Trait Matrix v1.0 (Plain Text)

Purpose

Define the rarity, evolution, and utility framework for *Shard Frontier* NFTs and shards. This matrix governs how in-game resources evolve into blockchain assets and how each rarity tier supports long-term engagement and market value.

Trait Structure Overview

Every collectible or NFT in *Shard Frontier* is built from a combination of:

- **Material Traits** (the ores and shards used)
- **Functional Traits** (speed, efficiency, power)
- **Visual Traits** (colour, texture, pattern, holographic effects)
- **Lore Traits** (origin story or event badge)

Each trait contributes to rarity, appearance, and potential perks.

Core Rarity Tiers

Tier	Source	Description	Utility
Raw	Common ore	Abundant and low-yield materials; short-term use	Basic upgrades
Refined	Processed ore	Mid-tier crafting input	Unlocks mid-level tools
Rare	Deep-zone anomalies	Difficult to obtain; unique visual patterns	Enhanced gameplay bonuses
Legendary	Event or DAO drops	Extremely limited, story-tied items	Highest visual/lore value, tradable NFT tier

Trait Categories

Category	Examples	Description
Material	Ferrite Dust, BDAG Quartz, Ion Crystal	Determines colour palette and particle effects
Energy	Reactor Core, Flux Cell	Defines animation intensity and glow strength
Structural	Alloy Frame, Nano Mesh	Controls shape variance and durability
Cognitive	AI Imprint, Memory Core	Adds lore hooks and narrative metadata

Each crafted item draws randomly (weighted) from these categories to maintain uniqueness.

Trait Evolution (Fusion System)

1. **Collect Shards** – obtained from mining or missions.
2. **Combine** – fuse two or more shards in the Forge to create an evolved shard.
3. **Refine** – use Energy Credits to stabilise the fusion; chance of mutation.
4. **Mint** – once stabilised, mint the NFT (on BDAG or bridged chain).

Mutation adds a random bonus trait (colour shift, glow pattern, small stat buff).
Higher rarity shards have increased mutation chance.

Trait Weighting

Rarity	Base Probability	Mutation Chance	NFT Output
Raw	60 %	2 %	Common item
Refined	25 %	5 %	Uncommon
Rare	10 %	10 %	Rare
Legendary	5 %	20 %	Unique 1/1 NFT

Weighting ensures longevity — players always have common finds but still chase high-rarity outcomes.

NFT Integration

- Minted NFTs inherit **trait metadata** directly from the shard combination.
- Metadata schema follows ERC-1155/721 hybrid standard.
- Rarity and fusion history visible on both BDAG explorer and Rarible storefront.
- Legendary and event NFTs include immutable "Creation Lore" lines (who forged it, during what event, DAO season, etc.).

Perk Examples by Trait Type

Trait	Example Perk
Material – Ion Crystal	+3 % mining speed
Energy – Flux Cell	+5 % reactor duration
Structural – Nano Mesh	+2 % hull integrity
Cognitive – Memory Core	Unlocks lore mission or hidden dialogue

Trait Families (Future Expansion)

1. **Solar Lineage** – warm gold/amber tones; linked to energy efficiency.
2. **Quantum Lineage** – blue/purple tones; boosts hover systems.
3. **Void Lineage** – dark metallics; linked to DAO governance perks.
4. **Genesis Lineage** – event-only, animated; visual prestige, no stat gain.

These families let future seasons add depth without breaking the existing economy.

Anti-Duplication & Rarity Assurance

- Each NFT stores a **fusion hash** derived from shard IDs to prevent duplicates.
- The system checks for identical trait combos before minting.
- DAO auditors can review randomness seed generators for transparency.

Visual & Thematic Direction

Clean BDAG-style design language: metallic gradients, luminescent edges, and animated particle loops for higher rarities.
Even Raw-tier shards look collectible and "real."

Deliverables for This Phase

1. PDF – *Trait Matrix v1.0*
2. Metadata Schema Draft (JSON template)
3. Rarity Weight Table for future seasons
4. Render Prompts – Shard variants (Raw → Legendary progression)