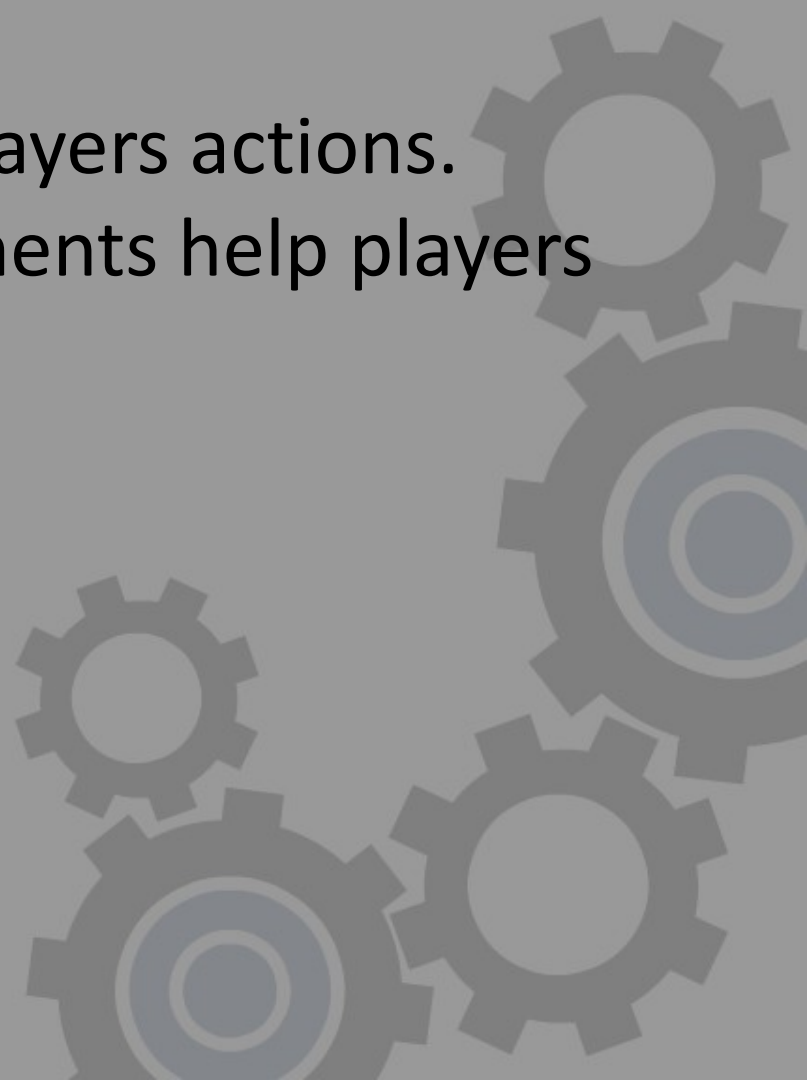# Intro to Melee Combat

Why Combat?

- Easy to understand.
- Fast – Quick feedback on players actions.
- Quick rewards and punishments help players feel smart fast.
- Scalable.

A Simple System

- One statistic – ATTACK.
- Value range is from 0% to 100%.
- ATTACK is the odds(%) of you killing a foe when you attack them.
- Each character attacks at the same speed, simultaneously.
- Combat is one vs. one, with no movement or map.

A Simple System cont.

- Percent odds could instead be a D20, D6, 2D10, 3D6, etc., but we'll generally just use percentages unless there is a reason not to.
- You'll normally want a variety of stats, but note that one is all you actually need.

Example 1

- Player 1 and player 2, each with 70% attack
- Odds Player 1 hits, player 2 misses:
  - 70/100*30/100 = .7*.3 = .21 = 21%
- Odds Player 1 misses, player 2 hits:
  - 30/100*70/100 = .3*.7 = .21 = 21%
- Odds both miss:
  - 30/100*30/100 = .3*.3 = .09 = 9%
- Odds both hit:
  - 70/100*70/100 = .7*.7 = .49 = 49%

Example 2

- Player 1 with 70% attack, Player 2 with 25%
- Odds Player 1 hits, player 2 misses:
    - 70/100*7/100 = .7*.3 = .525 = 52.5%
- Odds Player 1 misses, player 2 hits:
    - 30/100*25/100 = .3*.25 = .075 = 7.5%
- Odds both miss:
    - 30/100*75/100 = .3*.75 = .225 = 22.5%
- Odds both hit:
    - 70/100*25/100 = .7*.25 = .175 = 17.5%

Analysis of the System

- Odds of winning
- Odds of losing
- Odds of both losing ("winning?")
- Length of fight

Analysis of the System cont.

- What should the odds of winning be? When do you want them to be high? Low?
- What does 'both sides lose' mean for a game?
- When should a fight be quick? Long?

Attack

Which sword has higher attack? Which should the player desire/fear?

M
↕
D
↕
E

Adding Defense

- DEFENSE is a stat that makes the odds to hit ATTACK/(ATTACK+DEFENSE).
- The values can be anything, as long as they are on the same scale.
- Defense in this case is "Don't hit me/can't damage me." – show as fast moving targets/high dodge, or mobs with vulnerable and non-vulnerable target points.
- Defense serves many functions:
  – Create greater combat variance.
  – Scale threat level and differentiate mobs.
  – Differentiate between players and mobs.

Experience of Defense

Challenge: "Oh, that'll be hard to hit!"

Impotence: "Oh, I can't hurt that, need a new plan."
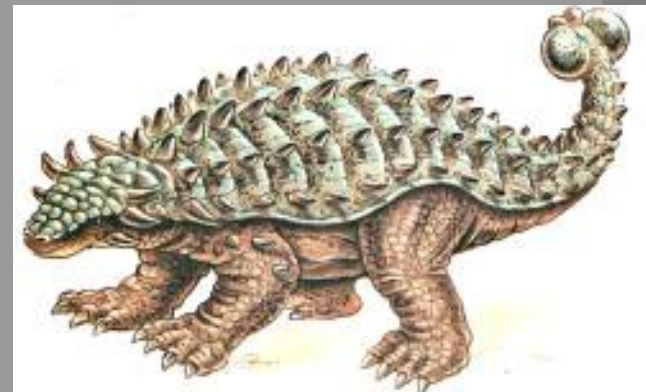
Adding Hit Points

- HP is a stat that allows a target to take more than one hit.
- High HP can be shown with size (Bigger = more HP), or combat effects (a hit that kills most mobs just causes a blood spurt).
- Hit points serve many functions:
  - Control Combat length.
  - Scale threat level and differentiate mobs.
  - Differentiate between players and AI mobs.

Hit Points

Targeting: the Troll
will be harder to beat
up than the goblin.

"Well, we started
the fight equal…"

Adding Damage

- DAMAGE allows characters to do variable damage when they hit.
- Could be a set value, a random roll, or a random roll plus a set value. This could also be modified by how much you hit by.
- Damage is the evil twin of Hit points, working with HP to create more interesting combats.
- Having Damage lets us have attacks that do different amounts of damage, leading to greater variance and more interesting fights.

Analysis of the greater system

- Odds of winning
- Odds of losing
- Odds of both losing
- Length of fight
- **Damage Per Turn (DPS)**

Adding Armor

- ARMOR reduces the amount of damage you take when you are hit.
- This could be a flat reduction, a % reduction, or something more complicated – armor as a Mechanic tends to lead to lots of varied Dynamics.
- Armor tends to prolong combat. High enough Armor can create 'infinite' combats.
- More than any other stat, players need to 'see' armor/damage reduction, so they can make tactical choices – this can be a great place to use sound effects.

A Complex System?

- ATTACK
- DEFENSE
- HIT POINTS
- DAMAGE
- ARMOR

System Analysis

- How long do fights last?
- How much variability in who wins?
- How much variability in each attack?
- Are there specific threshold effects? How do they feel to the player?
- Can a character near defeat come back?
- How complex is it?
- How does the scale of the numbers feel?

Homework

- Design 3 different combat systems using just these stats. Think about the basic math of how those systems work, and why you want them to work that way.
- Bring these systems to lab
- Lab report - Discuss the three systems, pick one to develop for next week.
- Read Art of Game Design chapter 10

Homework Cont.

- Lab reports are due via Moodle
- Naming convention is:
- (Class)(Section)_Lab(#)_(YourName)   Thus:

  – **GAT211A_Lab2_SarahSmith**

- (This is on Moodle)

Grading

- 4 Projects
  - 10%/20%/30%/40%
  - No resubmissions.
- Weekly lab reports
  - -2-+1% of final grade
- Attendance
  - -5% of final grade for each unexcused absence

Attack of the Rubric

Questions?