

ES	TECHNOLOGY	Knowledge & understanding	Needs	Resources	Processes
	TECHNOLOGY	Skills in designing & making	Preparing	Carrying out	Reviewing
	SCIENCE	K & U - Energy and forces	Properties of energy	Conversion of energy	Forces
	SCIENCE	K & U - Earth & space	Materials from Earth	Changing materials	<i>air resistance, sound, friction, push/pull</i>

Our air pump, when operated, compresses the air and forces it out through the outlet straw. The flaps and tabs prevent too much of the air escaping back up the body. The jet of air issuing from the outlet ought to be able to do some work.

We regularly use moving air to drive turbines, (windmills and the large wind generators we now see on the hills, for example).

We also use air to make sounds - musical instruments such as the trumpet, the flute or the clarinet. Church organs are wind instruments - an electric pump compresses air, and pressing the organ keys allows this air to escape into the organ pipes.

Our challenge is to build a card air pump that will generate both movement and sound.

STAGE ONE

What is going to move? Whatever it is it must not be too difficult to move - our pump is not likely to be very powerful. It could certainly make something flap, and it could drive a simple turbine if the turbine is both light and free turning.

SOUND - The air needs to vibrate - how can we make that happen? How do musical instruments vibrate the air? What's a whistle?

Can you whistle?

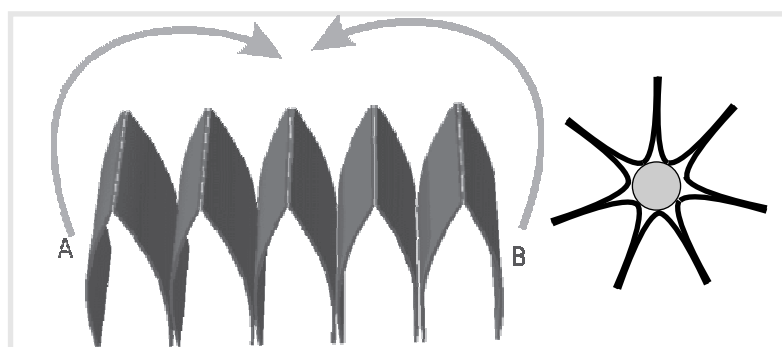
We won't want to waste any air pressure, so we must make sure that any leaks are kept to a minimum. You may find that the sides of your pump swell outwards when operated. This lets air escape. How could you stiffen the sides? (*See page 11*)

STAGE TWO

When you make your device you will need to test every idea carefully before you incorporate it into the machine. If your sound device doesn't work, is it the fault of the pump - or the sound device?

STAGE THREE

You will learn a lot from making your 'Skirly-whirly'. Much of what you discover will probably be of the "Well, that doesn't work" variety. If you ever make another attempt, you would benefit from any records you keep, so list all the failures and successes, and try to work out why some ideas didn't work while others did. Sometimes a good idea fails only because some component was picked up with gluey fingers!



Here is a quick way to make a little lightweight turbine for testing your pump design. Take a number of small rectangles of card, and fold them in the centre (so they are like tiny birthday cards). The number of cards should equal the number of blades you want on the turbine.

Glue them together side by side - but glue only the half furthest from the fold. When they are all together glue the first face A to the last face B. It will look a little like a star, and you will be able to slide a dowel or straw between all the folds, at the centre.

