



EQUIPMENT ADAPTATIONS

**Ways to create and
adapt equipment for an
Inclusive Sport for
Development project**

Equipment adaptation is an important aspect of inclusive physical activity and sport. Of course, it is possible to provide a wide range of opportunities using little or no equipment whatsoever. But adapting equipment in order to include specific individuals, or to create an accessible version of a game, is a key strategy.

There are two main ways of thinking about equipment adaptation.

Improvising equipment can serve a number of purposes.

- In settings where access to regular sports equipment is limited (or completely absent), simple equipment items can be improvised using locally available materials. For example, parachute games can be played using large bed sheets or blankets.
- Where regular sports equipment is unsuitable for certain individuals, an adapted version may be more appropriate and user-friendly. For example, if an adult-sized tennis racket or hockey stick is difficult to control or grasp, a smaller version can be made from reinforced cardboard or wood.

Using **regular equipment** in different ways also opens up possibilities.

- Implements with small striking surfaces can be replaced by alternatives, perhaps from a different sport, making it easier to hit a ball. For example, instead of using a narrow baseball bat, some players may have more success by striking with a tennis racket.

- Regular equipment can be modified in order to change or improve its application in an inclusive physical activity context. For example, by wrapping a plastic bag around a football or basketball and securing with tape, a sound ball can be created (ball crackles when rolling on the ground).

This resource includes examples of both of these strategies.

Part one explores ways of creating sports- and games-based equipment using locally available materials.

Part two suggests some innovative ways of utilising ordinary sports equipment items.



PART ONE

**Making inclusive sport
equipment from locally
available resources**

Improvised Equipment

- Sitting volleyball posts and net
- Different types of ball
- Using plastic bottles
- Table Tennis net
- Small table and bat
- Different types of bat
- Table Tennis table

All of the equipment shown here can be made from local materials.

Some of the larger items need welding or joining and the expertise of a local mechanic, welder or blacksmith will be needed. These people will often have excellent ideas for adapting the designs to make them stronger or more durable. It is always worth listening to the experts!!



Alemayehu using his expertise to design innovative sitting Volleyball posts and nets from locally available materials

Sitting Volleyball Net

Cutting list

- 25mm square section: 2 x 200mm; 6 x 100mm
- 20 mm square section: 5 x 800mm; 2 x 900mm

Material required

- 25mm and 20mm hollow section square tube; Screws with butterfly nuts and hexagonal nuts

Estimated Costs

\$10

How to make the equipment

- Start by cutting the metal to the lengths required.
- Weld together the bottom T and upright (25mm), drill holes and weld on the nuts for the securing screws. We call this the Base T.
- Cut the two supporting legs and fix to the Base T.
- Cut the three pieces that make the width of the net and weld 10cm of 25mm tube onto two of the pieces to make the joining sockets. Drill holes and weld on nuts for the securing screws. Join together and fit to the Base T.
- Cut the metal for the posts and fix hooks or pieces of hollow rod to fix the net.
- Secure the posts to the base triangle, and the posts are complete.
- Make a net using the same method as the Table Tennis nets.



Material required

Newspaper; Plastic; old garments

Estimated Costs

\$0 - \$1

How to make the equipment

Paper Ball - Useful for short distance throwing and accuracy games.

- Take a sheet of newspaper and crumple up into a small ball.

Noisy Ball - For people with a hearing impairment. The ball could also be used to play Goalball.

- Take a medium sized ball (10 -20cm diameter) wrap it in plastic and fix the plastic with tape.
- When the ball rolls it will make a sound.

Cloth ball

- Find an old clean garment like a vest or sock
- Roll up newspaper to make a ball that will fit inside the garment.
- Gradually draw the garment around the paper trying to keep a circular shape.
- Sew the end to keep the shape.



Using plastic bottles

Material required

- 2litre; 1 litre and 500ml bottles 5 litre containers can also be used

Estimated Costs

\$0

- Plastic bottles can be used as targets. If filled with water they can also roll.
- When using plastic bottles outside it is useful to fill them with sand or beans so they do not fall down. If using plastic bottles as skittles put just enough sand or beans in them so they can still be knocked over. Groups of bottles can also be used on a court or table as target practise in sitting volleyball or polybat
- Bigger bottles can have their tops cut off to make small targets for throwing things into



Material required

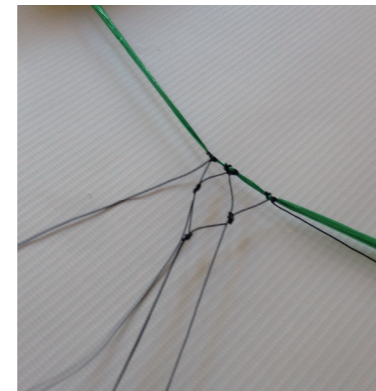
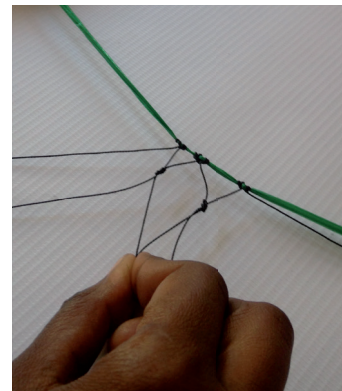
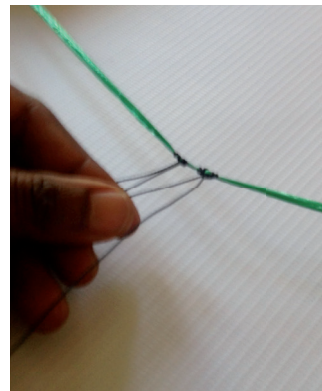
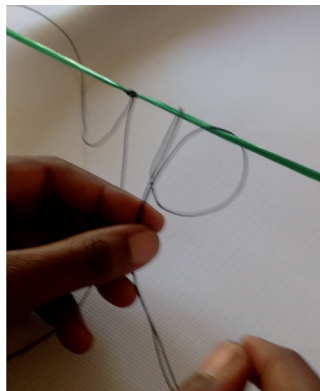
- Strong thread; Thick wire; Wool; Crochet hook

Estimated Costs

\$1

How to make the equipment

- This uses the same traditional method for making fishing nets
- Fix a piece of wire or strong rope between two points.
- Cut pieces of thread four times longer than the height of the net you want. If you want a net 15cm then cut 60cm
- Place these pieces of thread over the wire or rope to make a double length of thread (pic 1)
- Decide what size you want the holes in the net, and space the threads at that distance 1.5-2cm would work for a table tennis net.
- Knot the threads at the top so they are fixed (pic 2)
- Take two adjacent threads and knot them about 1.5-2cm down. Keep repeating this across the row.
- When one row is finished, start again on the next row a further 1.5-2cm down. (pic 3)
- Try to keep the pattern even.
- Finish the top and bottom by crocheting wool as a band or by sewing a band on.



Small table and bat

Material required

- 50mm square timber for the legs; 50x25mm. Timber for the net posts; table top; thin plywood for the bat; 6 long screws

Estimated Costs

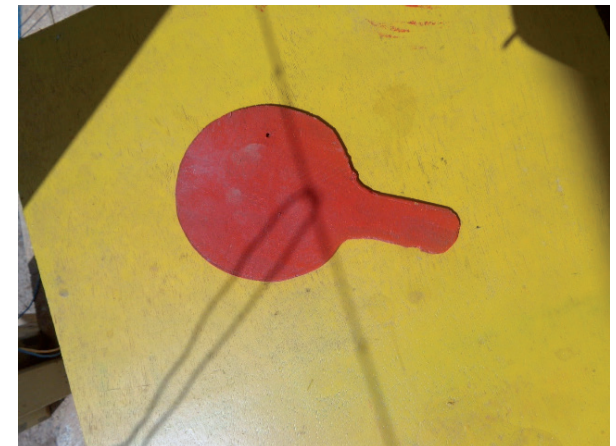
\$2

How to make the table

- Start by cutting the four legs about 300mm in length
- Screw legs to the top of the table
- Fix wood for net posts in the middle of the table at each side.
- Make a net using the same method as the Table Tennis nets.

How to make the bat

- Get a thin piece of ply
- Fold a piece of paper and mark half of the bat shape on it
- Fold out the paper, place on the wood and cut round it with a saw
- Smooth all edges with glasspaper



Material required

Cardboard; plywood; suitable sticks; rope; wire; hose pipe.

Estimated Costs

\$0 - \$5

How to make the equipment

Table tennis bats

- Get a thin piece of ply or cardboard
- Fold a piece of paper and mark half of the bat shape on it. The table tennis blade is 17cm high and 15cm wide.
- Fold out the paper, place on the wood and cut round it with a saw
- Smooth all edges with glasspaper

Tennis racket

- Measure a piece of wire about 80 cms, wind rope around the wire and then place a length of hose pipe over everything.
- Bend this to the shape of a tennis racket and put tape on the bottom to make a handle
- Across the width of the racket thread a piece of wire so it makes 7-10 rows of wire.
- Thread this string or rope through the wire to make the net.
- This type of racket may not be suitable for a game of tennis but could be used to gain coordination with bat and ball.

Hockey Sticks

- Find two pieces of wood the right length and shape
- Smooth off any splinters or pieces that are in the way
- You could use tape on the top for a handle

Different types of bat

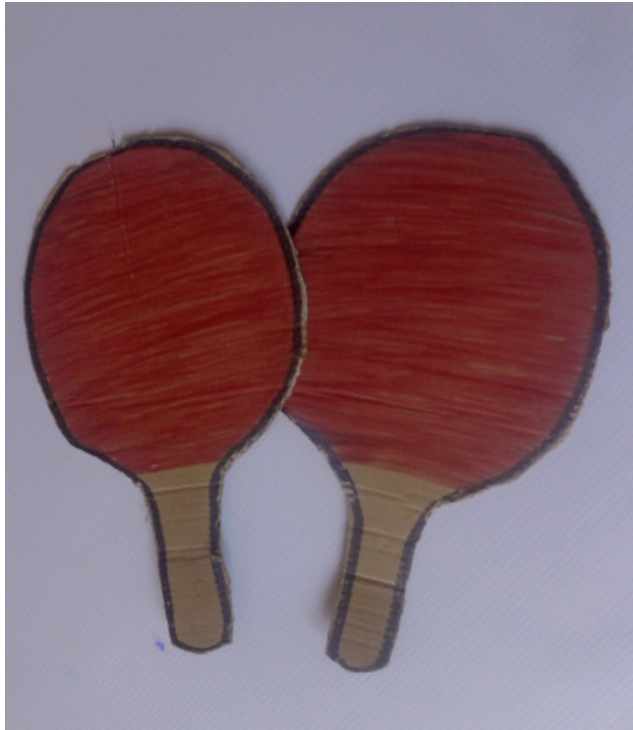


Table tennis



Tennis racket



Hockey sticks

Table Tennis table, 3/4 size

A full size table is 2740 x 1525 x 762.5mm. For smaller tables keep the height the same but try to keep the same proportion of 5:9 for the top.
This ¾ table will be 2050 x 1140 x 762.5mm allowing for some overlap of the top

Material required

- 30mm and 25mm hollow section square tube (for a small table 25mm and 20mm could be used); Screws with butterfly nuts

Cutting list

- 30mm square section: 4 x 730mm; 2 x 1750mm; 2 x 1140mm; 2 x 100mm
- 25 mm square section: 4 x 100mm; 2 x 1080mm for the top:
- 18mm ply or something similar cut into two pieces 1025 x 1140

Estimated Costs

\$20

How to make the equipment:

- This table is slightly shorter than the top to allow for an overlap
- Start by cutting the metal to the lengths required
- Weld together two legs (730mm) with the width piece (1140mm) on top.
- Weld the 25mm strengthening rail (1080) between the two legs about 400mm from the bottom of each leg.
- Weld two 100mm x 30mm sockets 30mm from the top of each leg
- Repeat this to complete the two ends of the table
- Weld 100mm x 25mm to each end of the long pieces
- Assemble the table
- Cut the ply for the top and join together with two hinges. Paint this green with white 25mm lines around the edges



Parachute or canopy games

These activities are widely used to foster teamwork and collaboration – and can be ideal inclusive group warm-ups.

However, any large sheet of material can be used as a substitute for a play canopy (parachute). This can include bed sheets, blankets, or if young people work in pairs, large plastic bags.



PART TWO

Using or adapting regular sports equipment

Ways of using or adapting regular sports equipment

In order to provide more opportunities in physical activity and sport for young people who have a wide range of abilities, it may be useful, or necessary, to adapt the use of regular sports equipment.

This could be because:

- Only regular sports equipment is available;
- Using this equipment in the 'traditional' or usual way may not be possible for some people.

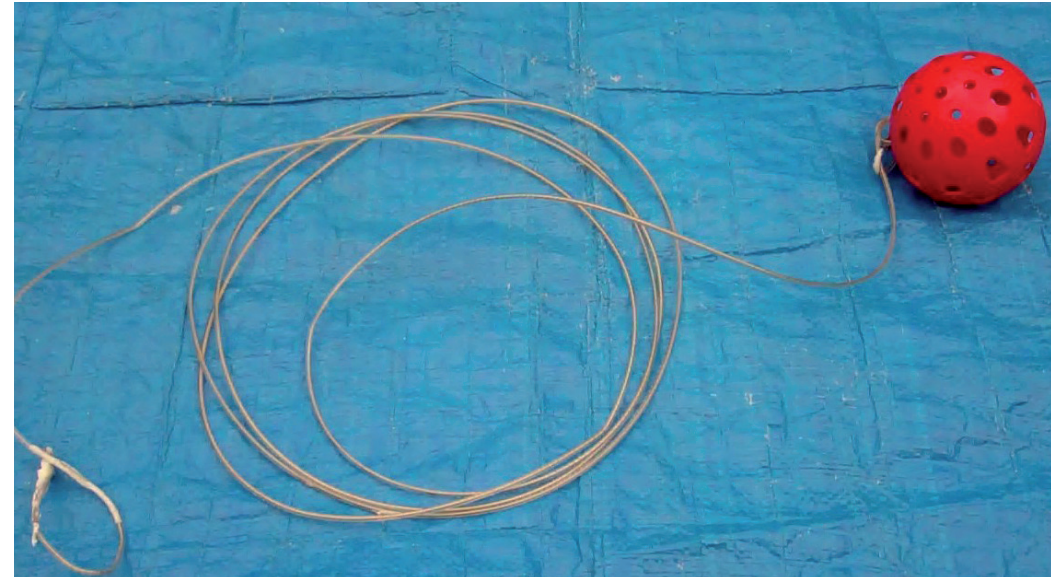
Here are some simple ways of adapting ordinary sports equipment or using it in a different way. There are also a few examples of how different formats of well-known sports and games have been developed in order to create accessible versions.



Ball/target games

If a severely mobility impaired person is participating in a target game using a ball, each time they throw or roll the ball it has to be retrieved and returned to them by a helper.

If a length of string or light cord is attached to any ball, this can promote independence by enabling the player to retrieve the ball themselves by pulling the ball back with the string. They can then continue to throw the ball again.



There are a number of possible equipment adaptations here.

Striking the ball from a 'tee'

Use a marker cone or marker disc (normally used for marking out a playing space or goals as an improvised tee.

Where a player may have difficulty in striking a moving ball, for example, in a softball or baseball activity, place the ball on top of a cone or marker disc. The player can strike the ball when ready. This is a particularly useful strategy for players who have coordination impairments.

Changing the bat

If a player finds that a narrow or small-headed bat (like a softball bat) makes it difficult to make contact with the ball, then try using a bat from a different sport, such as a tennis racket. This can give the player a much larger striking surface and provide early success and enable them to develop basic skills. If possible, offer batters a choice; they will often select the bat that they feel will suit them best.

Including vision impaired players

Players who have vision impairment can be included by turning a regular ball into a sound ball using a plastic bag (see how in the Improved Equipment section). A small airflow ball can be adapted by inserting small bells through the holes – these have to be squeezed in so that they will not fall out during play.

The key to using any sound ball, however, is that they must always roll on the ground or be bounced otherwise vision impaired players will not be able to detect them.



Striking/fielding games (cont.)

Slowing the ball down

As mentioned earlier, the speed of the ball can be effectively reduced by using a larger ball.

However, another simple way to reduce the speed of a ball is to deflate it slightly. This does not adversely affect the participation of non-disabled players, but may slow the ball down enough to enable players who have spatial/perceptual impairments to track its movement.



Hockey Sticks

These can be used in a completely different way by using them to help guide vision impaired people through simple movement patterns.

A vision impaired and sighted person hold two hockey sticks between them – each holding onto the end of two sticks. The sighted guide can lead their vision impaired partner through some simple coordinated movements. For example, walking (facing each other, or both facing the same way); or standing still, they can raise a lower both sticks – many different movements are possible.

This approach can also be useful when working with people who have coordination difficulties, or young people who reject contact with another person, but are happy to use the sticks as an intermediary.

Standard sports areas can be used in different ways to facilitate inclusion.

Volleyball

The height of a standard volleyball net is set at 2.43 metres (indoor) and 2.24 metres (beach) from the ground. For many players who have special needs this would be far too great a barrier (some players may be seated, for example).

The simple solution is to lower the net. In games where some players are standing and others are seated (perhaps in a wheelchair), the net can be around 1.5 metres (seated players closest to the net).

If players are seated on the floor (as for sitting volleyball) the net height can be around 1.1 metres – or even lower for beginners.

Note that using a solid barrier, like a low bench or some chairs laid end to end, can often be better for beginners as the ball often deflects off and rallies can continue.

Basketball

In a similar way to volleyball, the standard basket height can make it almost impossible for some people to score; for example, small children, people who have reduced strength and flexibility in their limbs or those using wheelchairs.

- The basic basketball target (the basket) can be adapted in different ways.
- Hang plastic or wooden hoops or pieces of lightweight wood vertically from the backboard at different heights. Players score by getting the ball through the hoops or hitting the targets with the ball.
- Place a large container, such as a large cardboard box or large plastic bin, at the foot of the net post, or directly under the basket. Players can score in the box/bin as an alternative.
- Hitting any part of the net post or backboard can count as a score.

Table tennis

Table tennis is a very dynamic game. The ball is small and fast-moving, the bat provides only a small striking surface, and the playing area, the table, is not large. In addition, players have to get the ball over a barrier (the net).

Polybat

Polybat uses the standard table tennis table (or any large table or tables pushed together) as the basis for an adapted table tennis game. By attaching some sides to the table and removing the net, a slower-moving ball can be pushed along the table surface using a regular table-tennis bat, a specially-developed polybat, a flat piece of wood, or by hand.

In polybat the ball must stay on the table surface – no bouncing (see the Polybat activity card). Alternatively, simply push the table tennis table against a wall and place a hard board (like a loose table-top) against the opposite side to create the rebound channel.



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