Part 1: Problem Statements

The following are some problems with most flashcard applications currently available. Note that some issues are addressed by particular applications, but none (that I am aware of) have solved all these problems to provide an optimal user experience.

The target users of this application are those who often use flashcards for vocabulary revision. These include native English speakers who wish to expand their vocabulary as well as English learners who may need additional features to effectively learn new words. The listed problems take the particular needs of these target groups into account.

1. There is no feature to automatically insert a definition or foreign language translation for vocabulary flashcards.
2. There is no audio pronunciation feature for vocabulary flashcards.
3. There is no feature for conveniently creating several flashcards at once.
4. There is no feature for automatically generating vocabulary flashcard decks.
5. There is no ability to automate flashcard revision using techniques such as spaced repetition.
6. Users are not able to customize their experience to best suit their needs and preferences.

Part 2: User Stories

Requirement: Create, edit and delete flashcard decks
Feature 1: Create flashcard decks   As a user,   So that I can organise my flashcards into different categories,   I want to create flashcard decks.   GIVEN I am on the homepage   WHEN I click on the add deck button   AND enter the deck name   AND select the revision style as either "standard" or "spaced repetition"   THEN the new deck should be created and appear on my homepage.
Feature 2: Edit flashcard decks   As a user,   So that I can update my deck's name and revision style   I want to edit my flashcard decks.

GIVEN I am on the homepage
WHEN I click on a deck
AND click the "edit deck" button
AND enter a new deck name
AND select my preferred revision style
AND click the "save changes" button
THEN the deck's information should be updated.

Feature 3: Delete flashcard decks

As a user,
So that I can keep my homepage organised and clutter free
I want to remove unwanted flashcard decks.

GIVEN I am on the homepage
WHEN I click on the delete deck button
AND select one or more decks
AND click on the "done" button
THEN the selected decks should be removed.

Requirement: Create, edit and delete flashcards

Feature 1: Create flashcards

As a user,
So that I can record important information for revision,
I want to create flashcards.

GIVEN I am on a deck's cards page
WHEN I click the add button
AND type the question/prompt in the front field
AND type the answer in the back field
AND click the "add card" button
THEN the new card should be added to the current deck.

Feature 2: Edit flashcards

As a user,
So that I can fix mistakes or add new information to my cards
I want to edit my existing flashcards.

GIVEN I am on a deck's cards page
WHEN I click the edit button
THEN I can select the back or front fields of the current card to edit them.
WHEN I edit a field
AND click the "save changes" button
THEN the card should be updated in the deck.

Feature 3: Delete flashcards

As a user,
So that I can keep my decks clutter free
I want to remove unwanted flashcards.

GIVEN I am on a deck's cards page
WHEN I click the delete button
THEN the current card being viewed should be removed from the deck.

Requirement: Automatically insert a definition or foreign language translation for vocabulary flashcards (PS 1 & 2)

Feature 1: Automatically insert definition and pronunciation information for vocabulary flashcards

As a user,
So that I can easily make new vocabulary flashcards,
I want to automatically add definition information for a given word.

GIVEN I am on the add card page
WHEN I type a word in the front field
AND select the "define" checkbox
THEN the definition and pronunciation information for that word should appear in the back field.

Feature 2: Automatically insert foreign language translations for vocabulary flashcards

As an English language learner,
So that I can learn the meaning of words in my native language with flashcards,
I want to automatically add the foreign language translation of a given word.

GIVEN I am on the add card page
WHEN I type a word in the front field
AND select the "translate" checkbox
AND select my language from the dropdown menu
THEN the translation for that word should appear in the back field.

Requirement: Create multiple flashcards at once (PS 3)

Feature 1: Create multiple flashcards at once by providing a list of front and back fields

As a user,
So that I can conveniently create several flashcards,
I want to add multiple flashcards to a deck at once from a list of front and back fields.

GIVEN I am on the add multiple cards page
WHEN I type front and back fields for all cards in the given format
AND click the "add cards" button
THEN all cards in the list should be added to the current deck.

Feature 2: Create multiple vocabulary flashcards at once by providing a list of terms

As a user,
So that I can conveniently create several vocabulary flashcards,
I want to add multiple vocabulary flashcards at once from a list of words.

GIVEN I am on the add multiple cards page
WHEN I type a list of words
AND select the "define" checkbox
AND click the "add cards" button
THEN all words and their definitions should be added as cards to the current deck.

Feature: Generate vocabulary deck (PS 4)

As a user,
So that I can expand my vocabulary,
I want to generate vocabulary decks with up to 200 cards based on my preferences.

GIVEN I am on the homepage
WHEN I click on the generate deck button
AND select the type of deck
AND select the difficulty of the terms
AND select the number of cards in the deck
AND click on the "add deck" button
THEN a vocabulary deck with my preferences should be added to the homepage.

Requirement: Revise flashcards in a deck

Feature 1: Revise flashcards in a standard deck

As a user,
So that I can memorise important facts,
I want to test my understanding by revising my flashcards.

GIVEN I am on the homepage
WHEN I click on a standard deck
AND click the "revise" button
THEN I should view the front side of the first card in the deck.
WHEN I click the card
THEN I should view the back of the card to check my understanding.

Feature 2: Revise flashcards in a spaced repetition deck (PS 5)

As a user,
So that I can more effectively memorize my flashcards,
I want to be given cards to revise based on the spaced repetition technique.

GIVEN I am on the homepage
WHEN I click on a spaced repetition deck
AND click the "revise" button
THEN I should see the front side of the first card to be revised.
WHEN I click the card
THEN I should view the back of the card along with "correct" and "incorrect" buttons.
WHEN I click on one of the buttons
THEN the card should be moved to the appropriate revision time based on spaced repetition intervals.

Requirement: Customize user experience (PS 6)

Feature 1: Select what information to include in automatic definition insertions.

As a user,
So that I can conveniently insert information that I need in my vocabulary flashcards,
I want to select the types of definition and pronunciation information that are automatically added.

GIVEN I am on the homepage
WHEN I click on my profile icon
AND select the "preferences" option
THEN I should view the preferences page.
WHEN I select options under the "definition card fields" heading
AND click the "save changes" button
AND automatically insert a definition in a new flashcard
THEN only the fields I had selected should appear in the back field of the card.

**Feature 2**: Change the site's colour scheme
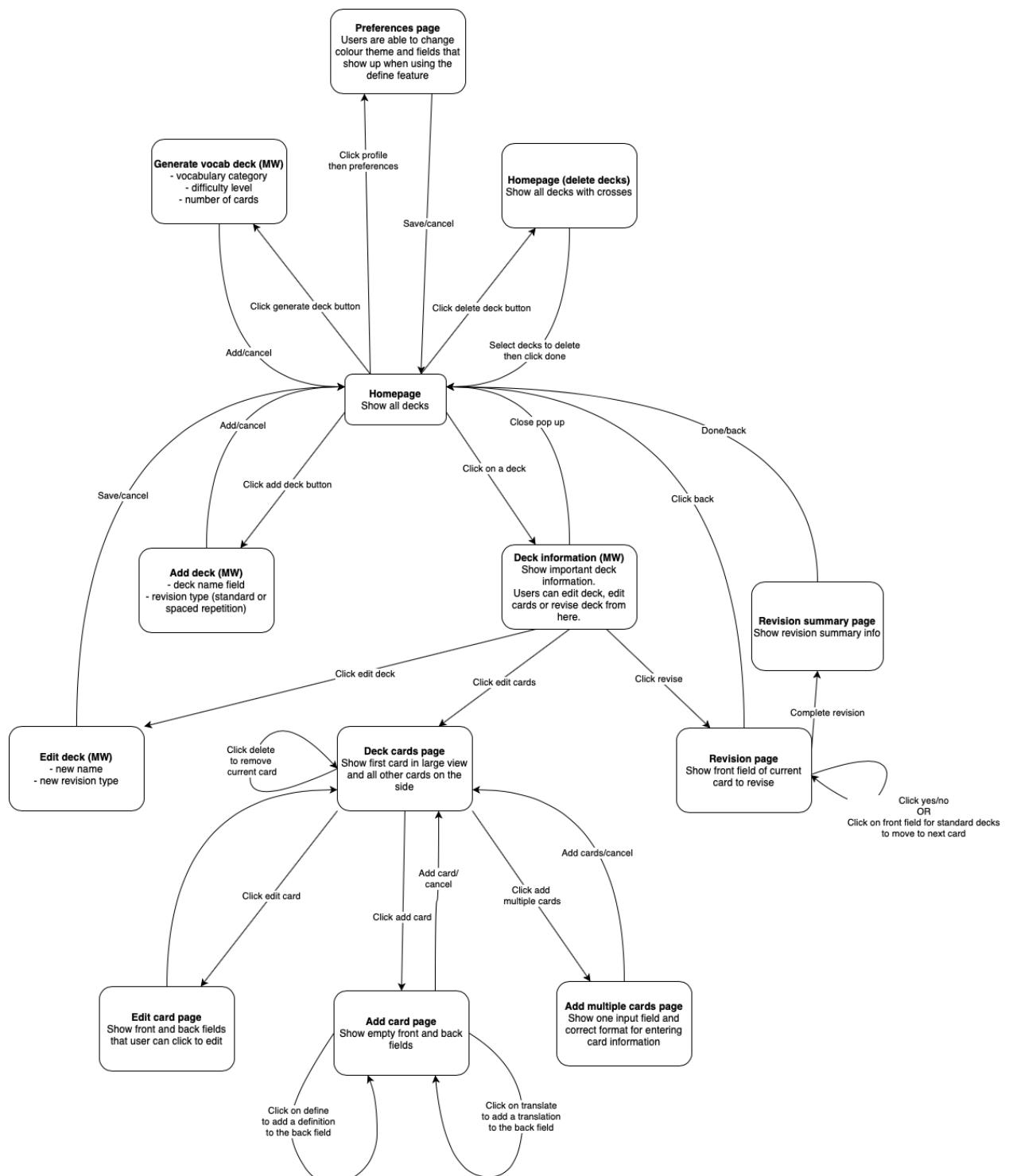
As a user,
So that I can better enjoy my experience while using the site,
I want to choose between at least two colour schemes.

GIVEN I am on the preferences page
WHEN I select one of the provided colour schemes
AND click the "save changes" button
THEN the site's colour scheme should change to reflect my selection.
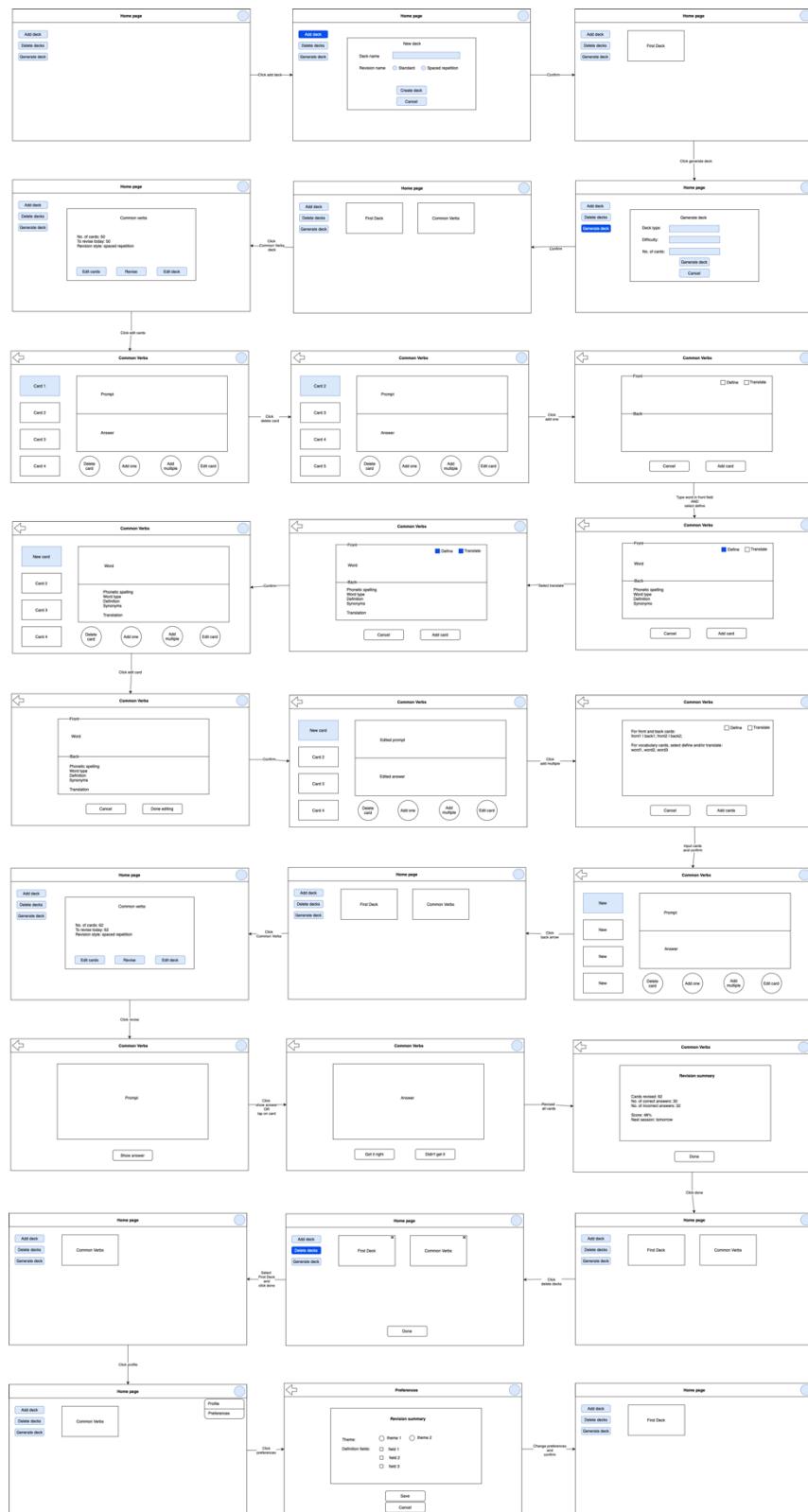
Part 3: Low Fidelity Prototype

The low-fidelity prototypes were made using draw.io.

The following is an overview of the various pages in the site and possible user interactions.

Preferences page
Users are able to change colour theme and fields that show up when using the define feature

Generate vocab deck (MW)
- vocabulary category
- difficulty level
- number of cards

Click profile then preferences

Save/cancel

Homepage (delete decks)
Show all decks with crosses

Click generate deck button

Click delete deck button

Add/cancel

Select decks to delete then click done

Homepage
Show all decks

Add/cancel

Close pop up

Done/back

Click add deck button

Click on a deck

Click back

Save/cancel

Add deck (MW)
- deck name field
- revision type (standard or spaced repetition)

Deck information (MW)
Show important deck information.
Users can edit deck, edit cards or revise deck from here.

Revision summary page
Show revision summary info

Click edit deck

Click edit cards

Click revise

Complete revision

Edit deck (MW)
- new name
- new revision type

Click delete to remove current card

Deck cards page
Show first card in large view and all other cards on the side

Revision page
Show front field of current card to revise

Click yes/no
OR
Click on front field for standard decks to move to next card

Add card/cancel

Add cards/cancel

Click edit card

Click add multiple cards

Click add card

Edit card page
Show front and back fields that user can click to edit

Add card page
Show empty front and back fields

Add multiple cards page
Show one input field and correct format for entering card information

Click on define to add a definition to the back field

Click on translate to add a translation to the back field

The following depicts simple UI components and demonstrates a sample interaction between a user and the site.

Part 3: High Fidelity Prototype

The high-fidelity prototype was made using Figma.
Prototype link:
https://www.figma.com/file/o2uPqb9r3iIOFfXX4PkmFH/VocabCards
Interactive view link:
https://www.figma.com/proto/o2uPqb9r3iIOFfXX4PkmFH/VocabCards?scaling=min-zoom&node-id=22%3A11
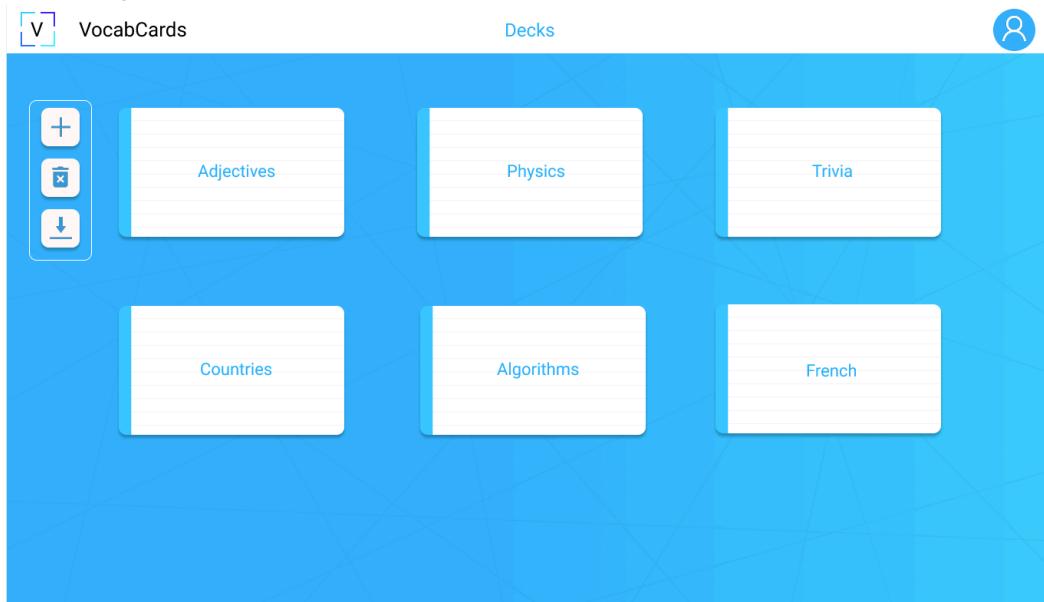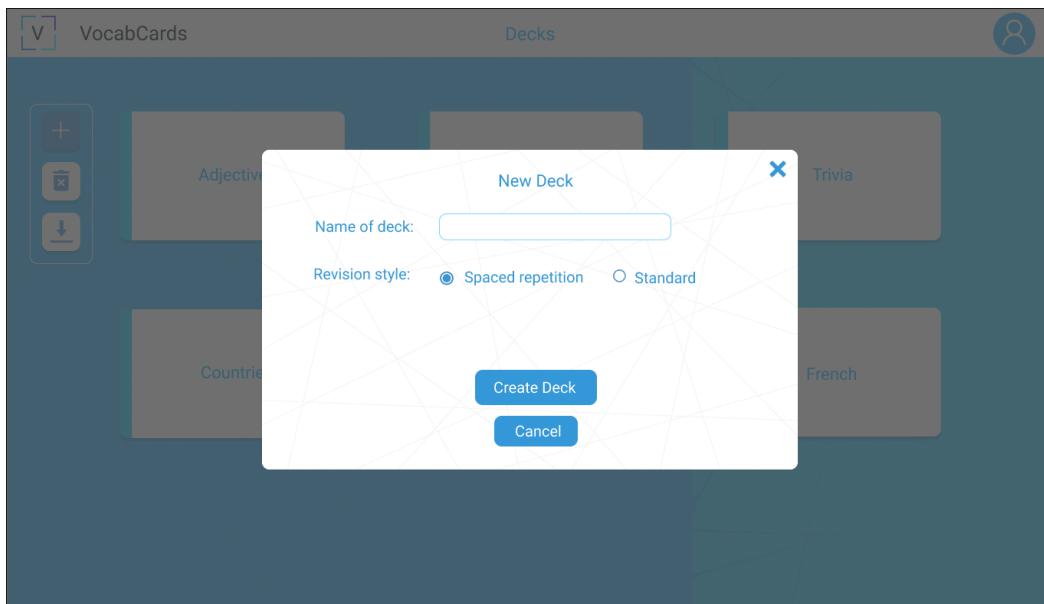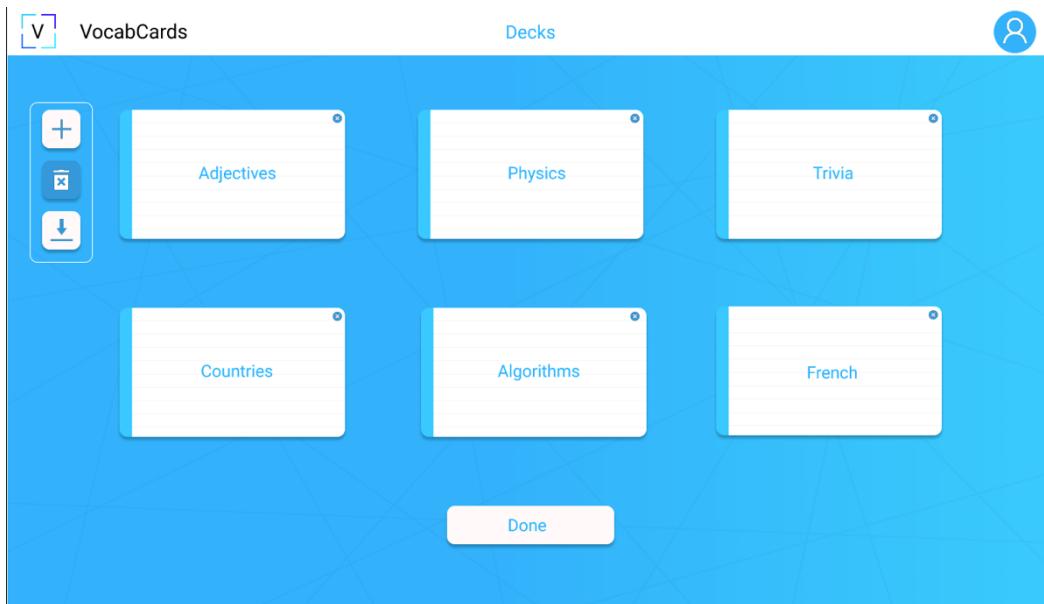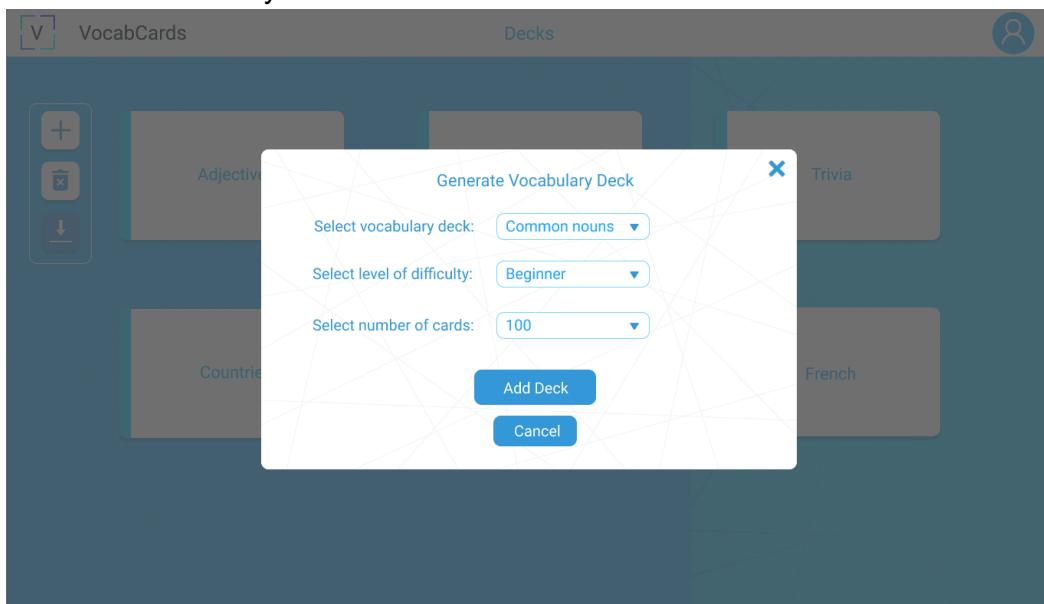
Homepage

Add deck

Delete deck

| V | VocabCards | | Decks | | 👤 |

	Adjectives ⊗	Physics ⊗	Trivia ⊗
➕			
🗑	Countries ⊗	Algorithms ⊗	French ⊗
⬇			

Done

Generate vocabulary deck

| V | VocabCards | | Decks | | 👤 |

Adjective   Trivia

Generate Vocabulary Deck ✕

Select vocabulary deck:	Common nouns ▼
Select level of difficulty:	Beginner ▼
Select number of cards:	100 ▼

Add Deck

Cancel

Countrie   French

Deck information

VocabCards   Decks

Adjectiv…   Trivia

Adjectives ✕

Number of cards: 42

To revise today: **12**

14%
Mastered

Revision style: Spaced repetition

[Edit Cards]   [Revise]   [Edit Deck]

Countrie…   French

Edit cards

Adjectives

Refreshing

Chilly

Alarming

Aggravating

Front

Refreshing

Back

/rɪˈfrɛʃɪŋ/ 🔊

Adjective

Pleasantly new or different.

Similar: new, novel

Add card

| Refreshing |
| Chilly |
| Alarming |
| Aggravating |

Front ☐ Define ☐ Translate (Italian ▾)

Back

Cancel   Add Card

Add multiple cards

| Refreshing |
| Chilly |
| Alarming |
| Aggravating |

Insert ☐ Define ☐ Translate (Italian ▾)

Normal cards format:
front1 | back1; front2 | back2;

Automatically filled vocabulary cards:
word1; word2; word3;

Cancel   Add Cards

Revise deck

Front — 1/12

Methodical

✕ ✓

Revision summary

Summary
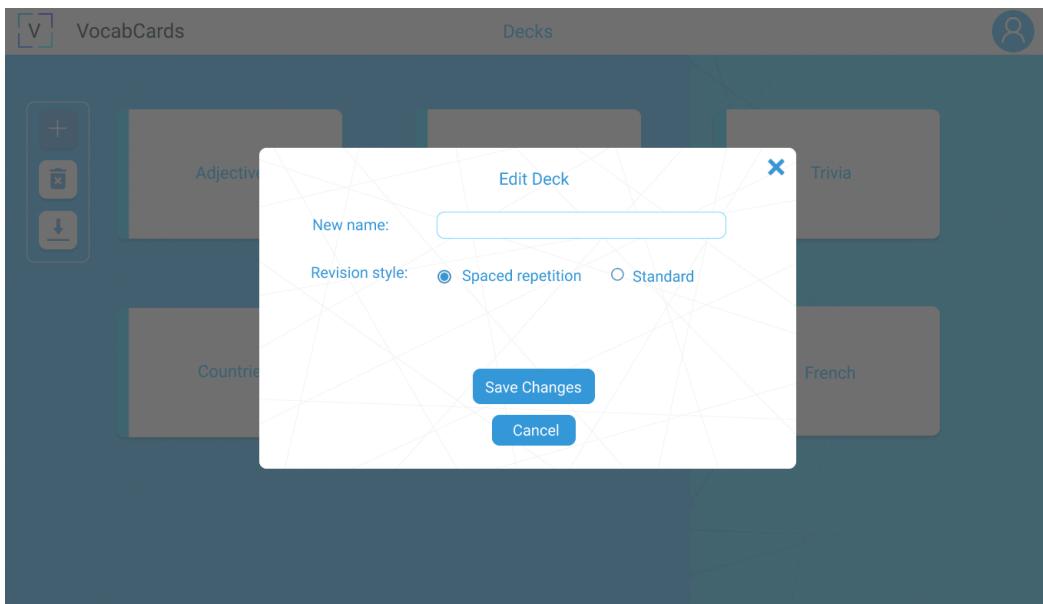
Cards revised:	12
Correct answers:	10
Score:	**83%**
Next revision:	Tomorrow
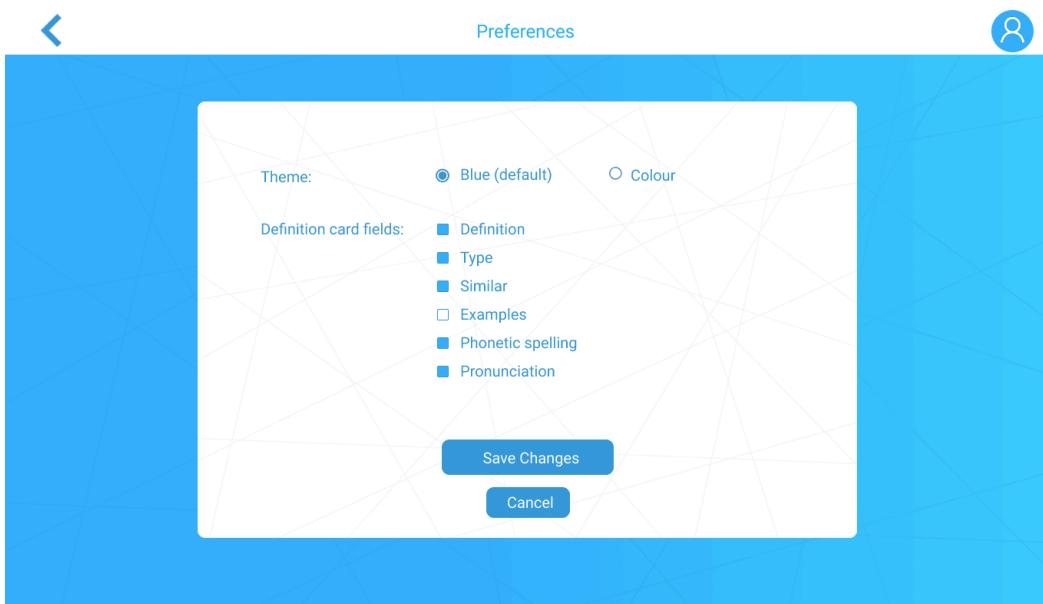
Done

Edit deck

VocabCards Decks

Adjective   Trivia

Edit Deck ✕

New name: [   ]

Revision style: ⦿ Spaced repetition ○ Standard

Save Changes

Cancel

Countrie   French

Preferences

‹ Preferences

Theme: ⦿ Blue (default) ○ Colour

Definition card fields: ■ Definition
■ Type
■ Similar
☐ Examples
■ Phonetic spelling
■ Pronunciation

Save Changes

Cancel

Alternative color theme

VocabCards   Decks

Adjectives   Physics   Trivia

Countries   Algorithms   French