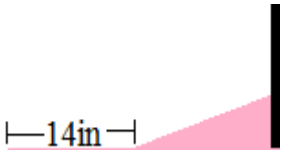
**Summer Design Series**

# Tennis Ball Tumble

Ready to design a robot? This project is about the “gaining control of game pieces” objective in the game.

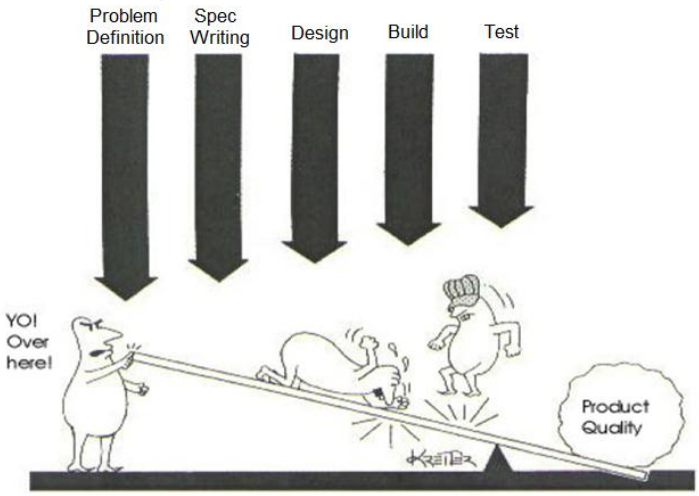
The game starts with tennis balls stacked in the fixed 1” pipe frames. The robots are in their opposing zones as shown. (The center bots can be slid along the walls.) Standard 2min matches, starting with 15sec autonomous.


- There’s no rule about the number of balls you can pick up or hold simultaneously.
- Only balls within the “zones” (and not in a robot) at the end of the match count.
- The zones slope into the field slightly from the edges. The un-sloped section is 14in wide.
- Robots start in the 28”x36”x60” configuration, but can expand up to an 80” cylinder



# Step 1: What's Your Problem?

How do you envision this game playing out? What do you need to do? Answer carefully—don't eliminate any solutions.




Use this section to formulate your problem statement (from my loophole-ridden project description). Note: concentrate just on game piece acquisition.

## Step 2: What Do You Want to Do?

Specs say *what* you want, not how you want it. They're specific, prioritized and measureable.


*Why never to ask an engineer for a cup of popcorn.*

| Write your specs, priorities, and tests here. We'll talk about them as a group, too. |
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## Step 3: Design Away!

Use this page of Step 3 to sketch, doodle, describe, or otherwise signify as many ideas as you can. After that, you'll switch papers with someone in your group and add, comment on or revise their ideas.

← The key to continuous brainwriting

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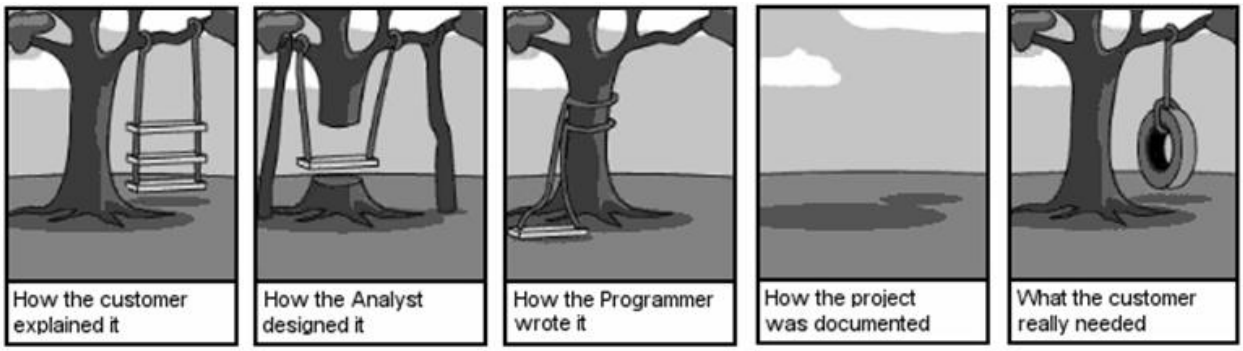
| You've got 5 minutes per round. Don't stop writing! Most ideas gets cookies ☺ |

## Step 3: Get Real

This is the more realistic design step. Take all those crazy ideas and develop (prototype, if you can) them into things that could work.




Don't forget your specs!

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| Use this page continuously—design is iterative! ☺ (Describe your iterations) |

# Step 3.5: Decision Time (Take 1)

Which design best meets your specs? Well that's a good question…

| Specs | Weight | TARDIS | Voyager | Serenity |
|---|---|---|---|---|
| Coolness | 40 | 4 | 3 | 5 |
| Flux Capacitor Usage | 60 | 3 | 3 | 3 (odd, they're all 3s. Is what you really want "energy use"? ) |
| Win Button Integration | 1000 | 5 | 3 | 5 |
| **Total Weighted** | | 4(40)+3(60)+5(1000)=5340 | 3(40)+3(60)+3(1000)=3300 | 5(40)+3(60)+5(1000)=5380 |

Welcome to the wonderful world of weighted objectives tables! Weight all your specs by the priority you gave them, and then rate how they do.
You don't need to go with what wins—combine good designs, revise something, even revise a spec or priority if it doesn't make sense.

## Steps 4 & 5: How'd It Go?

Design is iterative. Whether you got to test or not, what did you learn? Did you have fun? (No, honestly.) Did you learn something?

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| On this page, write a quick summary of your design, process, and problems/trade-offs. Then, what did your team learn? What didn't work? What could be different? Could anything make the team or process run smoother? |