## Placeholder image

Dungeons & Dice Design Document

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# Background

Dice-based RPG systems, which underpin many tabletop RPG games – such as Dungeons & Dragons and Pathfinder – use dice rolling as a core gameplay mechanic. Actions – such as player interactions, weapon damage, spell damage, item use, etc. – all rely on different combinations of dice being rolled to ascribe values to these actions.

The six main dice shared between different dice-based RPG systems are:

|  |  |  |  |
| --- | --- | --- | --- |
| **d4**  four-sided die | Image result for d4 die | **d10**  ten-sided die | Image result for d10 die |
| **d6**  six-sided die | C:\Users\wacki_000\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\6EBAF71D.tmp | **d12**  twelve-sided die | C:\Users\wacki_000\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\2C10E266.tmp |
| **d8**  eight-sided die | C:\Users\wacki_000\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\F3ACF433.tmp | **d20**  twenty-sded die | Image result for 1x Water D20 (twenty-sided) Die |

Examples of actions in Dungeons & Dragons that require dice rolls – and how the values of those rolls are interpreted - include:

* A player attempts a melee attack against a hobgoblin using a Flaming Warhammer and must roll a d20 to determine whether the attack meets its mark.
* The player’s attack hits, and they must roll to determine the damage inflicted on the enemy hobgoblin by their Flaming Warhammer. A d8 is rolled to determine the base damage, and a d6 is rolled to determine the additional fire damage. These dice are rolled together.
* The player receives damage from the hobgoblin and requires healing. They consume a Superior Healing Potion, which requires them to roll 8d4 to determine the total hit points they recover, with a +8-modifier added to their roll total.

# Overview

The purpose of the app should be for the user to be able to create custom dice sets – that is, to save specified combinations of dice which represent specific actions. For example, the user might create a custom dice set for the damage done by a Flaming Warhammer, containing a d8 and a d6, or a custom dice set for the hit points healed by a Superior Healing Potion, containing 8d4 and a +8 modifier.

For a given roll, the individual roll value for each die should be displayed, not just the cumulative total of all the dice involved in the roll. This is because these individual values may need to be altered, e.g., for an attack by the Flaming Warhammer, the d6 fire damage may need to be ignored if the attack is being made against an enemy who is protected from fire damage, or the d8 bludgeoning damage may need to be halved if the enemy has a resistance to bludgeoning damage. However, it would also be useful to display the cumulative total for cases where the individual rolls aren’t important, for example when rolling for the hit points recovered from consuming a Superior Health Potion.

Dice sets should be easy to construct and modify, with individual dice being added/removed. For example, a user may have a standard Warhammer (d8 bludgeoning damage) that they then get enchanted to add the d6 fire damage; instead of creating a new dice set for the Flaming Warhammer and removing the old dice set for the standard Warhammer, the user should simply be able to access the Warhammer dice set and add a d6 (and rename the set accordingly). Likewise, a magical weapon may lose its enchantment, meaning that any dice corresponding to enchantment-based bonus damage should be removed from the weapon’s dice set. A set should be able to be renamed, in case of typos, e.g., a user may accidentally name their set ‘Flaming Earjammer’ (which, is another weapon entirely, and would probably have piercing damage rather than bludgeoning!)

Further to the above considerations, it is important that comments can be associated with individual dice within a set, for important information, such as damage type, to be made visible to the user.

It may also be handy to have some standard dice sets built into the app for easy access by the user, e.g., a d20, which is the most frequently rolled die in D&D and Pathfinder. Further, as an extension it might be worth including generic dice set ‘templates’ that the user can build upon, for example for standard weapon types

A breakdown of the requirements – core and additional - is outlined in the following sections.

# Core Requirements

Core app specifications are categorized below, based on which of the key stages of implementation they fit into:

## The user should be able to roll a set of dice, with the results of the individual dice – as well as the cumulative total – displayed to the user.

* There should be a dice set class, with the following properties:
  + Name/title
  + Array of associated dice
  + Method to roll each of the dice in the dice array
* There should be a die class, with the following properties:
  + Number of sides
  + Method to roll and generate a random number between 1 and the number of sides
* There should be individual die UI elements, displaying:
  + Number of sides
  + Value of roll
  + Description/comment
* There should be a roll button, which calls the roll method on the dice set and sets the roll value of each individual UI element
* There should be a UI element displaying the cumulative total of the set roll

## The user should be able to create and save custom dice sets, selecting which set they would like to roll.

* There should be a create new dice set button to bring up a blank dice set, with the user able to define a name for the set as a string
* There should be a means of setting the name of a dice set on the dice set class
* There should be a button to add a new die to the current dice set, which brings up a box with input fields where the user is able to define the number of sides of the die, along with a description/comment for the die as a string
* There should be a button to add a constant modifier to the current dice set, which brings up a box with input fields where the user is able to define the value of this modifier, along with a description/comment for the modifier as a string (this could be incorporated into the above, with a single ‘add’ button where the user can choose either a die or a modifier)
* There should be a means of setting the description/comment on a die on the die class
* There should be UI elements for each of the existing dice sets that the user can select to display the dice in that set

## The user should be able to edit pre-existing dice sets, including renaming the set.

* The dice set class should have methods to add and remove dice from the dice array
* The die UI elements should include some means of removing the die from the set, e.g., from a drop-down list once the element has been selected
* The dice set should include some means of editing the set name, e.g., by making the displayed name string editable when selected
* The dice set should include some means of deleting it, with a prompt to prevent accidental deletion

# Additional Requirements

Additional app specifications – that is, ideas to extend and improve the app, but which are not strictly necessary for core functionality - are categorized below:

## There should be standard dice sets built into the app, e.g., d20

* A selection of pre-determined standard dice sets should be created, representing common actions, etc.
* There should be UI titles to separate the standard dice sets from a user’s built-in, i.e., a ‘Standard’ title with a list of the built-in dice sets below it, and a ‘Custom’ title with a list of the user’s custom dice sets below it

## There should be built-in dice set templates that the user can select to quickly generate a base set that they can then edit, for example corresponding to standard weapon classes or healing potions.

* A selection of pre-determined dice set templates should be created, representing standard weapon classes, common items, basic spells, etc.
* On creating a new dice set the user should be able to select the template they would like to use, or to use no template and create a blank dice set

## The results of a roll should be displayed to the user using images/animations and sound effects.

* Sound effects should be recorded/acquired of the various dice being rolled, which can be played when a dice set is rolled
* Images of the different dice should be created/acquired, with these being displayed to the user (displaying the correct roll values) when a dice set is rolled
* Displaying of the dice roll values should be delayed, allowing for the sound effects and any other effects to take place, e.g., any dice rolling SFX should be allowed to finish before results are displayed

# Artistic Direction and UI

The app is designed to be used on touch-screen technologies, specifically tablets and mobile phones, so the user interface should be created such that individual elements can clearly be seen and can be easily interacted with by the user. For example, any buttons should be large enough to press, and elements should be laid out such that they don’t overlap.

An idea of how the application might look once it meets the core requirements is given below:

Custom Set 2

Custom Set 1

Custom Set 3

Roll

Create new set

d6

slashing

6

d6

slashing

1

d6

slashing

3

d6

slashing

3

d4

ice

1

modifier

class bonus

+2

+

**Custom Set 1**

Given that this app is designed with players of fantasy tabletop RPG games in mind, the art style should reflect this. Medieval styling lends itself well, with natural colours – browns, beiges, reds, and metallic colours – and artistic embelishment on elements such as the buttons and die elements. However, website such as D&D Beyond demonstrate how it is possible to develop a modern style that still works, using primarily black, white, shades in between, and red.

On the following page are some images that represent the artistic style that the app should seek to achieve.



