Course Builder Tool Tutorial

TA at

Online Education Development Office (OEDO)

Center for Innovative Teaching and Learning (CITL)

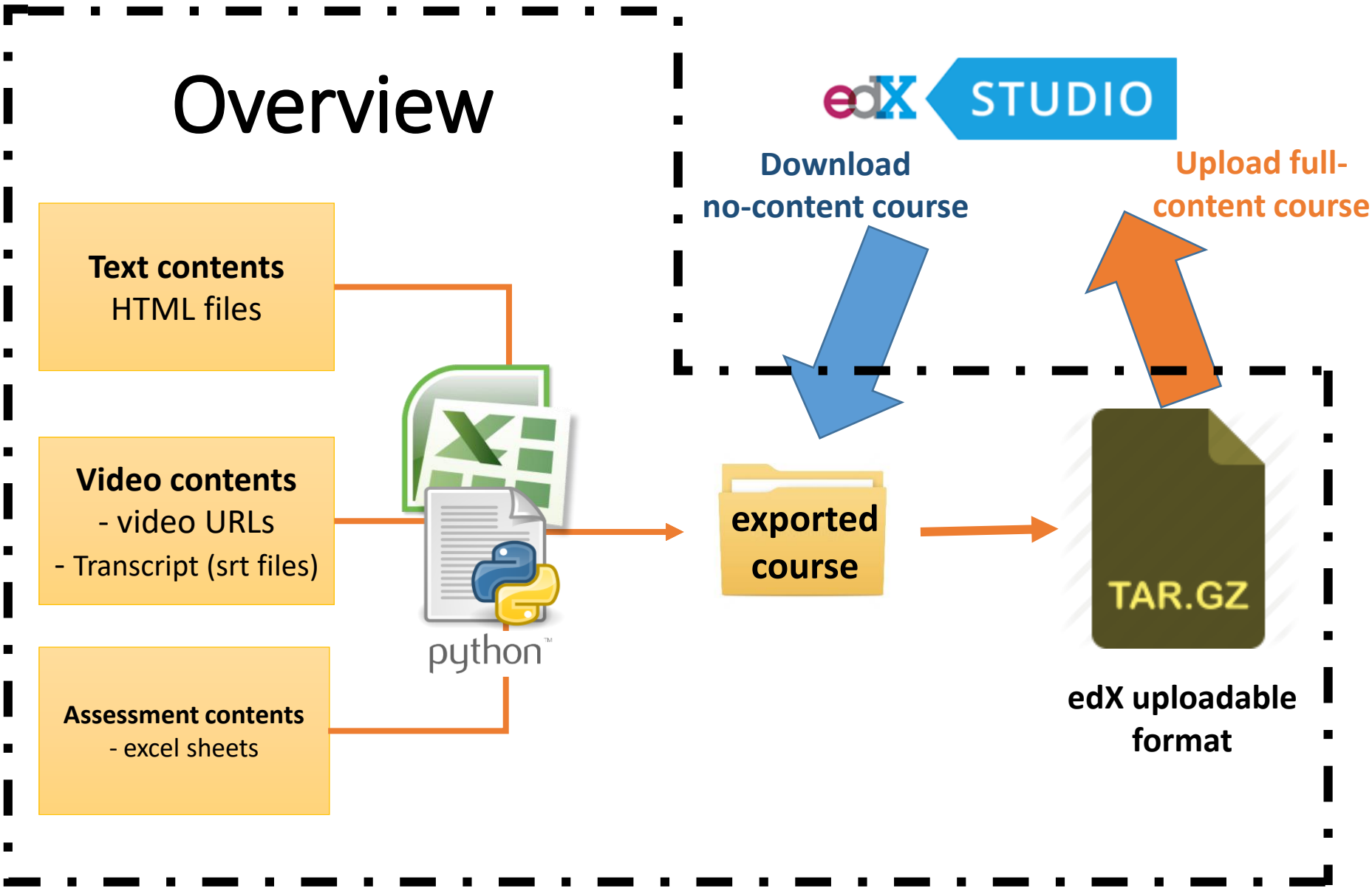
Tokyo Institute of Technology, Japan

Contents

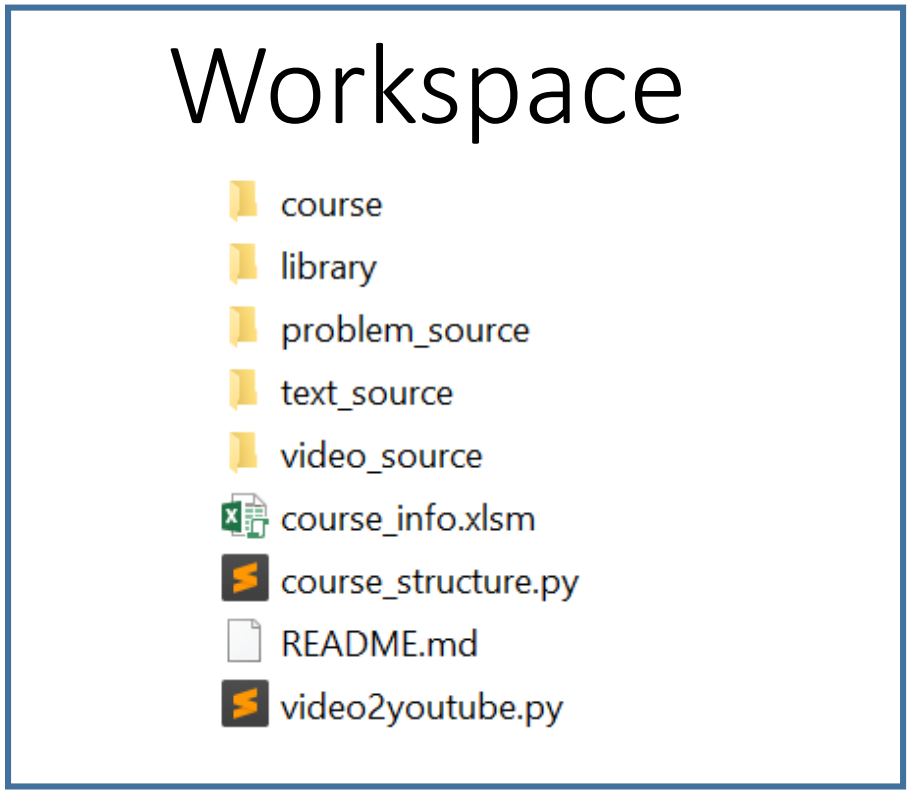
- Tool summary
- Definition of materials and outline
- Materials preparation
- How to fill data in macro-excel
- Built course with Python

Tool Overview

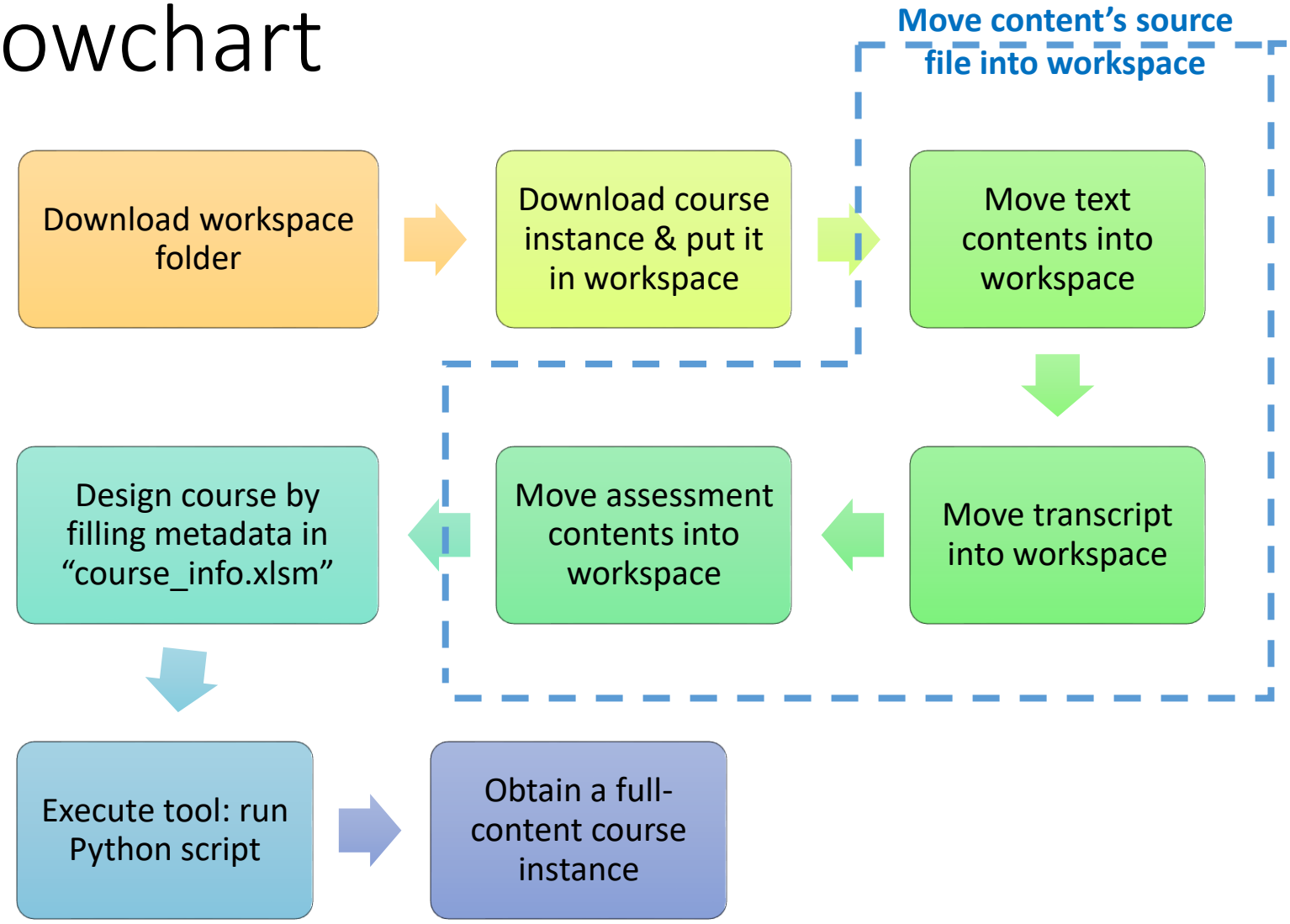
Overview


edX STUDIO
Download
no-content course
Upload full-
content course
Text contents
HTML files
Video contents
- video URLs
- Transcript (srt files)
Assessment contents
- excel sheets
python
exported
course
TAR.GZ
edX uploadable
format

- The tool’s workspace is available on GitHub
- https://github.com/TokyoTechX/edx-coursebuilder

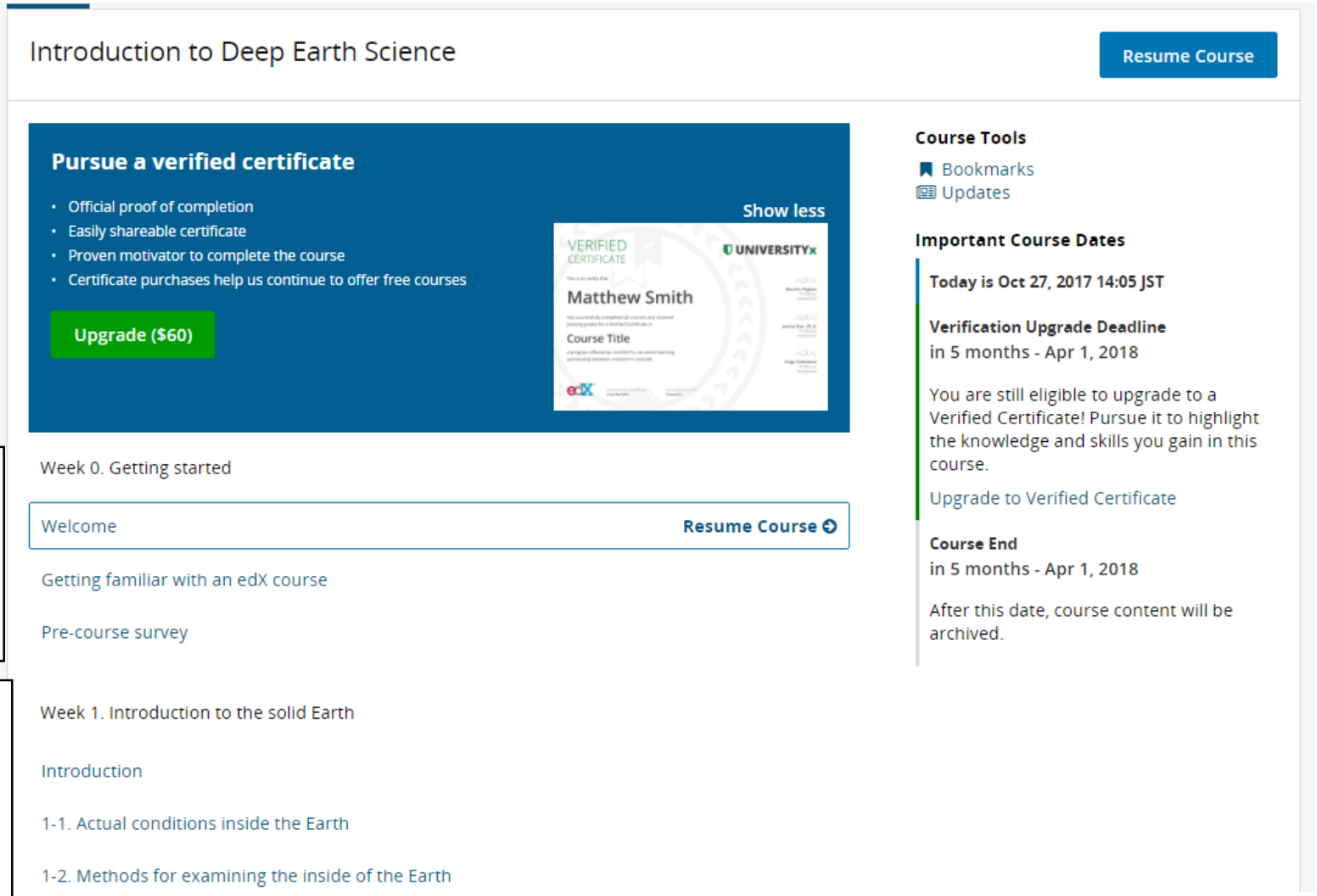


Flowchart


Move content's source file into workspace
Download workspace folder
Download course instance & put it in workspace
Move text contents into workspace
Move transcript into workspace
Move assessment contents into workspace
Design course by filling metadata in "course_info.xlsm"
Execute tool: run Python script
Obtain a full-content course instance

Definition of materials and outline

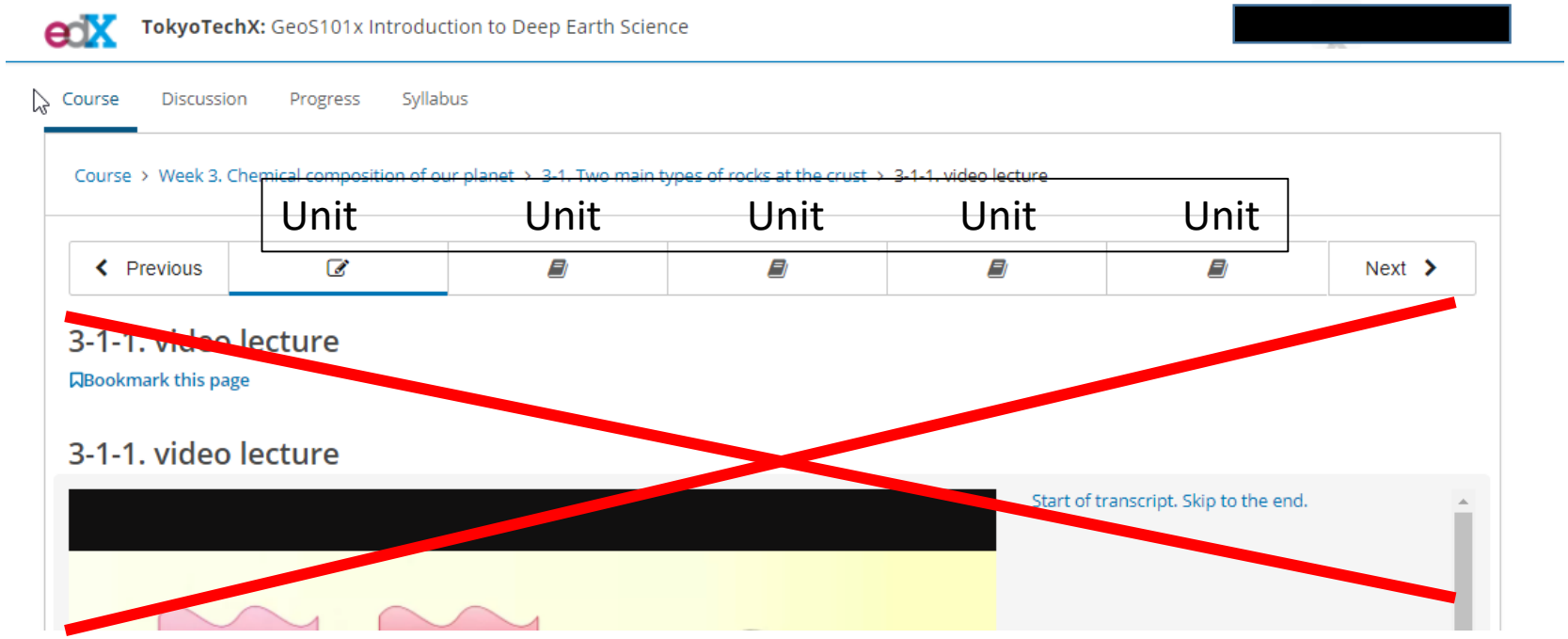
Course outline



Section
-subsection
-subsection
-subsection

Section
-subsection
-subsection
-subsection

Course outline



Text materials

3-1-3. Supplement: Granite and Basalt

Bookmark this page

First, let's review a bit about basalt and granite (1-4-2).

	Granite	Basalt
Photo	 Photo by Der Messer	 Photo by James St. John
Appearance	Lighter colors	Darker colors
Magma temperature	Low (1,100 to 1,200 K)	High (1,300 to 1,500 K)
Where they are found	Continental crust	Oceanic crust
Where they are formed	Mainly along subduction zones	Mainly mid-ocean ridges
Density	Around 2.7 g/cm^3	Around 2.8 g/cm^3

About igneous rock

Igneous rocks are classified as volcanic or plutonic according to the differences in their structures when observed under a microscope. Volcanic rocks are rocks formed when magma cools rapidly, and when their structures are observed with a microscope crystalline and non-crystalline or amorphous portions can be seen. The crystalline portions are called phenocrysts and the other part the matrix.

(There are also some rocks such as basalt whose phenocrysts are subtle to the point of being hardly noticeable.)

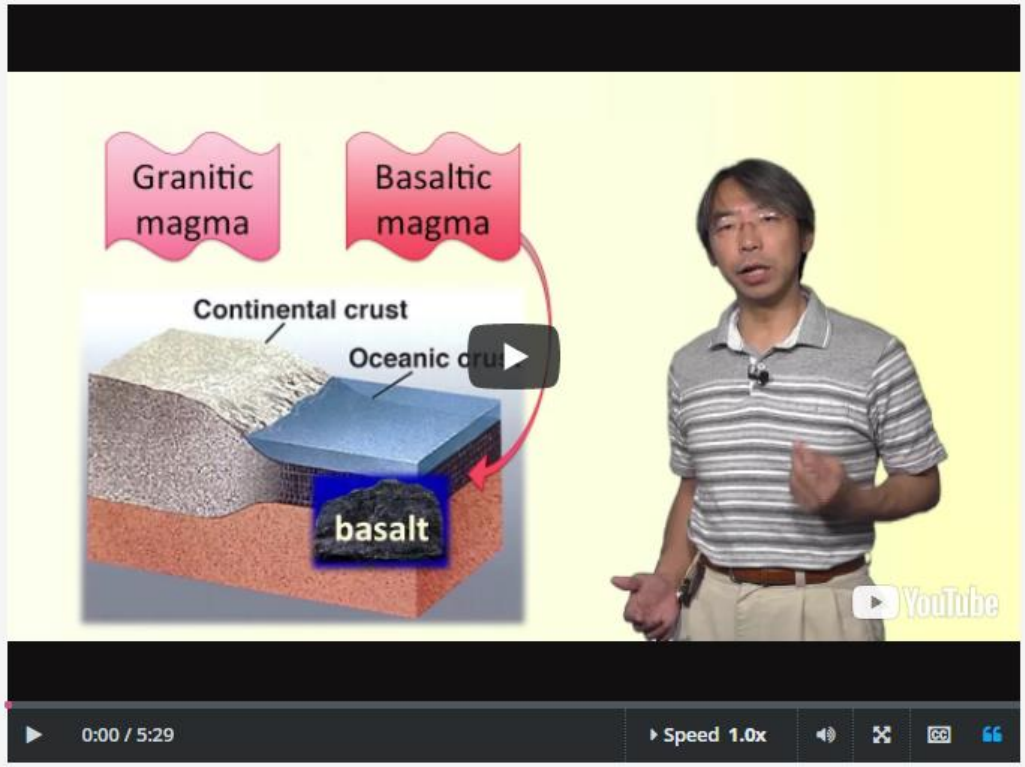
On the other hand, plutonic rocks are rocks formed deep in the Earth's interior when magma cools slowly, and have relatively large grains because all their components are formed through crystallization. Volcanic rocks are classified according to their chemical compositions, particularly how much SiO_2 they contain.

Where do igneous rocks form?

It is understood that igneous rocks' composition reflects the conditions at the time they formed. We will consider where igneous rocks are formed from this point on

Video materials

3-1-1. video lecture



Start of transcript. Skip to the end.

Well, this time, I would like to talk about the chemical composition inside the Earth,

and what types of rocks exist there.

The Earth can be divided into three major sections;

the crust, the mantle, and the core.

First, let's consider the Earth's crust.

The Earth's crust is made up of rocks, and the mantle is also made up of rocks,

both of these consist of rocks.

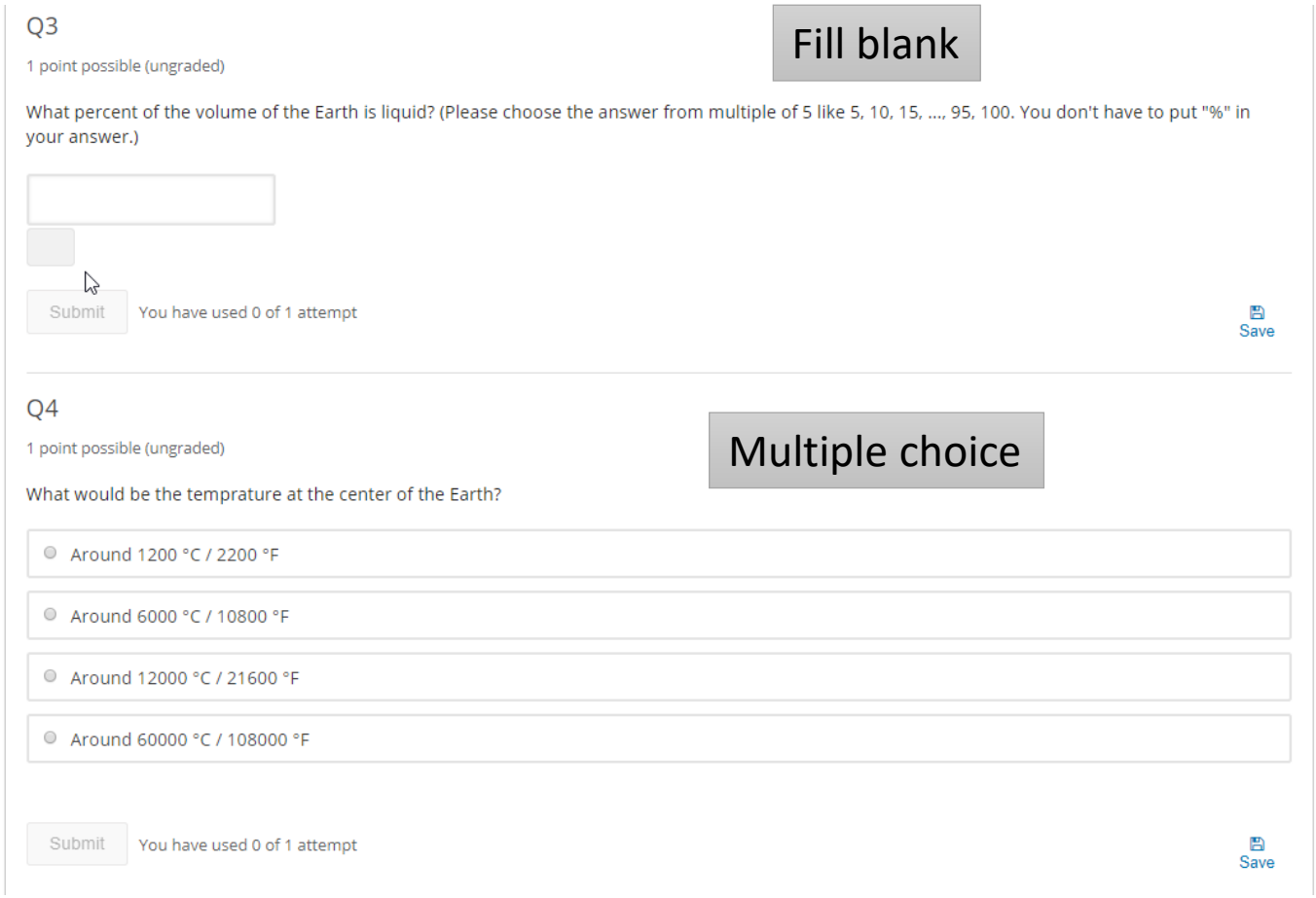
However, there is clear difference between them. What is the difference?

Well, the mantle and the crust are in a parent-child

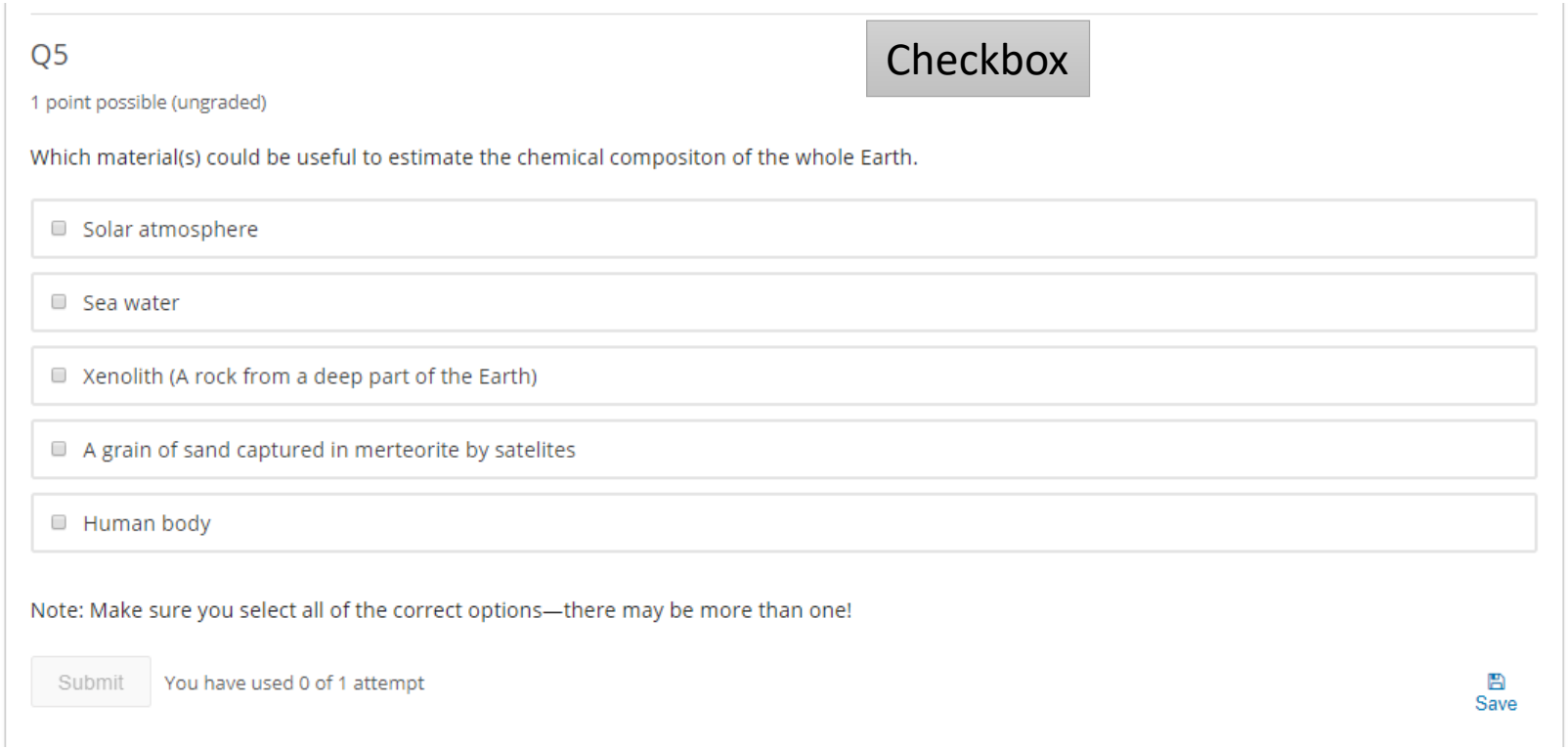
Video

Transcripts

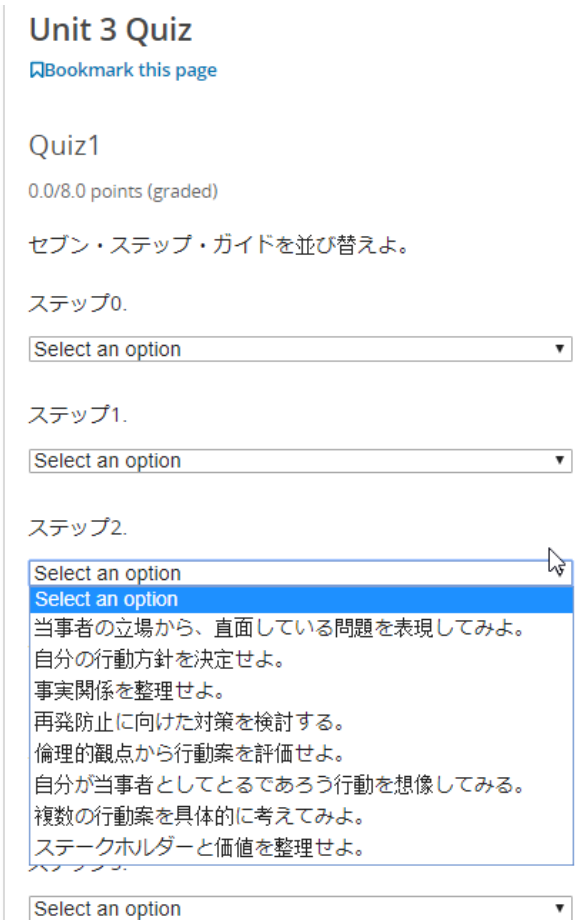
Assessment material



Assessment material



Assessment material



So far, handle only 4 types of assessment

Droplist

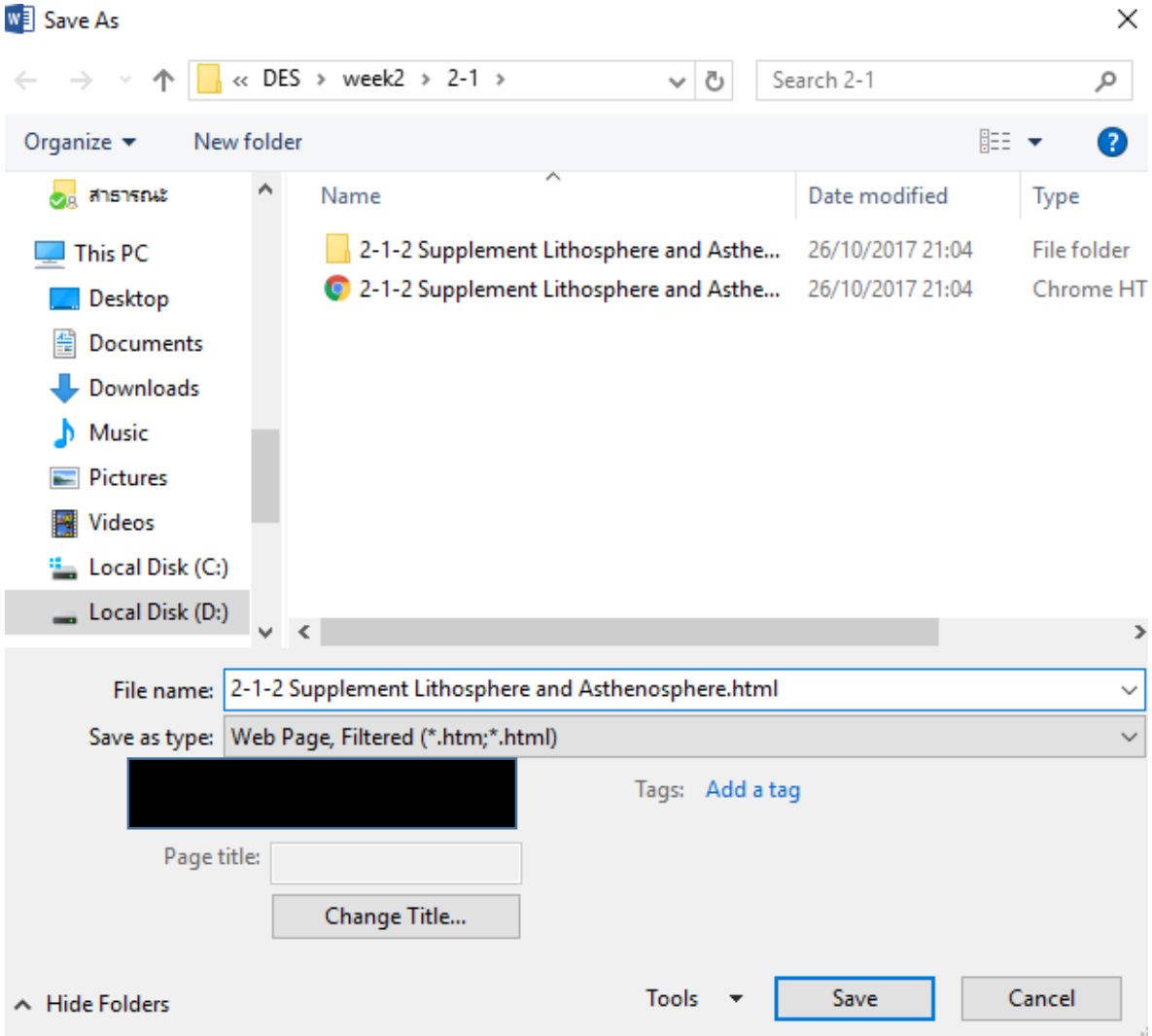
Material preparation

Text material preparation

- Prepared in any editor (Word, WordPad, notepad, etc.)
- But it needs to be converted to **HTML file**

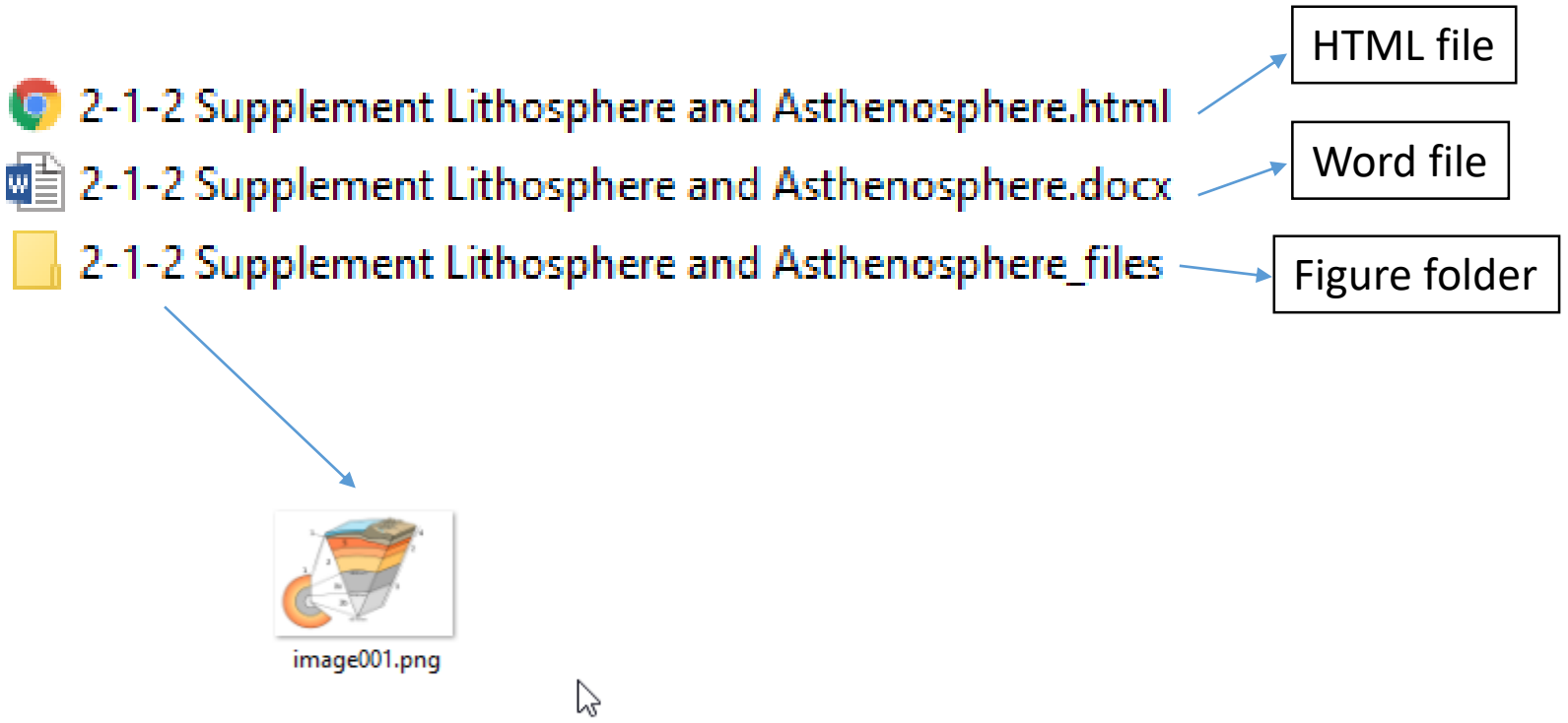
Text material preparation

- For example, Word→ HTML



Text material preparation

- For example, Word→ HTML



Video material preparation

- Video link (Youtube)
  - required URL format (https://youtu.be/f4JzqlwBLO8)

- Transcript (srt file) optional

```
0
00:00:04,710 --> 00:00:10,920
As stated in the previous subsection, the fate awaiting plates
which are produced at

1
00:00:10,920 --> 00:00:16,490
mid-ocean ridges is different in Atlantic Ocean and Pacific
Ocean.

2
00:00:16,490 --> 00:00:23,070
In this subsection, we will learn about the mid-ocean ridge in
the Atlantic Ocean, as

3
00:00:23,070 --> 00:00:26,480
well as plates produced there.

4
00:00:26,480 --> 00:00:33,670
When looking at a bathymetric chart, you can see that the Mid-
Atlantic Ridge is distributed

5
00:00:33,670 --> 00:00:39,629
```

Assessment material preparation

- XML format is required (but difficult)
- Assessment-formatted excel file is prepared
  - Format.xlsx → prepared in workspace folder

Fill blank

problem_display_name	grade_weight	max_attempts	hint	subquestion	answer
What percent of the volume of the Earth is liquid?		1		(Please choose the answer from multiple of 5 like 5, 10, 15, ..., 95, 100. You don't have to put "%" in your answer.)	80

Drop list

problem_display_name	grade_weight	max_attempts	hint	subquestion	droplist	answer
What percentage of global volcanic activity occurs at mid-ocean ridges?					25%	f
					50%	f
					75%	t
					100%	f

Assessment material preparation

Multiple choice

problem_display_name	grade_we	max_atte	hint	subquesti	choice	answer
Which material(s) could be useful to estimate the chemical compositon of the whole Earth.		1			Solar atmosphere	f
					Sea water	f
					Xenolith (A rock from a deep part of the Earth)	t
					A grain of sand captured in merteorite by satelites	f
					Human body	t

Same excel-based structure but

Multiple choice→ SINGLE correct answer
Checkbox →MULTI correct answer

checkbox

problem_display_name	grade_we	max_atte	hint	subquesti	choice	answer
Which material(s) could be useful to estimate the chemical compositon of the whole Earth.		1			Solar atmosphere	f
					Sea water	f
					Xenolith (A rock from a deep part of the Earth)	t
					A grain of sand captured in merteorite by satelites	f
					Human body	t

Assessment material preparation

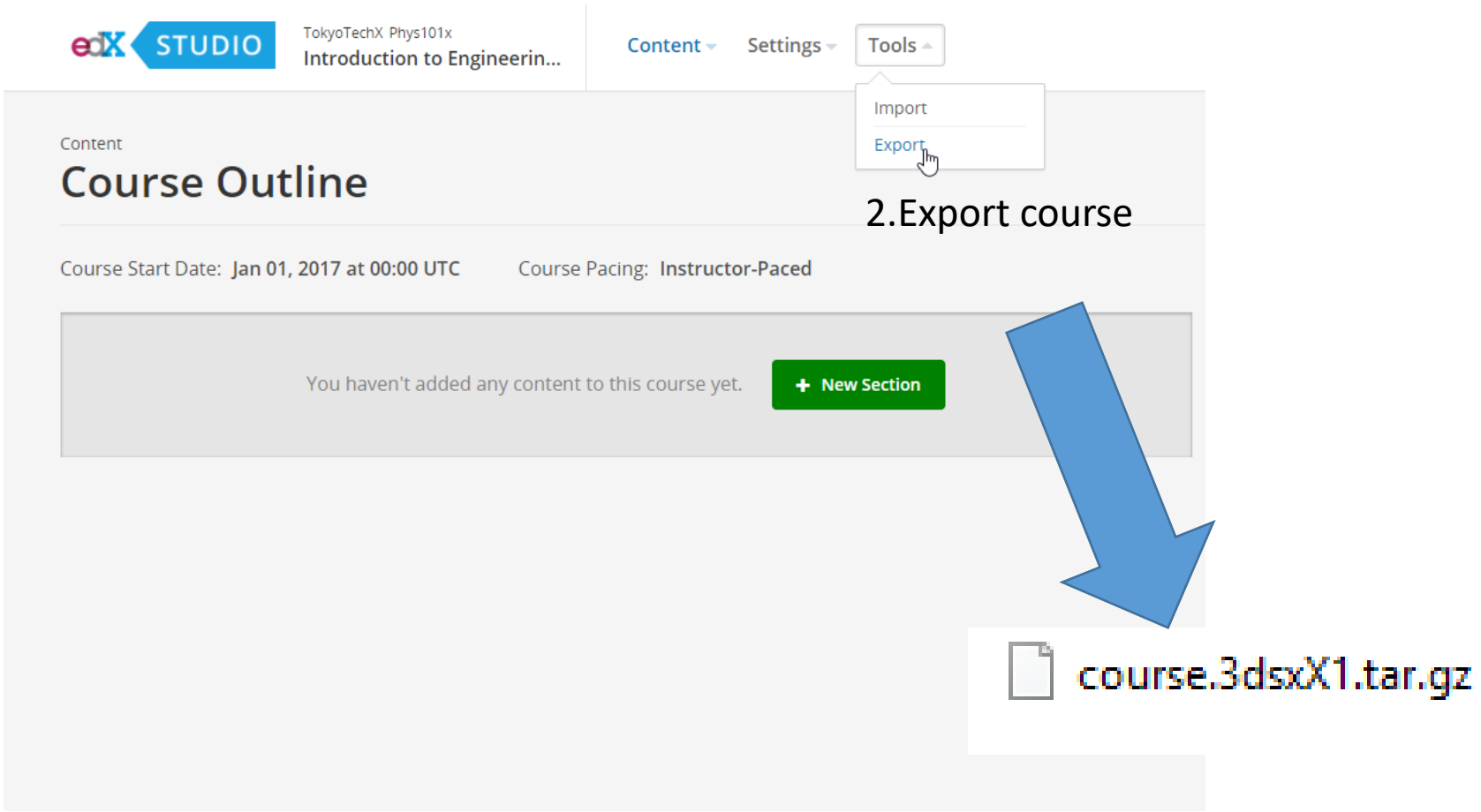
- Grade_weight : the number of points each problem is worth
- Max_attempts : number of times a student can try to answer

Source: Problem component setting in edx.studio

Fill data in macro-excel

Export an empty course instance

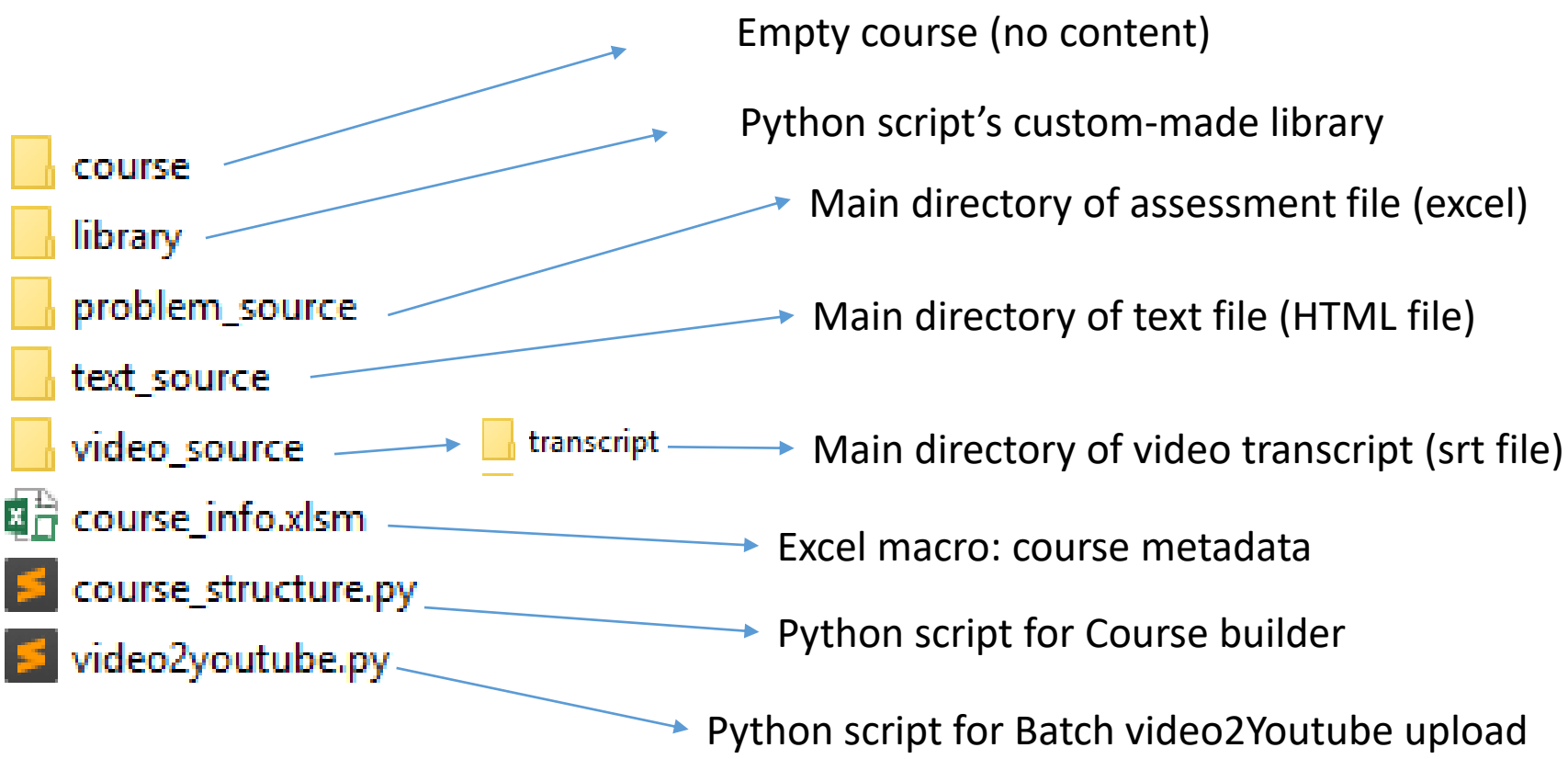
1.Create a new course instance



2.Export course

3. Unzip and place in workspace folder(see next slide)

Workspace folder



Course_info.xlsm

- Sheets
  - coursestructure
  - text
  - video
  - problem

Course builder

  - upload_list
  - caption_list
  - thumbnail_list

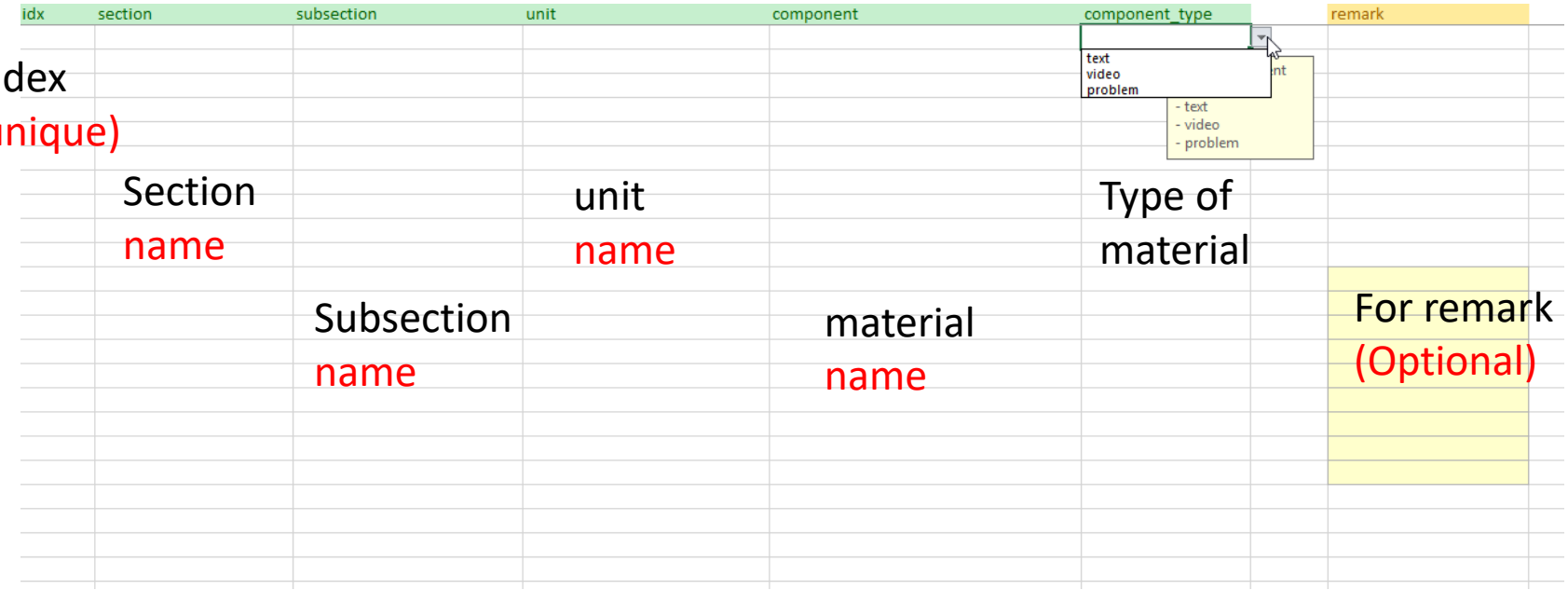
Batch video2Youtube upload

  - metada

leave it there, no need to consider

Coursestructure sheet

Course overview



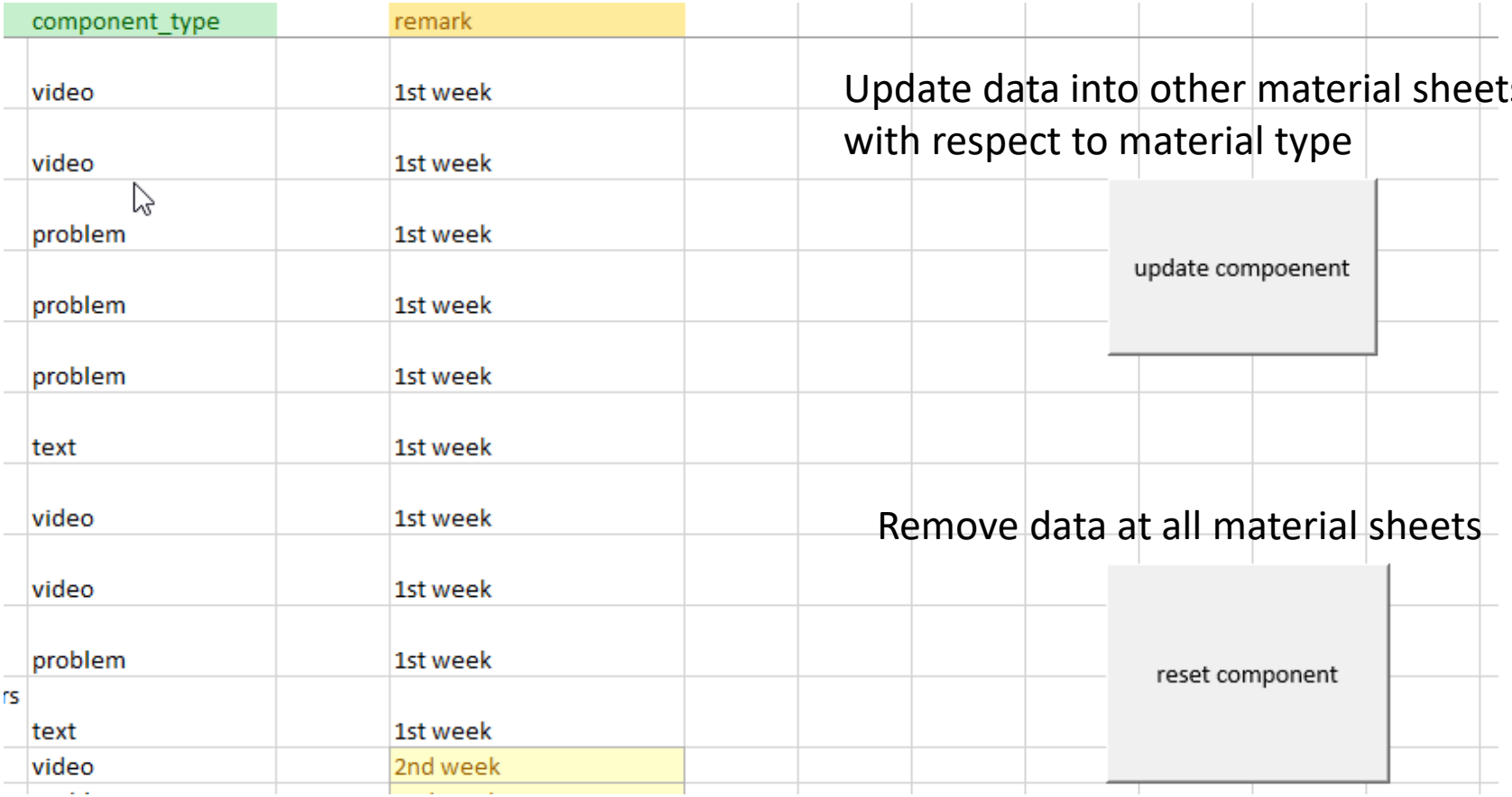
Coursestructure sheet

example

dx	section	subsection	unit	component	component_type	remark
1	Week 1. Introduction to the solide Earth	Introduction	Introductory Video	Introductory Video	video	1st week
2	Week 1. Introduction to the solide Earth	Introduction	Introductory Video	Random Video	video	1st week
3	Week 1. Introduction to the solide Earth	Introduction	Welcome Quiz	Q2	problem	1st week
4	Week 1. Introduction to the solide Earth	Introduction	Welcome Quiz	Q3	problem	1st week
5	Week 1. Introduction to the solide Earth	Introduction	Welcome Quiz	Q5	problem	1st week
6	Week 1. Introduction to the solide Earth	Introduction	About EARTH-LIFE SCIENCE INSTITUTE "ELSI"	About EARTH-LIFE SCIENCE INSTITUTE "ELSI"	text	1st week
7	Week 1. Introduction to the solide Earth	Introduction	About EARTH-LIFE SCIENCE INSTITUTE "ELSI"	ELSI Introductory Video	video	1st week
8	Week 1. Introduction to the solide Earth	1-1. Actual conditions inside the Earth	1-1-1. video lecture	1-1-1. video lecture	video	1st week
9	Week 1. Introduction to the solide Earth	1-1. Actual conditions inside the Earth	1-1-1. video lecture	quiz	problem	1st week
10	Week 1. Introduction to the solide Earth	1-1. Actual conditions inside the Earth	1-1-2. Summary: Data on the three layers of the earth	1-1-2. Summary: Data on the three layers of the earth	text	1st week
11	Week 2. Plate Tectonics	2-1. What are plates?	2-1-1. video lecture	2-1-1. video lecture	video	2nd week
12	Week 2. Plate Tectonics	2-1. What are plates?	2-1-1. video lecture	Quiz	problem	2nd week
13	Week 2. Plate Tectonics	2-1. What are plates?	2-1-2. Supplement: Lithosphere and Asthenosphere	2-1-2. Supplement: Lithosphere and Asthenosphere	text	2nd week
		2-2. Where plates are				

coursestructure sheet

Update/reset button



component_type	remark
video	1st week
video	1st week
problem	1st week
problem	1st week
problem	1st week
text	1st week
video	1st week
video	1st week
problem	1st week
text	1st week
video	2nd week

text sheet

Directory inside text_source folder

Directory of HTML file

HTML filename

before

idx	section	subsection	unit	text_name	file_dir	file_name
6	Week 1. Introduction to the solide Earth	Introduction	About EARTH-LIFE SCIENCE INSTITUTE "ELSI"	About EARTH-LIFE SCIENCE INSTITUTE "ELSI"		
10	Week 1. Introduction to the solide Earth	1-1. Actual conditions inside the Earth	1-1-2. Summary: Data on the three layers of the earth	1-1-2. Summary: Data on the three layers of the earth		
13	Week 2. Plate Tectonics	2-1. What are plates?	2-1-2. Supplement: Lithosphere and	2-1-2. Supplement: Lithosphere and Asthenosphere		
16	Week 2. Plate Tectonics	2-2. Where plates are produced	2-2-2. Supplement: Dating	2-2-2. Supplement: Dating		
18	Week 2. Plate Tectonics	2-3. Plates produced at Atlantic Ocean	2-3-2. Supplement: Hot Spots	2-3-2. Supplement: Hot Spots		
19	Week 2. Plate Tectonics	2-3. Plates produced at Atlantic Ocean	2-3-3. Supplement: Formation Of The Atlantic Ridge	2-3-3. Supplement: Formation Of The Atlantic Ridge		

after

idx	section	subsection	unit	text_name	file_dir	file_name
6	Week 1. Introduction to the solide Earth	Introduction	About EARTH-LIFE SCIENCE INSTITUTE "ELSI"	About EARTH-LIFE SCIENCE INSTITUTE "ELSI"	text_source\DES\week1\intro	About EARTH.html
10	Week 1. Introduction to the solide Earth	1-1. Actual conditions inside the Earth	1-1-2. Summary: Data on the three layers of the earth	1-1-2. Summary: Data on the three layers of the earth	text_source\DES\week1\1-1	1-1-2 Summary Data on the three layers c earth.html
13	Week 2. Plate Tectonics	2-1. What are plates?	2-1-2. Supplement: Lithosphere and	2-1-2. Supplement: Lithosphere and Asthenosphere	text_source\DES\week2\2-1	2-1-2 Supplement Lithosphere and Asthenosphere.html
16	Week 2. Plate Tectonics	2-2. Where plates are produced	2-2-2. Supplement: Dating	2-2-2. Supplement: Dating	text_source\DES\week2\2-2	2-2-2 Supplement Dating.html
18	Week 2. Plate Tectonics	2-3. Plates produced at Atlantic Ocean	2-3-2. Supplement: Hot Spots	2-3-2. Supplement: Hot Spots	text_source\DES\week2\2-3	2-3-2 Supplement Hot Spots.html
19	Week 2. Plate Tectonics	2-3. Plates produced at Atlantic Ocean	2-3-3. Supplement: Formation Of The Atlantic Ridge	2-3-3. Supplement: Formation Of The Atlantic Ridge	text_source\DES\week2\2-3	2-3-3 Supplement Formation Of The Atlar Ridge.html

video sheet

Directory inside video_source folder

before

idx	section	subsection	unit	video_url	video_name	file_dir	en_sub	jp_sub
1	Week 1. Introduction to the solide Earth	Introduction	Introductory Video		Introductory Video			
2	Week 1. Introduction to the solide Earth	Introduction	Introductory Video		Random Video			
7	Week 1. Introduction to the solide Earth	Introduction	About EARTH-LIFE SCIENCE INSTITUTE "ELSI"	Youtube url	ELSI Introductory Video	Directory of srt file	Eng srt filename	Jp srt filename
8	Week 1. Introduction to the solide Earth	1-1. Actual conditions inside the Earth	1-1-1. video lecture		1-1-1. video lecture			
11	Week 2. Plate Tectonics	2-1. What are plates?	2-1-1. video lecture		2-1-1. video			
14	Week 2. Plate Tectonics	2-2. Where plates are	2-2-1. video lecture		2-2-1. video			
17	Week 2. Plate Tectonics	2-3. Plates produced at Atlantic Ocean	2-3-1. video lecture		2-3-1. video lecture			

Optional

after

idx	section	subsection	unit	video_url	video_name	file_dir	en_sub	jp_sub
1	Week 1. Introduction to the solide Earth	Introduction	Introductory Video	https://youtu.be/35g4IVKXx8I	Introductory Video	video_source\transcript	01-TKTGEOS1T116-V012100-35g4IVKXx8I_en.srt	
2	Week 1. Introduction to the solide Earth	Introduction	Introductory Video	https://youtu.be/CzJNMhDY8io	Random Video	video_source\transcript	No_06_Week6-06-en.srt	No_01_Week6-01.srt
7	Week 1. Introduction to the solide Earth	Introduction	About EARTH-LIFE SCIENCE INSTITUTE "ELSI"	https://youtu.be/12-QvVorggg	ELSI Introductory Video	video_source\transcript	02-TKTGEOS1T116-V007600-12-QvVorggg_en.srt	
8	Week 1. Introduction to the solide Earth	1-1. Actual conditions inside the Earth	1-1-1. video lecture	https://youtu.be/dMURWt7hAOM	1-1-1. video lecture	video_source\transcript	03-TKTGEOS1T116-V016900-dMURWt7hAOM_en.srt	
11	Week 2. Plate Tectonics	2-1. What are plates?	2-1-1. video lecture	https://youtu.be/aaUzpFu6SAc	2-1-1. video lecture	video_source\transcript	02-TKTGEOS1T116-V013400-aaUzpFu6SAc_en.srt	
14	Week 2. Plate Tectonics	2-2. Where plates are produced	2-2-1. video lecture	https://youtu.be/v-LEBtzKMIU	2-2-1. video lecture	video_source\transcript	03-TKTGEOS1T116-V013600-v-LEBtzKMIU_en.srt	
17	Week 2. Plate Tectonics	2-3. Plates produced at Atlantic Ocean	2-3-1. video lecture	https://youtu.be/_gy-77dxeoE	2-3-1. video lecture	video_source\transcript	05-TKTGEOS1T116-V013500-_gy-77dxeoE_en.srt	

problem sheet

Directory inside text_source folder

Type of assessment

before

index	sectionname	subsectionname	unitname	file_dir	filename	sheet_name	problem_name	problem_type
3	Week 1. Introduction to the solide Earth	Introduction	Welcome Quiz				Q2	
4	Week 1. Introduction to the solide Earth	Introduction	Welcome Quiz				Q3	
5	Week 1. Introduction to the solide Earth	Introduction	Welcome Quiz				Q5	
9	Week 1. Introduction to the solide Earth	1-1. Actual conditions inside the Earth	1-1-1. video lecture				quiz	
12	Week 2. Plate Tectonics	2-1. What are plates?	2-1-1. video lecture				Quiz	
15	Week 2. Plate Tectonics	2-2. Where plates are produced	2-2-1. video lecture				Quiz	

droplist
multiple_choice
fill_blank
checkbox

- fill_balank
- multi_choice
- checkbox

Directory of excel file

excel sheet name

excel filename

after

index	sectionname	subsectionname	unitname	file_dir	filename	sheet_name	problem_name	problem_type
3	Week 1. Introduction to the solide Earth	Introduction	Welcome Quiz	problem_source	DES_problem.xlsx	intro_quiz2	Q2	multiple_choice
4	Week 1. Introduction to the solide Earth	Introduction	Welcome Quiz	problem_source	DES_problem.xlsx	intro_quiz3	Q3	fill_blank
5	Week 1. Introduction to the solide Earth	Introduction	Welcome Quiz	problem_source	DES_problem.xlsx	intro_quiz5	Q5	checkbox
9	Week 1. Introduction to the solide Earth	1-1. Actual conditions inside the Earth	1-1-1. video lecture	problem_source	DES_problem.xlsx	week1-1-1	quiz	droplist
12	Week 2. Plate Tectonics	2-1. What are plates?	2-1-1. video lecture	problem_source	DES_problem.xlsx	week2-1-1	Quiz	multiple_choice
15	Week 2. Plate Tectonics	2-2. Where plates are produced	2-2-1. video lecture	problem_source	DES_problem.xlsx	week2-2-1	Quiz	droplist

droplist
multiple_choice
fill_blank
checkbox

- multi_choice
- checkbox

Built course with Python

Course_structure.py

- Python 3
- Test environment: Windows 10
- Dependencies
  - xlrd, xlwt, lxml, pysrt

Course_structure.py

First, create course outline

- Run in terminal

```
python course_structure.py
```

- Select tasks

```
nter [1-3]
.Create course outline
.Add course contents
.Upload video to Youtube
```

- Type 1 and hit enter

Course_structure.py

- Course outline are created in course folder

```
no section: "section01" in course. Add link to course.xml
no section: "section02"" in course. Add link to course.xml
added new section: "section01.xml" file at chapter directory
     added new subsection link"subsection01"" in section:section01.xml
     added new subsection link "subsection02"" in file: section01.xml
added new section: "section01.xml" file at chapter directory
     added new subsection link"subsection03"" in file: section02.xml
     added new subsection link "subsection04"" in file: section02.xml
     added new subsection link "subsection05"" in file: section02.xml
added new section: "section02.xml" file at chapter directory
added new subsection: "subsection01.xml" file at sequential directory
     added new unit link "unit01"" in subsection:subsection01.xml
     added new unit "unit02"" in file: subsection01.xml
     added new unit "unit03"" in file: subsection01.xml
added new subsection: "subsection01.xml" file at sequential directory
     added new unit "unit04"" in file: subsection02.xml
     added new unit "unit05"" in file: subsection02.xml
added new subsection: "subsection02.xml" file at sequential directory
     added new unit "unit06"" in file: subsection03.xml
     added new unit "unit07"" in file: subsection03.xml
added new subsection: "subsection03.xml" file at sequential directory
     added new unit "unit08"" in file: subsection04.xml
     added new unit "unit09"" in file: subsection04.xml
added new subsection: "subsection04.xml" file at sequential directory
     added new unit "unit10"" in file: subsection05.xml
     added new unit "unit11"" in file: subsection05.xml
     added new unit "unit12"" in file: subsection05.xml
added new subsection: "subsection05.xml" file at sequential directory
added new unit: "unit01.xml" file at vertical directory
added new unit: "unit01.xml" file at vertical directory
added new unit: "unit02.xml" file at vertical directory
added new unit: "unit03.xml" file at vertical directory
added new unit: "unit04.xml" file at vertical directory
added new unit: "unit05.xml" file at vertical directory
added new unit: "unit06.xml" file at vertical directory
added new unit: "unit07.xml" file at vertical directory
added new unit: "unit08.xml" file at vertical directory
added new unit: "unit09.xml" file at vertical directory
added new unit: "unit10.xml" file at vertical directory
added new unit: "unit11.xml" file at vertical directory
added new unit: "unit12.xml" file at vertical directory
```

Course_structure.py

Then, add course material

- Run in terminal

```
python course_structure.py
```

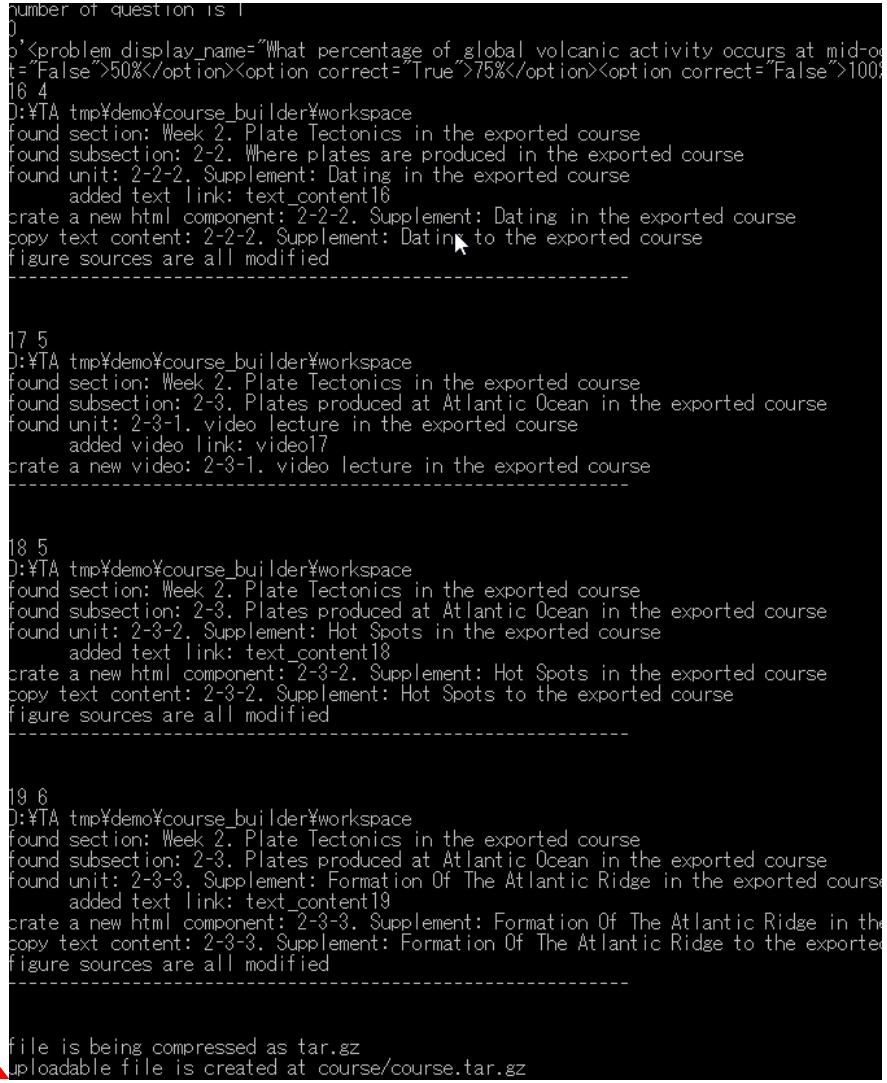
- Select tasks

```
nter [1-3]
.Create course outline
.Add course contents
.Upload video to Youtube
```

- Type 2 and hit enter

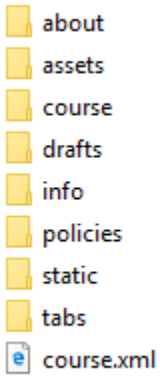
Course_structure.py

- Type 1 and hit enter
- Course materials are added in course folder
- Ready-to-upload course (tar.gz) is created at..

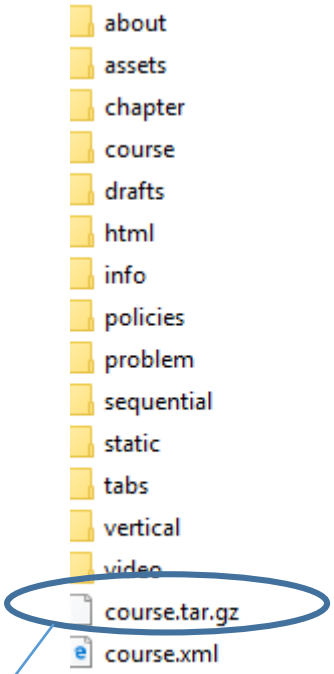


Course folder (before/after)

Before
No-contents course

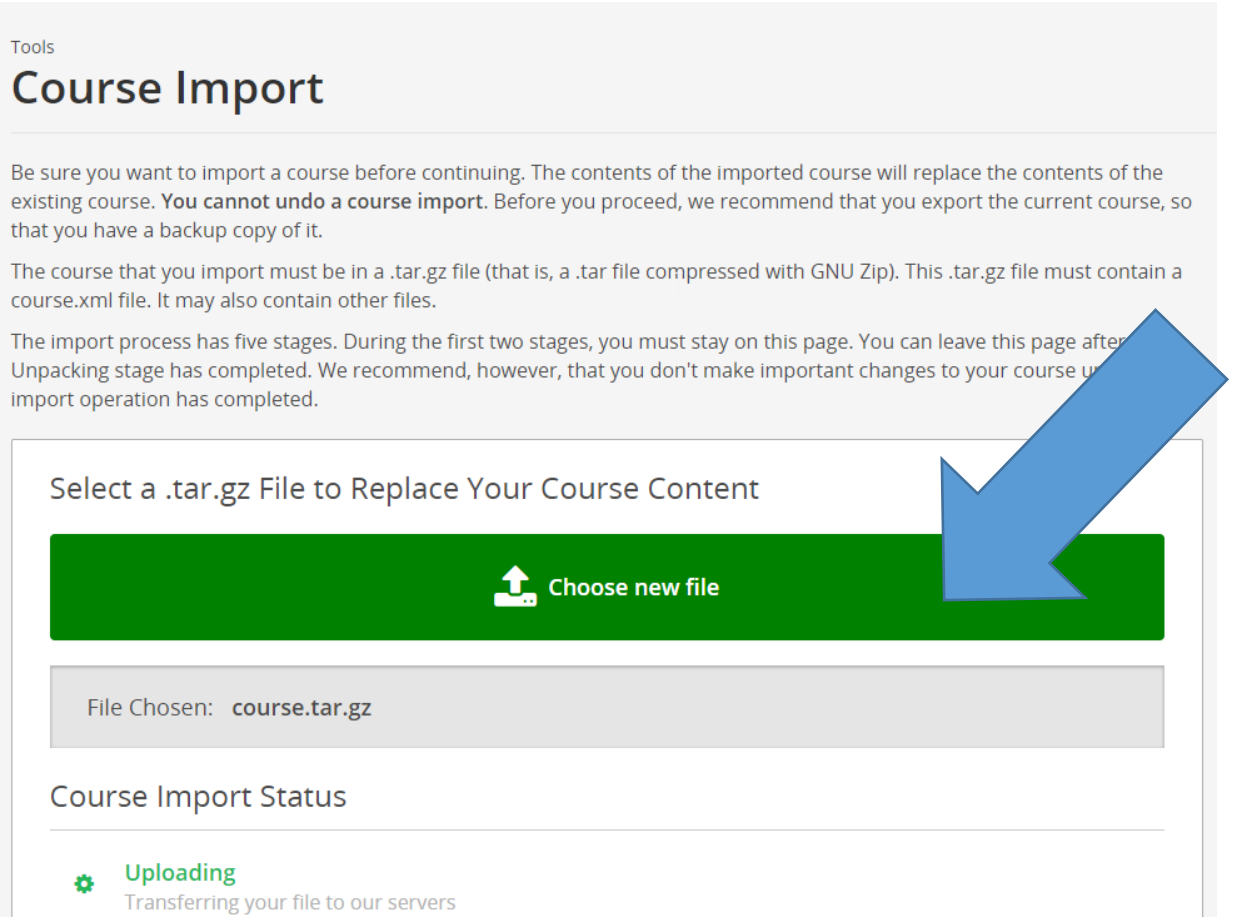


After
Contents-added course



Ready-to-upload course

Import a modified course



Modified course