

The Warrior's Tongue

(Teach yourself Klingon)

1.1. Requirements

I used 'MoSCoW' to prioritise requirements. The 'Must' requirements were handled in a 'waterfall' process. 'Should' requirements were then implemented. 'Could' and 'Won't' requirements were not attempted.

1.1.1. Must

	Requirement/achievement	Notes
0	consistent, logical filenames, commented code	To enable other developers to understand my code.
1	Basic wireframe design	
2	Angled corners for boxes	Initially using a trick from http://lea.verou.me/2011/03/beveled-corners-negative-border-radius-with-css3-gradients . This was unsatisfactory because it required two superimposed boxes, one for the border and another for the content. The superimposition was less than perfect. (See screenshot 1.)
3	Enable Klingon fonts, use them where appropriate	
4	Create pages linked to from footer	
5	Registration	
6	Log in and out	
7	Language Lesson 1	
8	Dictionaries	Content obtained from http://fanatiq.ru/myimages/redquest/Eclipse/1/The_Klingon_Dictionary.pdf
9	Test 1	
10	Mark test one	To make sure the mechanism worked, I first used dummy answers ('A', 'B', ... , 'T')
11	Sanitise input so that apostrophes don't have unpleasant effects	
12	Write history/culture lesson 1 and an unmarked history/culture assignment.	.
13	Update profile mechanism	Reuses the code from <i>Inverhaggis</i> .
14	Error-trapping	Each potential link or query error has its own error handler.

1.1.2. Should

	Requirement/achievement	Notes
15	Language lesson 2	
16	Test 2	
17	History and culture lesson 2	

17	'Course finished' page	
18	Admin facility	Not as featured as I'd like.
19	Contact us feature	
20	Logging out does not lose progress	

1.1.3. Could

None of these requirements were attempted.

	Requirement
21	language lessons 3-6
22	test 3-6
23	history/culture lesson 3-6 and their unmarked history/culture assignments

1.1.4. Won't

	Requirement
24	negative marking - set pass-mark to 18 out of 20, then deduct points from the student's total score for each incorrect answer. If the total mark falls below a certain level, return the student to the start.
25	a 'thermometer' in the right sidebar representing the student's progress
26	video footage for passing and failing tests
27	a breadcrumb trail just below the header (probably not needed for such a simple site)
28	audio clips of spoken Klingon in lessons

1.2. Pages and technologies

The site uses a MySQL database called *thewarriorstongue*. This has four tables

- *warriors*
- *answers*
- *wrongright*
- *testtwoquestions*.

If the whole site had been achieved, registered users could work through 6 language lessons. Each language lesson would be followed by a test - only by passing this test could the user move on to the following history and culture lesson or the succeeding lesson. After passing the 6th test, the user would be congratulated on being able to read and write fluent Klingon.

CSS is divided into 3 files: boxes, type, table styles. Code that is used in more than one page is in separate files, and included using `<?php include("page_fragments/file_name.html"); ?>`

The site design uses a trick from <http://dawsonmediadesign.com/blog/development/three-methods-for-creating-beveled-corners-css-css3-or-jquery> to give bevelled

corners and `@fontface` to enable using non-standard fonts.

All pages have headers and footers. For anonymous users, the header contains links to the Klingon Language Institute website (<http://www.kli.org>), registration and login. For logged-in users, PHP nuggets change these links to

- 'Quest' (which links to <http://en.memory-alpha.org>. In a live site, I'd implement a site search using <http://www.freefind.com> or similar)
- Update profile
- Log out.

1.2.1. Landing page

This contains an introduction to the site.

1.2.2. Registration and logging in

New registrants are entered into a *warriors* table. (The registration script writes their role [in *warriors*] as *admin*.) The script logs in new registrants, so they do not face a separate login step.

1.2.3. Language lesson 1 and Test 1

This has a link to Test 1. Test 1 is basically an HTML form. However, input is not verified, so there is no `onClick()` function. Submit POSTS answers to a PHP script.

1.2.4. Marking Test 1

A live site would need strong input sanitisation. However, I could not get `mysql_real_escape_string()` or `mysqli_real_escape_string()` to work. Eventually, I settled for stripping all apostrophes from input, using `str_replace`.

The PHP script constructs an array of the students' answers, then a second array containing the *answers* table's column headings. It then compares each answer with the correct answer. For each match, `$score` is incremented by 1, then 1 is written to a cell in *wrongright*. Finally, `$score` is written to the student's record.

If the student has answered all questions correctly, `$score` is 20 and the script leads to a page which allows progress to History and culture lesson 1. Otherwise, the script leads to a page which displays incorrectly answered questions (using a PHP script to examine *wrongright*), the score (using another PHP script to pull it from *warriors*), and an epithet (selected by a third PHP script) based on the score. These scripts could be amalgamated but it is better to 'make each program do one thing well' (Raymond, 2003).

Because there is just one *wrongright* table, two simultaneous users could affect each other's scores. For a live site, I'd amend *warriors* to have suitable fields for each user.

Also, the content

1.2.5. History and culture lesson 1

This has a `mailto` to allow users to submit assignments. It also has a link to Language lesson 2.

1.2.6. Language lesson 2

This reviews Language lesson 1, then teaches more Klingon grammar and vocabulary. It then links to Test 2

1.2.7. Test 2

The questions and input fields are appended to the page using AJAX/JSON, pulling questions from *testtwoquestions*. This has no advantage over the HTML form used for test 1. However, if the database contained a bank of questions, the javascript function could be adapted to pull a random set. (This would involve generating random numbers, putting them into an array, then pulling `question[array element]` from the DB.)

Currently there are two `for` loops because I had used `q01, q02, ...` in the mark-answers script. Removing leading zeroes broke my code.

Marking test 2 uses the same techniques as marking test 1. The full site would have had 6 very similar sets of scripts. Ideally, there would be just one set, using a parameter for the test being marked, so that more lessons could be added without adding more scripts.

1.2.8. History and culture lesson 2

The link to 'Test 3' leads to a 'You have finished' page because I have not written the subsequent pages.

1.2.9. Update profile

The page includes a script to pull details from *warriors* and hence pre-populate fields in a form. The form then `POSTS` data to a PHP script that updates *warriors*.

1.2.10. Admin facility

Admin pages have a different colour-scheme to the main site. Admins can register at

siteURL/adminRegister.php. (This is not available in the site user interface. However, there is nothing else to prevent unauthorised people registering as administrators: security by obscurity is a fairly poor approach (Bradley, 2013).)

Registration takes the registrant to */AdminRegisteredAndLoggedin.php*. This uses the same process as registration, but the script writes the `role` (in *warriors*) as *admin*. (This prevents non-admins from logging in.) Registration automatically logs in the registrant and leads to */adminRegisteredAndLoggedin.php*.

Admins can log in at */adminLogin.php*, whereupon they are taken to */adminLoggedin.php*. Both *adminRegisteredAndLoggedin.php* and *adminLoggedin.php* contain *adminthings.php*. This has code enabling admins to update users' email addresses, using the user's screen-name as the test factor. (Users can amend all other aspects of their profiles.) If an update is successful, the admin is notified in a refreshed copy of *adminLoggedin.php*.

There is also code for admins to delete accounts (users can't delete accounts), so long as the entered screenname and email match and the deletee is not an admin. (There is currently no code to delete admin accounts – I'd want a 'superuser' account-type for such operations.)

It also has form-to-mail code enabling admins to email anyone. (This will not actually send emails until I edit *php.ini*.) Sending an email redisplay *adminLoggedin.php* but the page detects whether an email has been 'sent' during this session and displays send confirmation.

1.2.11. Contact us

This feature is similar to the admin facility's email-users facility: if a message has been sent, the FAQ page 'confirms' the sender (either the current logged-in user or the email address entered by an anonymous user), the subject and the message content.

1.2.12. Retaining progress

Because progress through the site is designed to be linear, logging out and back in would take users back to the start. To get around this, the left sidebar contains PHP nuggets that call PHP scripts which examine the current user's test scores. If the user has passed a test, the HTML for the subsequent Language lesson (and previous material he or she should be able to access) is displayed in a larger font and has links to the relevant pages.

1.2.13. Error-handling

Each attempt to link to, read from or write to the database has code such as

```
if (!$link) {  
    header("location:../appropriately-named-error_page.php");  
    die();  
}
```

So there are many error pages. It may have been better for errors to POST error codes to a single error page which varied its content according to the error code.

1.3. Testing, platforms and browsers

The site was developed in MAMP on Macs running MacOS 10.8.3, and Safari. It was also tested in Firefox and Chrome. No significant functional differences were observed, but Firefox rendered input fields and colours differently. (Firefox has built-in checks for valid email addresses.)

The site was also tested on a Windows 7 virtual machine (running under VirtualBox on a Mac) with WAMPServer, Safari, Firefox and Chrome. No functional differences were noticed but the Klingon fonts were not used. I could not fix this, even by obtaining 'Windows versions' of the fonts. (Because the Windows fonts have different filenames, the relevant CSS was updated. This update's fonts did not work on the Mac.) My lesson here is to ensure @fontface works with my chosen fonts before development starts, or to **always** use web-safe fonts.

1.4. Success?

The site, if it had all six lessons, would enable a student to learn to read and write Klingon (in English lettering) as much as the original postal course. It also teaches some Klingon history and culture. Thus the primary requirements would have been achieved. Some aspects are better than the original brief, while some are worse. Better security would be necessary before the site could go live.

1.4.1. Look and feel

The implemented site looks and feels mostly as briefed but is arguably better than the brief. (See appendices for visual comparison.)

- Box corners aren't as angular as briefed.
- Colouring the lessons side-bar and changing the font according to progress was not attempted. Instead, a simple change in font-size was used.
- Colours are programmed as briefed but do not render as brightly as the brief.
- The brief used black type in a less legible font - the implementation font is clearer, and all type is white, increasing consistency.

1.4.2. Other factors

- As desired, returning users can restart at suitable points.
- History and culture exercises are included in History and culture lessons, rather than being a separate feature with model answers (accessible from any logged-in state).
- Site security is poor - there is almost no protection from SQL injection, while the plethora of `mailto:`s makes the site very vulnerable to spam.
- Klingon fonts do not work cross-platform.
- The 'Could' and 'Won't' requirements were not attempted.
- There are other places, as noted above, where I'd refactor the site to reduce complexity and increase extensibility and functionality.

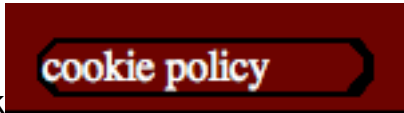
1.5. References

Raymond, E. S. (2003, September 19). *The Art of Unix Programming*. Retrieved April 21, 2013 from <http://www.fags.org/docs/artu/ch01s06.html>.

Bradley, T. (2013). *Security Through Obscurity: What You Don't Know CAN Hurt You*. Retrieved April 21, 2013 from <http://netsecurity.about.com/cs/generalsecurity/a/aa060103.htm>.

1.6. Appendices

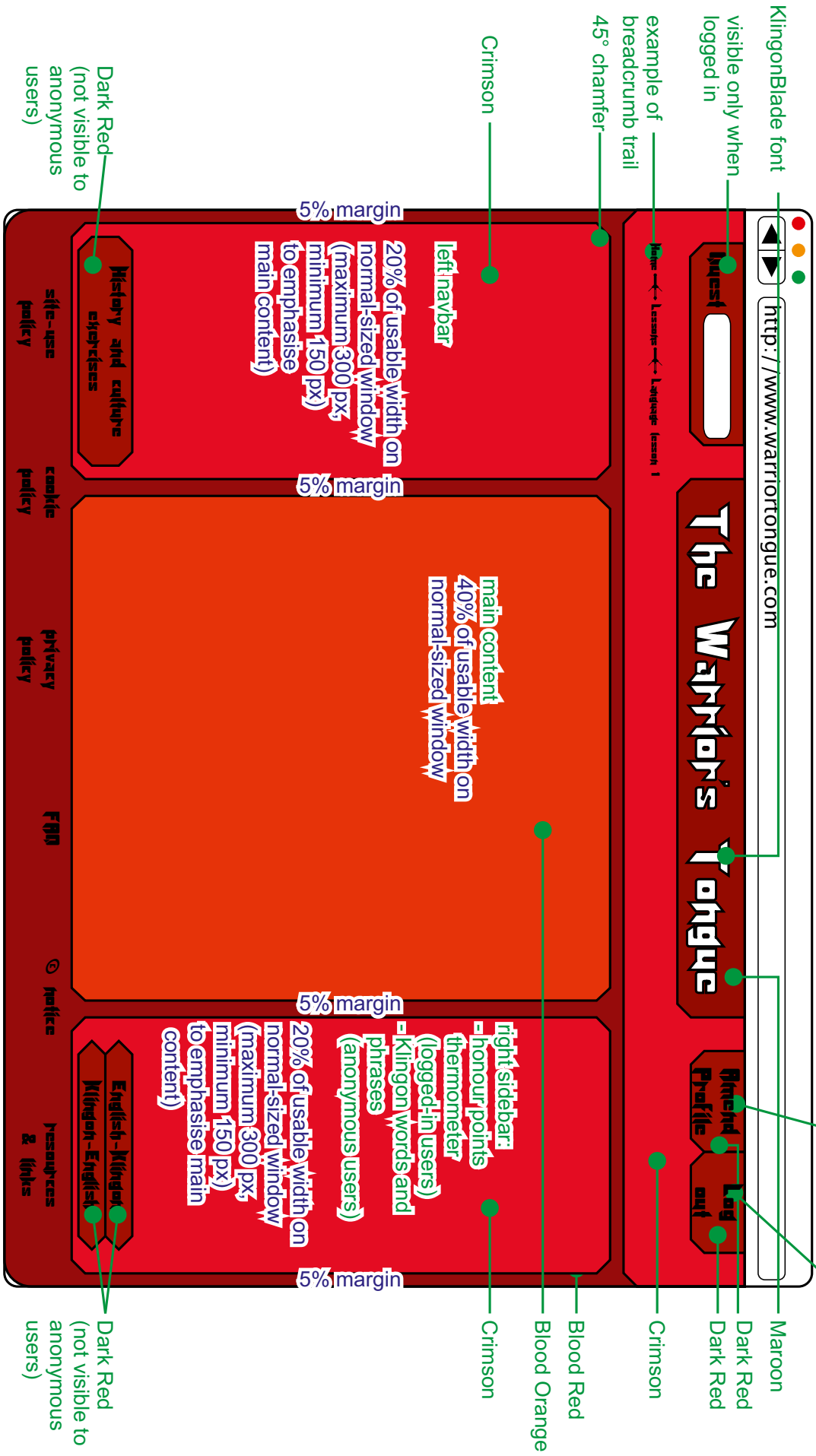
1.6.1. Screenshots



1. original angled-corner trick
2. Rendering differences (on Mac)

Browser	screenshot	how red is rendered
Safari		0%C, 95%M, 77%Y, 0%K
Firefox		0%C, 95%M, 76%Y, 0%K
Chrome		0%C, 95%M, 77%Y, 0%K

1.6.2. Comparison of implementation with diagrams from brief



For anonymous users, these become 'Register' and 'Log in'

KlingonBlade font

visible only when logged in

example of breadcrumb trail

45° chamfer

Crimson

left navbar

20% of usable width on normal-sized window (maximum 300 px, minimum 150 px) to emphasise main content)

5% margin

5% margin

main content
40% of usable width on normal-sized window

5% margin

20% of usable width on normal-sized window (maximum 300 px, minimum 150 px) to emphasise main content)

5% margin

Maroon

Dark Red

Dark Red

Crimson

Blood Red

Blood Orange

Crimson

Dark Red (not visible to anonymous users)

Dark Red (not visible to anonymous users)

site-use policy

cookie policy

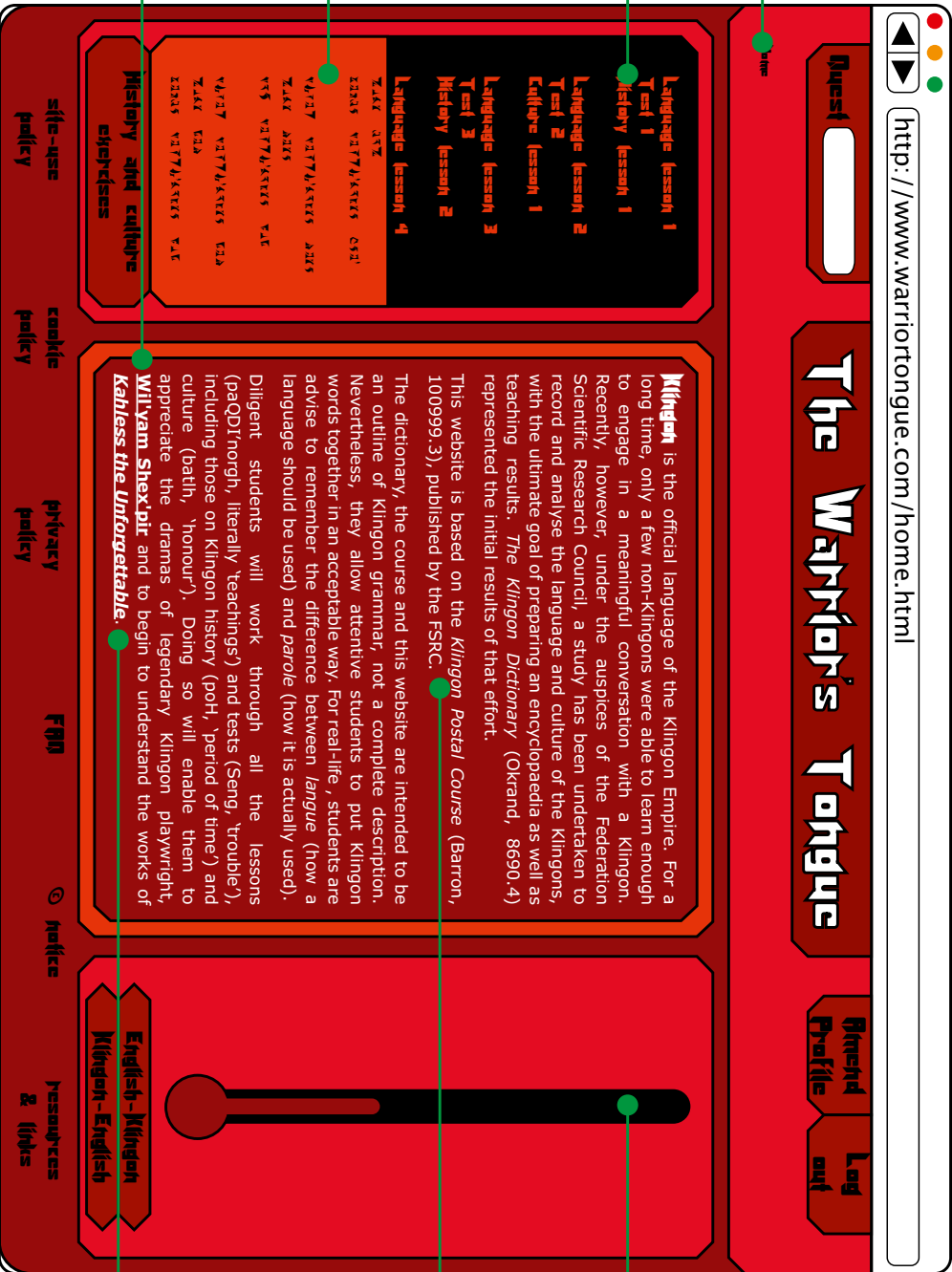
privacy policy

FAQ

contact

press/releases

2014



breadcrumb trail shows this is home page

accessible features in Klingon Blade font (Blood Red on black)

inaccessible features in Klingon language, in BeryKlingon font (black on Blood Red)

bold underlined for link to culture lesson

http://www.warriortongue.com/home.html

The Warriors Tongue

Home Quest

Klingon is the official language of the Klingon Empire. For a long time, only a few non-Klingons were able to learn enough to engage in a meaningful conversation with a Klingon. Recently, however, under the auspices of the Federation Scientific Research Council, a study has been undertaken to record and analyse the language and culture of the Klingons, with the ultimate goal of preparing an encyclopaedia as well as teaching results. *The Klingon Dictionary* (Okrand, 8690.4) represented the initial results of that effort.

This website is based on the *Klingon Postal Course* (Barron, 1000999.3), published by the FSRC.

The dictionary, the course and this website are intended to be an outline of Klingon grammar, not a complete description. Nevertheless, they allow attentive students to put Klingon words together in an acceptable way. For real-life, students are advise to remember the difference between *language* (how a language should be used) and *parole* (how it is actually used). Diligent students will work through all the lessons (paQDI'nohng, literally 'teachings) and tests (Seng, 'trouble'), including those on Klingon history (poH, 'period of time') and culture (bath, 'honour'). Doing so will enable them to appreciate the dramas of legendary Klingon playwright, **William Shakespeare** and to begin to understand the works of **Klless the Unforgettable**.

English-Klingon
Klingon-English

thermometer shows student's progress

For ease of reading, Verdana font white on Blood Red Left justified, because left- or right-aligned continuous prose looks AWFUL.

bold italic underlined for link to history lesson

The Warrior's Tongue

The Warrior's Tongue

The Warrior's Tongue

Over

Update Profile Log out

Language Lesson 1
 Test 1
 History and Culture Lesson 1

Language Lesson 2
 Test 2
 History and Culture Lesson 2

Language Lesson 3
 Test 3
 History and Culture Lesson 3

Language Lesson 4
 Test 4
 History and Culture Lesson 4

Language Lesson 5
 Test 5
 History and Culture Lesson 5

Language Lesson 6
 Test 6
 History and Culture Lesson 6

History and Culture exercises

You have successfully logged in, [Insert Name Here]
 Now start or continue your path to knowledge.
 Your path starts at Language Lesson 1. You may only proceed to Test 1 via that lesson, and you may only proceed further by passing Test 1.
 If you have already passed a test, the next language lesson you may take is indicated by a large font in the left sidebar, as are lessons you may revisit.

English to Mangon
 Mangon to English

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