# working with OPEN DATA

## Description

Learn the basics of working with open data in this hands-on, introductory class. Learners will find, download, manipulate and export simple sets of government data. Basic ability to use a computer and mouse is required. Register here for other classes in the Open Data Essentials series. Each class must be registered for separately.

## Learning GOALS > OUTCOMES

**Digital Proficiency >** Operate > Understand the Web

* Recognize and use web search as a method of retrieving online information (2017: Google).

**Digital Proficiency >** Navigate > Read Information in Digital Formats

* Identify and locate common types of digital information sources (2017: websites, databases, ebooks, search engines, social media/crowd sourced, open data portals).

**Digital Proficiency >** Navigate > Navigate Search Tools and Results

* Distinguish between information license types (2017: open access, purchase, subscription, digital locks, etc) and determine the impact on information access.

**Digital Fluency >** Connect > Communicate Effectively Online

* Recognize, criticize, and participate in online philanthropy, activism, and civic engagement.
* Discover and share information and resources via social networks.

**Digital Fluency >** Manage > Manage Digital Information & Data

* Identify the benefits and limitations of different data and information management tools.
* Create, maintain and interpret records, spreadsheets and databases for personal and professional purposes.
* Select file formats for use in different programs or apps as needed.

**Digital Fluency >** Manage > Present Digital Information & Data

* Design presentations of data and information in a variety of formats, including creating data visualizations with specialized tools (2017: Excel, infographics, etc).
* Understand and apply appropriate code to manipulate and display information & data (2017: open data sets; application design, tbd)

**Digital Fluency >** Create > Understand Creative Rights & Responsibilities in a Digital Context

* Determine how Canadian copyright laws and “copyleft” options (2017: Creative Commons, etc) govern the use and adaptation of existing works (ownership, term, fair dealing, etc).
* Differentiate between reuse, remix and attribution conventions and regulations in different media (eg: reusing code vs remixing visual art).

## Preparation

|  |  |
| --- | --- |
| Equipment Needed: | * Computers for learners * Projector/laptop * Internet access * Sound |
| **Materials Needed:** | * PowerPoint on usb * Handouts/evaluation forms for learners * Blank certificates + date stamp |
| **Setup Procedures:** | * Review the “Adult Teaching & Learning at VPL” teaching philosophy: <http://hub.vpl.ca/content/85898> * Review the lesson materials * Confirm that all necessary space and equipment has been booked |
| **Background Reading** | * <https://www.europeandataportal.eu/elearning/en/> * <https://schoolofdata.org/handbook/> * <http://paldhous.github.io/ucb/2016/dataviz/week5.html> |
| **# of Staff Required and/or Staff:Learner Ratio** | * 1-5 learners: 1 instructor * 6-12 learners: 2 instructors * For branch meeting room capacities, please see: <http://hub.vpl.ca/content/64490> |

## Opening

* Write your name and contact info (optional) somewhere visible
* Distribute handouts, evaluation forms

*Card number: 21383026295464/ Password: 2013*

## Lesson

| **LEARNING ACTIVITIES** | | | | **LEARNING OUTCOMES** |
| --- | --- | --- | --- | --- |
| **Slideshow and/or Demo** | **Time** | **Trainer Does** | **Learners Do** |  |
|  | **2 min** | **INTRODUCTION**  *Welcome* students; *introduce* yourself; *introduce* the class and series  *Remind* learners of washroom locations; turn off cell phones; etc.  *Ask* if everyone can hear you. | * Respond to instructor’s prompts |  |
|  | **3 min** | **Before we get started…**   * This is one of many learning opportunities at the library. * Today’s class is meant to be an introduction to the topic – there are lots more ways to delve deeper. * Today will be the final class in this series: for those who’ve attended both classes Congratulations! Please pick up your certificate of completion at the end of this lesson. (can hold one up) | * Listen to instructor * Ask questions |  |
|  |  | **LEARNING OPPORTUNTITIES AT VPL**   * There are several ways you can learn more about this topic. One way is through online learning at yourown pace.   **Lynda.com**   * + [vpl.ca/lynda](http://www.vpl.ca/lynda)   + videos; various tech topics; basic to advanced (including classes on Open Data)   *Inform learners* we will visit Lynda.com together at the end of the class.  **VPL Research Guides**   * [guides.vpl.ca](http://guides.vpl.ca/) * Wide variety of topics; collected books & online resources   *Show* them how to find the Research Guides from the VPL website and how to navigate to the relevant Research Guide | * Listen to instructor * Ask questions |  |
|  |  | **LEARNING OPPORTUNITIES AT VPL**   * This is **one of many learning opportunities** at the library. * Today’s class is meant to be an **introduction to the topic** – there are lots more ways to delve deeper. * There are many other ways to learn and **get help** on this and other topics at the library   + **Drop in** to any branch   + **Tech Café** at Central   + **Call or email** the library | * Listen to instructor * Ask questions |  |
|  | **5 min** | **LEARNING OBJECTIVES**  *Review* slide and read learning outcomes listed on slide  *Ask:*   * Any **comments or questions** about what we will be covering today?   *Lead* a round where people introduce themselves and answer this question:   * Please share your name and what brings you here today. What are you hoping to learn from this class? | * Respond to instructor’s questions/prompts |  |
|  | **2 min** | **REVIEW**  *Ask:*   * Who can give me a definition of Open Data?   + *Answer*: Open data is digital data that is made available with the technical and legal characteristics necessary for it to be freely used, reused, and redistributed by anyone, anytime, anywhere. * What are some examples of data sets we’re likely to encounter?   + *Possible answers*: crime data, zoning data, budgets and expense reports, data about bike racks or drinking fountains, public art and public washrooms, where we shop and what we buy. * Government agencies, institutions, organizations, and corporations have been acquiring and gathering this data for years. * Recently, there has been a **shift** in how data is viewed and used. **Data used to be kept private**, protected by the organization or agency that collected it. There is now a shift towards an **open data culture** where anyone can view and participate more deeply in shaping public discussions and/or policies * By opening up data, governments, institutions, organizations, and corporations are giving people the opportunities and tools to **innovate** and help improve the way we work, move, and govern. * Open data is now out there for us to view and use, but **where can you find all of these open datasets** and, once you have found them, **how can you use them**? This is what we will be focussing on today. . . | * Listen to instructor * Ask questions | * Recognize and use web search as a method of retrieving online information * Distinguish between information license types |
|  | **3 min** | **STEPS TO USING OPEN DATA**  **1) Acquiring:** Acquisition describes gaining access to data. Where can you find datasets and what types of datasets are available?  **2) Extracting**: Downloading the data. How to ensure you are downloading the entire dataset in a timely manner. In the extraction stage, data is converted from whatever input format has been acquired (e.g. XLS files, PDFs or even plain text documents) into a form that can be used for further processing and analysis.  **3) Cleaning & Converting**: As you acquire data, you will notice that such data often has many inconsistencies:   * duplicate records, * names used inconsistently, * amounts stated in badly formatted numbers, * while some data may not be usable at all due to file corruptions.   In short: data always needs to be **cleaned and processed**.  **4) Publishing:** Where are you going to publish your data? What platform are you going to use?  **5) Maintaining:** This process consists of maintaining data and metadata regularly, checking URIs & URLs, checking user feedback and continuous improvement and evaluating your success.   * NOTE: we will be pausing, briefly, between steps 3 and 4 to get some hands on practice with steps 1-3 before continuing on to learn more about steps 5 and 6. * Let’s now look at each of these areas in more detail . . .   [Background reading: <https://schoolofdata.org/handbook> ] | * Listen to instructor * Ask questions | * Identify and locate common types of digital information sources (2017: websites, databases, ebooks, search engines, social media/crowd sourced, open data portals). |
|  | **3 min** | **ACQUIRING: WHERE TO FIND DATA SETS**  *Refer* to handout (pages 1-3)  *Review* slide | * Refer to the handout * Listen to instructor * Ask questions | * Recognize and use web search as a method of retrieving online information * Identify and locate common types of digital information sources |
|  | **5 min** | **ACQUIRING: SEARCHING FOR DATA ON THE WEB**   * You can also search for data on the web using Google. Often simply combining a few keywords in a Google search with “data”, “open data”, “datasets”, or “database” is enough to find what you need, but you can also focus your queries using Google’s advanced search. * The options to **search by site or domain** and file type can be very useful when looking for data. You can make the domains as narrow or broad as you like: .gov, for instance, would search a wide range of U.S. government sites, while .edu would search the sites of all academic institutions using that top-level domain; journalism.berkeley.edu would search the web pages of the Berkeley J-School only. * The **file type** search offers a drop-down menu, with the options including Excel spreadsheets, and Google Earth KML and KMZ files. These are common data formats, but you are not limited to those on the menu.   [Background reading: <http://paldhous.github.io/ucb/2016/dataviz/week5.html> ] | * Listen to instructor * Ask questions | * See previous |
|  | **3 min** | **SEARCHING FOR HIDDEN DATA**  *Play Video (turn on subtitles)* | * Watch video * Listen to instructor * Ask questions | * See previous |
|  | **2 min** | **ACQUIRING: REMINDER!**   * **Check the License**   + The content, in any format, must be available under an open licence for you to use and reuse.   *Briefly discuss* “creative commons” and attribution.   * + Just because you find data online, doesn’t mean you’re allowed to use it   + It needs to have a special “open” license   + Even with this license, you are usually required to recognize where you got the original data (attribution) * **Evaluate the Data for Accuracy and Reliability:**   + Is this data reliable, accurate, and useful?   + Is this data complete?   + Is it up-to-date?   + If it comes from a survey, was it based on a representative sample of people who are relevant to your project?   + Find out whether it has been used for analysis before, and by whom. If a dataset was put together for an academic study, or is actively curated so it can be made available for experts to analyze, you can be reasonably confident that it is as complete and accurate as it can be. Before using any dataset, do some background research to find out how it was put together, and whether it has been rigorously checked for errors.   [Background reading: <http://paldhous.github.io/ucb/2016/dataviz/week5.html> ] | * Listen to instructor * Ask questions | * Distinguish between information license types * Determine how Canadian copyright laws and “copyleft” options govern the use and adaptation of existing works * Differentiate between reuse, remix and attribution conventions and regulations in different media |
|  | **1 min** | *Ask:*   * Any questions about acquiring or finding data?   *Record learners’ questions* to submit to Assistant Manager | * Ask questions |  |
|  | **3 min** | **EXTRACTING: TIPS & TRICKS**  **Look for Download Options:**   * After running a search on an online database, catalogue, or portal, you will probably want to download the results. Look for the **download link** or button. * Some online databases may impose **limits** on the number of results that are returned on each search or there may be a limit on how many of those results can be downloaded to your own computer.   **Download the Entire Database:**   * Downloading an entire database, where this is allowed. Some databases have a separate link from where data can be downloaded in its entirety, usually as a text file or series of text files. Note that large text files are again often stored in compressed folders, so may be invisible to a Google search by file type.   **Automate Downloads of Multiple Data Files:**   * Often data doesn’t reside in a single searchable database, but instead exists online as a series of separate files. In such cases, clicking on each link is tedious and time-consuming. But you can automate the process using the **DownThemAll!** A free Firefox add-on.   *Refer* learners to the handout (page 3)  [Background reading: <http://paldhous.github.io/ucb/2016/dataviz/week5.html> ] | * Refer to the handout * Listen to instructor * Ask questions | * Identify the benefits and limitations of different data and information management tools. * Create, maintain and interpret records, spreadsheets and databases for personal and professional purposes. * Select file formats for use in different programs or apps as needed. * Understand and apply appropriate code to manipulate and display information & data |
|  | **3 min** | **EXTRACTING: DATA MANAGEMENT**   * In the extraction stage, data is **converted** from the format you downloaded (e.g. XLS files, PDFs or even plain text documents) into a format that can be used for **further processing and analysis**. * If you are working with large, complicated datasets, this often involves loading data into a **database system**, such as MySQL (pronounced MY-SEQUEL) or PostgreSQL (pronounced POST-GRESS- Q – L) * SQL stands for Structured Query Language: it’s a programming language for creating and managing relational databases with the help of a relational database management system (RDMS)   *Refer* learners to the handout (page 3)   * **MySQL Community Edition** is the freely downloadable version of the popular open source database MySQL. It is available under the GPL (General Public License) free software license, which guarantees end users the freedom to run, study, share and modify the software. It is supported by a huge and active community of open source developers. * **PostgreSQL** is an open source object-relational database system. It is free and open-source software, released under the terms of the PostgreSQL License, a permissive free-software license. * Both of these are a software designed to use SQL to organize and manipulate large databases of information. * **Note**: This process is only required if you are working with very large, very complicated datasets | * Listen to instructor * Refer to the handout | * Select file formats for use in different programs or apps as needed. * Understand and apply appropriate code to manipulate and display information & data |
|  | **2 min** | **Extracting: More Practice With MySQL**  *Refer* learners to “How Use Open Data Handout ” page 7   * With your Vancouver Public Library card, you can learn more about working with MySQL through the online tutorials in the VPL Database **Lynda.com**. We will demo how to access Lynda.com at the end of the lesson. * You can also use free online services, like **CodeAcademy** and **w3schools**, to get you started with SQL (see handout) | * Listen to instructor * Refer to handout | * Understand and apply appropriate code to manipulate and display information & data |
|  | **1 min** | *Ask:*   * Any questions about extracting or downloading data?   *Record* learners’ questions to submit to Assistant Manager | * Ask questions |  |
|  | **3 min** | **CLEANING & PROCESSING**   * Clean data is data that is **consistent**, **free from duplication** and **ready for machine consumption**. * Knowing that data is clean is important to ensure you have a reliable starting point when working with it and creating new value from it. * If data is clean, it is also easier to combine it with different datasets.   *Play video* | * Watch video | * Identify the benefits and limitations of different data and information management tools * Create, maintain and interpret records, spreadsheets and databases for personal and professional purposes * Select file formats for use in different programs or apps as needed * Understand and apply appropriate code to manipulate and display information & data |
|  | **2 min** | **CLEANING & PROCESSING: TOOLS**  **Clean and Process Data With OpenRefine:**   * Checking and cleaning “dirty” data, and processing data into the format you need, can be the most labor intensive part of many data projects. However, Open Refine (formerly Google Refine) can streamline the task.   *Refer* learners to handout (page 4)   * Be aware that cleaning may take longer than you think. A careful cleaning process will, however, save substantial time in the long-run. * OpenRefine (formerly Google Refine) is tool for working with messy data: cleaning it and transforming it from one format into another.   + **Note**: Since October 2nd, 2012, Google has not actively supported this project. Project development, documentation and promotion is now fully supported by volunteers. <http://openrefine.org>   + **Note**: Again, you will probably only need to use this tool if you are working with large or very complex datasets. | * Refer to handout * Listen to instructor * Ask questions | * Identify the benefits and limitations of different data and information management tools. * Create, maintain and interpret records, spreadsheets and databases for personal and professional purposes. * Create, maintain and interpret records, spreadsheets and databases for personal and professional purposes |
|  | **5 min** | **Cleaning & Processing: Common Errors**   * **Wrong date formats** - Dates can be written in inconsistent ways. The most common error is the mixed use of American (MM/DD/YYYY) and European (DD/MM/YYYY) formats. * **Multiple representations** - People often try to save time when entering data by abbreviating terms. If these abbreviations are not consistent, it can cause errors in the dataset. Differences in capitalisation, spacing and genders of adjectives can all cause errors. * **Duplicate records** - A duplicate record is where the same piece of data has been entered more than once. Duplicate records often occur when datasets have been combined or because it was not known there was already an entry. * **Redundant data** - Redundant data is anything that is not relevant to your work with the dataset. Often a dataset has been created for a specific purpose which requires details you may not need. Common occurrences of redundant data include rows that represent total amounts. * **Mixed numerical scales** - Numerical values in datasets often use different scales to make it easier for a human to read. In budget datasets, for example, the units are often in the millions. 1,200,000 often becomes 1.2m. However, smaller amounts like 800,000 are still written in full. For a machine, this means they read the larger figure as 1.2, which causes errors. * **Mixed ranges** - Data is sometimes measured in ranges, such as age or salary range. In order for a machine to understand these ranges it is important to separate the high and low values. * **Spelling errors** - Spelling errors are often difficult to identify in tabular data. Don’t forget to run your data through a spell-checker to catch spelling errors.   [Background reading: <https://www.europeandataportal.eu/elearning/en/module11/#/id/co ]]-01> | * Listen to instructor * Ask questions | * See previous |
|  | **1 min** | *Ask:*   * Any questions about cleaning or processing data?   *Record learners’* questions to submit to Assistant Manager | * Ask questions * Listen to instructor * Ask questions |  |
|  | **1 min** | **LET’S PRACTICE!**   * We are going to practice with a very small data set.   *Assure* learners that we will be doing this together, as a group, step by step. | * Listen to instructor * Ask questions |  |
|  | **2 min** | *Read* the slide.  *Refer* learners to the handout (pages 6-7).  *Explain* that we will now follow the steps together to find and us an open data set. | * Refer to handout * Follow steps 1-15 together * Listen to instructor * Ask questions | * Identify and locate common types of digital information sources * Create, maintain and interpret records, spreadsheets and databases for personal and professional purposes. * Select file formats for use in different programs or apps as needed. |
|  | **10 min** | *Refer to handout:* using the “LET’S PRACTICE!” section of the handout, **guide the learners through each steps 1-6**, stopping frequently to ensure everyone is following along. | * Follow steps, ask questions, respond to prompts | * See previous |
|  | **5 min** | STOP AFTER STEP 6, and discuss the following:  **SAVING AN EXCEL DOCUMENT AS A CSV FILE**   * Now that we have located, downloaded, and cleaned our data set, we are ready to save it as a CSV File.   *Review* slide with the learners & *introduce* them to what CSV stands for and what it is.   * CSV is probably the simplest and most commonly used open data format. It is great to use with tabular data: data organized into tables (rows and columns). * The CSV file format is supported by almost all spreadsheets and database management systems. Many programming languages have libraries available that support CSV files. * All spreadsheet programmes support opening, editing and saving CSV files (eg Excel, OpenOffice, Google Docs Spreadsheets)   [Background reading: <http://opendatahandbook.org/glossary/en> ] | * Listen to instructor * Ask questions | * Identify the benefits and limitations of different data and information management tools. * Create, maintain and interpret records, spreadsheets and databases for personal and professional purposes. * Select file formats for use in different programs or apps as needed. |
|  | **5 min** | **CSV EXAMPLE**   * The data set we are working with today is in an Excel file. * Excel is a spreadsheet program created by Microsoft which allows someone to enter numerical values or data into the rows or columns of a spreadsheet. * The example above is also of a typical table in Excel. * The example below is the same table of data represented in CSV format.   [Background reading: <https://en.wikipedia.org/wiki/Comma-separated_values#Basic_rules_and_examples> ] | * Respond to instructor’s prompts | * See previous |
|  | **2 min** | **USING EXCEL TO CREATE A CSV FILE**   * The easiest method for working with a Comma-Separated Values (CSV) file is to use a spreadsheet application such as OpenOffice Calc or Microsoft Excel. * This video shows how easy it is to convert an Excel file into a CSV file.   *Play video* | * Listen to instructor * Ask questions * Watch video | * See previous |
| **NO SLIDE – LIVE DEMO** | **15 min** | *Restart* the steps on the handout, starting with #7.  *Guide* the learners through each step, stopping frequently to ensure everyone is following along. | * Follow steps * Ask questions | * Design presentations of data and information in a variety of formats, including creating data visualizations with specialized tools * Understand and apply appropriate code to manipulate and display information & data * Discover and share information and resources via social networks. |
|  | **1 min** | **RECAP: STEPS TO USING OPEN DATA**   * We have already discussed steps 1 to 3: Acquiring, Extracting, and Cleaning & Processing * We just practiced these first 3 steps when we searched for a dataset, downloaded it, removed errors and cleaned the data, and created a nice little data visualization with it. * But what now? What do you do with your data once you have created something new with it? How do you share it? | * Listen to instructor * Ask questions | * See previous |
|  | **5 min** | **PUBLISHING: PLATFORMS**  *Refer* learners to handout (pages 4-5)   * Open data platforms promote open data to users. Platforms are designed to allow users to quickly find and reuse relevant open data.   **Publishing as files on a website**  Some organisations only have a few datasets to share and they do that by publishing the files on their website. If you want to create your own website, you can use a free website using WordPress. If you need more help, the library offers free courses that you can register for online at <www.vpl.ca/events>.  **Upload to a portal**  is the most used channel for publishing Open Data. For example, some organizations, including the Government of Canada’s Open Government Portal, publish data using CKAN (The Comprehensive Knowledge Archive Network) a web-based open source management system for the storage and distribution of open data. Other examples of data portals (also known as data hubs) include Qlik and InfoChimps.  **Publication via an API**  is highly dependent on the type of software you are using. However, it is very important to publish the specifications with regard to the API onto your website. The API Evangelist and the API Webinar Series from DigiGov can be helpful tools if you would like to learn more about using or creating APIs. Refer to handout (page 7).  **Creating an App**  will require basic computer programming knowledge so you will need to know the basics of how to program in Java and build XML. | * Refer to handout * Listen to instructor * Ask questions | * See previous * Identify and locate common types of digital information sources |
|  | **4 min** | **PUBLISHING: API**  *Play* video | * Watch video * Ask questions | * Design presentations of data and information in a variety of formats, including creating data visualizations with specialized tools (2017: Excel, infographics, etc). * Understand and apply appropriate code to manipulate and display information & data (2017: open data sets; application design, tbd) |
|  | **2 min** | **PUBLISHING: APP DEVELOPMENT**  *Refer* learners to handout (page 7)   * With your Vancouver Public Library card, you can learn more about App Development through the online tutorials in the VPL Database Lynda.com.   *Remind* learners you will review how to access Lynda.com through the VPL website at the end of the lesson. | * Refer to handout * Listen to instructor * Ask questions | * See previous |
|  | **3 min** | **PUBLISHING: ADDING METADATA**   * It is important to ensure that your data can be found. The term usually applied to this is “the discoverability of data”. Essential for discoverability is **metadata**. * Metadata **describes** the data set itself (e.g. date of creation, title, content, author, type, size). This information about the data needs to be added to the catalogues to help discover the data – it’s data about data!   + W3C Foundation defines as: “structured information that describes, explains, locates or otherwise makes it easier to retrieve, use, or manage an information resource. Metadata is often called ‘data about data’.” * Metadata has a large influence on the re-use of Open Data. It will increase the discoverability and the re-use of your data. Therefore, take the time to inform the re-user about the quality of the data set by providing rich metadata. This will make the usability of the data set better.   [Background reading: <https://www.europeandataportal.eu/en/providing-data/goldbook/preparing-data> <http://w3c.github.io/dwbp/bp.html#metadata> ] | * Listen to instructor * Ask questions | * Identify the benefits and limitations of different data and information management tools * Create, maintain and interpret records, spreadsheets and databases for personal and professional purposes |
|  | **2 min** | **PUBLISHING: STANDARD DATASET METADATA**  *Follow* link on slide: <https://centerforgov.gitbooks.io/open-data-metadata-guide/content/appendix-a.html>  *Show* some examples of standard dataset metadata | * Listen to instructor * Ask questions | * See previous |
|  | **1 min** | **Publishing: Metadata Training**   * General information and training about metadata can be found on the W3C GitHub page <http://w3c.github.io/dwbp/bp.html#metadata>   *Refer* learners to the handout (page 5). | * Refer to handout * Listen to instructor * Ask questions | * See previous |
|  | **5 min** | **APPLY AN OPEN LICENSE**  *Refer* learners to the handout (page 5)     * Determine what intellectual property rights exist in the data. * Apply a suitable ‘open’ license that licenses all of these rights and supports the definition of openness (as outlined by the Open Definition) * Listed on the slide (and the handout) are two websites that you can go to add or apply an open license to your data: **Open Data Commons** and **Creative Commons**.   *Review* the slide giving an overview of the different types/kinds of licenses that are available and what they allow or don’t allow.     * **Public Domain**: refers to creative materials that are not protected by intellectual property laws such as copyright, trademark, or patent laws. The public owns these works, not an individual author or artist. Anyone can use a public domain work without obtaining permission, but no one can ever own it. * **Share-Alike:** if you publicly use any adapted version of this database, or works produced from an adapted database, you must also offer that database under the Open Database License. * **Note:** if you copy, modify, publish, translate, adapt, distribute or otherwise use information in any medium, mode or format for any lawful purpose, from most open datasets, you must also acknowledge the source of the information by including any attribution statement specified by the information provider(s) and, where possible, provide a link to this licence.   [Background reading: http://fairuse.stanford.edu/overview/public-domain/welcome/ <http://opendefinition.org/od/2.1/en/>] | * Refer to handout * Listen to instructor * Ask questions | * Distinguish between information license types * Determine how Canadian copyright laws and “copyleft” options * Differentiate between reuse, remix and attribution conventions and regulations in different media (eg: reusing code vs remixing visual art |
|  | **1 min** | *Ask*:   * Any questions about publishing data?   *Record* learners’ questions to submit to Assistant Manager | * Ask questions |  |
|  | **3 min** | **MAINTAINING:**   * Both data and metadata can become **outdated**. Updates, changes or other influences can cause metadata to become obsolete. This will result in **low discoverability and lower quality results** for re-users in their search for valuable datasets. Therefore, updates should be made regularly.   **Checking URIs & URLs**   * **U**niform **R**esource **I**dentifier & **U**niform **R**esource **L**ocator * The World Wide Web is dynamic. Therefore, it is important to regularly check if all your URIs and URLs (from and to datasets) are still working. If the data set’s URI or URL changes, a website that refers to your data set will redirect users to non-existing pages.   **Checking user feedback and continuous improvement**   * User feedback will increase the quality of your data publications. Users can provide feedback about the data on any aspect and by incorporating feedback into your processes, the usability and discovery of the data can be improved. Consider adding an option to receive feedback as a potential improvement of the portal. * <https://www.europeandataportal.eu/en/providing-data/goldbook/maintaining-data> | * Listen to instructor * Ask questions | * Recognize, criticize, and participate in online philanthropy, activism, and civic engagement * Discover and share information and resources via social networks * Create, maintain and interpret records, spreadsheets and databases for personal and professional purposes. |
|  | **5 min** | **BRAINSTORMING EXERCISE**   * Go over the slide with the learners * Have them work in groups to go through the exercise * Have them share their responses with the class | * Work in pairs or small groups to go through the exercise * Share their responses with the class | * Recognize, criticize, and participate in online philanthropy, activism, and civic engagement. |
|  | **1 min** | **CONTINUED LEARNING**  *Refer* learners to the handout (page 8)  *Navigate* to Lynda.com Open Data class   * **School of Data Online Courses**   A network of individuals and organizations working on empowering civil society organizations, journalists and citizens with skills they need to use data effectively.   * **Open Data Stack Exchange** is a question and answer site for developers and researchers interested in open data. | * Refer to handout |  |
|  | **3 min** | **Did we learn how to…?**  *Ask***:**   * Did we meet all of our goals today? Was there anything we didn’t cover? Do you have any other questions and/or comments   *Hand**out* **Certificates of Completion:** ask who has completed the series, fill name in template + date stamp  *Refer* learners to resources on the handout  *Review*how to search for more classes | * Listen to instructor * Ask questions |  |
|  | **-5 min** | **Time for practice, questions, etc** | | |

## Closing

* Thank learners for coming
* Ask them to take some time to fill out the evaluation form