

(A+)

Assignment 2 - Exercise Equipment

Client wants

- 2 person piece of exercise equipment (not able to be used individually)
- Must fit in a gym space (as normal equipment does) ✓
- No limit budget ✓
- For more serious athletes

Restate

Create a piece of exercise equipment to be used by two people at the same time. ✓

Brainstorm at least 10 ideas

1. Planker at weight for Bench press
2. Pedaling bike makes tension for row machine
3. Bench press/pull-up
4. Sawing motion exercise(2 man saw) — LIMB REMOVER.
5. Chin up/Squatting machine
6. 2 person balance board
7. Row/Ab roller
8. Leg press/ Plank
9. Teeter-totter pull-ups ✓
10. Bicycle powered treadmill

Requirements

Primary	Secondary
<ul style="list-style-type: none"> • Only works with two or more people • Does no harm to people ✓ <ul style="list-style-type: none"> ◦ Safety locks • Does not strap people in (climbing harness) • Sustainable end of life plan 	<ul style="list-style-type: none"> • Encourages people to workout • Easy/Low cost to produce ✓ • Easy to store • Accessible safety switches • Ideas/Uses for different levels able-body people • Used outside as an option • Does not use electricity

Defining the Interfaces

Primary:

- Hands - Handles(push/pull/swinging), Ropes, Chains, Pushing surface, hand pedals, punching
- Feet - Pushing Surface, Pedals, treadmill, kicking
- Legs - Pushing, Pulling Surface, balancing, kicking ✓
- Head - Pushing, Pulling Surface
- Arm - Pushing, Pulling Surface, balancing surface, punching
- Finger - squeezing/grabbing
- Mouth - biting

Secondary:

- Machine must sit on gym space floor ✓
- Advertising space ✓
- Easy storage
- Safety attachment

10 more ideas

1. Bicycle powered kickboxing sparring machine
2. Mouth biting tension for finger squeezing
3. Swing with high friction
4. Leg press for arm resistance ✓
5. Treadmill powered kickboxing sparring machine
6. Rope pull for Bicycle resistance
7. Bicycle powered balancing surface
8. Circular Balance Apparatus (Sphere-O-Core™)
9. Hand pedal resistances for chin ups
10. Pull down and chin up. — INTERESTING

Review Solutions and Keep Two

- Circular Balance Apparatus (Sphere-O-Core™) ✓
 - Simple
 - Can be used with 2 or more people
 - Concentrates on the usually neglected core
 - Can be combine with other simple pieces of equipment (dumbbells, medicine balls, kettle bells etc)
- Bicycle powered treadmill
 - Technology is already around ✓
 - People often know how to use this types of equipment
 - Teamwork for two people ✓

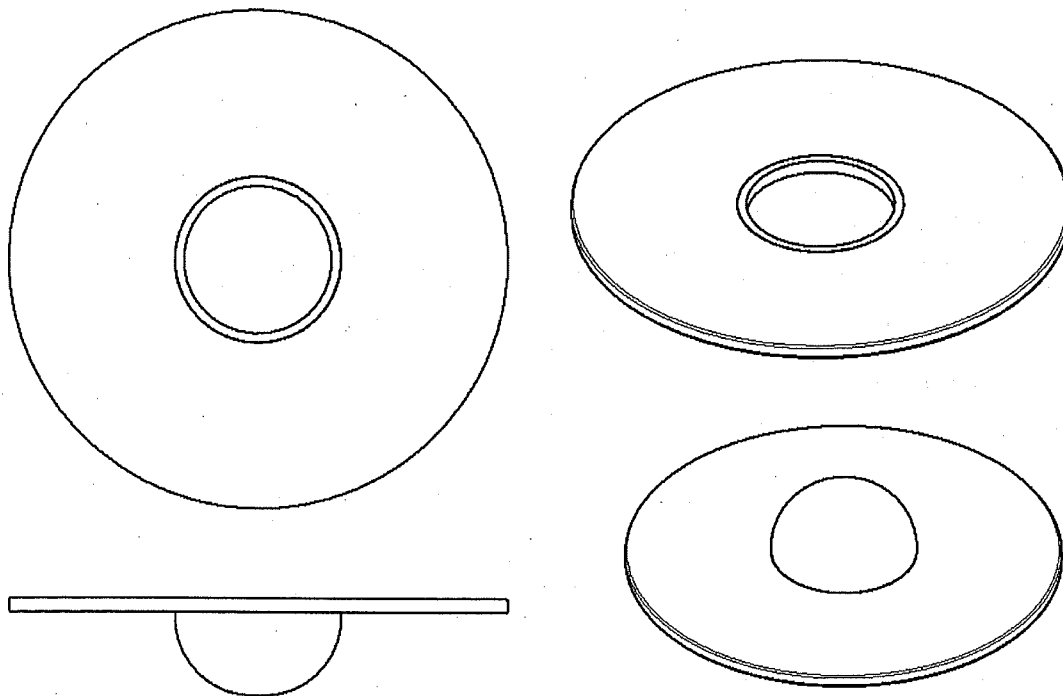
Pick One Solution

Circular Balance Apparatus (Sphere-O-Core™)

- Endless options of use

Details

The circular balance apparatus or Sphere-O-Core, see Figure 1, is a large inverted hollow hemisphere with a large circular disc centered to the top side. Two or more users space themselves on the large disc to achieve a balanced position. When one user moves, even slightly, the balance shifts and it's up to the other user(s) to compensate to maintain a balanced position. The athletes could move closer or further from the center to account for different weights or users. Having a soft rubber coating on the hemisphere would keep the impact of the apparatus on the floor space to a minimum. The Sphere-O-Core could also be used with 3 or more people. Users would just have to find the correct spacing to accommodate their number and achieve a balanced position. Additionally the users could combine other simple workouts such as squats, dumbbell exercises, pushups etc. while maintaining balance with their partner(s) thus working their core and balance as well as other targeted muscle groups..



GREAT
FUN TO
WORK OUT
ON WITH
LOTS OF
GAME
POTENTIAL

Figure 1: Different views of the Sphere-O-Core

Details continued

The disk and hemisphere will need to be made out of a hard plastic (recycled) so it is light enough to handle but durable enough to hold the weight of its users. Plastic is a good option because it can be produced in large shapes (unlike wood that would need to be linked together more often) and is lighter than metal. The disk would separate into two halves that would connect to the hemisphere using a set of bolts. The reason for bolts over a snap connection is that the whole Sphere-O-Core will be subjected to stresses and strains from all directions. Also having it come in pieces will allow it to be shipped and stored easier as the apparatus when assembled will be quite large.

When the Sphere-O-Core is no longer wanted it can be disassembled quite easily by unscrewing the bolts. Each part would consist of only one material (metal bolts, hard plastic disc pieces and a softer rubber coating for the sphere). The bolts could be reused, the plastic disc parts could be melted and re-molded into something else and the rubber coating would be the only part that might be discarded. The soft rubber coating on the hemisphere will be able to be separated from the hard plastic, so when the rubber coating wears out, it can be replaced easily. The function of the rubber coating is only to dampen the impact on the gym space so we could hopefully find a suitable recyclable material for this and/or make this out of recycled material such as old rubber tires..

Specification

Hemisphere diameter: 3 ft

Hemisphere Material: Hard recycled plastic

Hemisphere Cover: Soft Rubber

Disc diameter: 18 ft

Disc Thickness: 4 inch

Disc Material: Hard recycled plastic

Max Weight Supported: 800lb

Optional: Grip tape added to disc surface for traction