and replace it with the motor pulley. The nose of the motor pulley should be facing away from the motor as shown. Loosen the nut on the motor stand and turn the motor so that the shaft is facing vertically upwards. Re-tighten the nut.

Step 2

Cut a base 12cm x 25cm from the polystyrene foam. Glue the solar panel stand to one end of the base and the motor stand to the other end. Make sure the solar panel is facing away from the motor, and the motor is on the side furthest side away from the solar panel.

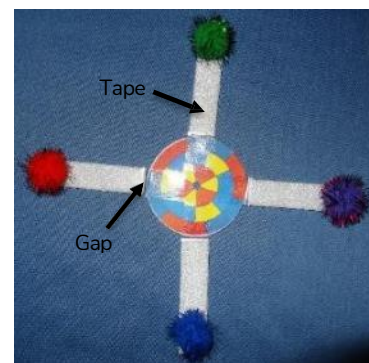
Step 3

Hold the card disc firmly on the sheet of card and use the pair of compasses to draw two concentric circles at diameters 5cm and 3cm. Colour each concentric ring in alternating bright primary colours. Choose only two colours for each ring to get spectacular colour mixing effects.



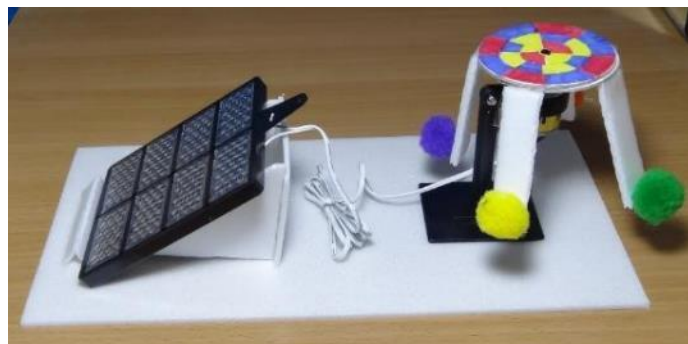
Step 4

Cut four strips of polystyrene foam 1.5cm x 7cm. Take four pompoms to act as passengers and glue them onto the foam strips. Use the transparent sticky tape to attach the four strips equally spaced around the edge of the card disc. Make sure there is a gap between the edge of the disc and the start of the polystyrene foam strip so that the tape can act as a hinge, allowing the strip to hang down when the ride is stationary and fly out horizontally when the ride is spinning.



Step 5

Slide the card disc onto the nose of the motor pulley. If it is loose then glue it on. Orientate the base so that the solar panel is facing the sun, watch the disc spin and see what happens to the strips of polystyrene and to the pairs of colours. Make sure the wires don't obstruct the ride and stop it going round.



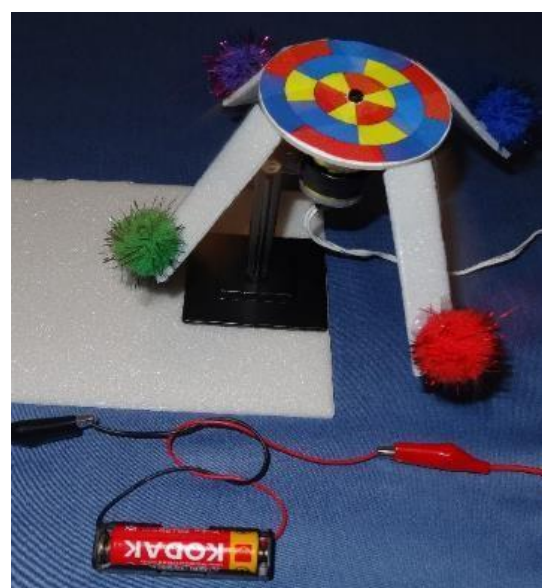
Step 6

Try controlling the fairground ride by covering and uncovering the solar panel with your hand. Try to work out roughly what proportion of the solar cells need to be covered to prevent the ride starting up at all.



Step 7

Try running the fairground ride with a battery instead of a solar panel. Use the plastic spanner to unscrew the two nuts holding the motor leads onto the solar panel, take off the washers then slide the motor connectors off the studs. Refit the washers and nuts onto the studs so you don't lose them. Fit the AA cell into the battery holder and use the two crocodile leads to connect the battery to the two motor connectors. Make sure the two motor connectors are not touching one another, or you will get a short circuit. Watch the ride rotate and see if there is any noticeable difference between the battery-operated ride and the solar powered one. What happens if you swap over the two crocodile clips attached to the battery? Remember to disconnect the battery when you have finished using the ride.



N.B. If you are dismantling this model to use for the next module then try to remove the motor stand carefully from the polystyrene base, so that you can re-use the base in module 4.