Dice Game

An exercise in Game Design

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Entertainment Technology Center
Carnegie Mellon University

Presented to Jesse Schell
By Daniel Rodriguez Cuberos

Dice Game: An exercise in Game Design.
Daniel Rodriguez Cuberos
www.danielrodriguez.info

2 | P a g e

Contents

Dice Game: An exercise in Game Design.
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3 | P a g e

I.   **Brainstorming Session.**

For the brainstorming session, I tried to compile as many game play uses of the dice into a list:

    i)   Type of interaction with the dice:

        (1) Rotation

        (2) Bounces

        (3) Throw

    ii)   Specific sequences of combinations in more than one die.

    iii) How many bounces can you produce when you roll your dice

    iv) Rolling a dice to compare it against another players' roll.

    v)   Having dices of different shapes and sizes.

    vi) Playing with your dice against an unknown(s) roll(s), as in pirate dice.

While I was brainstorming, and compiling this list, I saw the following formation in my fellow play tester dice assets:

Figure 1: The genesis of an idea...

This formation made me remember a game with a similar formation: Jenga.

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4 | P a g e

II. Initial Set of Rules

Setup

➢One player builds the tower of dice. The tower is based on figure 1. A (3 x 3 x 4) dice stack.
➢A die is thrown to decide who goes first. Whoever gets the lowest throw goes first. The player to the left goes next.

Game Play

➢When your turn starts, roll a die.
➢Search the tower for a matching die that has the number you rolled. Remove that die and keep it.
➢If the tower falls, you are out of the game.
➢If you successfully removed the die, your turn is over.

Winning Conditions

➢The game is over when there's only one player left. This means, all other players have made the tower collapse.

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5 | P a g e

III.   Playtesting Sessions

ITERATION	1
Result of this Iteration	Unplayable game. It needs work.
Playtesters	Nadia Labeikovsky Daniel Rodriguez
Revised Set of Rules No revisions to the set of Rules in this iteration	**Setup** ➢One player builds the tower of dice. The tower is based on figure 1. A (3 x 3 x 4) dice stack. ➢A die is thrown to decide who goes first. Whoever gets the lowest throw goes first. The player to the left goes next. **Game Play** ➢When your turn starts, roll a die. ➢Search the tower for a matching die that has the number you rolled. Remove that die and keep it. ➢If the tower falls, you are out of the game. ➢If you successfully removed the die, your turn is over. **Winning Conditions** ➢The game is over when there's only one player left. This means, all other players have made the tower collapse.
Analysis	This was the first iteration of my idea, right in the middle of my brainstorm. It was just to see if the idea was worth following. Nadia liked the mechanism to select the die to remove. It made sense with the overall "die should be center stage of the game" theme. This iteration confirmed that I was on the right track. This

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6 | P a g e

game has the dice as a protagonist; When you throw the dice and when you remove a die from the dice block.

What didn't work was that the tower kept crumbling down in every step. Also, the dices where too small (3/8'').

ITERATION	2
Result of this Iteration	Unplayable game. It needs work.
Playtesters	Daniel Rodriguez
Revised Set of Rules No revisions to the set of Rules in this iteration	**Setup** ➤One player builds the tower of dice. The tower is based on figure 1. A (3 x 3 x 4) dice stack. ➤A die is thrown to decide who goes first. Whoever gets the lowest throw goes first. The player to the left goes next. **Game Play** ➤When your turn starts, roll a die. ➤Search the tower for a matching die that has the number you rolled. Remove that die and keep it. ➤If the tower falls, you are out of the game. ➤If you successfully removed the die, your turn is over. **Winning Conditions** ➤The game is over when there's only one player left. This means, all other players have made the tower collapse.
Analysis	For this iteration, I went to Phantom of the Attic and bought 36 (0.5 inch) dice. These new dice made grabbing them much easier.

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7 | P a g e

	However, the tower still crumbles very easily. In this way, the game is impossible to win.

ITERATION	**3**
Result of this Iteration	Playable game. It needs work.
Playtesters	Daniel Rodriguez Zachary Pacheco Anup Doshi Chris Stagno
Revised Set of Rules	**Setup** ➢One player builds the tower of dice. The tower is based on figure 1. A (3 x 3 x 4) dice stack. ➢A die is thrown to decide who goes first. Whoever gets the lowest throw goes first. The player to the left goes next. **Game Play** ➢When your turn starts, roll a die. ➢Search the tower for a matching die that has the number you rolled **and it is not in the upper level of the structure**. Remove that die and keep it. ➢If the tower falls, you are out of the game. ➢If you successfully removed the die, your turn is over. **Winning Conditions** ➢The game is over when there's only one player left. This means, all other players have made the tower collapse.
Analysis	In this iteration, Anup and Chris noticed that someone Can grab a die from the top of the dice stack. This made the game very trivial and easy. I revised the set of rules and fixed this.

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8 | P a g e

ITERATION	4
Result of this Iteration	Playable game. It needs work.
Play testers	Daniel Rodriguez Whitney Babcock-McConnell Nadia Labeikovsky
Revised Set of Rules No revisions to the set of Rules in this iteration	**Setup** ➤One player builds the tower of dice. The tower is based on figure 1. A (3 x 3 x 4) dice stack. ➤A die is thrown to decide who goes first. Whoever gets the lowest throw goes first. The player to the left goes next. **Game Play** ➤When your turn starts, roll a die. ➤Search the tower for a matching die that has the number you rolled and it is not in the upper level of the structure. Remove that die and keep it. ➤If the tower falls, you are out of the game. ➤If you successfully removed the die, your turn is over. **Winning Conditions** ➤The game is over when there's only one player left. This means, all other players have made the tower collapse.
Analysis	This iteration occurred in the workshop. We went thru several sessions of the game. At the end of the workshop I had confirmed my worst gears: My Game Design had a severe flaw, due to the fact that instead of rectangular blocks, I was using square blocks. I was ready to abandon this idea and pursue new ones. But during the gameplay sessions and the workshop, I had seen designs that focused too much on boards, cards or other factors. I wanted to only focus on a dice, as a personal challenge. Whitney made an observation, in which he said that Sticky Tack and a toothpick could be used a die picking tool for my game. I figured that maybe I could use the Sticky tack to solve my lack of rectangular blocks.

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9 | P a g e

ITERATION	5
Result of this Iteration	Playable game. It needs work.
Play testers	Daniel Rodriguez Nadia Labeikovsky Manoj Anand
Revised Set of Rules No revisions to the set of Rules in this iteration	**Setup** ➢One player builds the tower of dice. The tower is based on figure 1. A (3 x 3 x 4) dice stack. ➢A die is thrown to decide who goes first. Whoever gets the lowest throw goes first. The player to the left goes next. **Game Play** ➢When your turn starts, roll a die. ➢Search the tower for a matching die that has the number you rolled and it is not in the upper level of the structure. Remove that die and keep it. ➢If the tower falls, you are out of the game. ➢If you successfully removed the die, your turn is over. **Winning Conditions** ➢The game is over when there's only one player left. This means, all other players have made the tower collapse.
Analysis	In this iteration we had Manoj. Manoj, a newcomer to both my dice game and Jenga game came to play test the game from a fresh perspective, as someone who can't compare the game to its original idea. He found the gameplay quite fresh and fast paced. He enjoyed the thrill of removing the blocks. For this iteration I tried sticking 6 dice, in 2 rectangular structures, 3 each: This time the game was playable. Manoj found the mix

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10 | P a g e

	of "sticky" dice and single dice very interesting.

ITERATION	**6**
Result of this Iteration	Playable game.
Play testers	Daniel Rodriguez Nadia Labeikovsky Manoj Anand
Revised Set of Rules	**Setup** ➢One player builds the tower of dice. The tower is based on figure 1. A (3 x 3 x 4) dice stack. ➢A die is thrown to decide who goes first. Whoever gets the lowest throw goes first. The player to the left goes next. **Game Play** ➢When your turn starts, roll a die. ➢Search the tower for a matching die that has the number you rolled and it is not in the upper level of the structure. ~~Remove that die and keep it.~~ **Put the die you removed at the top of the structure.** ➢If the tower falls, you are out of the game. ➢If you successfully removed the die, your turn is over. **Winning Conditions** ➢The game is over when there's only one player left. This means, all other players have made the tower collapse.
Analysis	In this iteration we tried putting the die you took at the top of the structure, as in the original Jenga game. Manoj liked that twist, saying that it added more challenge to each player's turn, and kept the player engaged. However, I noticed that most of the dice structured ended up resting over the two rectangular pieces.

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11 | P a g e

ITERATION	7
Result of this Iteration	Playable game.
Play testers	Daniel Rodriguez Nadia Labeikovsky Manoj Anand
Revised Set of Rules	**Setup** ➢One player builds the tower of dice. The tower is based on figure 1. A (3 x 3 x 4) dice stack. ➢A die is thrown to decide who goes first. Whoever gets the lowest throw goes first. The player to the left goes next. Game Play ➢When your turn starts, roll a die. ➢Search the tower for a matching die that has the number you rolled and it is not in the upper level of the structure. Remove that die and keep it. Put the die you removed at the top of the structure. ➢If the tower falls, you are out of the game. ➢If you successfully removed the die, your turn is over. Winning Conditions ➢The game is over when there's only one player left. This means, all other players have made the tower collapse.
Analysis	For this iteration I tried sticking 12 dice, in 4 rectangular structures, 3 each:

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12 | P a g e

	The result from this iteration was that the structure became much more resilient to players choices, and some of the assembled/glued pieces could be taken.

ITERATION	8
Result of this Iteration	Playable Game
Play testers	Daniel Rodriguez Nadia Labeikovsky
Revised Set of Rules	**Setup** ➢One player builds the tower of dice. The tower is based on figure 1. A (3 x 3 x 4) dice stack. ➢A die is thrown to decide who goes first. Whoever gets the lowest throw goes first. The player to the left goes next. Game Play ➢When your turn starts, roll a die. ➢Search the tower for a matching die that has the number you rolled and it is not in the upper level of the structure. Remove that die and keep it. Put the die you removed at the top of the structure. ➢If the tower falls, you are out of the game. ➢If you successfully removed the die, your turn is over. Winning Conditions ➢The game is over when there's only one player left. This means, all other players have made the tower collapse.
Analysis	In order to facilitate gameplay, and divert choices for the players, I decided to add 4 two-glued dice to the glued dice set:

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13 | P a g e

As a result, I found out that the player now couldn't grab a lot of the dice, without making the tower crumble.

This leave us with two choices:

a) Allow the player to grab the dice on the upper level, to ease gameplay at the beginning. In this way, there's a sense of progression.

b) Remove the 4 two-glued dice structures from the "gooey" dice sets.

I decided to apply these two choices, sequentially.

ITERATION	9
Result of this Iteration	Playable Game.
Play testers	Daniel Rodriguez
Revised Set of Rules	**Setup** ➤ One player builds the tower of dice. The tower is based on figure 1. A (3 x 3 x 4) dice stack. ➤ A die is thrown to decide who goes first. Whoever gets the lowest throw goes first. The player to the left goes next. Game Play ➤ When your turn starts, roll a die. ➤ Search the tower for a matching die that has the number you rolled ~~and it is not in the upper level of the structure.~~ Remove that die and keep it. Put the die you removed at the top of the structure. ➤ If the tower falls, you are out of the game.

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14 | P a g e

	➢ If you successfully removed the die, your turn is over. Winning Conditions ➢ The game is over when there's only one player left. This means, all other players have made the tower collapse.
Analysis	In this iteration, this situation happened As it can be seen, a one sided dice tower was built. This is a not so obvious result of the rule change. This type of behavior in-game promotes a quick elimination (the tower is very collapse-prone). Interestingly enough, there wasn't any sense of progression as the beginning as I had hypothesized.

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15 | P a g e

ITERATION	10
Result of this Iteration	Playable Game.
Play testers	Daniel Rodriguez
Revised Set of Rules	**Setup** ➢One player builds the tower of dice. The tower is based on figure 1. A (3 x 3 x 4) dice stack. ➢A die is thrown to decide who goes first. Whoever gets the lowest throw goes first. The player to the left goes next. Game Play ➢When your turn starts, roll a die. ➢Search the tower for a matching die that has the number you rolled and it is not in the upper level of the structure. Remove that die and keep it. Put the die you removed at the top of the structure. ➢If the tower falls, you are out of the game. ➢If you successfully removed the die, your turn is over. Winning Conditions ➢The game is over when there's only one player left. This means, all other players have made the tower collapse.
Analysis	In this iteration, the game really felt more challenging. The game starts really easily, since you can pick the dice at the top. The catch is that the last player in a round will be out of "easy picks" and depending on the other's players choices, he might face situations such as the one shown here:

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16 | P a g e

Overall, this choice adds flow to the game, as the game starts easily, and becomes challenging gradually.

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17 | P a g e

IV.   Final Rule Set

Setup

➢   One player builds the tower of dice. The tower is based on figure 1. A (3 x 3 x 4) dice stack.

➢   A die is thrown to decide who goes first. Whoever gets the lowest throw goes first. The player to the left goes next.

Game Play

➢   When your turn starts, roll a die.

➢   Search the tower for a matching die that has the number you rolled and it is not in the upper level of the structure. Remove that die and keep it. Put the die you removed at the top of the structure.

➢   If the tower falls, you are out of the game.

➢   If you successfully removed the die, your turn is over.

Winning Conditions

➢   The game is over when there's only one player left. This means, all other players have made the tower collapse.

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18 | P a g e

V.   Estimate of Mass Development Costs

Element	Method used (Prototype)	Cost per Unit (Prototype)	Method used (Mass Production)	Cost per Unit (Mass production)
Die	Bought on the Phantom of the Attic. Sticky Tack bought at an art shop.	0.40	Bought from a manufacturer. Each dice comes with pegs and holes, to "glue them" together.	0.6 (x 37) = 22.2
Instruction Manual	Printed at the ETC	0.20	Designed and printed by a manufacturer	0.5
Production Cost per Unit				22.5
Cost for Sale (Unit)				**29.99**