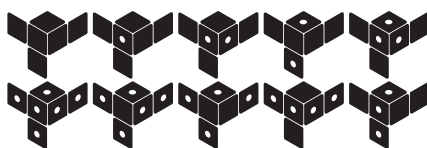




BOOLEAN DICE

A Dice Set with 6 Games and 3 Puzzles
Invented For the
Sixth Gathering For Gardner (G4G6)
by Wei-Hwa Huang

WHAT YOU GET



Ten special dice. The face of each die is either White (has a round sticker) or Black (doesn't). Each die is unique. You also get this little sheet of paper that tells you what you can do with these dice. If you have any other ideas, please e-mail them to me at whuang@ofb.net. For future developments, I will be posting updates and other game ideas I receive at <http://www.ofb.net/~whuang/gp/booleandice/>

CREDITS:

Playtesting and Innovation: David Gausebeck, Joe Huber, Tom Lehmann, Jill Lundquist, Noam Shazeer, Luke Weisman

SOME BASIC TERMINOLOGY

To make the games easier to describe, we're going to adopt some basic terminology for the games. Most games assume that players are sitting on comfortable chairs around a flat table with room to roll dice; use your best judgement for adapting games to other scenarios.

Black-up: A die is **Black-up** if the topmost face is black (has no round sticker).

Color: The **Color** of a die is the color of the topmost face.

Constrained: If a game is **Constrained**, it means that *you are not allowed to get up from your seat before the game is over!* (If you are sitting on chairs, consider using the Crokinole "butt-cheek" rule — you cannot move your chair and must keep at least one "cheek" on the chair at all times.) It also means you may not touch most dice (unless you **Possess** them).

Display: To place a die so that other players may **View** it. **Possession** of the die is unchanged.

Examine: To inspect a die fully (all six faces). You may touch it and/or pick it up.

Nudge: To turn a die 90 degrees so that a different face is on top. Getting the bottom face to the top requires **Nudging** twice.

Possess/Possession: Taking a die. When the die is in your **Possession**, you may **Examine** it freely. You may also hide it from the view of other players. If other players ask you how many dice you possess, you must answer truthfully, but you are not obligated to divulge the identity of those dice.

Reveal: To take a die and turn it upside-down, showing all players the bottom face of the die. You may *not* **Examine** the die unless explicitly allowed to.

Roll: To roll a die. In general, you may not **Examine** or **Reveal** a die that you roll unless it is in your **Possession**.

Shift: To move a die without showing anyone the bottom face. You may turn it to look at the other faces.

Split: This is an easy way of splitting one set of dice into two groups of five dice each, where one group has five **Black-up** dice and the other has five **White-up** dice. Roll all 10 dice. If five are **White-up** and five are **Black-up**, you're done. Otherwise, pick whichever **Color** there's the least of, and put those dice in one pile. Re-roll the other dice until there are 5 or less of the other **Color**. If there are exactly 5, you're done. Otherwise, put those dice of the other **Color** into a second pile, and reroll the rest until they split appropriately.

Surrender: To lose **Possession** of a die. Sometimes the die is **Surrendered** to another player (who then gains **Possession** of it); sometimes it is just **Rolled**.

View: To look at a die (without touching it or leaving your seat). You may crane your head in an attempt to see more of the die.

White-up: A die is **White-up** if the topmost face is white (has a round sticker).

GAME 1: WHITE, BLACK, OR ROLL

Players: 2 (or more; see variations)

This is a **Constrained** game.

Object: To gain more points than your opponent, usually by predicting the unseen bottoms of the dice.

Setup: Players should agree on a central area where the dice can be rolled; dice that fall outside the area would be considered illegal. Choose a player to go first. That player takes all the dice and **Rolls** them. If there are any illegal dice, simply reroll all of them. The other player takes the first turn. After that, players alternate turns.

Play: On your turn, point at a die and declare *one* of the following three calls: "white", "black", or "roll". Your opponent then may **View** that die. You may not proceed until the opponent tells you that they are done **Viewing**.

If you said "white" or "black", you are predicting the color of the bottom face of the die. **Reveal** the die. If you are correct, you get to take the die into your **Possession**. If you are wrong, you must **Roll** the die, and you have to **Surrender** a die to your opponent. (If you don't have any dice, then they take **Possession** of the die you declared.)

If you said "Roll", just **Roll** the die you just picked up.

If a die is rolled illegally during a turn, the roller's opponent *may* **Examine** the die and then **Roll** it.

Game End: When there are no more dice left, the game is over. Whomever has the most dice in their **Possession** wins. In case of a tie, **Roll** the dice in your **Possession**; whomever has the most **White-up** dice wins. In case of another tie, everyone **Rolls** again.

Variations

Timed: Try playing the game with a standard chess clock. Hit the clock when you declare, when you are done **Viewing**, after you **Roll** a die, and after you **Possess** or **Surrender** a die.

Multiple-Players: Turns go clockwise. Instead of **Surrendering** a die to your opponent when you are wrong, you **Surrender** it by **Rolling** it instead. If you ever **Roll** illegally, you must also **Surrender** a die. If you have no dice and must **Surrender** one (either by wrong guess or illegal roll), you have been eliminated from the game. Walk around the table. Lord your newfound visual ability over the players who are still allowed to win. If there is a tie for most dice at the end, *all* players **Roll** until there is a unique winner.

GAME 2: LIAR'S BOOLEAN DICE

Players: 2 or more

Goal: To avoid losing all of your dice.

Setup: You'll need one set of Boolean Dice for every two players in the game. (Yes, the game works fine with two players and one set.) If there are two players, **Split** the dice. Otherwise, put all the dice in one big pile. Mix them up. Everyone grabs five dice (randomly) into **Possession**. Choose a player to take the first turn in the first round. Any leftover dice are in a center pile and may be **Examined** by any player. Ignore the center pile when counting **White-Up** dice during the game.

Play: The game consists of several **rounds**. In each round, a player takes the first turn, then the turn proceeds clockwise around the table until there is a **challenge**. Resolving the challenge ends the round, and a new round is started, with the first turn taken by the player to the left of the challenger.

At the beginning of each round, all players roll all their dice. Secretly, so that the other players don't see. Dice cups are great but cupping with a hand also works. You may not re-orient your dice, but you may **Examine** them.

The first player then declares an integer number. They are declaring that there are at least that many **White-up** dice. Their turn is now over.

For all subsequent turns, a player must either make a declaration of a higher number, or they may **challenge** the previous player's declaration.

If they decide to declare a higher number, they *may* opt to **Display** all their dice, and **reRoll** a subset of their dice. Dice that are not **ReRolled** must remain **Displayed** for the rest of the round; the ones that are **reRolled** are hidden. (continued on back)

PUZZLE 1: CHECKERBOARD CUBE

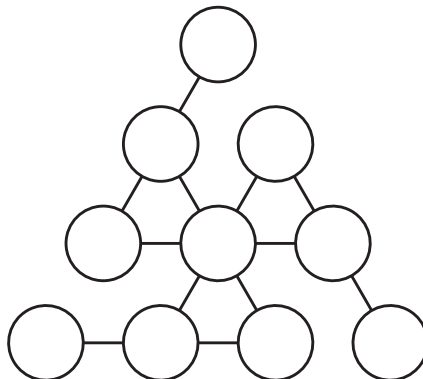
(based on a puzzle by Peter Ritmeester) Remove two dice. Using the other 8 dice, make a 2x2x2 block that has a "checkerboard" pattern on all six faces. Can this be done no matter which two you remove?

PUZZLE 2: BIG CHECKERBOARD

Using 9 dice, make a 1x3x3 block so that the two external 3x3 faces have a "checkerboard" pattern, and the other external (1x3) faces are monochromatic.

PUZZLE 3: MANDALA

Place the dice on the circles of this mandala, one die per circle, in a meaningful way (you'll have to figure out what that way is). As a hint (and to disambiguate symmetry), the die with 5 white faces and 1 black face goes on the first circle in the second row. The solution is unique.





In case of a **challenge**, all players reveal all their dice. The number of **White-up** dice is counted and the count is compared against the current declaration:

If the count is *higher* than the declaration, then the challenger has lost. The challenger must **Surrender** a die of their choice to the center pile.

If the count is *lower* than the declaration, then the declarer has lost. The declarer must **Surrender** a die of their choice to the center pile.

If the count is *equal* to the declaration, then the challenger has lost badly. The challenger chooses one of their dice and **Surrenders** it to the declarer!

If someone runs out of dice as a result of a **challenge**, they are eliminated and out of the game. The winner is the last person with dice after all other players have been eliminated.

GAME 3: THE STACK

Players: 2
This is a Constrained game.

Object: To win a **Challenge** or to have your opponent make the stack fall.
Setup: Take the dice and **Split** them. Each player then **Possesses** one set. Sit across from each other, with a flat surface between.

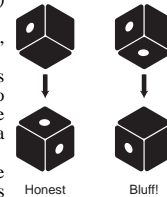
Play: The first player chooses any die, and places it on the surface so that each player sees three faces; the top face and two faces that the other player can't see. Then the second player chooses any die, and places it on top of that. The players will then take turns putting dice on top, creating a tall stack. Once a die is placed it may not be touched unless there is a **challenge!** You do not have to place the die cleanly on top; it can be askew, but the alignment should be reasonably clear. If a player ever causes the tower to fall, they have lost!

When you place a die, it "should" (see **Bluffing**, below) be the "inverse" of the die below on three faces. First, the touching faces (the bottom of the die you place and the top of the topmost die on the stack) should be different; and the faces that you see (but that your opponent doesn't) should also differ between your new die and the topmost die.

Bluffing: Players *can bluff*. You don't have to play a die that matches. However, on their opponent's turn, the opponent can attempt to **Challenge**.

Challenge: Instead of placing a die, a player may decide to **Challenge** the previous player's turn, which will end the game. A player's first die *cannot* be challenged; so the first legal challenge is on the second player's second turn! To **Challenge**, remove the die that your opponent just placed, and **Examine** it. Depending on if it was a bluff or not, the game is decided.

If the second player places the tenth and last die successfully on the top of the stack, the first player *must* **Challenge**. Note that this means that the second player is guaranteed a win if that die actually matches.



GAME 4: SHUT THE BOX

Players: 2
(Basic idea by Joe Huber)

You'll need pen and paper.
Object: To roll 0, 1, 2, 3, 4, and 5 **White-Up** dice before your opponent can.

Setup: Write two columns of numbers from 0 through 5. On top of each column, draw three little circles, which will represent **Nudges**. **Split** the dice; each player then **Possesses** one set.

Play: Players take turns simultaneously. Roll all your dice (your opponent sees them). You may then cross out the number that corresponds to the number of **White-up** dice you rolled.

After your roll but before you cross off a number, you can decide to use your **Nudges**. To use a **Nudge**, cross off one of your little circles and then **Nudge** one of your dice. You are free to use all three **Nudges** in one turn if you want, but be aware that you won't have any left!

After all **Nudging** and crossing-off has happened, determine this: has the number of **White-Up** dice of one player (at any time during the turn) matched the number of **White-Up** dice of the other player (at any time during the turn)? If so, *switch* dice sets with the other player so that you now **Possess** the other set. (Note that you can use **Nudges** to force a switch, but you can't use them to avoid a switch.)

Winning: Whomever crosses off all their numbers first wins. If both players cross off all their numbers on the same turn, whomever has the most **Nudges** left wins. If they have the same number of **Nudges** left, the game is a draw.

GAME 5: APARTHEID

Players: 1
(Game (but not title) invented by Tom Lehmann)

Object: To segregate the dice into two groups of five, one group with all black faces on bottom, the other with all white faces on bottom.

Setup: Roll all 10 dice. During play, you may **Shift** dice but not **Examine** them. Designate two areas to be Black and White; once dice are placed in these areas, they cannot leave.

Play: You have 5 turns. On each turn, choose a die and **Roll** it. Then choose any two dice and put one in each area.

Game End: Turn over the dice in each area. If all the Black-area dice are black and all the White-area dice are white, you have won. Be thankful that these are only dice and not humans.

GAME 6: SPY VS. SPY

Players: 2 or more
(Game by Tom Lehmann, Joe Huber, and Wei-Hwa Huang)

You need one set for each player. This is a **Constrained** game.
Story: Each player represents the intelligence agency of a different country. You must recruit members from your **populace** to become either **desk agents** or **field agents**. **Desk agents** provide resources for **field agents**, who can then execute many offensive and defensive actions. You are eliminated when you lose all your **field agents**.

Object: To be the last player with **field agents**.

Setup: Each player decides if they are going to be White or Black. (It is more fun if there are an equal number in each faction.) Their decision is then called their **friendly** color; the opposite color is called the **unfriendly** color. (For most of this game, only the top face of a die matters.) Each player **Possesses** one set of ten dice. Then, each player rolls all ten dice. (One re-roll is permitted.) The **unfriendly** dice are the **populace**. The **friendly** dice form your initial agency; you may **Examine** them and divide them into two groups: **desk agents** and **field agents**. Choose a player to go first; turns will then proceed clockwise.

Play: On your turn, do these three steps in order:

1. The **desk agents** generate **orders**. **Roll** all of your **desk agents**. The number of **friendly** dice is the number of **Orders** you can carry out this turn.

2. The **field agents** execute **missions**. Each **field agent** can be assigned at most one **Mission** per turn (unless they **Rest**; see below). Most **Missions** are simple missions consisting of one **Order**; some **Missions** are advanced missions that require two **Orders** to carry out. When you run out of **Orders**, you must stop executing **Missions**. The possible **Missions** are listed below.

3. The agency **reorganizes** (the **field agents** get a rest and swap places with the **desk agents**). You *must* switch at least one **field agent** with a **desk agent**; then (optionally) you may swap more. Each agent can only move once per reorganization turn. *Note:* assigning the **turncoat** (the all-**unfriendly** agent) to a desk job will require *two* **desk agents** to take its place in the field (and the **turncoat** never generates any **Orders** anyway, so this can be quite risky).

When a player loses all their **field agents**, they are eliminated. Last player to remain after eliminating all other players wins!

Simple Missions (only one **order** needed):

- **General Recruiting:** **Roll** your **populace**. Any **friendly** dice may be recruited to your agency; you decide if they are going to be **field agents** or **desk agents**. You can immediately use any **field agents** you acquire for other **Missions**.

- **Targeted Recruiting:** Choose any one die in your **populace** and **Nudge** it. If it becomes **friendly**, you may recruit it. Follow the same rules as above.

- **Infiltrate Enemy Country:** Choose another player to infiltrate. **Roll** the **field agent** that is carrying out this **Mission**:

- If the result is **unfriendly**, the **Mission** has failed and it ends.
- If the result is **friendly**, the infiltration was successful. The enemy player may now **Arrange** their **field agents** for you to **View**. After **Viewing**, specify an enemy **field agent** to be the **victim**. The enemy player then **Rolls** the **victim**:

- If the result is **friendly** to the enemy, the **victim** has remained loyal and the infiltration has failed.
- If the result is **unfriendly** to the enemy, then the enemy has lost the agent and must **Surrender** the die — it now becomes a **free agent**. (All **free agents** may be **Examined** by any player.)

- **Scout Enemy Country:** Choose another player; you may **Examine** all of their **populace**.
- **Rest:** Choose a **field agent** that has already carried out a **Mission**. They are now available to carry out another **Mission** (as long as there are enough **orders**, of course).

Advanced Missions (two **orders** needed):

- **Recruiting the Turncoat:** There's one member of your **populace** that is completely **unfriendly** and can't be recruited by normal means — call it the **turncoat**. You can recruit it via an **Advanced Mission**. When you **Infiltrate** with the **turncoat**, the meanings of all **Rolls** are reversed!

- **Recruiting a Free Agent:** If there are any **free agents** available (due to previous successful **Infiltrations**), you may attempt to **Recruit** one of them. Take the **free agent** and the **field agent** that is executing the **Mission** and **Roll** them both. If they are the same color, the recruiting was successful — take the **free agent** into **Possession** as a **field agent**, but it may not be used this turn.

- **Extra Training:** You may make one **desk agent** a **field agent**, or vice versa.
- **Infiltrate Enemy Agency:** This is just like infiltrating an enemy country, except that you now attack the **desk agents** instead of the **field agents**.

- **Scout Enemy Agency:** Choose another player; you may **Examine** all of their agents.