EES2 History and Computing Workshop Lesson Plan

<table>
<tr><td colspan="3">Expected Learning Outcomes/ Intentions: What will be the learning objective or intention for this lesson?</td></tr>
<tr><td colspan="3">1. record observations as structured data in a digital catalogue
2. edit catalogue mark-up templates to reflect objects studied
3. encode personal stories about museum objects as text with presentational mark-up
4. use Quire to include catalogue data and marked-up text within a digital book
5. explain how marked-up text and catalogue data enable Quire to automate book creation</td></tr>
<tr><td colspan="2">Lesson Details</td><td>120 minute lesson with Y10 History and Computing students</td></tr>
<tr><td colspan="2">Additional Materials</td><td>● Computer running Quire software
○ For October 24th trial this is the pre-configured macbook provided by U. Oxford
● Configured folders for Quire book (using EES2 provided template), figures group entries, objects group entries, photos from handling sessions, and final thoughts, with read-write or read access as appropriate granted to students
○ Grant folder access to students per Setup Instructions
○ For October 24th trial these have been pre-configured by U. Oxford in the bespoke oxforduniversity@cheneyschool.org account
● Student completed worksheets from the Ashmolean Visit and Rumble Workshop
● Students should have access to their Google Docs stories produced in the Rumble Workshop
● Printed copies of Markdown cheatsheet and worksheet of instructions for this workshop
● Provided slides for this workshop
● An online YAML validator (e.g. https://codebeautify.org/yaml-validator) may be helpful if the Quire debug provides insufficient detail</td></tr>
<tr><td>Time</td><td>Student Activities</td><td>Teacher Activities</td></tr>
<tr><td>0-10</td><td>Do Now Activity: Students login to their devices, open the Google Drive application and then use VSCodium Explorer to locate the workshop folders.</td><td>Start of lesson:
1. Login on the teacher’s computer
○ For the October 24th trial this must be the guest account linked to the Quire software - oxforduniversity@cheneyschool.org</td></tr>
</table>

	Students should begin reading their worksheet while they wait for the lesson to begin	2. Display the History and Computing Workshop slides 3. Direct students to sit in the same pairs they worked in during the visit to the Ashmolean Museum and the Rumble Museum Workshop. 4. Hand out worksheets and direct students to the DNA
10-20	Listen and answer questions	**Explain the purpose of the workshop:** Outline the lesson objectives and what the students will achieve. Emphasise the links to the Ashmolean visit and the Rumble session, and that the end product will be a digital book. Emphasise that modern computing is not always a discrete subject and there is much interdisciplinary work. This is an example of such work.
	Listen to explanation Suggest key-value pairs, or examples of values for a given key. Suggest reasons for YAML format compared to Linked Art format for structured data	**Introduction to Linked Art, YAML and Quire using key-values and structured data:** Using slides 4-8 explain the concept and purpose of structured data to move information between computers and key-value encapsulation. Introduce the Linked Art and YAML formats, draw out ideas around why YAML may be used and the adv/disad compared to Linked Art. Make links to previous lessons on python. Question students throughout the explanation

	Answer questions on sensible values for key-value pairs	**Demonstration 1a:**
		On the computer with Quire installed, mirroring to the board.
		Demonstrate editing a YAML file (publication.yaml), updating key-value pairs to reflect the group details needed in the book. Select students to give values.
		
		Open the file `cheney_book/content/_data/publication.yaml` in VSCodium.
		
		Key-values to edit on screen have been noted with a comment `# Cheney History & Computing`
		
		Keys and example value answers within publication.yaml are:
		`title: "Cheney School Museum Catalogue"`
		`subtitle: "Objects from the Ashmolean and Rumble Museums"`
		
		`publisher:`
		`  - name: "Cheney School"`
		`  - location: Oxford`
		
		`contributor:`
		`  - full_name: "Computing & History Class"`

		Question students throughout.

	Students should watch the demonstration and the preview build of the Quire book.	**Demonstration 1b: Preview the Quire book (slide 22)**
		Continuing on the computer with Quire installed, mirroring to the board:
		● Open a terminal (cmd-space then 'terminal')
		● Change directory (cd) to
		`Google Drive/My Drive/history_and_computing_workshop/cheney_book`
		○ Filename completion using the tab button works in the terminal
		● Run **quire preview** from a terminal window and debug
		○ You must be in the cheney_book directory for the quire command to work
		○ The preview webservice is running once the following lines have been output:
		`[11ty] Watching…`
		`[11ty] Server at http://localhost:8080/`
		○ N.B. this is then obscured by subsequent debug
		○ N.B. an earlier line is a red herring:
		`[quire] INFO  Figures  Processing complete`
		This line <u>does not</u> indicate the preview is running (yet)
		● Display the preview in a web browser at URL http://localhost:8080
		○ It may take a few seconds to load
		● Briefly click through the first few screens of preview so that students can see the metadata which was modified in Demonstration 1a.
		● Once **quire preview** demonstration is finished, **it needs to be stopped using Ctrl+c**

20-25		**Return to slides:** Explain that Quire has been used before the workshop to convert Linked Art into YAML. Slide 11 has a brief video of this and slide 12 shows the final screen shot. **Narration to video**: the left-hand side shows Linked Art JSON-LD on a website at Yale University. The identifier for Yale's Linked Art JSON-LD is copied and given as the argument to the Quire software, which you can see on the right-hand side. The Quire software is told to add any objects found in the Linked Art JSON-LD to the objects.yaml file used by Quire, and at the same time download any pictures available from the Yale web service.
	Think and give answers on the purpose of identifiers in structured data and what makes a good or bad identifier	**Identifiers in structured data:** Slide 13: explain the purpose of 'identifiers' and question the class on the advantages of 'identifiers'. Check students can use the terms structured data and identifier confidently and give examples of each.
25-35	Students begin at Section II: locating the structured data for their Ashmolean	**Students begin Section II of worksheet on structured data**

	object, adding additional observation data and checking for syntax errors.	Outline the task the students will now complete, reminding them that the final aim is to produce a book which incorporates the structured data, stories and photos from both museum objects - Rumble and Ashmolean. Support the class with following the computing worksheets, which guide students through the tasks. Questions to ask as you circulate (those in italics are those posed on the worksheet that students should have thought about): ● Can they explain the differences between YAML and Linked Art, or between Markdown and html. Why use one over another? ● What key-value pairs are you adding? *What are the other keys and values? What is the benefit of every pair/museum using the same keys? What difficulties might arise when computers exchange information which has different key names?* ● Will their chosen identifier work for all the objects in the Ashmolean? What about at other institutions if the objects are on loan? ● What is the benefit of working as a pair to check syntax? Have you identified any repeated errors? What are these errors?
35-40	**During demonstration:** Observe how objects.yaml is updated Relate this action to what will happen with their yaml file. Compare their yaml file to a completed example on the screen.	**Show class objects.yaml being updated** Once one or two groups have completed task **5.g** the objects.yaml file should be updated. Ask for a volunteer group and have all students pause and look at the board. On the board, show the objects.yaml file being updated: 1. Using VS Codium locate and open the main objects.yaml in cheney_book/content/_data/ 2. Open and locate the 'objects_yaml_by_group' folder and open the file of the volunteer group ○ e.g. group_12_object_ashmolean.yaml 3. Select (ready to copy) the volunteer group's updated yaml code from their individual file 4. Locate and match the corresponding original object entry in the main objects.yaml. Be careful as some IDs are similar 5. Paste the volunteer group's revised object entry into the main objects.yaml, overwriting the original object entry. Set students back to work on Section II for a few minutes, slower groups can return to Section II after the next explanation.

		Return to slides from slide 15: Presentational markup in Markdown Talk through slides, introducing Markdown syntax and relating it to HTML.
40-45	Using the cheatsheet students should suggest the code to use in the teacher's demonstration.	**Demonstration 2a:** Demonstrate editing a Markdown file (content/index.md), updating an image key-value and text for the cover of the book. Select students to give suggestions. Select a photo to use for the cover from the `student_photos` folder. ● IMG_5688.jpg is suggested for the Cheney Trial on 24th October Make a copy of this image file in `cheney_book/content/_assets/images/figures/` Open `cheney_book/content/index.md` in VSCodium. Change the value of the `image:` key to be the photo filename within the figures folder, e.g. `image: figures/IMG_5688.jpg` Replace the placeholder with a short description for the book suggested by the class. Markdown formatting could be added e.g. bold Question students throughout.
	Students should watch the demonstration and the preview build of the Quire book.	**Demonstration 2b: Preview the Quire book (slide 22)** ● Run **quire preview** from the terminal window and debug ● Display the preview in a web browser at URL http://localhost:8080 ○ It may take a few seconds to load ● Briefly click through to the cover page of the preview where the photo and description will be visible, so that students can see the results of the modifications in Demonstration 2a. ● Once **quire preview** demonstration is finished, **it needs to be stopped using Ctrl+c**
45-55	Listening and asking questions as needed	**Return to slides from slide 18 - 21: combining structured data and presentational mark-up in a Quire book** Talk through slides, explaining how Quire brings the elements we have already learnt about together.
	For those groups who have not yet completed they should continue in	**Students should let you know as each group completes their YAML object entry (the end of Section II).**

	Section II. They are asked to inform their teacher when Step 6 is complete (the end of Section II). All students should then move onto Section III	**Teacher 1** updates the main objects.yaml with each group's object entry as it comes, following the instructions in the previous step of the lesson plan. **Students progress to Section III of the worksheet on presentational mark-up** **Teacher 2** continues to circulate and ask the questions to check students are demonstrating the use and understanding of a variety of Markdown syntax.
55-60	Students should watch demonstration 3 and the build of the Quire book.	**Demonstration 3: Building the Quire book (slide 22)** To build the book there needs to be a syntactically correct objects.yaml and syntactically correct group markdown files for the Ashmolean objects. Ideally these will contain contributions from all groups but if you are short of time, or some groups have been unable to complete the task, then the content can be curtailed as long as the syntax is correct. On the computer with Quire installed, mirroring to the board: ● Run **quire preview** from a terminal window and debug ● Display the preview in a web browser at URL http://localhost:8080 ○ It may take a few seconds to load ● Briefly click through the complete preview so that students can see an overview of how their data has been processed. ○ Students will check the content in detail later, by studying the PDF output. ● Once **quire preview** is finished with, **it needs to be stopped using Ctrl+c** ● Run **quire build** and debug ● Finally run **quire pdf** *Due to the timing of the October 24th trial lessons, the build and debugging will happen over lunchtime.*
0-10	**Students return from lunch** Once the PDF is built students should follow step 9 and check their content - this is a shared PDF and all groups' contributions will be visible. Students will let teachers know if they see any mistakes in their PDF	**Return from lunch - Slide 23** Tell students to load the PDF that has been built on their computers and check their group's contributions (worksheet step 9). Explain that this contains both structured data and presentational mark-up. Students have the following prompting questions on the worksheet: *Does it include your observations as a table? Can you see how these have been derived from the key-value pairs you entered? Is there a picture of the object automatically included from the Ashmolean object record? Is your story present and correct? Is your story formatted and styled as you expect?* Students should let you know if there are problems with their Quire book pages.

10-20	Students complete Section IV: Use YAML to update a figures.yaml file, producing captions and labels for figures related to their Ashmolean object. Once they have completed Step 12 students will inform their teacher that the figures.yaml code is ready for copying	**Students begin Section V of worksheet on adding photos to the book** Support the class with following the computing worksheets, which guide students through the task of creating a new YAML file and adding key-value pairs for their photo. Questions to ask as you circulate (those in italics are those posed on the worksheet that students should have thought about): *What are all the other photos which are already in this folder? Where do you think they came from? (they came from Linked Art)*
20-25	**During demonstration:** Observe how figures.yaml is updated Relate this action to what will happen with their yaml file. Compare their yaml file to a completed example on the screen.	**Show class figures.yaml being updated** Once one or two groups have completed task **12** the figures.yaml file should be updated. Ask for a volunteer group and have all students pause and look at the board. **Teacher 1** updates the main figures.yaml with each group's object entry as it comes: 1. Using VSCodium locate and open the main figures.yaml in cheney_book/content/_data 2. Open and locate the 'figures_yaml_by_group' folder and open the file of the volunteer group who have finished ○ e.g. group_12_figure_ashmolean.yaml 3. Select (ready to copy) the volunteer group's updated yaml code from their individual file 4. Paste the volunteer group's new figures entry into the main figures.yaml file **Teacher 2** continues to circulate and ask the questions to check students are writing their figures.yaml file correctly and checking syntax
25-30	Students continue to complete Step 12, and tell their teacher when they have completed their figures.yaml file. Then move onto Step 13, adding shortcode references to their Markdown file. This is the end of Section V.	**Students should let you know as each group completes their YAML figures entry (the end of Step 12).** **Teacher 1** updates the main figures.yaml with each group's object entry as it comes, following the instructions in the previous step of the lesson plan. **Students progress to Step 13 of the worksheet and add shortcode references to their Markdown file** **Teacher 2** continues to circulate and ask the questions to check students are demonstrating the use and understanding of Markdown
	Students are working in pairs.	Once all students have completed Step 13 (the end of Section V) you should **Rebuild Quire**

	At this point it would be sensible for one of the pair to check the PDF output and one student to move onto Section VI and begin work on the yaml files for the Rumble object.	**Teacher 1** should use the previous guidance to produce a preview of Quire, build and output a PDF. This will now incorporate their figures and captions. It will then need to be checked by students. **Teacher 2** continues to circulate and support the class in moving onto Section VI - creating a page for the Rumble object and/or checking their PDF
TAKING STOCK At this point the class has completed adding all the information for one whole object, from the Ashmolean Museum. Students now repeat the exercises above but for the Rumble Object - details below		
30-40	Students continue to complete Section VI, and tell their teacher when they have completed their objects.yaml file. Then move onto Step 15, adding mark-up to their Rumble story to a Markdown file	**Students should let you know as each group completes their YAML objects entry for the Rumble object (the end of Step 14).** **Teacher 1** updates the main objects.yaml with each group's object entry as it comes, following the instructions previously written in the lesson plan. **Students progress to Step 15 of the worksheet and add mark-up to their Rumble story using Markdown** **Teacher 2** continues to circulate and ask the questions to check students are demonstrating the use and understanding of Markdown.
	Students are working in pairs. At this point it would be sensible for one of the pair to check the PDF output and one student to move onto Section VI step 15, 16 and 17, referencing the Rumble object in the Markdown and adding their own photos to the figures.yaml file	Once all students have completed Step 14 (the middle of Section VI) you should **Rebuild Quire** **Teacher 1** should use the previous guidance to produce a preview of Quire, build and output a PDF. This will now incorporate their object data, figures and captions for the Ashmolean object and their object data for the Rumble object. It will then need to be checked by students. **Teacher 2** continues to circulate and support the class in working through Section VI step 15, 16 and 17, referencing the Rumble object in the Markdown and adding their own photos to the figures.yaml file
40-50	Students continue with Section VI steps 15-17	**Students continue Section VI steps 15-17 of worksheet on completing their Rumble book entry** Support the class with following the computing worksheets, which guide students through the task of adding their Rumble story mark-up using Markdown, then referencing the object ID in the Markdown file

	Students continue to complete Section VI, and tell their teacher when they have completed their figures.yaml file. They move onto Section VII and link their Ashmolean and Rumble objects.	**Students should let the teacher know as each group completes their Markdown file for the Rumble object (the end of Step 17).** **Teacher 1** updates the main figures.yaml with each group's figures entry as it comes: 1. Using VS Codium locate and open the main figures.yaml in cheney_book/content/_data 2. Open and locate the 'figures_yaml_by_group' folder and open the file of the groups who have finished 3. Select (ready to copy) the group's updated yaml code from their individual file 4. Paste the volunteer group's new figures entry into the main figures.yaml file **Students progress to Section VII of the worksheet and link their Ashmolean and Rumble objects** **Teacher 2** continues to circulate and supports the correct use of Markdown to produce links between objects
50-60	Students are working in pairs. At this point it would be sensible for one of the pair to check the PDF output and one student to move onto Section VII linking their Ashmolean and Rumble objects.	Once all students have completed Step 17 (and reached the end of Section VI) you should **Rebuild Quire** **Teacher 1** should use the previous guidance to produce a preview of Quire, build and output a PDF. This will now incorporate their object data, figures and captions for the Ashmolean object and their object data, figures and captions for the Rumble object. It will then need to be checked by students. **Teacher 2** continues to circulate and support the class in linking their object Markdown files together in Section VII.
	Extension - Section VIII Students can add extra objects to their book by completing the objects.yaml/Markdown files/figures.yaml cycle for the additional artefacts they handled or observed at either museum. When an additional object or figure file is completed they must tell their teacher so it can be incorporated.	**Extension - Section VIII** Students can add extra objects to their book by completing the objects.yaml/Markdown files/figures.yaml cycle for the additional artefacts they handled or observed at either museum. To be included in the final book produced by Quire the updates to objects and figures will need to be incorporated by a teacher, copying them from the group file into the objects.yaml and figures.yaml files.

	Students create a new Google Doc in the ‘student_summaries’ folder, and write a short paragraph describing what they have done today, and what they have learnt.	**Plenary** Students should produce a new Google Doc (folder stated on worksheet) and summarise what they have learnt from this experience and what they have achieved/completed.