

PLAYCENTRE SANDPIT DIGGER – BUILD INSTRUCTIONS

Sandpit diggers have long been a favourite in Playcentre. They encourage better co-ordination, imaginary play, conversation and co-operation.

The sandpit environment is harsh, abrasive and often wet. Cheaper diggers often don't last the distance – undersized components are bent or broken, and steel goes rusty.

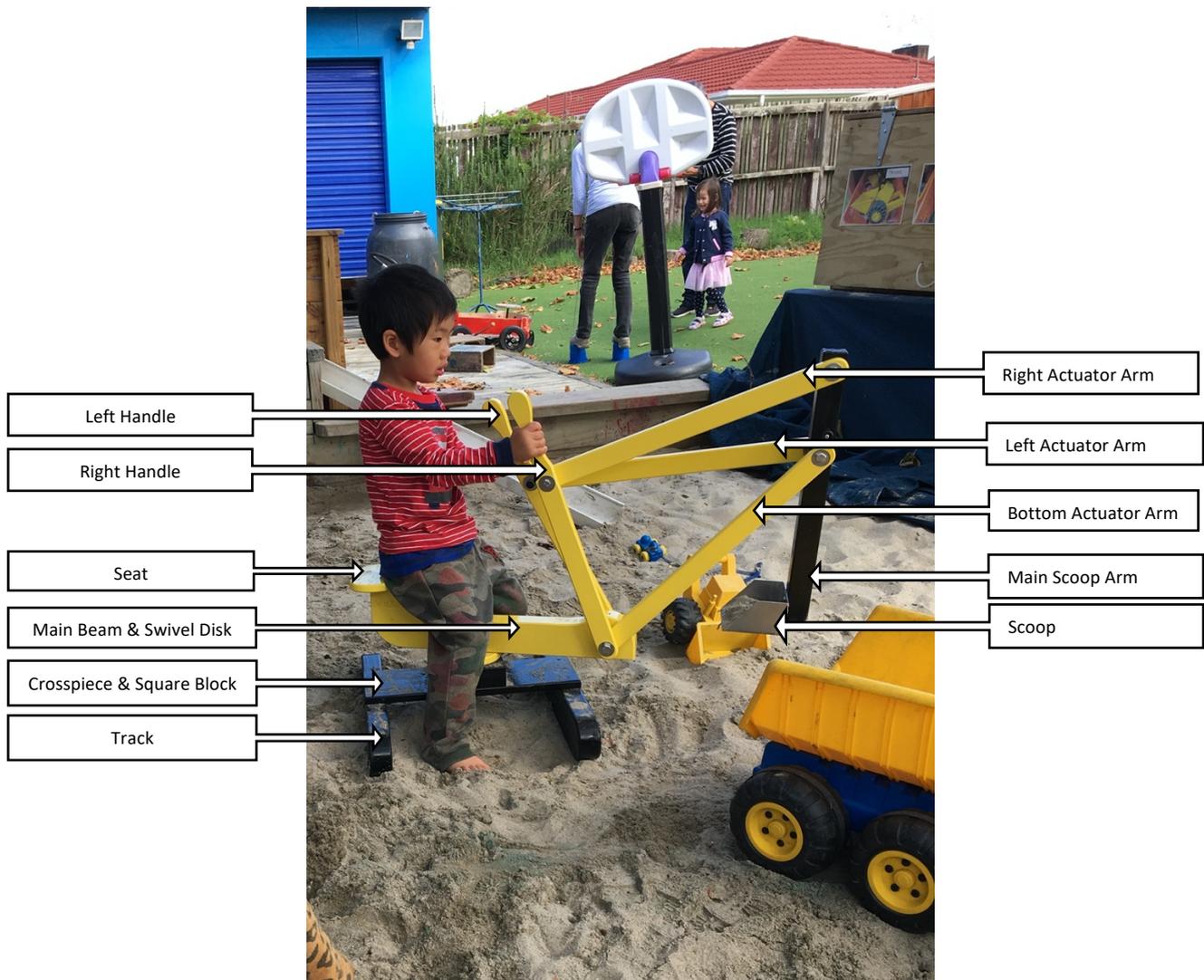
This digger was designed to last, using wood for strength and lightness, stainless steel for long life, and robust fittings for ongoing operation.

It is suitable for construction by someone who has woodworking skills and access to suitable tools.

The design was based on a digger made for North Shore Playcentres by ITM and Rotary. In turn, that design was based on a digger that had lasted 44 years at Takapuna Playcentre.

Feel free to adapt the design.

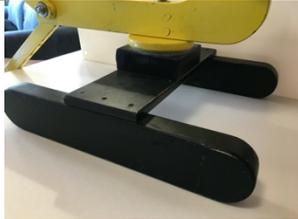
Robin Watts, New Windsor Playcentre, September 2020

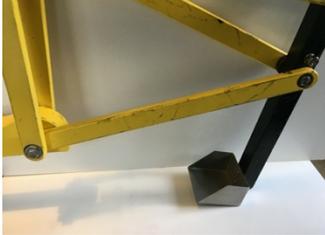
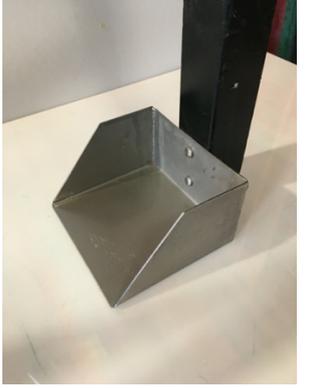


MATERIALS

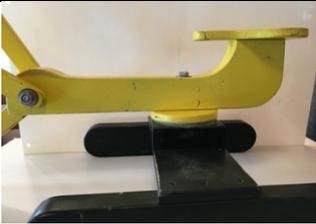
SUBSECTION	ITEM	MATERIAL	DIMENSIONS	QUANTITY
Base	Tracks	90 x 45 H3.1 or SG8	500mm long	2
	Crosspiece	140 x 18 H3.1	450mm long	1
	Square Block	140 x 45 H3.1	140mm long	1
	Screws	SS 8g CSK	50mm	6 + 4 = 10
Seat/Swivel/Beam	Main Beam	140 x 45 H3.1 or SG8	550mm long	1
	Swivel Disk	17mm Ply H3	140mm dia	1
	Seat	17mm Ply H3	220 long x 150 wide	1
	PE Swivel Disk	4mm PE Cutting Board	135mm dia	1
	Screws	SS 8g CSK	50mm	2 + 2
	Swivel Bolt	SS M12 Hex Bolt with SS M12 Nyloc Nut and 2 x SS M12 Washers at least 32mm dia	180mm	1
	Actuator Bolt	SS M12 Hex Bolt with SS M12 Nyloc Nut and 4 x SS M12 Washers at least 32mm dia	120mm	1
Arms/Actuators	Handles	40 x 18 H3.1	560mm long	2
	Actuators	40 x 18 H3.1	575mm long	3
	Spacer Disk	18mm H3.1 scrap	42mm dia	1
	Main Scoop Arm	42 x 42 H3.1	515mm long	1
	Handle Bolts	SS M8 Hex Bolt with SS M8 Nyloc Nut and 3 x SS M8 washers at least 30mm dia	50mm	2 sets
	Arm Bolt (Raise)	SS M10 Hex Bolt with SS M10 Nyloc Nut and 4 x SS M10 washers at least 30mm dia	110mm (or 100mm and counterbore for the head and nut)	1
	Arm Bolt (Scoop)	SS M10 Hex Bolt with SS M10 Nyloc Nut and 3 x SS M10 washers at least 30mm dia	75mm	1
	Arm Bolt (Actuator Stop)	SS M10 Hex Bolt with 2 x SS M10 Plain Nuts and 2 x SS M10 washers	60mm	1
Bucket	Bucket	1.6mm Stainless Steel	120mm wide x 110mm deep x 65mm high	1
	Screws	SS 12g mushroom head	30mm	2

COMPONENTS AND SUBASSEMBLIES

ITEM	PICTURE	NOTES
Tracks, Crosspiece and Square Block		<p>Each track is 500mm long. Cut a half circle at each end.</p> <p>Screw the cross piece (450mm) to the centre of each track with 3 screws.</p> <p>Screw the square block to the crosspiece with 4 screws.</p> <p>Mark the centre of the block and drill 12.5mm dia for the vertical pivot bolt.</p>
Main Beam		<p>550mm long. The beam is cut down to 70mm high for most of the length, optional bulge at the actuator end. Seat landing is 100mm.</p> <p>From the seat end:</p> <p>200mm to the vertical pivot hole (12.5 dia)</p> <p>500mm to the actuator cross bolt hole (12.5 dia), which is 40mm up from the bottom.</p>
Swivel Disk and Seat		<p>The swivel disk is 140mm dia. Centre it and screw it to the underside of the main beam with 2 screws.</p> <p>Drill the vertical pivot hole (12.5 dia) before attaching the seat.</p> <p>The seat is 220mm x 150mm. Cut it to a suitable seat shape and screw it to the seat landing on the main beam with 2 screws.</p> <p>From a PE (Polyethylene) kitchen cutting board, cut a disk 135mm dia and drill a 12.5mm hole in the centre.</p>
Left and Right Handles		<p>The handles are 560mm long. Shape the ends to a suitable shape for small hands to grasp.</p> <p>The bottom hole (12.5 dia) is 25mm from the bottom end of the handle.</p> <p>The top hole (8.5 dia) is 380mm from the bottom end of the handle (i.e. 355mm from the bottom hole).</p> <p>There are two of these handles and they are identical.</p>
Left (Lift) and Right (Scoop) Actuator Arms		<p>The left and right actuator arms are 575mm long. Round the ends as desired.</p> <p>The hole at the handle end (8.5 dia) is 25mm from the end of the actuator arm.</p> <p>The hole at the main scoop arm end (10.5 dia) is 25mm from the end of the arm, i.e. 525mm from the hole at the other end.</p> <p>There are two of these arms and they are identical.</p>

ITEM	PICTURE	NOTES
Bottom Actuator Arm		<p>The bottom actuator arm is 575mm long. Round the ends as desired.</p> <p>The hole at the main beam end (12.5 dia) is 25mm from the end of the actuator arm.</p> <p>The hole at the main scoop arm end (10.5 dia) is 25mm from the end of the arm, i.e. 525mm from the hole at the other end.</p>
Main Scoop Arm		<p>The main scoop arm is 515mm long. The lower end can be optionally cut on an angle, to make it easier to operate the scoop.</p> <p>The hole at the top end (10.5 dia) is 30mm from the end of the actuator arm.</p> <p>The hole for the other two arms (10.5 dia) is 180mm from the top end of the arm, i.e. 150mm from the top hole.</p> <p>There is a third hole (10 dia) which is 145mm from the top end. The bolt in here acts as a stop to the scoop arm locking in an extended position. It may be best to position this hole after assembly.</p>
Scoop		<p>The scoop was custom made from 1.6mm stainless steel, TIG welded at the back corners. It is 120mm wide and 110mm deep and 65mm high. The distance from the top of the oblique cut to the back is 40mm.</p> <p>You can decide your own dimensions and method of manufacture.</p> <p>Drill 2 mounting holes and screw the scoop to the main scoop arm with 2 screws.</p>

ASSEMBLY

STEP	PICTURE	NOTES
Paint the components.		Paint each of the components with a hard wearing paint.
Assemble the main beam to the base.		<p>Use the M12 x 180 SS bolt to join the main beam to the base.</p> <p>The assembly order is: Bolt, Washer, Main Beam, PE disk, Base, Washer, Nyloc Nut.</p> <p>Tighten the Nyloc Nut so as to allow the main beam and seat to swivel.</p>
Assemble the left and right actuator arms to the handles.		<p>Use the M8 x 50 bolts to connect the arms to the handles. The bolt heads should be on the outer face.</p> <p>The assembly order for the <u>right</u> actuator is: Bolt, Washer, Handle, Washer, Actuator Arm, Washer, Nyloc Nut.</p> <p>The assembly order for the <u>left</u> actuator is: Bolt, Washer, Actuator Arm, Washer, Handle, Washer, Nyloc Nut.</p> <p>Tighten the Nyloc Nuts so as to allow the arms to swivel on the handles.</p>
Assemble the handles and the remaining bottom arm to the main beam.		<p>Use the M12 x 120 SS bolt to join the handles and bottom arm to the main beam.</p> <p>The assembly order is: Bolt, Washer, Right Handle, Washer, Bottom Arm, Washer, Main Beam, Washer, Left Handle, Washer, Nyloc Nut.</p> <p>Tighten the Nyloc Nut so as to allow the handles to move freely.</p>
Assemble the Scoop Arm to the Actuator Arms.		<p>The top bolt is M10 x 75 and connects the <u>right</u> actuator arm to the Scoop Arm.</p> <p>The assembly order is: Bolt, Washer, Right Actuator Arm, Washer, Scoop Arm, Washer, Nyloc Nut.</p> <p>The bottom bolt is M10 x 110 and connects the bottom arm and the <u>left</u> actuator arm to the Scoop Arm.</p> <p>The assembly order is: Bolt, Washer, Bottom Arm, Washer, Scoop Arm, Wooden Spacer, Washer, Left Actuator Arm, Washer, Nyloc Nut.</p> <p>Tighten the Nyloc Nut so as to allow the arms to move freely.</p> <p>Note: The picture shows an M10 x 100 bolt, which has been counter-bored on both sides to fit.</p>

FINAL ASSEMBLY

STEP	PICTURE	NOTES
<p>Position and fix the stop bolt on the Scoop Arm</p>		<p>The stop bolt prevents the arm from extending too far and “locking” in the extended position. The expected position is 145mm from the top of the Scoop Arm. Confirm the position and drill a 10mm hole. The assembly order is: Bolt, Washer, Scoop Arm, Washer, Plain Nut, Plain Nut. Adjust the position of the nut so the flat rests against the bottom arm, and tighten the second nut to lock it position.</p>
<p>Review the final assembly</p>		<p>Confirm that all the pivots are moving freely and that you can raise the Scoop arm using the left handle, and draw the scoop towards you with the right arm.</p>
<p>Confirm the digger can be folded back</p>		<p>You're done!</p>