A complete guide to damage calculation in Wynncraft

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Contents

1 Overview

This is going to be a very (overly) detailed guide on wynn damage calculations with all the details you didn't need to know. For the gist of things check out motoki1's damage calculation thread first:

https://forums.wynncraft.com/threads/how-damage-is-calculated.176082/

2 General concepts

2.1 Definitions and conventions

For formulas in this whitepaper we will use the following conventions/functions:

- `:=` refers to assignment
- `floor` is the floor function (round down)
- `min` and `max` are take the min and max of their arguments respectively.

There are six damage types the player can deal in Wynncraft: Neutral damage as well as the five elemental damages (Earth, Thunder, Water, Fire, Air). Most builds in the current meta do not focus on dealing neutral damage but on elemental damage, and the game itself has ways of converting neutral damage into elemental damage. Generally, whenever the game converts, it will convert some % of neutral damage to elemental damage. When this happens we will use the `convert_and_floor` formula:

```
function convert_and_floor(neutralBase, neutral, pctConvert):
    convert := min(neutral, neutralBase * pctConvert)
    elemental := floor(convert)
    new_neutral := floor(neutral - convert)
    return (elemental, new_neutral)
```

This function returns two values: The elemental damage that as converted, and the new neutral damage.
This means that in general, the sum of the elemental and neutral damage after conversion will be **LOWER** than the neutral damage before. The parameters will be explained more in context, and this formula applies equally to both min and max damages.

Spells, melee attacks, and powder attacks (think: quake) are treated similarly in Wynncraft. For simplicity we will refer to all of them as "spells", but there are some mechanics that only apply to melee attacks – those will be specifically called out.

2.2 Base Damage

Base damage can refer to many things. In this whitepaper the term "Base Damage" will refer to the damage that is displayed on the weapon for non-crafted items, before any powder is applied, and to the damage calculated after crafted powder application for crafted items.

3 Crafted Base Damage calculation

3.1 Baseline damage and neutral damage

Crafted items have a concept of ”baseline damage” that can be retrieved from the Wynn API (there are too many variations to document here). The min and max possible baseline damage depends on weapon type and level. The baseline damage range corresponds to the neutral damage the weapon would have if it got a normal speed roll.

Material tiers used in crafting have a multiplicative effect on baseline damage. For any recipe, the final baseline multiplier as given as follows:

```
multiplier := (mat1Contrib * mat1Amt + mat2Contrib * mat2Amt) / totalMatAmt)
baseline_multiplied := floor(baseline_rolled * multiplier)
```

where `mat1Amt`, `mat2Amt`, and `totalMatAmt` are the amounts of material 1, material 2, and total material used in the recipe, and `baseline_rolled` is a random number between the min and max values for the crafted baseline. This means that, for example, if you are crafting a wand, using tier 2 wood and tier 1 string will yield a slightly stronger weapon than using tier 1 wood and tier 2 string.

Fast and slow weapons have their neutral damage adjusted by the following formulas:

```
baseline_prepowder (FAST) := floor(baseline_multiplied * 2.05 / 2.5)
baseline_prepowder (NORM) := baseline_multiplied
baseline_prepowder (SLOW) := floor(baseline_multiplied * 2.05 / 1.5)
```

(If you are familiar with attack speed multipliers you may recognize this as adjusting for attack speed while keeping the same baseline. No adjustment is needed for normal speed.)

3.2 Crafted weapon powder conversion

When using powders as ingredients or applying powders to crafted items, the powders actually modify the base damage of the weapon (damage before spell conversions). This works by applying the following routine:

```
ingredPowders := list of powders applied as ingredients.
                     read left to right, and then top to bottom
                       1 2
                       3 4
                       5 6

appliedPowders := list of powders applied by powder master, in order

totalPowders := appliedPowders + ingredPowders (list concatenate)

nBase := baseline_prepowder
eDamages := [0, 0, 0, 0, 0]
```

```
for each powder in totalPowders:
    pctConvert := powder conversion amount
    convert_amt = floor(pctConvert * nBase)
    nBase := nBase - convert_amt
    powderMin := powder min damage
    powderMax := powder max damage
    powderAverage := floor((powderMin + powderMax) / 2)
    eBonus := convert_amt + powderAverage
    Add eBonus to the appropriate elemental damage

base_averages := nBase + eDamages (list concatenate)
base_min := floor(base_average * 0.9) (multiply and floor all elements)
base_max := floor(base_average * 1.1) (multiply and floor all elements)
```

Notice that after each powder is applied, the neutral base damage is updated. This means that the more powders are applied, the less conversion each one takes: Applying two Earth VI powders (46% conversion each) in this step will not convert 92% of the neutral damage to earth damage, but only convert (1-(1-0.46) * (1-0.46)) = 70.84% of damage to earth damage.

Also notice that powders applied normally are actually applied **BEFORE** ingredient powders – the reverse of what you would expect from the ingame process!

For a detailed work example (using this process and the process for normal powder application), see **Long Worked Examples - Crafted Item Power Application**

4 General Damage calculations

The following are applied (roughly) in order when calculating damage.

Note: ORDER MATTERS! For example, raw damage is applied before spell multipliers but after attack speed multipliers, meaning that raw spell is affected by the spell multiplier but not by your attack speed multiplier.

4.1 Spell Conversions

Most spells in wynncraft have spell multipliers which can convert weapon neutral damage into elemental damage. These are applied using the convert_and_floor formula directly to the weapon's base damage. The full (known) spell conversion table is given below.

Note: Even if a weapon has no neutral damage, spell conversion can make the attack to zero damage in a certain element, which can be applied to elemental weaknesses.

Apply the following routine to both the min and max damages:

```
baseNeutral := weapon base neutral damage
newNeutral := baseNeutral
for each elemental conversion:
    (newNeutral, elemental) :=
        convert_and_floor(baseNeutral, newNeutral, conversionPercent)
    Add elemental damage to weapon elemental damage
```

Notice that we always use the base neutral damage of the weapon to calculate how much neutral damage is converted. Details can be found in the appendix.

Melee damage has no spell conversion so nothing happens in this step.

4.1.1 Worked example

Suppose your weapon has 95-100 base neutral damage and you cast Meteor. Applying the `convert_and_floor` formulas for min earth damage:

```
convert := min(95, 95*0.3) = min(95, 28.5) = 28.5
elemental := floor(convert) = 28
new_neutral := floor(neutral - convert) = floor(95 - 28.5) = 66
```

After this step the weapon has 66 neutral damage and 28 earth damage.

Applying the same logic for the fire damage:

```
convert := min(66, 95*0.3) = min(66, 28.5) = 28.5
elemental := floor(convert) = 28
new_neutral := floor(neutral - convert) = floor(66 - 28.5) = 37
```

So at the end of this our weapon will have 28 earth and fire danage, and 37 neutral damage (minimum).

For the maximum damage you can apply the same logic but this time there will be no rounding, and you will end up with 30 earth and fire damage, and 40 neutral damage.

4.2 Normal powder conversion

Normal powder conversion works essentially the same way spell conversion works, except it also adds raw damage.

Apply the following routine to both the min and max damages:

```
!!! NOTICE: Using the baseNeutral and newNeutral values obtained from above!!!
for each powder applied:
    (newNeutral, elemental) :=
        convert_and_floor(baseNeutral, newNeutral, conversionPercent)
    Add elemental damage to weapon elemental damage
    Add powder raw damage to weapon elemental damage
```

Important takeaways:

- Powder conversion applies **AFTER** spell conversion.

  This means that even if your weapon displays full monoelemental damage, it can still have some of its damage split off by powder conversion (up to 60% on mage!)

- Powder conversion uses the same base neutral damage as spell conversion.

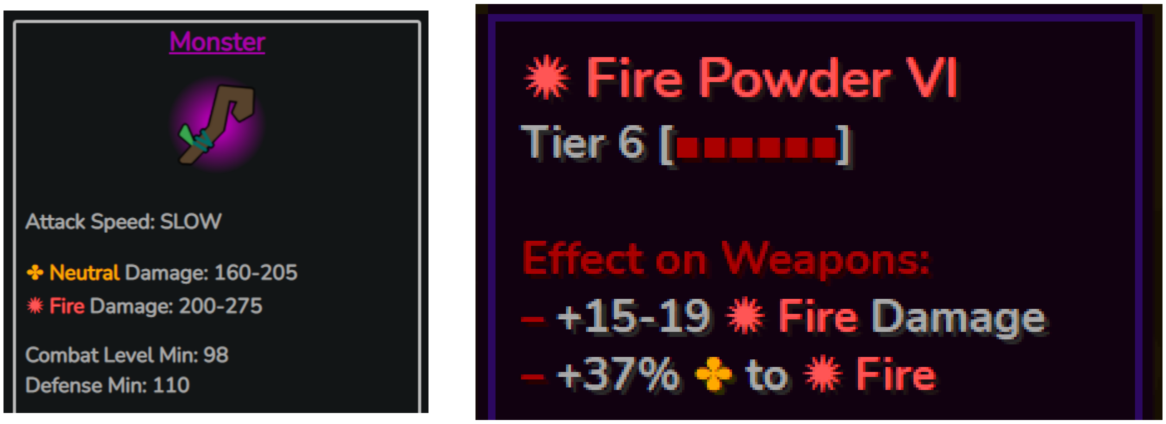
  This means that, for example, on mage, applying just a single earth VI powder will be enough to convert all the neutral damage on meteor to elemental damage.

- Powder conversion in normal slots works very differently to powder conversion as an ingredient.

  Powders as ingredients decrease and update base neutral damage when they are applied. Powders applied normally do not.

4.2.1 Worked example (Non crafted Item)

Lets apply 3x fire powder 6 to Monster:



Monster

Attack Speed: SLOW

✤ Neutral Damage: 160-205
✹ Fire Damage: 200-275

Combat Level Min: 98
Defense Min: 110

✹ Fire Powder VI
Tier 6 [■■■■■■]

Effect on Weapons:
– +15-19 ✹ Fire Damage
– +37% ✤ to ✹ Fire

Figure 1: Left: Unpowdered Monster. Right: Fire powder 6.

Monster has a base of [160-205] Neutral Damage and [200-275] Fire Damage.

Fire Powder VI adds +15-19 fire damage and converts 37% Neutral Damage to Fire Damage.

1. Apply the first fire powder.

   Fire Damage: [200-275] + [15-19] = [215-294].

   37% base neutral: 0.37 × [160-205] = [59.2-75.85].

   Subtracting from base neutral, we get [100.8-129.15] → [100-129] Neutral Damage

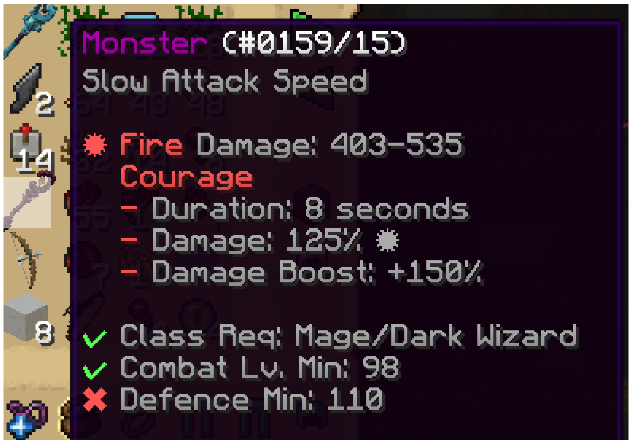
   Adding to the fire damage, we get [274.2-369.85] → [274-369] Fire Damage

   Notice how we're flooring both damages. This means, yes, we lose a tiny bit of damage in converting for each powder applied.

2. Apply the second fire powder.

   Fire Damage: [274-369] + [15-19] = [289-388].

   The neutral conversion applies to the base damage, so again we convert [59.2-75.85] damage.



Monster (#0159/15)
Slow Attack Speed

✹ Fire Damage: 403-535
Courage
- Duration: 8 seconds
- Damage: 125% ✹
- Damage Boost: +150%

✓ Class Req: Mage/Dark Wizard
✓ Combat Lv. Min: 98
✖ Defence Min: 110

Figure 2: Monster after applying 3 tier 6 fire powders.

This leaves us at [289-388] + [59-75] = [348-463] fire damage total, and [100-129] - [60-76] = [40-53] neutral damage remaining.

3. Apply the final fire powder.

   Fire Damage: [348-463] + [15-19] = [363-472]

   There is less than [59.2-75.85] neutral damage remaining, so all of it is converted to fire.

   [363-472] + [40-53] = [403-535] fire damage as expected! Woohoo!

4.3 ID bonuses

ID bonuses encompasses four types of effects that are all lumped into "ID bonuses":

1. Actual ID bonuses (spell%, elemental%).
2. Skill point bonuses (Defense gives additional fire damage, etc.)
3. Strength and dexterity bonus. Strength gives a flat % boost to all damage, Dexterity gives a chance for damage boost to increase by 100% (not applicable to poison).
4. Powder effects. Curse and courage both have the effect of increasing damage boost by some amount.

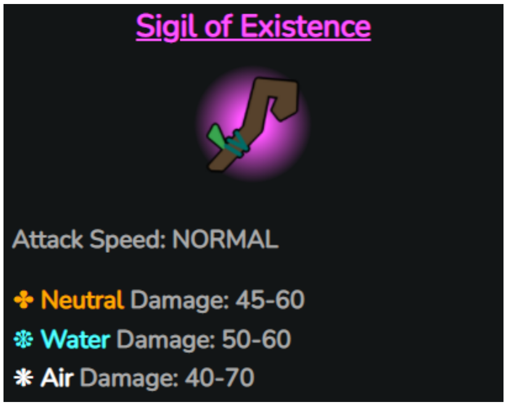
Notably (as of this writing) none of these effects are multiplicative. That means that you should take all of your total boost% values, add them together, and then apply them to your weapon's damage. The result is likely to be a non integer number and that is fine.

Details on powder bonuses are in the appendix.

Damage cannot go negative; if you have more than -100% damage after ID bonuses it is capped at zero.

4.3.1 Worked example 1

Consider the following build as an example: (clickme)

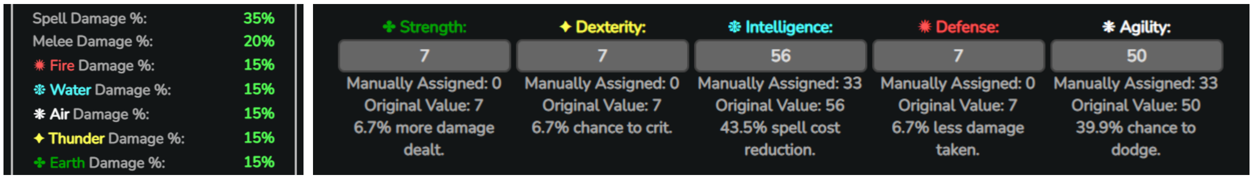


Sigil of Existence

Attack Speed: NORMAL

✤ Neutral Damage: 45-60
❄ Water Damage: 50-60
❋ Air Damage: 40-70

Figure 3: Sigil of Existence. (IDs not shown)



Spell Damage %:	35%
Melee Damage %:	20%
✹ Fire Damage %:	15%
❄ Water Damage %:	15%
❋ Air Damage %:	15%
✦ Thunder Damage %:	15%
✤ Earth Damage %:	15%

✤ Strength:	✦ Dexterity:	❄ Intelligence:	✹ Defense:	❋ Agility:
7	7	56	7	50
Manually Assigned: 0	Manually Assigned: 0	Manually Assigned: 33	Manually Assigned: 0	Manually Assigned: 33
Original Value: 7	Original Value: 7	Original Value: 56	Original Value: 7	Original Value: 50
6.7% more damage dealt.	6.7% chance to crit.	43.5% spell cost reduction.	6.7% less damage taken.	39.9% chance to dodge.

Figure 4: Relevant build stats, for reference

Assume we are casting a spell. To compute the boosts, we would do the following:

- Neutral damage is unaffected by elemental damage % boosts (duh).

  The total boost applied to the neutral damage (non crit) is:

  $$6.7\%\ \text{(Strength skillpoint)}\ + 35\%\ \text{(Spell damage)}\ = 41.7\%$$

  so in we would multiply the neutral damage range by $1 + 0.417 = 1.417$.

  If we assume a critical hit, we get

  $$6.7\%\ \text{(Strength skillpoint)}\ + 35\%\ \text{(Spell damage)}\ + 100\%\ \text{(Crit modifier)}\ = 141.7\%$$

  so we would multiply the neutral damage range by $1 + 1.417 = 2.417$.

- Water damage is affected by the Water Damage ID as well as the intelligence skillpoint.

  The total boost applied to the water damage (non crit) is:

  $$6.7\%\ \text{(Strength skillpoint)}\ + 35\%\ \text{(Spell damage)}\ + 15\%\ \text{(Water damage \%)}$$
  $$+\ 43.5\%\ \text{(Intelligence skillpoint damage)}\ = 100.2\%$$

  so in we would multiply the water damage range by $1 + 1.002 = 2.002$.

  Crit damage is calculated the same way – add an effective 100% damage boost.

- The Air damage boost (and other elemental damage boots) are calculated in the same way.

4.4 Attack Speed Multipliers

The weapon attack speed is accounted for by multiplying by an attack speed multiplier, that way different attack speed weapons with vastly different base damage can still deal about the same spell damage.

Melee attacks of course are not affected by this. This includes powder specials with damaging effects (Quake, Chain lightning, and Courage).

Details on attack speed multipliers are in the appendix.

4.5 Raw Damage

Raw damage is simple. Add the raw damage as neutral damage to the weapon's damage.

There are two asterisks:

- For spell damage, total damage cannot go negative. This means that the sum of raw spell and elemental spell damage must be at least zero. If the negative raw spell exceeds the elemental damage, then the total damage is set to zero.
- For melee damage, total *neutral* damage cannot go negative. This means that you can still deal elemental damage with your melee attack even with large negative raw melee damage.

4.6 Spell Multipliers

Each spell attack has a Spell Multiplier which affects how much damage is dealt by the spell, acting as a direct multiplier to all the damage numbers calculated so far.

Spell multiplier numbers are given in the appendix.

4.7 Other Multipliers

The strength potion effect multiplies all damage except poison damage.

Weapon tomes multiply all damage including poison damage.

5 Poison damage calculation

Poison damage calculation is relatively straightforward. To calculate the damage per tick:

```
poison_one_tick = poison (ID) / 3 * (1 + strength \%) * (1 + powder boost)
```

where `powder boost` is the sum of active courage/curse powder specials.

For example, if two curses were applied to the enemy, the would take (1 + 2 * 2.1) = 5.2 times the normal poison damage.

The damage display ingame rounds up.

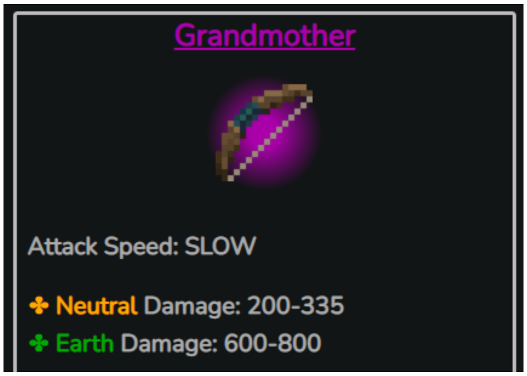
6 Long Worked Examples

6.1 Bomb Arrow full spell calculation

Consider the following build: (clickme)

We will calculate the bomb arrow damage for this build, assuming maximum rolls.

The relevant weapon and powder information is shown below.

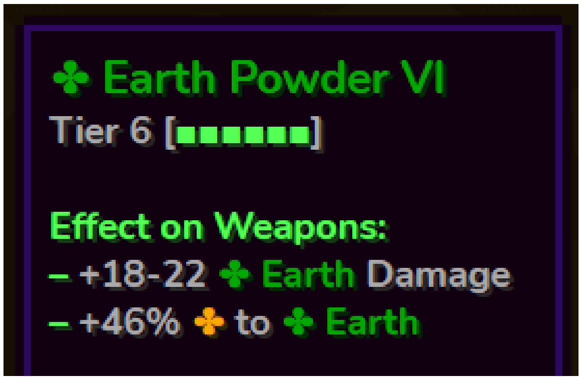


Grandmother

Attack Speed: SLOW

✤ Neutral Damage: 200-335

✤ Earth Damage: 600-800



✤ Earth Powder VI

Tier 6 [■■■■■■]

Effect on Weapons:

– +18-22 ✤ Earth Damage

– +46% ✤ to ✤ Earth

Figure 5: Left: Unpowdered Grandmother. Right: Earth powder 6.

First, we have to compute the spell conversion. The base neutral damage is [200-335], and the spell conversion of bomb arrow is 25% earth and 15% fire. Applying the formula in **Section 4.1**:

- Earth conversion:

  ```
  convert := min(neutral, base_neutral * convert)
           = min([200-335], [200-335]*0.25) = [50-83.75]
  elemental := [600-800] + floor(convert) = [650-883]
  new_neutral := floor(neutral - convert)
               = floor([200-335] - [50-83.75]) = [150-251]
  ```

  After this step, we are left with `[150-251]` neutral damage remaining, and `[650-883]` earth damage.

- Fire conversion:

  ```
  convert := min([150-251], [200-335]*0.15) = [30-50.25]
  elemental := [0-0] + floor([30-50.25]) = [30-50]
  new_neutral := floor([150-251] - [30-50.25]) = [120-200]
  ```

  After this step, we are left with `[120-200]` neutral damage remaining, and `[30-50]` fire damage.

Next, we have to apply powders. The base neutral damage is still `[200-335]`, the earth damage is `[650-883]`, the fire damage is `[30-50]`, the remaining neutral damage is `[120-200]`. Each powder converts 46% of damage to Earth damage, as well as adding 18-22 raw damage. Applying the formula in **Section 4.2**:

- First powder:

  ```
  convert := min(neutral, base_neutral * convert)
           = min([120-200], [200-335]*0.46) = [92-154.1]
  elemental := [650-883] + [18-22] floor(convert) = [760-1059]
  new_neutral := floor(neutral - convert)
               = floor([120-200] - [92-154.1]) = [28-45]
  ```

  After this step, we are left with `[28-45]` neutral damage remaining, and `[760-1059]` earth damage.

- Second powder:

  ```
  convert := min([28-45], [200-335]*0.46) = [28-45]
  elemental := [760-1059] + [18-22] floor(convert) = [806-1126]
  new_neutral := floor([28-45] - [28-45]) = [0-0]
  ```

  After this step, we have no more neutral damage remaining, and `[806-1126]` earth damage.

- Since we have no more neutral damage remaining, the next two powders just apply their raw directly to the damage:

  ```
  elemental := [806-1126] + [18-22] + [18-22] = [842-1170]
  ```

After applying powders, we are left with no more neutral damage, `[842-1170]` earth damage, and `[30-50]` fire damage.

Next we will calculate the ID boosts. The build has:

- 125 Strength points (73.8%)
- 60 Defense points (45.8%)
- 68% Spell damage
- 429 Raw Spell damage
- 46% Earth damage
- -3% Fire damage

The earth damage modifier is:

$$73.8\% \text{ (Strength skillpoint) } + 68\% \text{ (Spell damage) } + 46\% \text{ (Earth damage \%)}$$
$$+\ 73.8\% \text{ (Strength skillpoint damage bonus) } = 261.6\%$$

The fire damage modifier is:

$$73.8\% + 68\% - 3\% + 45.8\% = 184.6\%$$

Applying each damage modifier:

```
earth_damage := [842-1170] * (1 + 2.616) = [3044.672-4230.72]
fire_damage := [30-50] * (1 + 1.846) = [85.38-142.3]
```

Next we will multiply by the attack speed multiplier. The attack speed multiplier for slow speed is 1.5X (from the **Attack Speed Multipliers Table**), so:

```
earth_damage := [3044.672-4230.72] * 1.5 = [4567.008, 6346.08]
fire_damage := [85.38-142.3] * 1.5 = [128.07-213.45]
```

Next we add the raw spell damage to the (currently zero) neutral damage:

```
neutral_damage := [0-0] + [429-429] = [429-429]
```

Finally we multiply all the damages by the spell multiplier. Bomb arrow has a 250% spell multiplier, or 2.5X (from the **Spell Multipliers Table**):

```
earth_damage := [4567.008, 6346.08] * 2.5 = [11417.52-15865.2]
fire_damage := [128.07-213.45] * 2.5 = [320.175-533.625]
neutral_damage := [429-429] * 2.5 = [1072.5-1072.5]
```

so the final damages is

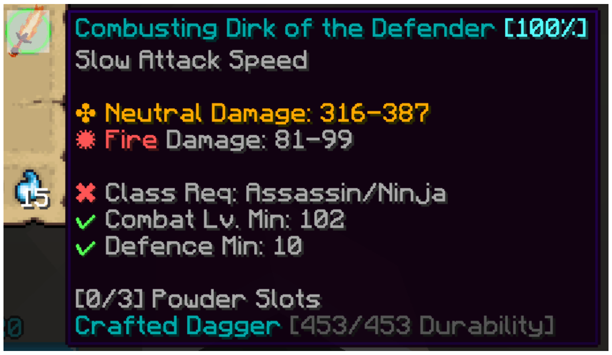
```
Grandmother build: Bomb Arrow Damage

Earth: [11417.52-15865.2]
Fire: [320.175-533.625]
Neutral: [1072.5-1072.5]
```

And thats it! No dexterity in the build so we don't have to worry about crit damage.

6.2 Crafted Item Powder Application

Full credit ferricles for this example.

We start with this crafted weapon. The only ingredient used in crafting was a single tier 3 fire powder. This weapon happens to have a prepowder baseline damage of 434 (which can be figured out by trial and error / guessing based on the material tier (T1/T1) and attack speed (slow)).



Combusting Dirk of the Defender [100%]
Slow Attack Speed

✣ Neutral Damage: 316-387
✹ Fire Damage: 81-99

✖ Class Req: Assassin/Ninja
✓ Combat Lv. Min: 102
✓ Defence Min: 10

[0/3] Powder Slots
Crafted Dagger [453/453 Durability]

Figure 6: Combusting Dirk of the Defender

We will apply the following powders in order at the powder master:

1. Thunder III
2. Fire III
3. Thunder III

The T3 powder has a conversion factor of 13% and a flat damage boost of [2,18]. The F3 powder has a conversion factor of 19% and a flat damage boost of [6,10].

1. Apply powders as ingredients.

   Based on the formula in **Section 3.2**, we will apply the powders to the crafted baseline in the following order

   (a) Thunder III (powder master)
   (b) Fire III (powder master)
   (c) Thunder III (powder master)
   (d) Fire III (ingredient)

   We will keep track of the neutral damage `n`, the thunder damage `t`, and the fire damage `f` at each step.

- Thunder 3 (I)

```
(1) n = 434, t = 0, f = 0
(2) floor(0.13 * 434) = 56 (Elemental conversion, round down)
(3) n := n - 56 = 378
(4) t := t + 56 = 56
(5) t := t + floor((2+18)/2) = 66
```

- Fire 3 (I)

```
(1) n = 378, t = 66, f = 0
(2) floor(0.19 * 378) = 71
(3) n := n - 71 = 307
(4) f := n + 71 = 71
(5) f := f + floor((6+10)/2) = 79
```

- Thunder 3 (II)

```
(1) n = 307, t = 66, f = 79
(2) floor(0.13 * 307) = 39
(3) n := n - 39 = 268
(4) t := t + 39 = 105
(5) t := t + floor((2+18)/2) = 115
```

- Fire 3 (II)

```
(1) n = 268, t = 115, f = 79
(2) floor(0.19 * 268) = 50
(3) n := n - 50 = 218
(4) f := f + 50 = 129
(5) f := f + floor((6+10)/2) = 137
```

2. We then convert baseline damage to damage ranges. We grab the numbers from the last round of calculation: `n = 218, t = 115, f = 113, e = w = a = 0`.

```
(1) [n1, n2] := [floor(0.9n), floor(1.1n)] = [196, 239]
(2) [t1, t2] := [floor(0.9t), floor(1.1t)] = [103, 126]
(3) [f1, f2] := [floor(0.9f), floor(1.1f)] = [123, 150]
```

3. Apply powders as if they were applying on a non-crafted weapon, using the process outlined in **Section 4.2**. The F3 powder used during crafting doesn't apply, so our array is [T3 F3 T3].

   - Thunder 3 (I)

     ```
     (1) .13 * [196, 239] = [25.48, 31.07]
     (2) n := floor([196, 239] - [25.48, 31.07]) = [170, 207]
     (3) t := floor([103, 126] + [25.48, 31.07]) = [128, 157]
     (4) t := [128, 157] + [2, 18] = [130, 175]
     ```

   - Fire 3

     ```
     (1) .19 * [196, 239] = [37.24, 45.41]
     (2) n := floor([170, 207] - [37.24, 45.41]) = [132, 161]
     (3) f := [123, 150] + [37, 45] = [160, 195]
     (4) f := [160, 195] + [6, 10] = [166, 205]
     ```

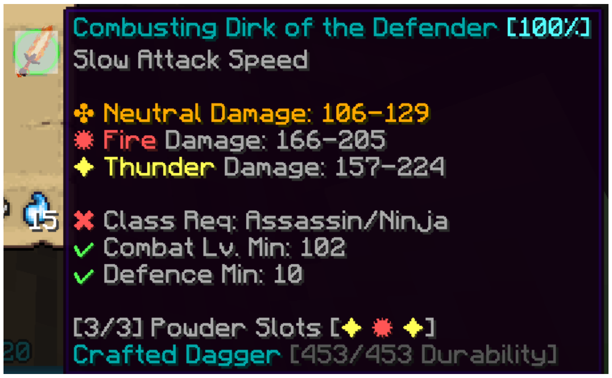
   - Thunder 3 (II)

     ```
     (1) .13 * [196, 239] = [25.48, 31.07]
     (2) n := floor([132, 161] - [25.48, 31.07]) = [106, 129]
     (3) t := floor([130, 175] + [25.48, 31.07]) = [155, 206]
     (4) t := [155, 206] + [2, 18] = [157, 224]
     ```

4. Our final damages are:

   ```
   (1) Neutral = [106, 129]
   (2) Fire = [166, 205]
   (3) Thunder = [157, 224]
   ```

Here are the actual results:



Combusting Dirk of the Defender [100%]
Slow Attack Speed

✤ Neutral Damage: 106-129
✹ Fire Damage: 166-205
✦ Thunder Damage: 157-224

✖ Class Req: Assassin/Ninja
✓ Combat Lv. Min: 102
✓ Defence Min: 10

[3/3] Powder Slots [✦ ✹ ✦]
Crafted Dagger [453/453 Durability]

Figure 7: Powdered Combusting Dirk of the Defender

The results match the calculations!

7 Changelog

Dates are DD/MM/YY.

- 23/04/21:
  - Added more worked examples to sections 4.3, 4.2
  - Added extra worked examples section
  - Moved poison damage calculation into its own (short) section
  - Added changelog

8 Appendix

8.1 Crafted material tier multipliers

Tier	Multiplier contribution
1	1
2	1.25
3	1.4

8.2 Spell Conversion Table

Spell	Earth	Thunder	Water	Fire	Air
Teleport	0	40	0	0	0
Meteor (Blast Damage)	30	0	0	30	0
Meteor (Burn Damage)	0	0	0	0	0
Ice Snake	0	0	50	0	0
Bash (First Hit)	40	0	0	0	0
Bash (Second Hit)	0	0	0	0	0
Charge	0	0	0	40	0
Uppercut (First Damage)	20	10	0	0	0
Uppercut (Fireworks Damage)	0	40	0	0	0
Uppercut (Crash Damage)	0	20	0	0	0
War Scream (Area Damage)	0	0	0	75	25
War Scream (Air Shout)	0	0	0	75	25
Arrow Storm	0	25	0	15	0
Escape	0	0	0	0	50
Bomb	25	0	0	15	0
Arrow Shield (Shield Damage)	0	0	0	0	30
Arrow Shield (Arrow Rain)	0	0	0	0	30
Spin Attack	0	30	0	0	0
Multihit (1st to 10th hits)	0	0	0	0	0
Multihit (Fatality)	30	0	50	0	0
Smoke Bomb	25	0	0	0	25
Totem (Smash Damage)	0	0	0	20	0
Totem (Tick Damage)	0	0	0	0	20
Haul	0	20	0	0	0
Aura	0	0	30	0	0
Uproot	30	0	0	0	0

Spell	Earth	Thunder	Water	Fire	Air
Quake	100	0	0	0	0
Chain Lightning	0	100	0	0	0
Courage (First Hit)	0	0	0	100	0

8.3 Powder Special Boost tables

Weapon powder specials (Damage boost %)					
Effect	Tier 4	Tier 4.5	Tier 5	Tier 5.5	Tier 6
Wind Prison*	400	450	500	550	600
Courage	70	90	110	130	150
Curse	90	120	150	180	210

*Note: Wind prison only boosts air damage!

Armor Powder Special Caps	
Effect	Cap
Rage	400%
Killstreak	200%
Concentration	150%
Endurance	200%
Dodge	150%

8.4 Attack speed multipliers (spell damage)

Attack speed multipliers	
Speed	Multiplier
Super fast	4.3
Very fast	3.1
Fast	2.5
Normal	2.05
Slow	1.5
Very Slow	0.83
Super Slow	0.51

8.5 Spell Multiplier Table

Spell	Multiplier (percent)
Teleport	100
Meteor (Blast Damage)	500
Meteor (Burn Damage)	100
Ice Snake	70
Bash (Both Hits)	130
Charge	150
Uppercut (First Damage)	300
Uppercut (Fireworks Damage)	50
Uppercut (Crash Damage)	50
War Scream (Area Damage)	50
War Scream (Air Shout)	30
Arrow Storm (Per Arrow, 60 arrows)	10
Hawkeye (Per Arrow, 5 arrows)	80
Escape	100
Bomb	250
Arrow Shield (Shield Damage)	100
Arrow Shield (Arrow Rain)	200
Spin Attack	150
Multihit (1st to 10th hits)	27
Multihit (Fatality)	120
Smoke Bomb (10 max, 2/s)	60
Cherry Bomb (3x)	110
Totem (Smash Damage)	100
Totem (Tick Damage)	20
Haul	100
Aura (Center Damage)*	200
Uproot	100

*Note: Aura damage is maximum at the center and decreases to half damage at the edge.

9 Powder Special Damage Tables

Weapon powder special damage multipliers (percent)					
Effect	Tier 4	Tier 4.5	Tier 5	Tier 5.5	Tier 6
Quake	155	220	285	350	415
Chain Lightning*	200	225	250	275	300
Courage (First Hit)	75	87.5	100	1125	125

*Note: Chain Lightning damage multiplier decreases by 20% per arc.

9.1 The final formula

TBD :(