Computers & people play shut the box!
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In the basic game, when you roll, you get to flip any combination of numbers adding to your roll.

The game ends when either all the numbers have been flipped or you get a roll you cannot cover.

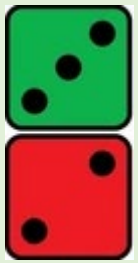
We are imagining an interactive circle where, with some programming we expand the playing field and test participant ideas.
The leader has a chance to program these and meet again and report results at the next session.
We show one way this might go!

Once a number has been flipped it cannot be used again.

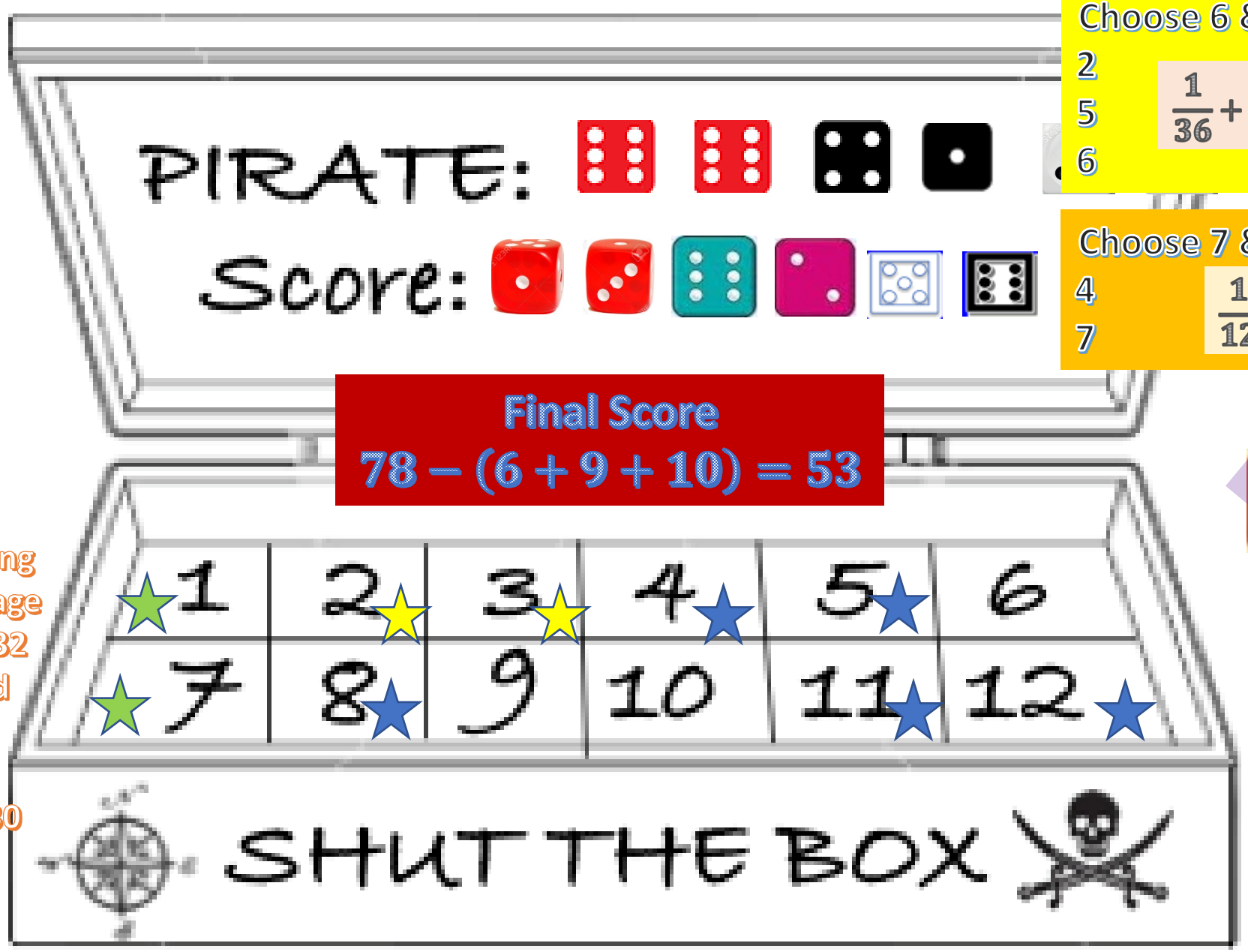
Your final score is the sum of all the numbers you flipped – max possible

Is $1+2+\cdots+12 = \frac{12 \cdot 13}{2} = 78$

LET'S PLAY



This kind of reasoning will get you an average score of about 37.32
If you look beyond just the next roll you can raise this to around 42.30



Final Score

$78 - (6 + 9 + 10) = 53$

Choose 6 & 2 – can't cover
2
5
6

$$\frac{1}{36} + \frac{1}{9} + \frac{5}{36} = \frac{5}{18}$$

Choose 7 & 1 – can't cover
4
7

$$\frac{1}{12} + \frac{1}{6} = \frac{1}{4}$$

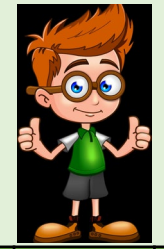
A more competitive version of shut the box.

SCORE 29

★	★	★
★	★	★
7	★	9
10	11	12

Play as before except when a player cannot cover the roll, then they are allowed to take from their opponent.

But your opponent gets the points!!!!



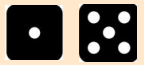
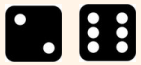
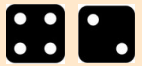
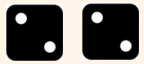
SCORE 61

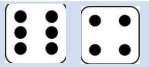
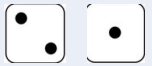
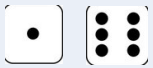
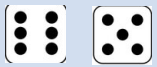
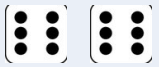
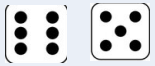
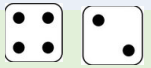
★	★	★
★	★	★
★	8	9
★	★	★

Now for something radical!

Consider playing this game with As many as 100 players!

Except when a player is out – his/her score is frozen and available numbers cannot be taken by others.

Roll #	Value	Action
1		2
2		8
3		6
4		5,3
5		4,2
6		OUT!

Roll #	Value	Action
1		10
2		3
3		4
4		7
5		11
6		12
7		1,1
8		5,6
9		OUT!

But how do we proceed with so many players?

This could be answered differently by different circles

Here is one set of possibilities:

Designate less than half of the players as belonging to the CPU brain.

Try to use super common sense so that the CPU players can beat the others
In other words we want the best scores to be among the CPU players.

So when a CPU player cannot play their own board they will try to give points to the other CPU players OR…. (But decide precisely how to do this)

They can CUT non-cpu players by taking the 1s,2s,and maybe 3s from those doing well.

But we have to give some sort of sense to the non – cpu players such as only Looking ahead 1 move on their board and trying to not give points to CPU players

Some results & observations:

When the total number of players is close to 50 or higher , the winning score is nearly always 78 – but can the CPU players have more of these than the non-cpu players?

When the percentage of CPU players is at least 35%, the CPU wins or ties more than 74% of the time. (Winning about 61% of the time)

The CPU did also win in these cases:
2 out of 35 players
5 out of 32 & 5 out of 33 & 5 out of 34

What would happen if we tried to maximize The average score rather than looking at the leaders only?

Cutting the leaders works Over 90% of the time It's tried but it can't stop all challengers