

COPYRIGHT © 2013 DIGIPEN (USA) CORPORATION. ALL RIGHTS RESERVED.

# BLADESMITH

INTERACTIVE TABLETOP SIMULATION

CHRIS MORRIS  
GAT 212 – S13 A

# TABLE OF CONTENTS

---

- 1. Overview**
  - a. Summary
  - b. Goals
  - c. Required Materials
- 2. Roles**
  - a. Customer
  - b. Bladesmith
- 3. Commerce**
  - a. Submitting Orders (Two Player)
  - b. Receiving Orders (One Player)
- 4. Blacksmithing**
  - a. Material Selection
    - i. Material Sheets
  - b. Heating
  - c. Forging
    - i. Drawing
    - ii. Hardening
  - d. Finishing
  - e. Delivery
- 5. Blade Blueprints**
  - a. Dagger
  - b. Long Sword
  - c. Katana
  - d. Claymore
- 6. Custom Scenarios**
  - a. Military Contract
  - b. Wealthy Investor
  - c. Damascus Steel
  - d. Bad Batch
- 7. Credits**

# OVERVIEW

## SUMMARY

This simulation is designed to deliver the experience of an up-and-coming blacksmith that specializes in crafting a variety of bladed weapons. The “bladesmith,” as he is sometimes called, utilizes tools and techniques that were available prior to the industrial revolution. In the hands of a capable bladesmith and utilizing little more than a forge, hammer, and anvil, medieval blacksmiths were able to create a wide variety of wrought iron and steel weapons. Many famous bladesmiths gained lasting fame and renown for the quality of their weapons, utilizing techniques far ahead of their competitors. A small number of blacksmiths have even attained immortal status due in no small part to the quality of their steel, spawning myths and legends about the almost supernatural power of their crafting abilities and blades.

## GOALS

The Bladesmith simulation should provide the player with a basic understanding of the process of creating a bladed weapon from smelting ore to finishing the forged blade.

The player will explore each step: selecting the appropriate materials, smelting ore and creating an alloy, heating, forging, and finishing the item. Each step of the process is vital, with each taking equal importance to all others. While most Hollywood representations of blacksmithing tend to focus on forging and hammering, with legendary blades being created in seemingly no time at all, in reality it is obviously a much more complex and intricate process.

The player will engage with the material during each step of the process, making thoughtful decisions based on timing and strength to determine what the proper course of action is at any given moment. During smelting and forging, it is necessary to determine whether to apply more or less heat, carefully feeding more fuel or oxygen to the forge to attain the optimal heat for working the metal or properly creating the alloy. Folding, drawing, and hardening each require different levels and intervals of heating

and hammering, including carefully calculating the necessary strength and location of each strike.

Properly finishing the piece is just as critical as properly working the metal up to this point. Polishing and smoothing the piece into the desired shape and appearance, as well as additional heat treatment to achieve the desired hardness are all critical in ensuring the completed blade has achieved the best possible quality. Many Japanese bladesmiths are well known for spending nearly as much time in this step as any other.

Upon completion, the player will deliver the finished blade to the customer and await the final verdict regarding the quality of the craftsmanship. This will determine what types of orders the player receives in the future. As the player gains a deeper understanding of the blacksmithing process and how to excel at completing each step, it may be possible to generate enough interest via word-of-mouth to gain access to more lucrative orders and better quality (and more difficult to master) materials.

## **REQUIRED MATERIALS**

- **Suite of Gaming Dice – (Multiples of: D4, D6, D8, D10, D12, D20, D100)**
- **Scratch Paper**
- **Pens/Pencils**
- **Digital Timer (Stop Watch/Cell Phone)**
- **Sheet/Blueprint Printouts (Multiple)**
- **Basic Calculator**

# ROLES

## CUSTOMER

Note: The customer is not required to run the core simulation, but can be used to facilitate a multiplayer experience or create a smoother experience for the primary player.

The main function of the customer is to provide the Bladesmith with a series of orders to fulfill, providing additional variety for the primary player. For each order, the customer can roll **one 100-sided dice (1D100) + 100 (Base Currency)** to determine the amount of currency they have to spend. This currency can be used to request the number of iron and/or steel blades that they can currently afford. Each type of metal has a basic cost, which is then modified by the cost of producing the blade to determine the final price incurred. (See: Shopping for further information.)

The secondary function of the customer is to help the Bladesmith manage timing during the smithing process. With a sole player, the Bladesmith would be required to manage their timer during each time-sensitive step of the crafting process. For example, when the Bladesmith is ready to begin heating the metal, the customer can set and start the timer and issue warnings at various intervals. This allows the Bladesmith to focus completely on the heating or other crafting processes without being required to also manage their own timer. (See: Blacksmithing for further information.)

## BLADESMITH

The Bladesmith is the primary player inside of the simulation. The player proceeds through a series of steps as follows:

1. Receive Order
2. Purchase Materials
3. Heat Material
4. Forge Blade
5. Finish Blade

6. Repeat 3-5 until Order is complete
7. Deliver completed Order

The Bladesmith must follow this sequence of steps, each comprised of a set of precise techniques which must be executed properly in order to run a successful shop. A successful Bladesmith can craft blades that are both high in quality and efficiently built. Knowing when to be conservative and when to take risk during the crafting process is integral in minimizing wasted material and maximizing profitability per blade, this is a skill that takes significant time to hone for the majority of journeyman smiths.

## COMMERCE

### SUBMITTING ORDERS (Two Player)

To submit an order to the Bladesmith, the customer must first determine how much currency they have to use for this particular order. Customers begin with **100 base currency** and roll **1D100** to modify their total currency amount to spend on this order. All of the currency does not need to be spent (don't overwhelm the smith), but anything left over does not carry over between orders; rather, each customer is treated as a unique entity and always starts with a minimum of **100 currency**. Each blade has a cost which is derived from the material cost multiplied by the blade value ((Material Amount \* Material Cost) \* Blade Value = Actual Cost), this is to ensure that the Bladesmith is able to turn a profit on each item sold. (See: Tables below for cost information.)

Material	Cost
Iron	5
Steel	15

Blade	Multiplier	Material Amt
Dagger	1.5x	1
Long Sword	2x	2
Katana	3x	3
Claymore	3.5x	4

Use the Order Sheet to present the Bladesmith with a formal record of your order request. (Bladesmith: See Receiving Orders for further instructions.)

## ORDER SHEET

ITEM	AMOUNT	TYPE	COST
LONG SWORD			
CLAYMORE			
KATANA			
DAGGER			

TOTAL	CURRENCY	TOTAL
	100 + _____	

### RECEIVING ORDERS (Single Player)

Bladesmith Note: If you have received an Order Sheet from a customer, you can disregard this step and go straight to the Blacksmithing section ahead.

**Step One:** In order to determine what blade(s) you will be smithing, you need incoming orders. Use the order sheet and first roll **1D4** to first determine the blade type. Then, roll **1D4** again to determine the material type. (See: Tables below for more information.) You can do this as many times as you would like, but each blade has a cost to produce. As a Bladesmith, you have **50 currency** to spend when starting out. Blades cost the blacksmith only what it takes to purchase the raw materials. It is important to start out conservative, as not to run out of currency.

Roll	Blade	Roll	Material
1	Dagger	1-2	Iron
2	Long Sword	3-4	Steel
3	Claymore		
4	Katana		



# BLACKSMITHING

## MATERIAL SELECTION

**IRON:** Iron is one of the most common metals on the planet and is used in a variety of applications, including weapon making. Iron is strong, but highly susceptible to rust and corrosion. It can be heated in a blast furnace, using fireproof brick and a hand-operated bellows to deliver forced air. The strength of iron weapons is highly dependent on the carbon and other “impurities” that are added to or removed from the metal during the crafting process. A specific amount of carbon content and the addition of various alloying elements to raw iron contribute to the production of steel.

**STEEL:** Steel is strong, durable, and highly resistant to corrosion. Steel is derived from iron ore by removing impurities and excess carbon, elements which can make the metal brittle or far less ductile. If a specific type of steel is desired, various other elements can be alloyed in by adding them to the metal mixture during the smelting process. Producing quality steel is highly labor-intensive and requires great skill. The end result of good steel and proper steel work is a high quality blade which may be up to one-thousand times stronger than a normal iron blade, making it unrivaled in its strength and durability.

MATERIAL SHEETS

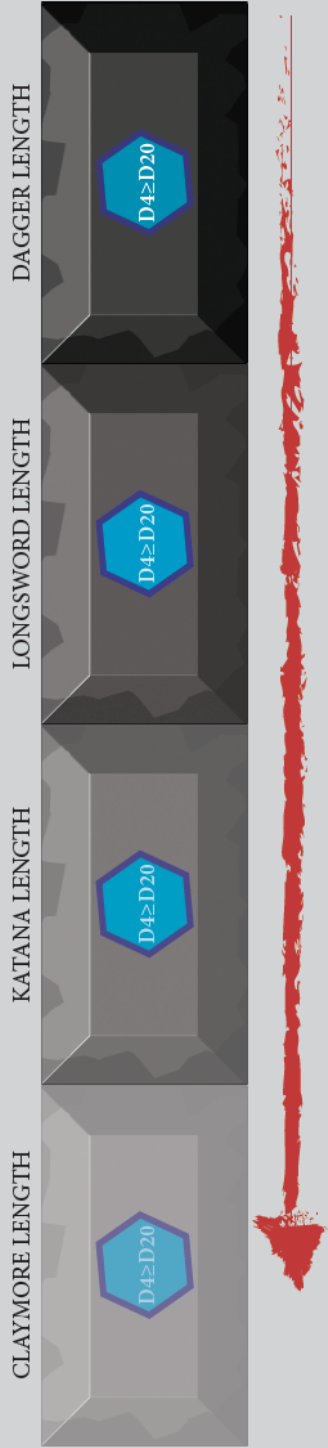
IRON

HEATING		
Target	Minimum	Maximum
75	65	85



TIME LIMIT: 120 Seconds

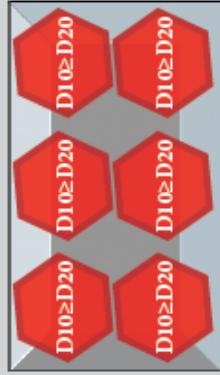
DRAWING		
Target	Minimum	Maximum
18	16	20



TIME LIMIT: 90 Seconds

# STEEL

HEATING			
Target	Minimum	Maximum	
65	60	75	



TIME LIMIT: 90 Seconds

DRAWING			
Target	Minimum	Maximum	
16	14	18	

CLAYMORE LENGTH	KATANA LENGTH	LONGSWORD LENGTH	DAGGER LENGTH



TIME LIMIT: 60 Seconds

## HEATING

**Heating** the material is an important first step in creating a high quality blade. Each material has a different level of heat required to obtain the proper ductility (the metal becomes soft and flexible, making it easier to work). The material sheets specify how much time is allowed for proper heating and the correct temperature range. The Bladesmith takes the material bar, either iron or steel, and applies heat by using a hand-operated bellows and forge. To forge metal, follow these steps:

1. Determine the appropriate bellows “pressure” range. Each bar has red nodes which specify a minimum and maximum allowed dice value, ie. **D10**≥**D20**. This means that you must roll a minimum of **D10** or maximum of **D20** and everything in between. Use an adequate number of dice or some other value indicator to keep track of the heat being applied via the bellows onto one of the six nodes on the material bar.
2. When ready to heat the metal, start a timer that is limited to the time limit value for the material. This is indicated by the red-colored time limit value on the material sheet.
3. Roll a die and place it on one of the six red nodes on the metal bar, this indicates how much pressure has been applied on the bellows and as a result how much heat has been applied to the metal. Continue to repeat this step until all six nodes are filled, paying close attention to the recommended heating values for the material.

If it is necessary to replace the heat value on an individual node, it is possible to re-roll and replace that value. After first applying heat to a new node, the previous node has sufficiently “cooled” allowing the value to be re-rolled. Be careful to not run out of time or go over the maximum temperature.

When all six slots are full or the timer has been depleted, the sum of the face value of all dice should be no greater than the maximum value or less than the

minimum; else the material is ruined and must be replaced. Making another attempt will subtract the base material cost from the Bladesmith's supply of currency.

4. If the material has been successfully heated to the desired temperature (within the minimum or maximum), it is time to move on to **Forging**. Furthermore, if the **Target** temperature has been obtained, add **30 Seconds** to the new step. Otherwise, if the material has been ruined, try again with a newly purchased material bar.

# FORGING

## DRAWING

**Drawing** is the process by which the metal is lengthened by reducing up to two of the other dimensions. This is crucial for forging any blade, which must be long and thin, both for stabbing and cutting. The bar can be flattened and tapered to achieve the desired result based on the type of blade that is being created.

In order to properly draw the blade, the Bladesmith should take the following steps:

1. Select the appropriate material sheet and determine the appropriate “force” with which to strike the metal with the smith’s hammer. Each bar has a specified minimum and maximum allowed dice value, ie. **D4≥D20** contained in the blue nodes. This means that you must roll a minimum of **D4** or maximum of **D20** and everything in between. Use an adequate number of dice or some other value indicator to keep track of the strike being applied via the hammer onto the bar.
2. Based on the type of blade being forged, determine what length the metal should be drawn to. When ready to begin drawing the metal, start a timer that is limited to the time limit value for the material. This is indicated by the blue-colored time limit value on the material sheet.
3. Select and roll a die and place it on the blue node that is located on the first metal bar, indicated with the text, “Dagger” above it. If the strike falls within the minimum or maximum range, the metal has been successfully drawn out by one unit of length. If the strike is not sufficient, roll an additional die and add the new value until an adequate number is achieved. Repeat this process until the metal has been drawn out to the desired length. For each node that contains the **Target** value after successfully drawing the blade, add **fifteen** seconds to the time allotted in the **Hardening** process.
4. If time runs out and the metal was over or under worked, repeat the **Heating** step. Otherwise, move on to **Hardening**.

## HARDENING

**Hardening** the blade is the crucial final step in the forging process and is integral to creating a high-quality, sharp, and durable bladed weapon. The hardening process ensures that the blade will not break or fail in the thick of battle. It ensures that the blade is well-balanced and has the sharpest possible cutting edge. Without this step, the metal would be no more than a hammered hunk of iron and barely useful as even a blunt instrument.

In order to properly harden the blade, the Bladesmith should take the following steps:

1. Select the appropriate **blade blueprint** and determine the appropriate “force” with which to strike the metal with the smith’s hammer. Each red node specifies a minimum and maximum allowed dice value, ie. **D4≥D8**. This means that you must roll a minimum of **D4** or maximum of **D8** and everything in between. Use an adequate number of dice or some other value indicator to keep track of the strike being applied via the hammer onto the weapon.
2. Based on the type of blade being forged, the amount of strikes and required force will be different. When ready to begin hardening the blade, start a timer that is limited to the time limit value for the blade. This is indicated by the blue-colored time limit value on the material sheet.
3. Select and roll a die and place it on a red node that is located on blade. If the strike falls within the minimum or maximum range, the blade has been successfully hardened in that location. If the strike is not sufficient, roll an additional die and add the new value until an adequate number is achieved. Repeat this process until the entire blade has been sufficiently hardened.
4. If time runs out and the blade was over or under worked, repeat the **Heating** step. You do not have to repeat the **Drawing** step, but lose any time bonuses you may have previously earned.
5. If the blade has been sufficiently **Hardened**, move to the **Finishing** step. If the blade has reached the **Target Value**, add **1D4** for final value in the **Finishing** step.



## FINISHING

When **Finishing** the blade, it is time to polish and refine it so that the quality of the workmanship is accurately reflected in the appearance. Finishing involves descaling any burnt carbon from the surface, polishing, filing, and any in some cases a final heat treatment. Proper **Finishing** helps the smith to earn slightly more currency from their work. This does not cost the customer anything additional when using two players.

1. Roll **1D10** to determine finish quality.
2. Roll a **1D4** if it was gained from the **hardening** step.
3. Add the value of all rolls; this is the **final quality** of the blade.
4. Move to the **Delivery** step.

## DELIVERY

Congratulations! You have successfully completed a blade (or a few). Now, it's time to release it into the world and hope it grows up to be a legendary weapon strapped to the side of some heroic knight.

1. The **Bladesmith** earns currency equal to the total value of the blade. This is derived from (Material Cost \* Blade Multiplier).
2. Add additional currency equal to the **final quality** value of the blade. (Currency can be tracking using multiple **D100** or a separate piece of paper.)
3. Now, it's time to repeat from the beginning. Hone your skills and earn as much as possible to graduate to superior materials and more powerful blades.

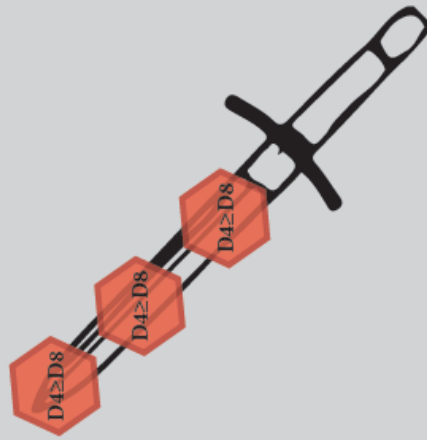


# BLADE BLUEPRINTS

## DAGGER

### DAGGER

HARDNESS			
Target	Minimum	Maximum	
16	10	22	



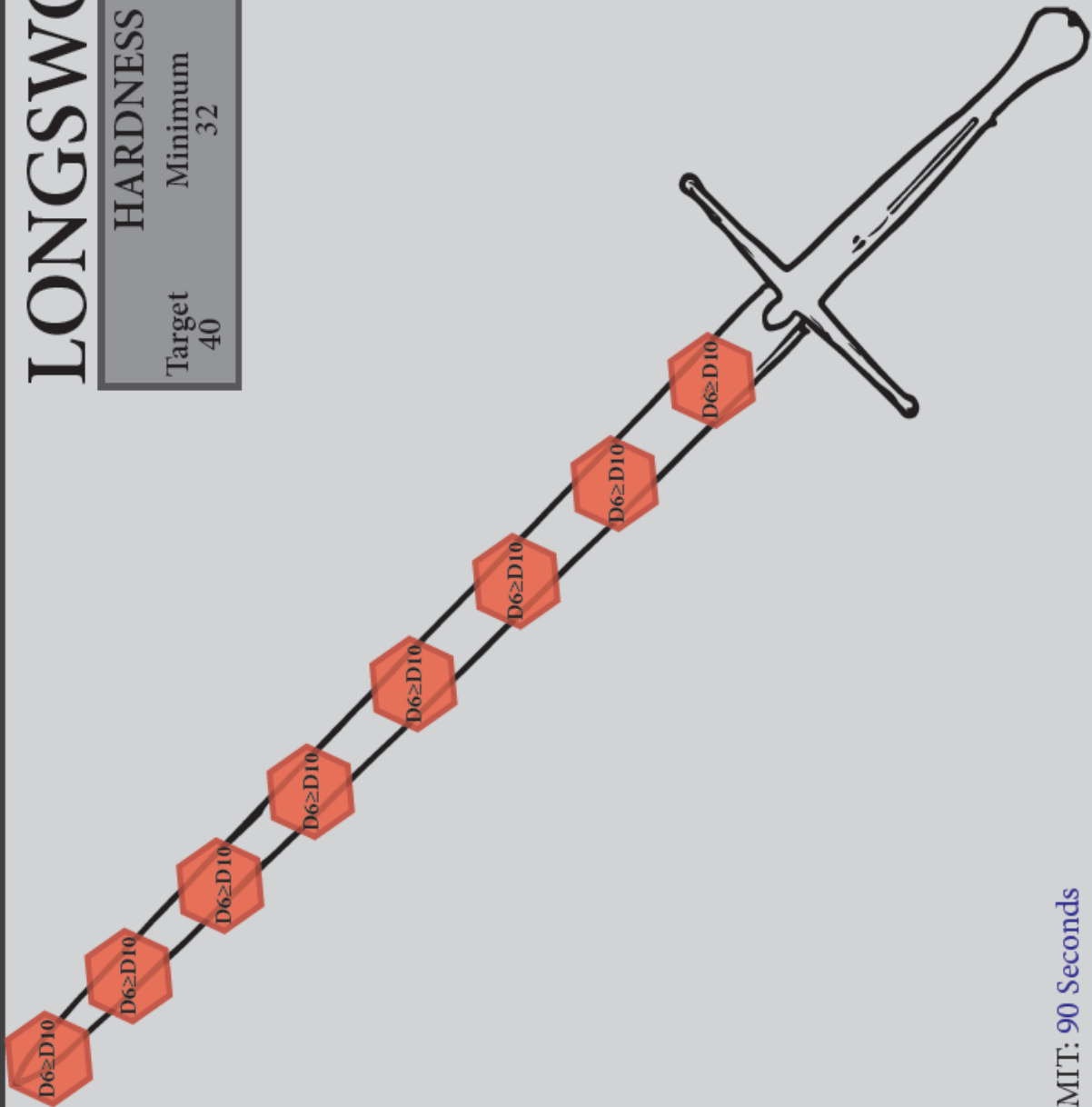
TIME LIMIT: 60 Seconds

## LONG SWORD

# LONGSWORD

### HARDNESS

Target	Minimum	Maximum
40	32	48



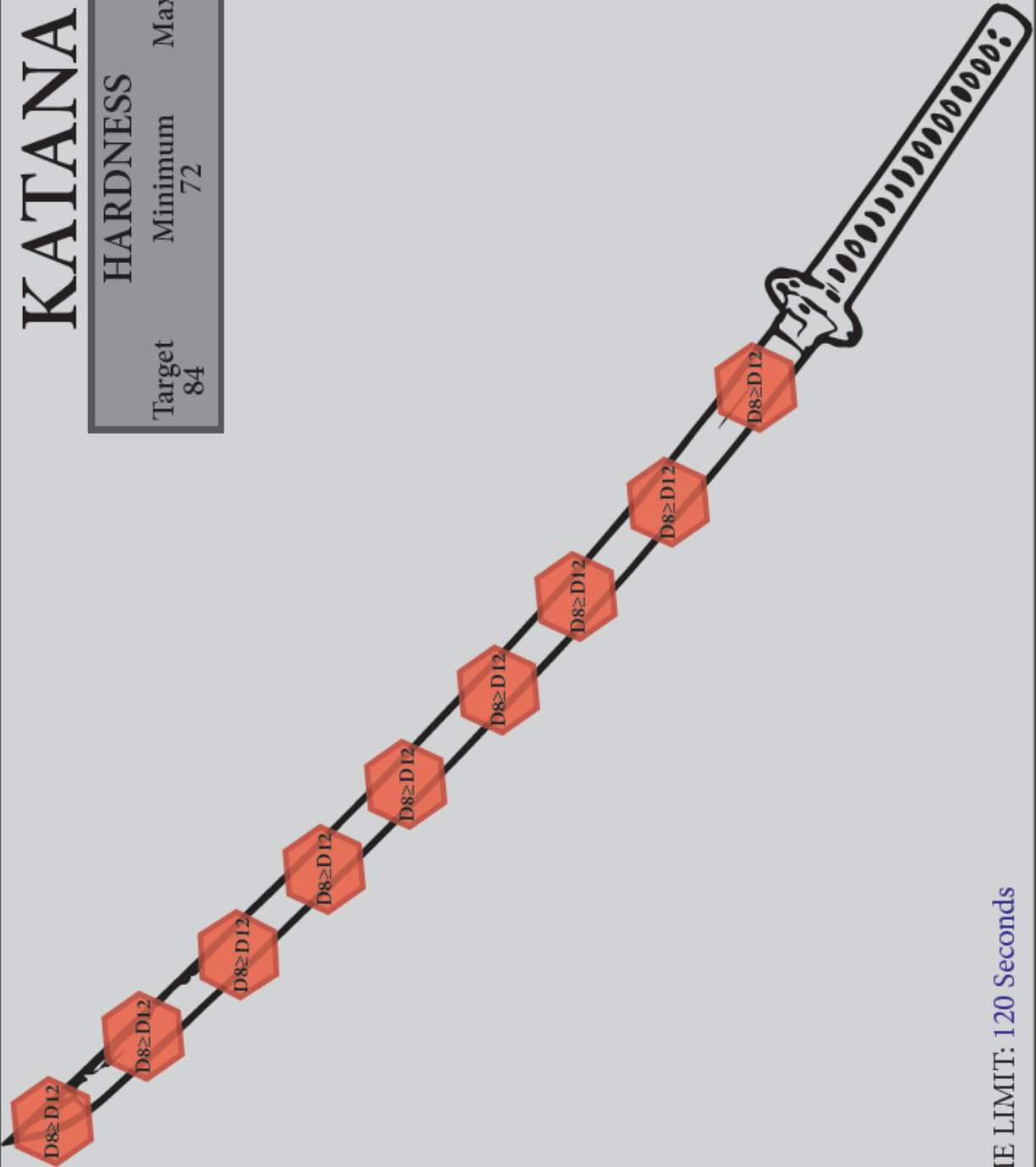
TIME LIMIT: 90 Seconds

## KATANA

# KATANA

### HARDNESS

Target	Minimum	Maximum
84	72	96



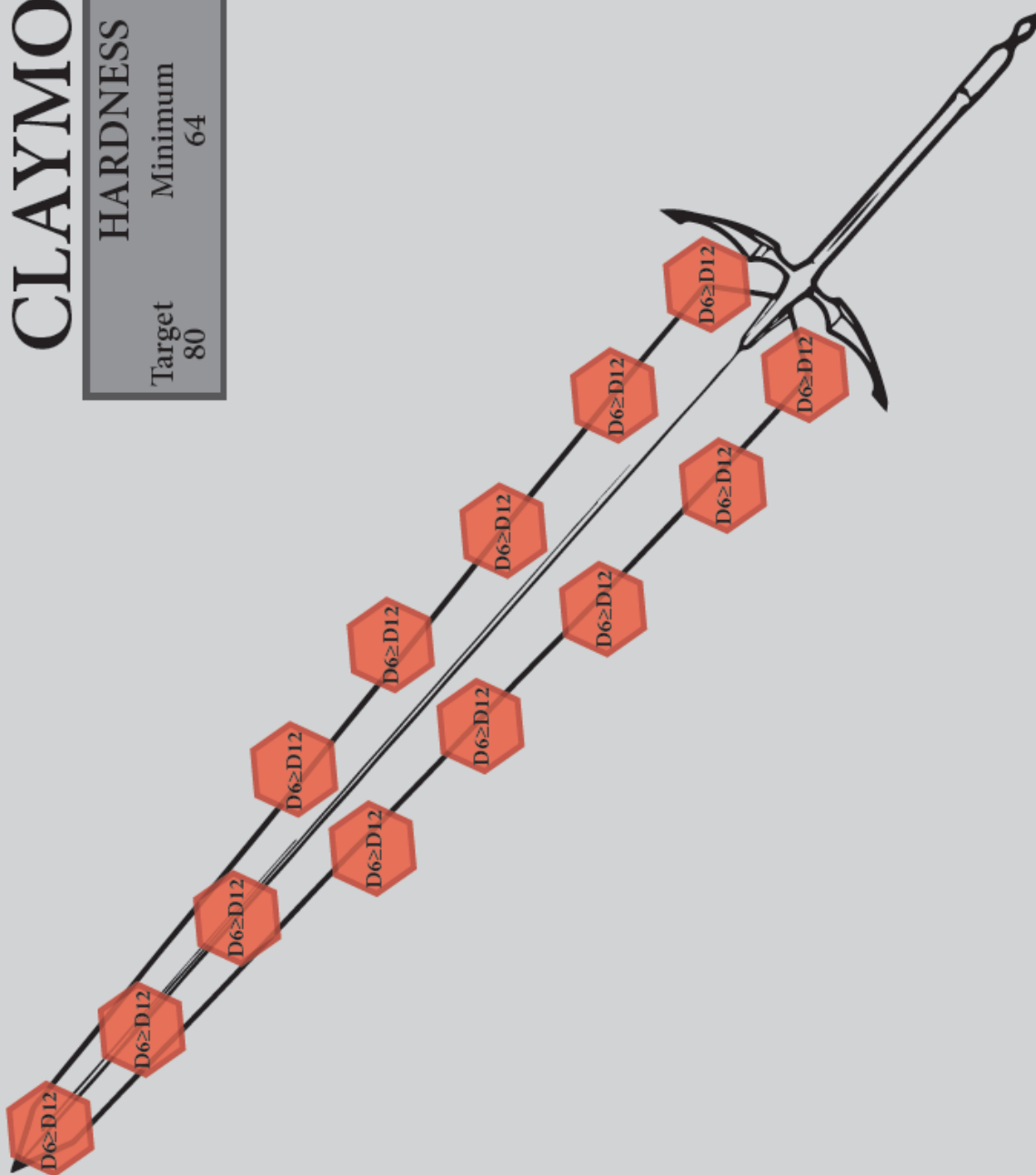
TIME LIMIT: 120 Seconds

## CLAYMORE

# CLAYMORE

### HARDNESS

Target	Minimum	Maximum
80	64	96



TIME LIMIT: 120 Seconds

# CUSTOM SCENARIOS

## MILITARY CONTRACT

The city militia is in dire need of a large amount of long swords and they need them yesterday! They have employed every blacksmith in the city toward the effort, including you. The militia isn't asking for masterworks, they simply need something that will get the job done and can be quickly tossed and cheaply replaced. The militia is willing to pay a huge sum on completion of the contract and it's no secret that they don't have any sort of real quality control process. Use this to your advantage, get the cheapest possible materials and squeeze out the maximum possible profit margins. Normally this might not be your thing, but this might just be that nice boost you have been looking for in order to move into that new shop down the street.

### Scenario Modifications:

- Iron Blades Only
- Long Swords Only
- Iron Heating: 95 Maximum, 65 Target, 45 Minimum, 90 Seconds
- Iron Drawing: 20 Maximum, 14 Target, 10 Minimum, 60 Seconds
- Long Sword Hardness: 72 Maximum, 20 Minimum, 30 Target, 60 Seconds
- Time bonuses and final quality no longer applies. All blades are considered identical when finished.

### Scenario Goals:

You purchase 30 units of low-quality Iron for 150 currency. You must successfully craft 20 Long Swords while following the imposed modifications. Upon completion of the contract, you will be granted 400 currency.

## WEALTHY INVESTOR

A wealthy merchant is looking for a pocket blacksmith that he can employ on the cheap and use to make some easy coin. He could get better quality blades from a more skilled smith, but that definitely wouldn't maximize his potential profit margins. He is willing to supply you with material that he obtained from some, "highly reputable ore dealer," but you're not quite sure what that is supposed to mean. All you know is that he wants to pay you to smith a bunch of blades on the cheap, so he can turn around and flip them for a tidy profit. On the upside, it only costs your time – on the downside, he wants to take the lion's share of the cut on every sale. For a nobody, as far as blacksmiths are concerned, it might be a good, low risk way to get some coin in your pocket and make a name for yourself.

### Scenario Modifications:

- Iron or Steel
- Daggers and Long Swords Only
- Iron Heating: 85 Maximum, 75 Target, 65 Minimum, 60 Seconds
- Iron Drawing: Default, 45 Seconds
- Steel Heating: 80 Maximum, 75 Target, 70 Minimum, 60 Seconds
- Steel Drawing: Default, 45 Seconds
- Dagger Hardness: Default, 45 Seconds
- Long Sword Hardness: Default, 60 Seconds
- Time bonuses still apply. Final quality bonus does not.

### Scenario Goals:

The merchant has provided you with 10 Iron and 10 Steel. He wants 8 Long Swords, with at least half being steel and 8 Daggers with at least half being steel. Upon completion of the contract, you will be granted 300 currency. For each additional blade delivered (over the 16 total) you will earn an additional 5 currency for iron and 10 currency for steel.

## DAMASCUS STEEL

You have come upon a travelling merchant who is looking to unload a large amount of the legendary (and highly expensive) Damascus Steel. This is the sort of stuff that most blacksmiths can only dream about working with. No one is really quite sure how it is even made, except of course for the ones who made it. Blades made with this steel will never break and can cut through literally anything. Some claim the method of production was known only to extraterrestrials, but those people are crazy anyway – right? Buy up as much of this stuff as possible and don't mess it up! If you do everything properly, you could be sitting in your brand new villa and sipping the finest wine by this time next week.

### Scenario Modifications:

Steel Only

Katana Only

Steel Heating: 95 Maximum, 90 Target, 85 Minimum, 60 Seconds

Steel Drawing: 20 Maximum, 18 Target, 16 Minimum, 30 Seconds

Katana Hardness: Default, 90 Seconds

Time and final quality bonuses still apply.

This scenario cannot be played twice in a row.

### Scenario Goals:

You have access to up to **100** units of Damascus Steel at **40** currency per unit. The Katana multiplier for a successfully crafted Damascus Steel Katana is set to 3 ½ times. Determine how much of that marvelous steel you want (see: can afford) and get to work! Upon the completion of all of the blades, offload them on the market place for **(40 \* 3.5) + Final Quality Bonus**. Don't mess this up.

## BAD BATCH

You have purchased an exceptionally horrible batch of iron. It is brittle and flakey, covered in rust and burnt carbon. It's obvious that this stuff won't be of any use in its current state, especially not for forging any sort of proper blade. If you can figure out how to properly rescue this batch, you might be able to squeeze some decent steel out of the iron. It's definitely going to take some work and it is more than likely that most of your purchase will be completely destroyed in the forge, but with enough luck, you just might be able to turn a small profit from this setback.

### Scenario Modifications:

Iron Heating Step Only

120 Second Time Limit

Iron Heating: 200 Maximum, 175 Target, 160 Minimum

The Iron cannot be cooled, heat is added cumulatively.

### Scenario Goals:

Spend 100 currency to obtain 25 units of low quality iron.

Add as much heat as possible to the metal during the heating process, constantly pumping the bellows to create a white hot blast furnace. It is important to burn out all of the contaminants as well as the excess carbon. Most of the iron will be destroyed in the process, but with any luck you can get some high quality steel out of the process.

If the heat lands within the required heating values by the end of the time limit, gain one piece of steel. Otherwise, the iron is destroyed. Be careful how much heat is applied with any given pump of the bellows, since you can't stop until the timer is completely depleted!



## CREDITS

# BLADESMITH

PRESIDENT: CLAUDE COMAIR

INSTRUCTOR: SCOTT DODSON

DESIGNER: CHRIS MORRIS (GAT 212 S13-A)

3/21/2013

COPYRIGHT © 2013 DIGIPEN (USA) CORPORATION. ALL RIGHTS RESERVED.