**FANTAILLED BIRD**

This is an adaptation of a traditional Chinese toy. Take a 7.5 cms. x 3.0 cms. strip of bond paper. Fold its length into three equal parts. Leaving one third of the width cut two sectors along the length. Repeat the same at the other short edge Fig(1). Fold one third of the thin strips inwards and glue them Fig(2). Take a piece of used refill about 1 cm. long and flatten one of its end between your teeth Fig(3). Put a pin through this end. The oval refill end prevents the pin head from going through Fig(4). Apply glue (Fevibond, Vamicol are best) on the doubled up ends. Fix the pin as shown in Fig(5). Now turn the strip and stick the two glued portions together Fig(6). If you hold the refill in Fig(7), and blow air then the fan will rotate. Fold a FLAPPING BIRD (previous model) using a 10 cms. square of thick paper. Cut the bird’s tail as shown in Fig(8). Apply glue on both the inner portions of the tail and stick the plastic refill of the fan as shown in Fig(9). Tie a thread to the bird Fig(10) and then rotate it Fig(11). The tail fan will rotate giving a feeling of the bird in flight.
When you chuck this fascinating plane it will take a round and come back to you. So, you can chuck it with one hand and catch it with the other. Take a 15 cms. square of thin but strong paper. Glazed newspaper will do very well. Fold the paper in half from the bottom to the top Fig(1). Fold it in half from side to side Fig(2). Press the paper flat Fig(3). Unfold it again Fig(4). Now fold the top edge to meet the centre fold line Fig(5). Fold the right side edge down to meet the centre line Fig(6). Then fold it down again to meet the centre of the paper Fig(7). Repeat the process on the left side edge Fig(8). Fold the top point backwards to meet the centre line Fig(9). Now fold the paper into half from side to side Fig(10).
STUNT PLANE CONTINUED

Fold down the top wing so that it meets the side edge Fig(11). Fold the bottom wing in just the same way Fig(12). Unfold the wings again. Fold up the tail section. The picture shows you where the fold line starts and ends Fig(13). Press the tail flat and unfold it again Fig(14). Push the tail section inside itself along the fold line Fig(15). Fig(16,17) show this process in more detail. Fold the wings down again and open them out. Shape the wings by curling the bottom edge upwards Fig(18). To loop the loop, hold the plane with its nose pointing upwards and with the underside facing you Fig(19). Throw the plane smoothly upwards. It should loop away from you and then come back Fig(20). So, have great fun throwing it with one hand and catching it with the other. You can make this plane perform several other stunts and tricks.
For the best performance you must fly the loop glider in a big room where the air is still. For making the loop glider you will need scissors, a sheet of bond paper, ruler, pencil, a plastic soda straw and some sticky tape Fig(1). Cut two strips of paper, one measuring 2 cms. x 16 cms. and the other 2 cms. x 10 cms. Fig(2). Cut the plastic soda straw so that it is 15 cms. long Fig(3). Bend the small strip into a loop so that its ends slightly overlap. Tape the overlapping ends together. Repeat this step with the large strip Fig(4). Instead of sticky tape you can use any good adhesive. With a piece of sticky tape attach the small loop to one end of the soda straw Fig(5). Attach the larger loop to the opposite end Fig(6). The glider is now ready for a take-off. To fly the loop glider, hold it high with the small loop in the front and throw gently Fig(7). The loop glider will glide through the air, losing height slowly. If the loop glider wobbles about then adjust the position of the loops. See what happens when you fly the loop glider with the large loop in the front.
**UDANA MASTA**

हे खेलण कल्याणाची पद्धत एकदा सोपी आहे. पण हे खेलण उडवला लागतं की आसार्यचिक्यत व्यावसाय होतं. हा उडते मासा हवेत गोल गोल फिरून खाली चेतो. त्यसाठी जुंबा वर्तमानप्राचा कागद आणि काळी एकेक साहित्य पुरे (चित्र 1). जुंबा वर्तमानप्राची २ से.मी. संदर्भी लांब पडणे कापा (चित्र 2). ही पडणे आरंभी ठेकून पडणे चालवून उडवून बांजूने अथवा भागापटत कापा. वाचारही दादी बांजूने कापा (चित्र 3). आठवी दोनदी कापलेली भाग दुसऱ्या एकेकर असलेल्या अणाच्या (चित्र 4). आणि एकेकर असलेल्या अणाच्या. ते न सुदर्शन रहितील याची काठली भाग (चित्र 5). आठवी विषयात दुव्वा उडवणारे मासा तवार होईल (चित्र 6). हा मासा हवेत उडवल्याच गोल गोल फिरून खाली अधिक (चित्र 7). आठवी वेगाने आकाराच्या आणि रंगांचे मासे करून भरा.

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**FLYING FISH**

This is the simplest and the most amazing flying object that you can make. The flying fish will twist and turn round and round. To make it all you will require is a sheet of paper (old newspaper will do well) and a scissor Fig(1). Cut a long strip of paper about 2 cms. wide Fig(2). Place the strip in a horizontal position. On the lower right-hand side, cut a slit half way across the strip. Repeat on the upper left-hand side Fig(3). Bring the right-hand slit over to meet the left-hand slit Fig(4). Slip both the slits into each other so that they are interlocked together Fig(5). This is what your completed flying fish would look like Fig(6). Throw the flying fish high up in the air and it will twist and turn around on its way to the ground Fig(7). Try making flying fishes of various sizes and colours.
It is a great fun to make and fly this helicopter. It will turn around just like a real helicopter. For making it you will need a scissors, an old post-card and a paper clip Fig(1). Cut a long strip of postcard about 3 cms. wide Fig(2). Turn the strip and keep it sideways. Make two slits in the strip as shown, being careful each time to cut only two-thirds of the distance Fig(3). Hold the upper right-hand end and the lower left-hand end Fig(4) and bring them together Fig(5). Fasten the two ends together with the paper clip, so that the helicopter will stay vertical while flying Fig(6). Now drop the helicopter from a height and watch it whirl round and round Fig(7). Make a loop with the thumb and first finger of your right hand. Try and catch the vertical tail of the falling helicopter in this loop. It will require a bit of co-ordination but it is great fun.
PULLBACK CAR

This toy was devised by Mr. K.V.S.Kartha - an active member of the Kerala Sastra Sahitya Parishad. This is a very delightful car. On being pulled back this car stores energy. On leaving it this energy is released and the car dashes forwards. Take a small plastic soap case and make four holes in it with a divider point as shown in Fig(1). Heat the tip of a long needle Fig(2) and poke it in the centre of a cheap quality plastic button Fig(3). Put two such button and needle assemblies in the holes of the soap case. Heat the eye end of the needles and affix one button each Fig(4). The buttons become the wheels and the needles become axles. Now tie some sewing thread on the thin end of a 20 cms. long broomstick Fig(5). Tape or tie the broomstick well to the side of the soap case. Tie the other end of the thread to the needle of the front wheels Fig(6). Now keep the car on the ground and pull it back. You can see the thread rolling up on the needle axle. This results in the broomstick bowing down and storing energy Fig(7). On releasing the car the stored energy in the broomstick propels the car forwards Fig(8).
This toy was also contributed by Mr. K.V.S.Kartha - an active member of the Kerala Sastra Sahitya Parishad. Well, this matchbox is a very obedient one. It will instantly obey your orders. When you say Go then it slides down the string. When you say STOP then it immediately halts. To make it is quite easy. Take a cardboard matchbox drawer and cut two V notches in the middle of its two long edges Fig(1). Make a clear hole in the centre of both the ends of the drawer Fig(2). Cut an old balpen refill equal in size to the width of the drawer Fig(3). Affix this refill in the V notches of the drawer Fig(4). Weave a 70 cms. long thread through the two holes in the drawer. The thread should go over the refill. Tie small pieces of folded paper at the ends of the thread for a good grip Fig(5). Carefully cover the drawer with the outer shell of the matchbox Fig(6). The outer shell keeps the refill in place. Now hold the two ends of the string upright. On pulling the two ends of the string, the string inside the matchbox rubs against the refill and brakes to a stop Fig(7). On loosening the tension even slightly the matchbox slides down the string because of its own weight. This simple toy is based on friction and gravity.
TWIN TURBINES

Both these turbines work very well and are very easy to make.

Take the plastic lid of any round tin. A pan masala tin lid is ideal Fig(1). Mark out six equally spaced lines on its rim. Cut these lines and about 1 cm. of the perimeter Fig(2). Offset the cut portions to make the blades of the turbine. Make a hole in the centre of the lid and press fit a 2 cms. long piece of used ballpen refill in it Fig(3). Put a long needle inside the refill bush to complete the turbine Fig(4). Hold the turbine under a water stream and see it spin Fig(5).

For the second turbine take the outer cover of a cigarette pack Fig(6). Cut it into half its length Fig(7). Using the existing creases fold three equally spaced blades. Trim the blades into equal size and stick them Fig(8). Affix a 6 cms. long used ballpen refill through the centre using some glue Fig(9). Put a long needle through the refill for the axle Fig(10). Hold the two ends of the needle and blow or else keep the turbine under a stream of water and see it spin Fig(11).
This windmill is essentially a propeller on a notched stick. Its working has puzzled and baffled people for over a century. Take a 25 cms. long reed stick, or even a used sketch pen, and cut notches on it using a knife or a triangular file Fig(1). The notched stick is shown in Fig(2). The ice-cream stick shown in Fig(3) is used to stroke the notches. Make a small propeller about 3 cms. long from another ice-cream stick Fig(4). Put a loose pin or nail through the propeller hole and fix it at the end of the notched stick Fig(5). Holding your forefinger on the far side of the notched stick and your thumb on the near side, stroke the ice-cream stick back and forth on the notches. The propeller will turn in one direction Fig(6). Now loosen your forefinger and let your thumb press against the stick, stroking the stick back and forth all the while. The propeller will now turn in the opposite direction. The horizontal and vertical vibrations of the notched stick are not the same frequency and amplitude. The resulting vibrational motion of the stick and thus of the pin is elliptical. Depending on the finger pressure and the side which is rubbed, these elliptical vibrations can be clockwise or anti-clockwise. The friction between the pin and the propeller sets the propeller in motion.