
# Data Visualization Certification Syllabus

Syllabus

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# Introduction

## Effective data visualization - the crucial last part of the data pipeline

Numbers are central to our understanding of performance. They enable us to make informed decisions. The way we determine success or failure is almost always based on numbers. We derive great value from the stories that numbers tell, yet we rarely consider the significance of how we present them.

Data visualization is an umbrella term to cover all types of visual representations that support the explanation, examination, and communication of data.

To use visualizations effectively, we must do more than simply display data graphically. We must understand how visual perception works and then present data visually.

At the last step of the data pipeline, we make decisions based on data. After creating, cleaning, storing, managing, and analysing it, we present the data in order to facilitate taking action and making decisions based on it. To assist in this process, we transform the numbers into data visualizations with the help of graphs or tables in dashboards and reports. Anyone can easily create charts and tables, but are they effective?

Making good visualizations requires attention, knowledge, and expertise. If we pay too little attention to this last step of the production process, our data will not be successful. The likely result is that our message will come across as bad or wrong, which would be a great pity. That would be a shame because we have paid a lot of care and attention to all the previous steps in the process, and in the last step we would have ruined this!

To avoid this, a data visualization needs to be effective in the first place.

## The Effective Data Foundation (EDF)

The Effective Data Foundation (EDF) is a private collaboration that aims to promote effective use of data.

## Intended audience

The Effective Data Foundation – Data Visualization Certification is intended for anyone who creates visualizations for an audience, for example in reports, dashboards, or presentations.

Therefore, it is ideal for people for whom the concept of data visualization is relatively new and who wish to become competent in visualizing data. It is also for people already working in this field who wish to strengthen their knowledge and improve their skills.

## The EDF – Data Visualization Certificate

This EDF Certification recognises awareness and understanding of the components of data visualization and how to foster its adoption and application for the benefit of everybody who needs to make decisions based on data transformed in a visualization.

The EDF Certification is achieved through an exam which demonstrates that a participant:

- Knows how visual perception works, why it is important and what benefits it brings;
- Is aware of how to choose the correct data visualization in each situation;
- Is aware of how to properly format a data visualization;
- Understands the critical role of color and the ways in which to use this;
- Is aware of how to avoid the common pitfalls in data visualization;
- Can design an effective grid and layout;
- Understands the importance of asking the right questions at the start of each design.

The syllabus outlines the knowledge that the candidate will be tested on during the exam. It also provides suggestions for preparation (background reading) and highlights the benefits of taking this exam.

## Certifying Organisation

The Effective Data Foundation

# The EDF – Data Visualization Exam

You first need to have successfully completed the Effective Data Foundation Visualization Exam in order to obtain the EDF Data Visualization Certificate. The exam procedure is explained in this section.

## Practical information

You must pass a multiple-choice exam in which your knowledge of effective data visualization will be tested to obtain an EDF Certificate. All exam candidates will access the online exam environment and need to answer 60 multiple-choice questions within 60 minutes. To pass, you must answer 65% of the questions correctly (or at least 39 of the 60 questions). Each question has precisely four possible answers, where one or multiple answers are correct. You will receive the result immediately after the exam. (Digital) Access to your certificate will be given once you have passed.

| | |
|---|---|
| Number of questions: | 60 |
| Time (minutes) for the exam: | 60 minutes |
| % Minimal passing grade: | 65% |
| Open or closed book: | Closed |
| Language: | English |
| Exam format: | Online |
| Type of questions | Multiple choice |
| Are there also negative questions included in the exam (*for example: "which of the following is NOT a good data visualization?"*) | Yes. Candidates are advised to read the questions carefully |

## Levels

The EDF Data Visualization Certification tests candidates at levels 1 and 2 according to the Bloom Revised Taxonomy.

**Bloom Level 1: Recall & Retention**
We test candidates on their ability to memorize factual information, to retain information by collecting, remembering, and recognizing specific knowledge. Knowledge includes facts, terms, answers, or terminology.

**Bloom Level 2: Understanding**
We test candidates on their ability to construct meaning from oral, written, or graphical pieces of information. This is done by interpreting, summarizing, distracting, comparing, classifying, predicting, or explaining the message.

## Your investment

The EDF Exam requires preparation, which means this is an investment in time for personal study and attention covering the subject of effective data visualization. You are completely free to do this in several ways and can consider self-study, reading the reference materials listed in the syllabus, or following a training programme which is designed in line with this syllabus.

Refer to the list of topics in this syllabus. Here you can see which subjects you will be tested on during the exam. The time it takes to prepare for the exam depends on your prior knowledge, experience, and training. Commercially offered training programmes that prepare for the Effective Data Visualization Exam will typically last two to three days. You should allow sufficient time for self-study to address the subjects listed in this syllabus.

## Preparation and recommended literature

During your exam preparation, you should familiarize yourself with the concepts of Effective Data Visualization, for example by following a course and reading specified literature. There are ongoing publications about effective data visualization. So, it should be straightforward to find books, articles, blogs, vlogs, or videos about the different aspects.

We include a recommended reading list in this syllabus.

We also advise you to contact people who work with effective data visualization and observe what they do and the techniques they use - and also talk to them.

We have included the following in the syllabus to help you get started:

- Specifications of the examination material - divided into modules.
- The weighting of each individual module towards the overall exam.
- A list of key terms and concepts detailing what must be covered.
- Literature suggestions are available for newcomers in field. Note many of the data visualization concepts have been established for some time and are widely accepted with online and offline reference materials available.
- A practice exam is available online after purchasing an exam. The practice exam contains questions at the same level as the questions in the actual exam. The number of questions may differ from the actual exam. The actual exam includes 60 questions, and you will have 60 minutes to answer them.

## Preparation training

We endorse the added value of thoroughly preparing for the Data Visualization Exam and strongly recommend preparatory classroom training, webinars, and online eLearning journeys.

This can help you to understand the essence of effective data visualization and can give you practical examples. That said, it is not mandatory to follow specialized training.

The Effective Data Foundation does not accredit trainers, training institutions or training programmes. The composition and duration, organization, pricing, and execution of the training is the responsibility of the trainer.

# Topics of the EDF Data Visualization Exam

In this section, you can read about how the Data Visualization Exam is structured and which subjects you will be tested on as a candidate. It is also a tool that you can use to prepare yourself for the test.

In this syllabus we indicate the topics that are covered in the exam and additional topics which are relevant for further study but are not covered in the exam. During the exam you will be tested on your general knowledge about**:**

**Topic 1: Explore and explain data**

- Exploring data
- Explaining data
- Data storytelling

**Topic 2: Visual perception**

- Human perception
- Human ways of thinking
- Data interpretation

**Topic 3: How to visualize data**

- Why do we visualize data?
- Marks & channels
- Visualization forms: charts and tables
- When to use which visualization form

**Topic 4: Data visualization design**

- Visual hierarchy
- Visualization building blocks
- The use of color
- Layout and grids

**Topic 5: Visualization workflow**

- Questions to start the design process
- Drawing and sketching
- Design workflow steps and supporting materials

## Exam structure

The exam specifications describe the topics in the subject matter of the Data Visualization Exam, and their relative importance. Questions can be asked during the exam about the following subjects.

| | Topic | % Questions in the exam |
|---|---|---|
| 1 | Explore and explain data | 15% |
| 2 | Visual perception | 20% |
| 3 | How to visualize data | 30% |
| 4 | Data visualization design | 25% |
| 5 | Visualization workflow | 10% |

The following sections specify what knowledge is expected in each of these topics.

# Exam topics and recommended literature

## Topic 1: Explore and explain data

Goals:

- Describe the key properties of the Explore phase (recall)
- Describe the key properties of the Explain phase (recall)
- Recognize activities that belong to a specific phase (comprehend)
- Describe the typical data forgeries (recall)
- Describe the main steps in the data storytelling arc (recall)

Recommended literature:

- Effective Data Storytelling, Brent Dykes
- Storytelling with Data, Cole Nussbaumer Knaflic
- DataStory: Explain Data and Inspire Action Through Story, Nancy Duarte

## Topic 2: Visual perception

Goals:

- Describe the key components of our visuals system (recall)
- Describe the three types of memory (recall)
- Describe the pre-attentive attributes (recall)
- Describe the gestalt principles (recall)
- Describe the systems of thinking (recall)
- Describe the three essential components used to describe a data set (recall)
- Describe the eight principal quantitative relations in data (recall)
- Describe the difference between correlation and causation (recall)
- Describe the need for context (recall)

Recommended literature:

- Information Visualization, Colin Ware
- Visual Thinking for Design, Colin Ware
- https://vizzendata.com/2020/07/06/utilizing-gestalt-principles-to-improve-your-data-visualization-design/

## Topic 3: How to visualize data

Goals:

- Recognize the need to answer the WHY question first (comprehend)
- Describe the reasons for choosing a table (recall)
- Describe the reasons for choosing a chart (recall)
- Describe the reasoning for choosing a specific chart type: CHRTTS (recall)

Recommended literature:

- Data Visualisation, Andy Kirk
- Show Me the Numbers, Stephen Few
- The Functional Art, Alberto Cairo
- The Truthful Art, Alberto Cairo
- Better Data Visualizations, Jonathan Schwabish
- Effective Data Visualization, Stephanie Evergreen
- Data Points: Visualization with meaning

## Topic 4: Data visualization design

Goals:

- Recognize the need for visual hierarchy (comprehend)
- Describe the techniques used to implement visual hierarchy (recall)
- Describe the main building blocks of a data visualization (recall)
- Describe the use of color (recall)
- Recognize the power of layout and grids (comprehend)
- Describe the key design choices per type of visual (recall)

Recommended literature:

- Data Visualisation: A Successful Design Process, Andy Kirk
- Information Dashboard Design, Stephen Few
- How Charts Lie, Alberto Cairo
- Better Data Visualizations, Jonathan Schwabish
- Visualize This, Nathan Yau
- Visualization Analysis and Design, Tamara Munzner
- The Wall Street Journal Guide to Information Graphics, Donna M. Wong
- Data at Work, Jorge Camões

## Topic 5: Visualization workflow

Goals:

- Recognize the main questions to start the design process (comprehend)
- Describe the approach with drawing and sketching (recall)
- Recognize the Five Design Sheet method (comprehend)
- Describe the supporting materials in your design process (recall)

Recommended literature:

- http://fds.design/
- Data Visualisation: A Successful Design Process, Andy Kirk
- Data Visualization: A Practical Introduction, Kieran Healy

# Exam regulations

## General rules

An Effective Data Visualization Certification via the Effective Data Foundation is a prestigious title, and fraud is not tolerated. Your exam will be immediately rejected if fraud is found to have been committed during or after completion of the exam. As a result, you will not be reimbursed for your examination fees.

If you fail to pass the exam, you will not receive a certificate. This also means that you must purchase and take a new exam for your certification. Every candidate only gets one attempt per exam to succeed.

## Sharing of exam questions is illegal

It is not allowed to share exam questions with others or make them public. This is a violation of the copyright and IP of the Effective Data Foundation and the Certifying Body. Doing so can lead to legal action by the Certifying Body with potentially harmful consequences.

## Feedback and questions

We have done our best to help you prepare for the Effective Data Foundation Exam by publishing this syllabus.

We would like to know what you think of this syllabus and the exam. If you have any suggestions for us, we would love to hear from you.

Have fun,  take your time preparing for the exam, and good luck. Naturally, we also wish you lots of fun in putting what you've learned into practice!

On behalf of the team – Effective Data Foundation.