# Personalized Children's Book Generator — Full Plan & Prototype Prompts

> Complete roadmap, technical design, user flows, prompt engineering, and ready-to-run prompt templates for building a SaaS that creates personalized children's books (illustrations + layout) using Google Imagen (Gemini/Vertex AI).

---

## 1. Product at a glance

**Name (placeholder):** LittleLens Books

**One-liner:** From a child's name, a face reference and a short creative brief, auto-generate a fully illustrated, print-ready children's book (8–24 pages) with consistent characters, on-brand styles, and optional physical printing.

**Target customers:** Parents, grandparents, gift shops, schools, self-publishing indie authors, and children’s merch brands.

**Core value:** Emotional, hyper-personalized keepsake books produced in minutes—cheaper than bespoke illustrators, faster than manual design.

---

## 2. Core features (MVP scope + nice-to-have)

**MVP features:** - Onboarding form: child name, pronouns, age, personality tags, short story idea, character face photo (optional), preferred art style (cartoon / watercolor / collage), book length (8 / 12 / 16 pages). - Character reference generator: auto-create/update a 1-page character sheet from photo + text inputs. - Prompt pipeline to generate page-by-page illustrations (batch generation), with previews. - Simple WYSIWYG layout builder to edit text and re-generate individual pages. - Export: high-resolution PDF (300 DPI) print-ready, and web-optimized images for sharing. - Payment and order flow (digital download + optional print-on-demand partner integration).

**Nice-to-have:** - Voice narration audio generation. - Localization (translate story & re-generate images for cultural context). - Multiple child/character support (siblings, pets). - Collaboration, gifting flows, and personalized inscriptions. - Marketplace for premium illustrators to refine AI output.

---

## 3. Strategic differentiators (defensibility)

- **Character continuity engine**: store character tokens + reference sheet to ensure consistent appearances across pages and sequels.
- **Emotion & developmental staging**: visuals tuned to child’s age (visual complexity, vocabulary, themes).
- **Human-in-the-loop editing**: let parents pick a style and optionally request human retouches for high-margin prints.

- **Privacy-first workflow**: ephemeral face-processing, opt-in storage, and consent for likeness.

---

## 4. High-level user flow

1. Sign up / authenticate.
2. Input child data: name, pronouns, age, interests, short plot (2–4 sentences), upload photo (optional).
3. Choose book length & art style; choose cover template.
4. System creates character sheet (one API call + optional refine step).
5. System generates story outline / page breakdown (auto or user-supplied).
6. Batch-generate illustrations for each page using Imagen; produce low-res previews for approval.
7. User reviews pages, requests per-page re-generations or edits (masking/inpainting), or requests human retouch.
8. Once approved, system composes print-ready PDF and offers download/print order.

---

## 5. Technical architecture (components)

**Frontend:** Next.js (React) or similar – responsive UI with a storyboard editor and image preview grid.

**Backend:** Node.js (NestJS / Express) or Python (FastAPI).

**Storage:** GCS / S3 for image assets; Postgres for metadata.

**Queue & Workers:** BullMQ / Redis for batching image-generation jobs, retries and rate limiting.

**AI Service Adapter:** Thin service that encapsulates Imagen/Gemini API calls and abstracts model parameters, rate-limiting, and provenance metadata handling.

**PDF Composer:** Server-side composition using Puppeteer or ReportLab to layout images and text at 300 DPI.

**Human Review UI & Ops:** Admin dashboard for manual retouches and quality control.

**Payment / Printing:** Stripe for payments; integrate with Printful / Blurb APIs for printing fulfillment (optional).

**Monitoring & Logging:** Sentry, Prometheus, and cost alerts for image generation spend.

---

## 6. Data models (simplified)

```
-- pseudocode
User(id, name, email, stripe_customer_id)
Project(id, user_id, title, status)
Character(id, project_id, name, gender_pronouns, description,
reference_image_url, token) -- token = stable descriptor
```

```
Page(id, project_id, page_number, page_text, image_urls[], status)
GenerationJob(id, page_id, prompt, model, params, cost, created_at, status)
Asset(id, project_id, url, type, metadata)
```

---

## 7. Story generation & page structure

**Two modes:** - **Author-supplied story:** user pastes story; system splits into pages using heuristics (sentence count, scene breaks) and suggests image prompts. - **AI-assisted story:** user supplies 2–4 bullet points, system generates a child-friendly story (tone option: whimsical, adventurous, gentle) and a page-by-page outline.

**Page structure template:** - Page header: page_number, text_block (1–3 short sentences), image composition spec (foreground subjects, background, props, mood, color palette).

---

## 8. Prompt engineering strategy (principles)

1. **Two-stage prompting:** generate a character reference image (or set of 3–6 expressions/poses) first. Use that as a visual anchor (seed image or "character token") for subsequent scene prompts.
2. **Use structured style tokens:** maintain consistent style by encoding `style_token` values (e.g., `watercolor_soft`, `bold_vector`, `paper-cut_collage`) and always include them in prompts.
3. **Scene templates:** prompts should explicitly list composition, camera angle, lighting, clothing, emotion, and negative prompts.
4. **Batch with variation constraints:** for pages that require consistent look, set stricter guidance scale / less randomness. For background or filler pages, allow more diversity.
5. **Masking & inpainting:** allow parents to upload/paint a mask to reposition a character or swap a prop.
6. **Provenance & safety:** attach metadata (child name, character token, generation timestamp, SynthID if present) to every image asset.

---

## 9. Prototype prompts & templates (ready-to-run)

> **Notes:** Use these templates with your Imagen adapter. Replace variables inside `{{ }}`.
> Add or remove style tokens depending on test results. Keep negative prompts short.

### 9.1 Character sheet (seed generation)

**Purpose:** Create a canonical character reference (multiple poses and expressions). Use either an uploaded photo or text-only.

**Template (photo-assisted):**

```
[Instruction]
Create a character reference sheet of the child based on the reference photo
provided. Output four high-quality illustrations on a single 2-column layout:
(1) front-facing portrait headshot; (2) 3/4 standing pose; (3) side smiling
profile; (4) three small expression thumbnails (happy, surprised, sleepy).
Ensure consistent features across all images: skin tone {{skin_tone}}, hair
{{hair_description}}, eye color {{eye_color}}, distinguishing marks:
{{marks}}. Clothing: {{favorite_clothing}}.

Style: {{style_token}} (e.g., watercolor_soft, cartoon_flat, paper_cut),
simple backgrounds with subtle gradient or flat color. Lighting: soft
daylight. Camera: slightly wide-angle for full-body, tight crop for headshot.

Tone: warm, whimsical, child-friendly.

Output requirements: each illustration 1024x1024; label each sub-image with a
small text overlay (headshot, 3/4 pose, profile, expressions). Include a
short JSON in the metadata describing features: {"skin_tone":..., "hair":...,
"style_token":...}.

Negative prompts: avoid photorealism, avoid adult features, avoid text other
than labels.
```

**Template (text-only):**

```
Create a character reference sheet for a child named {{child_name}}, age
{{age}}. Physical description: {{description}}. Provide 4 images: headshot,
3/4 standing, profile, and three emotion thumbnails. Style: {{style_token}}.
Keep visuals consistent across frames.
```

### 9.2 Page illustration prompt (general)

**Purpose:** Generate the main illustration for a single page.

**Template:**

```
[Instruction]
Illustrate a children's book scene for page {{page_number}} with the
following elements.

Character(s): primary: character_token:{{character_token}} (use the character
reference). Secondary: {{secondary_characters}} (e.g., cat, grandma, tree).

Scene description: {{scene_short_description}} (one sentence - who does what,
where).

Composition: camera angle: {{camera}} (e.g., eye-level, bird's-eye, low-
```

```
angle); crop: {{crop}} (e.g., full-body, waist-up); focal point:
{{focal_point}}.

Environment: {{environment}} (e.g., cozy bedroom, rainy street, enchanted
forest). Props: {{props}}.

Style: {{style_token}}. Palette: {{palette}} (e.g., pastel blues and warm
yellows). Lighting & Mood: {{lighting}}.

Constraints: maintain character_token likeness; ensure child appears age-
appropriate; do not include brand logos or real-world trademarks.

Output: single image, 2048x1536 (or desired aspect ratio), flattened PNG with
transparency optional. Include generation metadata.

Negative prompts: photorealistic, gore, adult-sized features, extra limbs,
blurry faces.
```

**Example (for page 3):**

```
Illustrate page 3 with primary: character_token:ABCD1234 ("Maya"), secondary:
small orange cat.
Scene: Maya opens a secret cardboard door in her treehouse and finds a
glowing jar of fireflies.
Composition: eye-level, 3/4 view, waist-up; focal point on Maya's hands and
jar.
Environment: dim treehouse interior with warm rim light from the jar;
scattered books and cushions.
Style: watercolor_soft. Palette: deep greens, warm ambers. Lighting: glow
from jar reflections on face.
```

### 9.3 Inpainting / Edit prompt (mask-assisted)

**Purpose:** Replace/retouch a region while preserving the rest.

**Template:**

```
[Instruction]
Use the provided base image and mask: replace the masked area with a new
render of the character in a slightly different pose. Preserve background
texture and lighting. Character: character_token:{{character_token}}. Target
pose: {{pose_description}}.

Style: same as original ({{style_token}}). Constraints: seam-free blend,
consistent shadows, maintain skin tone and hair details. Output: PNG with
alpha channel.
```

```
Negative prompts: mismatched colors, visible seams, text overlays.
```

### 9.4 Cover art prompt

```
[Instruction]
Design a cover for the children's book titled "{{book_title}}" starring
{{character_name}}. Composition: bold, central portrait of the character;
include the book title text area reserved at top; subtitle area at bottom for
personalization (e.g., "A story about {{child_name}}'s adventure").
Style: {{style_token}}; highly legible from thumbnail; include 3 background
motif options: stars, clouds, simple patterned wallpaper.
Resolution: 3500x2660 300 DPI print-ready layout. Leave 0.25 in bleed.
Include space for barcode on the back (no barcode content).

Negative prompts: small illegible fonts, fine details that won't print well.
```

### 9.5 Batch variation prompt (to produce 3 alternate compositions)

```
Produce 3 distinct yet consistent variations of this scene. Keep
character_token likeness exact; vary camera angle (slightly), background
props (swap cushion for a book), and color accent (warm/cool). Keep style and
palette consistent.
```

### 9.6 Tone/style prompt tokens (examples)

- `watercolor_soft`: wet brush strokes, soft gradients, muted palettes, paper texture grain
- `cartoon_flat`: bold outlines, flat fills, high contrast, playful proportions
- `paper_cut`: paper collage look — layered cut shapes, visible paper edges, slight drop shadows
- `storybook_real`: painterly yet illustrative, rich textures, cinematic lighting

Include `--style:watercolor_soft` or equivalent in your prompt adapter to keep tokens consistent.

---

## 10. Character continuity technique (practical)

1. **Create and persist a** `character_token`: After first character generation, compute a deterministic hash of salient descriptors (skin, hair, clothing, style) and store it as `character_token`.
2. **Seed subsequent prompts with** `character_token`: Use the saved character reference image as `image_seed` for new prompts; include textual descriptor `character_token:XXXX` in every prompt.
3. **Use a small classifier to validate likeness**: run a quick similarity check (CLIP or embedding distance) to confirm generated page images match the character reference.
4. **Human override**: failure path invites user to 'regenerate using face photo' or request manual retouch.

---

## 11. Quality control & cost management

- Generate low-res previews first (e.g., 512px) — show to user for approval. Only render final high-res images once user approves or pays for print.
- Implement per-project budgets / credit caps with alerts.
- Use instructive negative prompts and higher guidance to reduce retries.

---

## 12. Safety, legal & privacy

- **Likeness & consent:** require parental consent for using a photo of a child. Explicit checkbox and a short TOS snippet.
- **Data retention:** by default, store character reference for 30 days; provide opt-in for longer storage with clear privacy notes.
- **Child-safe content moderation:** run generated text and image through a safety filter to disallow sexual content, graphic violence, hate symbols, and adult themes.
- **IP clarity:** clarify that artwork is AI-generated; provide license terms for personal use vs commercial resale.

---

## 13. Monetization model

- Freemium: free low-res preview (watermarked), pay-per-full-resolution image (credits), or subscription for unlimited low-res + reduced cost per high-res.
- Print revenue: margin on physical book orders via POD partner.
- Premium service: professional illustrator retouching for top-tier orders.

---

## 14. MVP roadmap (8 weeks)

**Week 0 — Prep & research**: design core flows, choose print partner, create initial UI wireframes.

**Week 1 — Auth & onboarding**: basic auth, user project creation, onboarding form.

**Week 2 — Character seed flows**: upload face or text, generate & show character sheet (low-res). Save character_token.

**Week 3 — Story engine**: implement story-splitting & page outline generator (basic heuristics + optional LLM assist).

**Week 4 — Batch generation & previews**: worker queue, Imagen adapter, low-res previews for pages.

**Week 5 — Page editor & re-generation**: small WYSIWYG, per-page inpainting integration.

**Week 6 — PDF composition & download**: high-res generation, PDF composer, test print-ready outputs.

**Week 7 — Payments & print integration**: Stripe and POD API; pricing page.

**Week 8 — Pilot & polish**: onboard 5 beta families, collect feedback and iterate.

---

## 15. Metrics & success criteria

- Conversion (preview → paid download) > 5% initially.
- Cost per acquisition (CPA) < $20 for early pilots via parenting groups.
- Average order value (AOV) > $25 (with prints).
- Generated image acceptance rate > 80% after one iteration.

---

## 16. Risks & mitigations

- **Bad likenesses / uncanny valley:** require character refinement step; provide guided retouch and human-in-the-loop.
- **High generation costs:** preview low-res; gated high-res; subscriptions.
- **Legal exposures (likeness):** explicit consent and opt-out; local-law disclaimers for EU/UK when necessary.
- **Child safety concerns:** strict moderation and admin review for flagged content.

---

## 17. UI/UX prototype (screen list & behavior)

1. Landing / examples gallery
2. Project creation form (name, age, story prompt, photo upload)
3. Character sheet preview with tweak controls (hair color, clothing)
4. Storyboard (page thumbnails) with status tags (preview / revised / approved)
5. Page editor (text + regenerate image + mask edit)
6. Cover designer (choose templates, edit title)
7. Checkout & delivery (digital download + print options)
8. Account settings (data retention policy, delete project)

---

## 18. Sample prompts (full example end-to-end)

**Inputs:** - child_name: Maya - age: 5 - pronouns: she/her - skin_tone: light brown - hair_description: curly dark brown hair tied in two pigtails with red bows - favorite_clothing: purple dress with yellow stars - interests: fireflies, treehouse, reading - style_token: watercolor_soft - short_story_bullets: ["Maya finds a secret jar of glowing fireflies in her treehouse", "She shares them with her sleepy cat", "They learn to say goodnight to the stars"]

**Character sheet prompt (photo-assisted):** (see template in 9.1)

**Page generation (page 1 — title spread):** (see 9.4 cover art prompt)

**Page generation (page 3 — scene):** (see example in 9.2 above)

---

## 19. Implementation checklist & developer notes

- Build Imagen adapter with wrappers for: prompt templating, seed image upload, inpainting, batch requests, provenance capture.
- Expose safe retry strategy and backoff to avoid runaway costs.
- Implement small CLIP-based likeness check with tunable threshold to reduce regenerations.
- Create a small library of style tokens and example prompts for internal QA.
- Create a tight feedback loop: A/B test palette, style, and cover templates with early users.

---

## 20. Next steps I can do for you now (pick any)

1. Convert the prompt templates into a JSON schema + code-ready prompt generator (Node/Python).
2. Draft the API contract for the Imagen adapter (endpoints, params, sample responses).
3. Create a minimal React storyboard UI mock (single-file component) and export assets.

---

### Appendix A — Prompt debugging tips

- If faces are inconsistent: increase guidance scale, add the explicit phrase `"maintain the exact facial features from the character reference"` and use the reference image as a seed.
- If hands look odd: add `"hands should be simple and childlike, avoid complex finger positions"` to the prompt.
- For better print results: request at least 300 DPI and render at a larger resolution (e.g., 3500 px on the long edge), then downscale in the PDF composer.

---

*Document created as a working playbook — ready to iterate. If you want one of the next steps implemented, pick a number and I'll generate the code/schema/UI now.*