



Project No.: 618103-EPP-1-2020-1-PS-EPPKA2-CBHE-JP

Edu4ALL

Disability as diversity: The inclusion of students with disabilities in higher education

Deliverable D2.5.2-B	Developing Training Tutorials by UPV/EHU-B
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Work Package (WP)	WP2: Establishing the Inclusive Education Unit at PC HEIs
WP Leader	National & Kapodistrian University of Athens
WP members	Palestine Technical University Kadoorie The University of the Basque Country Irbid National University Partners for Sustainable Development The University of Jordan Al-Ummah University College Palestine Technical College Int@E UG
Issue date	30 th March 2023
Version/Status	Final v.1

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Project information

Project number	618103-EPP-1-2020-1-PS-EPPKA2-CBHE-JP
Action code	CBHE-JP
Project acronym	Edu4ALL
Project Title	Disability as diversity: The inclusion of students with disabilities in higher education
Funding scheme	Erasmus+ KA2
Date of EC approval	31/07/2020

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Document Data

Distribution List*	PU
Work Package	WP2: Establishing the Inclusive Education Unit at PC HEIs
Task	2.5 Developing Training Tutorials
Deliverable Title	Developing Training Tutorials by UPV/EHU
Work Package Leader	National & Kapodistrian University of Athens
Work Package Members	Palestine Technical University Kadoorie The University of the Basque Country Irbid National University Partners for Sustainable Development The University of Jordan Al-Ummah University College Palestine Technical College Int@E UG
Date of issue	30/03/2023
Total number of pages	240

*Choose from:

PU (Public)

RE (Restricted to a group specified by the Consortium (including the Commission Services)

CO (Confidential, only for members of the Consortium (including the Commission Services)

Version History

Version	Date	Author/Organization
Final	30/03/2023	N. Garay-Vitoria, M.Arrue, E. Larraza Mendiluze, X. Gardeazabal/ UPV-EHU

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1 Introduction

This Deliverable includes the presentations used in the 2nd Training Visit to the University of The Basque Country, Spain, from March 6th to 10th 2023, in the framework of Task 2.3: “Professional Development and Capacity building of partner country staff”.



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First steps for a Moodle account in UPV/EHU's eGelaPi

Edurne Larraza Mendiluze, Associate Professor

March 06, 2023



University of the Basque Country

Universidad del
País Vasco / Euskal
Herriko
Unibertsitatea

- Your LDAP account at UPV/EHU
- Change your password
- My turn to enrol you in our eGelaPi
- Let's go in
- Practical issues

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Your LDAP account at UPV/EHU



NAZIOARTEKO
BIKINTASUN
CAMPUSA
CAMPUS DE
EXCELENCIA
INTERNACIONAL

2023ko otsailaren 24an / 24 de febrero de 2023

Erabiltzaile ez korporatibo baten kontu eskabidearen jakinarazpena Notificación de Solicitud de Cuenta de Usuario No Corporativo

Gestio akademikoa

ZURE KONTUKO

Abala egin zuen jn./and.: **LARRAZA MENDILUZE, EDURNE**

Kontuaren titularra:

ACCOUNT

KONTUA:

PASSWORD

PASAHITZA:

HELBIDE ELEKTRONIKOA:

POSTA ZERBITZARIA: **mailin.ehu.es**

KOLEKTIBOA: **Gonbidatua**

Kontua erabiltzeko muga-eguna: **2023/03/31**

Egun horretatik aurrera balio izateko, aldezturik berriro behar duzu.

- Your LDAP account at UPV/EHU
- Change your password
- My turn to enrol you in our eGelaPi
- Let's go in
- Practical issues

1) Go to the following url:

<https://labur.eus/eM8b2>

2) Change the password

CAMBIO DE CONTRASEÑA

Introduzca el usuario ldap, la contraseña actual y la nueva contraseña.

La longitud mínima de la nueva contraseña deberá ser de 8 caracteres y contener 3 conjuntos de caracteres de los siguientes 4 posibles: mayúsculas, minúsculas, números y caracteres especiales.

No se permiten palabras de diccionario.

No se pueden repetir las últimas contraseñas

Más información en [este enlace](#)



The form is a light gray rectangle containing four labels on the left and four corresponding input fields on the right. The labels are: '*Usuario LDAP', '*Contraseña Actual', '*Nueva Contraseña', and '*Repetir Contraseña'. Below these fields is a button labeled 'CAMBIAR'.

User account

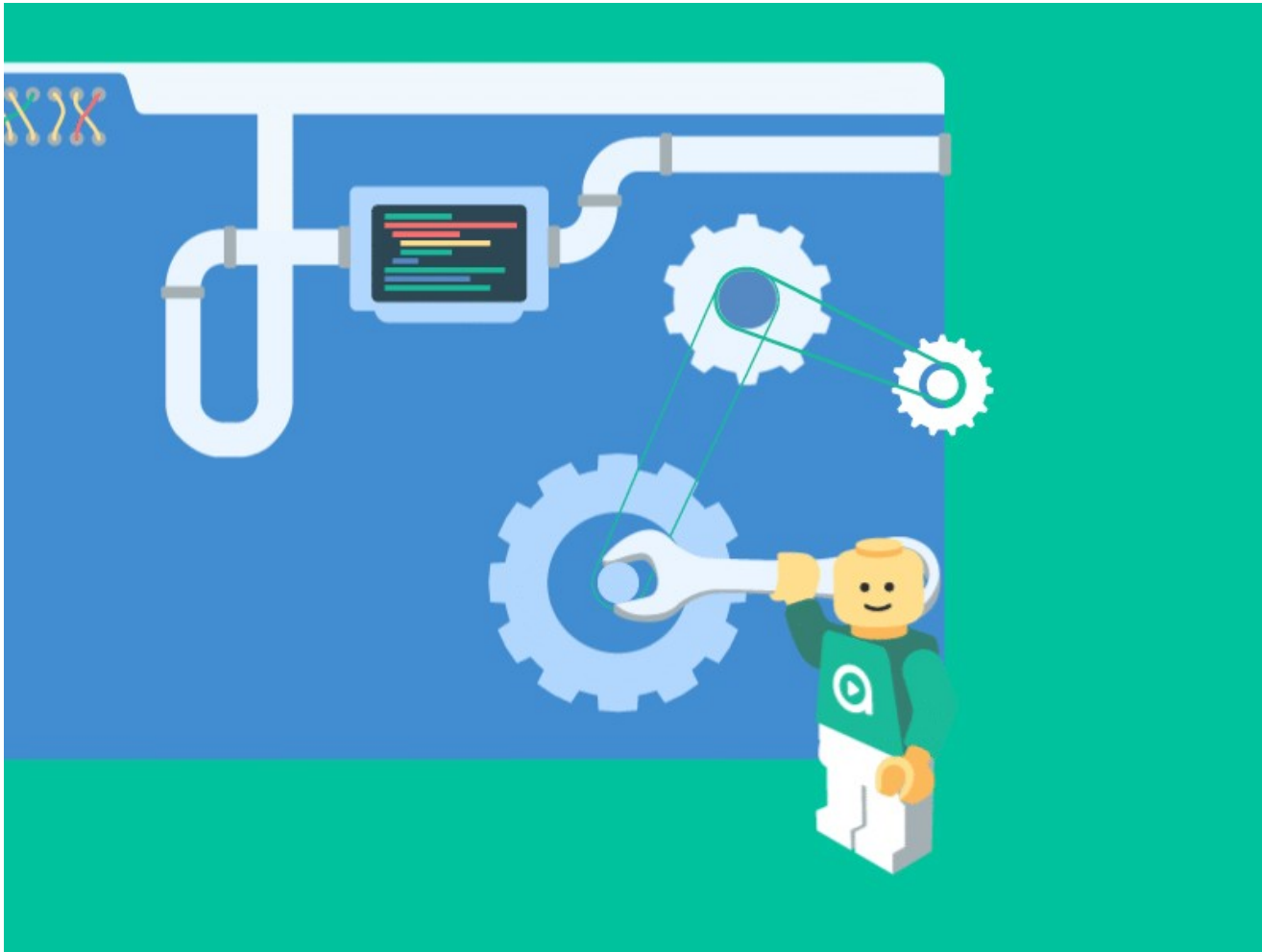
Password on the paper

New password

Repeat new password

- Your LDAP account at UPV/EHU
- Change your password
- My turn to enrol you in our eGelaPi
- Let's go in
- Practical issues

My turn to enrol you in our eGelaPi



- Your LDAP account at UPV/EHU
- Change your password
- My turn to enrol you in our eGelaPi
- Let's go in
- Practical issues

1) Go to the following url:

<https://egelapi.ehu.eus>

Let's go in



2) Enter your credentials

A screenshot of the Egelapi login page. The browser address bar shows 'https://egelapi.ehu.eus/login/index.php'. The page has a header with language options: Deutsch, English, Español, Euskara, Français, Italiano. Below the header is a blue banner with the EHU logo and text in Basque. A white box on the left contains the text 'Martxoak 6-10 marzo EHU Master Week Online'. To the right of this box is a message in Basque about the Master Week. The main content area has a blue background with a large white text box that says 'Arautu gabeko irakaskuntzarako laguntza plataforma'. In the foreground, there is a white login form with the 'egelapi' logo. The form has two input fields: 'Erabiltzaile-izena' (Username) and 'Pasahitza' (Password). Arrows point from the text 'User' to the username field and 'New password' to the password field. A blue 'Sartu' (Log in) button is at the bottom of the form.

Deutsch | English | Español | Euskara | Français | Italiano

Universidad del País Vasco Euskal Herriko Unibertsitatea

Martxoak 6-10 marzo
EHU Master Week
Online

Master bat ikastea pentsatzen ari zara?
Konektatu EHU Master Week-era eta argitu zure zalantzak informazio-saioetan.
Eman izena! <https://labur.eus/EHU>

Erabiltzaile-izena
Erabiltzaile-izena

Pasahitza
Pasahitza

Sartu

Arautu gabeko irakaskuntzarako laguntza plataforma

Let's go in



3) Choose the course Edu4All-Training

The screenshot shows the eGELAPI web application interface. At the top, there's a navigation bar with language options (Deutsch, English, Español, Euskara, Français, Italiano) and a dropdown for 'Material erabilgarria'. The user is logged in as 'EDURNE LARRAZA MENDILUZE'. A sidebar on the left contains links to Home, Dashboard, Calendar, Private files, and My courses. The main content area has a header for 'Universidad del País Vasco / Euskal Herriko Unibertsitatea' and a 'gELAPI' logo. Below the header, there are four icons: Dashboard, Calendar, Grades, and Preferences. The 'My courses' section is titled 'My courses: In progress and Future' and lists the 'Edu4All-Training' course with its teachers: MYRIAM ARRUE RECONDO, NESTOR GARAY VITORIA, XABIER GARDEAZABAL MARTINEZ DE ESPRONCEDA, and EDURNE LARRAZA MENDILUZE.

Let's go in



4) There we are!

A screenshot of a web browser showing the 'Edu4All-Training' course page. The browser's address bar shows the URL 'https://egelapi.ehu.es/course/view.php?id=2196'. The page has a top navigation bar with a search icon, a notification bell, and the user's name 'EDURNE LARRAZA MENDILUZE'. A sidebar on the left contains a menu with items like 'E4AT', 'Participants', 'Badges', 'Grades', 'Sections', 'Home', 'Dashboard', 'Calendar', 'Private files', 'Content bank', 'My courses', and 'Accessibility report'. The main content area is titled 'Edu4All-Training' and shows a breadcrumb trail: 'Home / My courses / E4AT / Sections / Resources of Training Event in Donostia'. Below this, there's a tabbed interface with 'Resources of Training Event in Donostia' selected. The content area features the Edu4All logo, a description: 'This course contains the resources developed for the Event Training for Edu4All Erasmus+ project in Donostia.', the dates '6-10 of march, 2023', and the institution 'UPV-EHU'. There are sections for 'GENERAL ISSUES' and 'DAY 1', each containing a PDF icon and the text 'Agenda of the meeting'.

Thank you for your attention



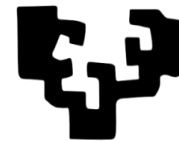
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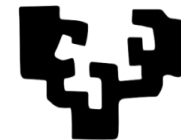
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Universal Design for Learning (UDL)

Nestor Garay-Vitoria, Associate Professor

March 06, 2023



University of the Basque Country

Universidad del País
Vasco / Euskal Herriko
Unibertsitatea

- About Universal Design for Learning (UDL)
- UDL Guidelines
- Tools and tricks
- UDL Checklist Technology
- Practical issues

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About Universal Design for Learning (UDL)



About Universal Design for Learning – UDL (I)



- Universal Design for Learning (UDL) is a framework to improve and optimize teaching and learning for all people based on scientific insights into how humans learn.
 - **UDL at a glance:** <https://www.youtube.com/watch?v=bDvKnY0g6e4>
- The UDL Guidelines are a tool used in the implementation of Universal Design for Learning. These guidelines offer a set of concrete suggestions that can be applied to any discipline or domain to ensure that all learners can access and participate in meaningful, challenging learning opportunities.
 - **Recognition networks:** The **What** of learning
 - **Representation:** For resourceful, knowledgeable learners, present information and content in different ways.
 - **Strategic networks:** The **How** of learning
 - **Action & Expression:** For strategic, goal-directed learners, differentiate the ways that students can express what they know.
 - **Affective networks:** The **Why** of learning
 - **Engagement:** For purposeful, motivated learners, stimulate interest and motivation for learning.

About Universal Design for Learning – UDL (II)



- Therefore, UDL emphasizes three large brain networks that comprise the vast majority of the human brain and play a central role in learning.
 - The **affective network**: how learners monitor the internal and external environment to set priorities, to motivate, and to engage learning and behavior,
 - The **recognition network**: how learners sense and perceive information in the environment and transform it into usable knowledge,
 - The **strategic network**: how learners plan, organize, and initiate purposeful actions in the environment.
- Each of these networks tend to be spatially distinguishable in the brain:
 - the affective network is generally buried in the center of the brain;
 - the recognition network is located in the back/posterior regions, and
 - the strategic (motor) network is positioned in the anterior/front of the brain.

About Universal Design for Learning – UDL (III)



- While it should be noted that all the networks work together, CAST focuses on this simplified model of the brain to highlight what is relevant for the learning brain and to try to understand and plan for learner variability.
- Some suggested videos:
 - How UDL Guidelines map to the three learning networks:
<https://www.youtube.com/watch?v=UvD0bGZb348>
 - Neuroscience makes UDL a strong educational framework:
<https://www.youtube.com/watch?v=oZFecRXOvjC>

- About Universal Design for Learning (UDL)
- UDL Guidelines
- Tools and tricks
- UDL Checklist Technology
- Practical issues

UDL Guidelines



udlguidelines.cast.org | © CAST, Inc. 2018 | Suggested Citation: CAST (2018). Universal design for learning guidelines version 2.2 [graphic organizer]. Wakefield, MA: Author.

UDL Guidelines (I)



- The UDL Guidelines are a tool used in the implementation of Universal Design for Learning.
- The UDL Guidelines can be used by educators, curriculum developers, researchers, parents, and anyone else who wants to implement the UDL framework in a learning environment.
- These guidelines offer a set of concrete suggestions that can be applied to any discipline or domain to ensure that all learners can access and participate in meaningful, challenging learning opportunities.
- Because the UDL Guidelines are meant to be informed by feedback from the field as well as new research, they have been updated several times in the past. The current version is 2.2 launched in 2018.
- They are in the process of updating the Guidelines once again:
<https://www.cast.org/news/2020/community-driven-process-update-udl-guidelines>.

UDL Guidelines (II)



- The UDL Guidelines are expressed via a set of principles, composed by some guidelines and there are several checkpoints to ensure every guideline.
- UDL aims to change the design of the environment rather to change the learner.
 - When environments are intentionally designed to reduce barriers, all learners can engage in rigorous, meaningful learning.
- Next we present the list of principles, guidelines and checkpoints, which can be found at:
 - <https://udlguidelines.cast.org/>

UDL Guidelines organization (I)



- The UDL Guidelines are organized both horizontally and vertically.
- Vertically, the Guidelines are organized according to the three principles of UDL: engagement, representation, and action and expression.
- The principles are broken down into Guidelines, and each of these Guidelines have corresponding “checkpoints” that provide more detailed suggestions.

Provide multiple means of **Engagement**

Affective Networks
The “WHY” of Learning



Provide multiple means of **Representation**

Recognition Networks
The “WHAT” of Learning



Provide multiple means of **Action & Expression**

Strategic Networks
The “HOW” of Learning



UDL Guidelines organization (II)



- The Guidelines are also organized horizontally.
- The “access” row includes the guidelines that suggest ways to increase access to the learning goal by recruiting interest and by offering options for perception and physical action.

Access

Provide options for
Recruiting Interest

Provide options for
Perception

Provide options for
Physical Action

- The “build” row includes the guidelines that suggest ways to develop effort and persistence, language and symbols, and expression and communication.

Build

Provide options for
Sustaining Effort & Persistence

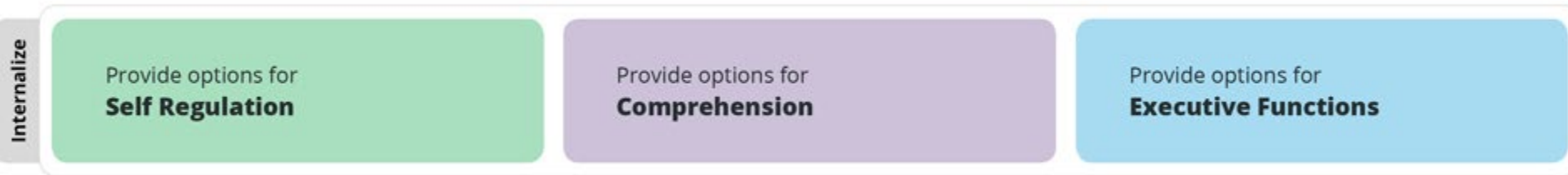
Provide options for
Language & Symbols

Provide options for
Expression & Communication

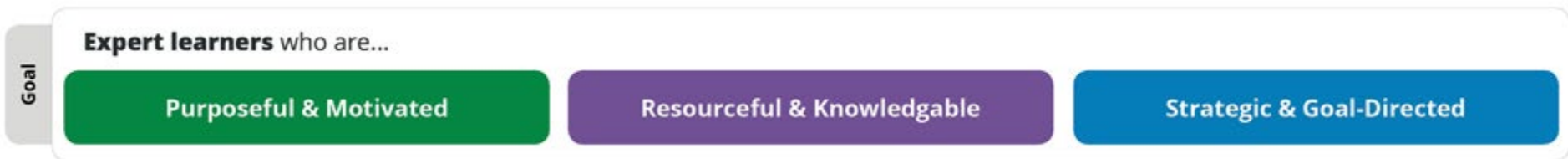
UDL Guidelines organization (III)



- Finally, the “internalize” row includes the guidelines that suggest ways to empower learners through self-regulation, comprehension, and executive function.



- Taken together, the Guidelines lead to the ultimate goal of UDL: to develop “expert learners” who are, each in their own way, resourceful and knowledgeable, strategic and goal-directed, purposeful and motivated.



- **Provide multiple means of representation.**
- Learners differ in the ways that they perceive and comprehend information that is presented to them.
 - For example, those with sensory disabilities (e.g., blindness or deafness); learning disabilities (e.g., dyslexia); language or cultural differences, and so forth may all require different ways of approaching content.
 - Others may simply grasp information quicker or more efficiently through visual or auditory means rather than printed text.
- Also learning, and transfer of learning, occurs when multiple representations are used, because they allow students to make connections within, as well as between, concepts.
- In short, there is not one means of representation that will be optimal for all learners; providing options for representation is essential.

Guideline 1: Provide options for Perception



- **Interact with flexible content that doesn't depend on a single sense like sight, hearing, movement, or touch.**
- Learning is impossible if information is imperceptible to the learner, and difficult when information is presented in formats that require extraordinary effort or assistance.
- To reduce barriers to learning, it is important to ensure that key information is equally perceptible to all learners by:
 - providing the same information through different modalities (e.g., through vision, hearing, or touch);
 - providing information in a format that will allow for adjustability by the user (e.g., text that can be enlarged, sounds that can be amplified).
- Such multiple representations not only ensure that information is accessible to learners with particular sensory and perceptual disabilities, but also easier to access and comprehend for many others.

Guideline 1 checkpoints



- **Checkpoint 1.1: Offer ways of customizing the display of information.**
 - Use flexible materials with settings that can be adjusted based on needs and preferences.
- **Checkpoint 1.2: Offer alternatives for auditory information.**
 - Share information in more ways than sound and voice alone.
- **Checkpoint 1.3: Offer alternatives for visual information.**
 - Share information in more ways than images and text alone.

Guideline 2: Provide options for Language & Symbols



- **Communicate through languages that create a shared understanding.**
- Learners vary in their facility with different forms of representation—both linguistic and non-linguistic.
- Vocabulary that may sharpen and clarify concepts for one learner may be opaque and foreign to another.
- As a result, inequalities arise when information is presented to all learners through a single form of representation.
- An important instructional strategy is to ensure that alternative representations are provided not only for accessibility, but for clarity and comprehensibility across all learners.

Guideline 2 checkpoints



- **Checkpoint 2.1: Clarify vocabulary and symbols.**
 - Construct meaning from words, symbols, and numbers using different representations.
- **Checkpoint 2.2: Clarify syntax and structure.**
 - Make the patterns and properties of systems like grammar, musical notation, taxonomies, and equations explicit.
- **Checkpoint 2.3: Support decoding of text, mathematical notation, and symbols.**
 - Make sure text and symbols don't get in the way of the learning goal.
- **Checkpoint 2.4: Promote understanding across languages.**
 - Use translations, descriptions, movement, and images to support learning in unfamiliar or complex languages.
- **Checkpoint 2.5: Illustrate through multiple media.**
 - Make learning come alive with simulations, graphics, activities, and videos.

Guideline 3: Provide options for Comprehension



- **Construct meaning and generate new understandings.**
- The purpose of education is not to make information accessible, but rather to teach learners how to transform accessible information into useable knowledge.
- Constructing useable knowledge, knowledge that is accessible for future decision-making, depends not upon merely perceiving information, but upon active “information processing skills” like selective attending, integrating new information with prior knowledge, strategic categorization, and active memorization.
- Individuals differ greatly in their skills in information processing and in their access to prior knowledge through which they can assimilate new information.
- Proper design and presentation of information—the responsibility of any curriculum or instructional methodology—can provide the scaffolds necessary to ensure that all learners have access to knowledge.

Guideline 3 checkpoints



- **Checkpoint 3.1: Activate or supply background knowledge.**
 - Build connections to prior understandings and experiences.
- **Checkpoint 3.2: Highlight patterns, critical features, big ideas, and relationships.**
 - Accentuate important information and how it relates to the learning goal.
- **Checkpoint 3.3: Guide information processing and visualization.**
 - Support the process of meaning-making through models, scaffolds, and feedback.
- **Checkpoint 3.4: Maximize transfer and generalization.**
 - Apply learning to new contexts.

- **Provide multiple means of action & expression.**
- Learners differ in the ways that they can navigate a learning environment and express what they know.
 - For example, individuals with significant movement impairments (e.g., cerebral palsy), those who struggle with strategic and organizational abilities (executive function disorders), those who have language barriers, and so forth approach learning tasks very differently.
 - Some may be able to express themselves well in written text but not speech, and vice versa.
- It should also be recognized that action and expression require a great deal of strategy, practice, and organization, and this is another area in which learners can differ.
- In reality, there is not one means of action and expression that will be optimal for all learners; providing options for action and expression is essential.

Guideline 4: Provide options for Physical action



- **Interact with accessible materials and tools.**
- A textbook or workbook in a print format provides limited means of navigation or physical interaction (e.g., turning pages, handwriting in spaces provided).
- Many interactive pieces of educational software similarly provide only limited means of navigation or interaction (e.g., using a joystick or keyboard).
- Navigation and interaction in those limited ways will raise barriers for some learners—those with physical disabilities, blindness, dysgraphia, or who need various kinds of executive functioning supports.
- It is important to provide materials with which all learners can interact.
- Properly designed curricular materials provide a seamless interface with common assistive technologies through which individuals with movement impairments can navigate and express what they know—to allow navigation or interaction with a single switch, through voice activated switches, expanded keyboards and others.

Guideline 4 checkpoints



- **Checkpoint 4.1: Vary the methods for response and navigation.**
 - Interact with tools and environments that make learning physically accessible to all.
- **Checkpoint 4.2: Optimize access to tools and assistive technologies.**
 - Open doors to learning with accessible tools and devices.

Guideline 5: Provide options for Expression & Communication



- **Compose and share ideas using tools that help attain learning goals.**
- There is no medium of expression that is equally suited for all learners or for all kinds of communication. On the contrary, there are media, which seem poorly suited for some kinds of expression, and for some kinds of learning.
- While a learner with dyslexia may excel at story-telling in conversation, he may falter when telling that same story in writing.
- It is important to provide alternative modalities for expression, both to the level the playing field among learners and to allow the learner to appropriately (or easily) express knowledge, ideas and concepts in the learning environment.

Guideline 5 checkpoints



- **Checkpoint 5.1: Use multiple media for communication.**
 - Express learning in flexible ways.
- **Checkpoint 5.2: Use multiple tools for construction and composition.**
 - Share thoughts and ideas using tools that complement the learning goal.
- **Checkpoint 5.3: Build fluencies with graduated levels of support for practice and performance.**
 - Apply and gradually release scaffolds to support independent learning.

Guideline 6: Provide options for Executive functions (I)



- **Develop and act on plans to make the most out of learning.**
- At the highest level of the human capacity to act skillfully are the so-called “executive functions.”
- Associated with networks that include the prefrontal cortex, these capabilities allow humans to overcome impulsive, short-term reactions to their environment and instead to set long-term goals, plan effective strategies for reaching those goals, monitor their progress, and modify strategies as needed.
- In short, they allow learners to take advantage of their environment.

Guideline 6: Provide options for Executive functions (II)



- Of critical importance to educators is the fact that executive functions have very limited capacity due to working memory.
- This is true because executive capacity is sharply reduced when:
 - executive functioning capacity must be devoted to managing “lower level” skills and responses which are not automatic or fluent thus the capacity for “higher level” functions is taken; and
 - executive capacity itself is reduced due to some sort of higher level disability or to lack of fluency with executive strategies.
- The UDL framework typically involves efforts to expand executive capacity in two ways:
 - by scaffolding lower level skills so that they require less executive processing; and
 - by scaffolding higher level executive skills and strategies so that they are more effective and developed.
- Previous guidelines have addressed lower level scaffolding, this guideline addresses ways to provide scaffolding for executive functions themselves.

Guideline 6 checkpoints



- **Checkpoint 6.1: Guide appropriate goal-setting.**
 - Practice setting challenging and authentic goals.
- **Checkpoint 6.2: Support planning and strategy development.**
 - Formulate reasonable plans for reaching goals.
- **Checkpoint 6.3: Facilitate managing information and resources.**
 - Support organization and memory using flexible tools and processes.
- **Checkpoint 6.4: Enhance capacity for monitoring progress.**
 - Analyze growth over time and how to build from it.

Some suggested videos



- Engagement and a focus on assessment:
<https://www.youtube.com/watch?v=295mZSyW1Vc>
- Variability in strategic networks:
<https://www.youtube.com/watch?v=cUWCosULq2U>
- Variability in practice:
<https://www.youtube.com/watch?v=UZGJOTXWI-s>

- **Provide multiple means of engagement.**
- Affect represents a crucial element to learning, and learners differ markedly in the ways in which they can be engaged or motivated to learn.
- There are a variety of sources that can influence individual variation in affect including neurology, culture, personal relevance, subjectivity, and background knowledge, along with a variety of other factors.
- Some learners are highly engaged by spontaneity and novelty while others are disengaged, even frightened, by those aspects, preferring strict routine.
- Some learners might like to work alone, while others prefer to work with their peers.
- In reality, there is not one means of engagement that will be optimal for all learners in all contexts; providing multiple options for engagement is essential.

Some suggested videos



- Affective responses operate on a broad continuum:

<https://www.youtube.com/watch?v=X0xEAD6ZnYM>

- Technology and engaging students:

<https://www.youtube.com/watch?v=0YmZptlP6E>

Guideline 7: Recruiting Interest



- **Spark excitement and curiosity for learning.**
- Information that is not attended to, that does not engage learners' cognition, is in fact inaccessible. It is inaccessible both in the moment and in the future, because relevant information goes unnoticed and unprocessed.
- As a result, teachers devote considerable effort to recruiting learner attention and engagement.
- But learners differ significantly in what attracts their attention and engages their interest. Even the same learner will differ over time and circumstance; their “interests” change as they develop and gain new knowledge and skills, as their biological environments change, and as they develop into self-determined adolescents and adults.
- It is, therefore, important to have alternative ways to recruit learner interest, ways that reflect the important inter- and intra-individual differences amongst learners.

Guideline 7 checkpoints



- **Checkpoint 7.1: Optimize individual choice and autonomy.**
 - Empower learners to take charge of their own learning.
- **Checkpoint 7.2: Optimize relevance, value, and authenticity.**
 - Connect learning to experiences that are meaningful and valuable.
- **Checkpoint 7.3: Minimize threats and distractions.**
 - Foster a safe space to learn and take risks.

Guideline 8: Sustaining Effort & Persistence



- **Tackle challenges with focus and determination.**
- Many kinds of learning, particularly the learning of skills and strategies, require sustained attention and effort. When motivated to do so, many learners can regulate their attention and affect in order to sustain the effort and concentration that such learning will require.
- However, learners differ considerably in their ability to self-regulate in this way. Their differences reflect disparities in their initial motivation, their capacity and skills for self-regulation, their susceptibility to contextual interference, and so forth.
- A key instructional goal is to build the individual skills in self-regulation and self-determination that will equalize such learning opportunities (see Self Regulation).
- In the meantime, the external environment must provide options that can equalize accessibility by supporting learners who differ in initial motivation, self-regulation skills, etc.

Guideline 8 checkpoints



- **Checkpoint 8.1: Heighten salience of goals and objectives.**
 - Set a vision for the goal and why it matters.
- **Checkpoint 8.2: Vary demands and resources to optimize challenge.**
 - Rise to high expectations using flexible tools and supports.
- **Checkpoint 8.3: Foster collaboration and community.**
 - Cultivate a community of learners.
- **Checkpoint 8.4: Increase mastery-oriented feedback.**
 - Guide learning by emphasizing the role of effort and process.

Guideline 9: Self Regulation (I)



- **Harness the power of emotions and motivation in learning.**
- While it is important to design the extrinsic environment so that it can support motivation and engagement, it is also important to develop learners' intrinsic abilities to regulate their own emotions and motivations.
- The ability to self-regulate—to strategically modulate one's emotional reactions or states in order to be more effective at coping and engaging with the environment—is a critical aspect of human development.
- While many individuals develop self-regulatory skills on their own, either by trial and error or by observing successful adults, many others have significant difficulties in developing these skills.
- Unfortunately some classrooms do not address these skills explicitly, leaving them as part of the “implicit” curriculum that is often inaccessible or invisible to many.

Guideline 9: Self Regulation (II)



- Those teachers and settings that address self-regulation explicitly will be most successful in applying the UDL principles through modeling and prompting in a variety of methods.
- As in other kinds of learning, individual differences are more likely than uniformity.
- A successful approach requires providing sufficient alternatives to support learners with very different aptitudes and prior experience to effectively manage their own engagement and affect.

Guideline 9 checkpoints



- **Checkpoint 9.1: Promote expectations and beliefs that optimize motivation.**
 - Set personal goals that inspire confidence and ownership of learning.
- **Checkpoint 9.2: Facilitate personal coping skills and strategies.**
 - Develop and manage healthy emotional responses and interactions.
- **Checkpoint 9.3: Develop self-assessment and reflection.**
 - Increase awareness around progress toward goals and how to learn from mistakes.

Some suggested videos



- Students understanding their strengths and challenges:

<https://www.youtube.com/watch?v=8-itUhxxovs>

- Modeling self-regulation:

<https://www.youtube.com/watch?v=akp3MuLax9I>

- Creating optimal learning environments:

https://www.youtube.com/watch?v=TZ_3MI5HU0k

- Determining strengths, needs, and preferences:

<https://www.youtube.com/watch?v=xjOQ4ANwg0I>

- Student self-monitoring:

<https://www.youtube.com/watch?v=nrLqOKoXV1Q>

Applying to practice



- The UDL Guidelines are not meant to be a “prescription” but a set of suggestions that can be applied to reduce barriers and maximize learning opportunities for all learners.
- They can be mixed and matched according to specific learning goals and can be applied to particular content areas and contexts.
- In many cases, educators find that they are already incorporating some aspects of these guidelines into their practice; however, barriers to the learning goal may still be present.
- The first step in applying the UDL framework to practice is to define a specific, challenging learning goal.
- Some guidelines may not be relevant to certain learning goals.
- The Guidelines are seen as a tool to support the development of a shared language in the design of goals, assessments, methods, and materials that lead to accessible, meaningful, and challenging learning experiences for all.

Some suggested videos



- UDL minimizes modifications for individual students:
<https://www.youtube.com/watch?v=XLxEE7VYaPE>
- UDL principles level the playing field without lowering standards:
<https://www.youtube.com/watch?v=Mwr4VrlzWbQ>
- A profound insight regarding the importance of tools and strategies in education:
<https://www.youtube.com/watch?v=engFSDRIFH4>
- Choosing a few Guidelines to incorporate into each lesson:
<https://www.youtube.com/watch?v=AmP3-9Ztx68>
- Aligning curriculum with students:
<https://www.youtube.com/watch?v=vRZjiKWyBmg>
- Taking a critical look at teaching practices through the UDL lens:
<https://www.youtube.com/watch?v=sNIFMHTb5i4>
- UDL and insights about teaching methods:
<https://www.youtube.com/watch?v=ZEFtsClzBIE>

In summary, UDL Guidelines...



- **The UDL Guidelines are a tool that can be used to design learning experiences that meet the needs of all learners.**
- These Guidelines offer a set of concrete suggestions for applying the UDL framework to practice and help ensure that all learners can access and participate in meaningful, challenging learning opportunities.
- The UDL Guidelines structure:
<https://www.youtube.com/watch?v=wVTm8vQRvNc>

- About Universal Design for Learning (UDL)
- UDL Guidelines
- Tools and tricks
- UDL Checklist Technology
- Practical issues

Some suggested videos



- Implementing Universal Design for Learning:
<https://www.youtube.com/watch?v=qm78ngldSZg>
- A simple way to apply the three UDL principles:
<https://www.youtube.com/watch?v=0J7-pWs16CA>

From Theory and Practice: UDL “Quick Tips” (I)



- Colorado State University (CSU) suggests several ideas to bring UDL from theory to practice
 - https://d25vtythmttl3o.cloudfront.net/uploads/sites/187/files/2016/08/udl_quick_tips02.pdf
- We summarize them on next table.

From Theory and Practice: UDL “Quick Tips” (II)



	Objectives and benchmarks	Instructional materials	Teaching methods	Assessment methods
Representation	Describe objectives in ways that are clear and specific	Provide options in the way information is presented	Provide options for building knowledge	Use assessments that accurately measure knowledge development
Expression	Describe objectives in ways that are measurable and achievable	Provide options for students to express what they know	Provide options for building skills	Use assessments that measure skill development
Engagement	Establish objectives that motivate students to learn	Provide options in the ways students can interact with instructional materials	Provide options for building motivation and engagement	Use assessments that accurately measure emotional (attitudinal) development

Universal Design: Places to start



- This wiki is maintained by Jay T. Dolmage, an associate professor of English at the University of Waterloo. It contains a variety of guides to integrating the principles of universal design into many aspects of college courses. Among the topics covered are the following:
 - Universal Design of Lectures and Presentations
 - Universal Design of Questions and Discussion
 - Universal Design of Group Work, Collaboration, and In-Class Activities
 - Universal Design of Large Assignments
 - Universal Design of Tests and Exams
 - Universal Design of Interaction One-on-One with Students
 - Universal Design in a Laboratory Setting
 - Universal Design General Suggestions
 - <http://universaldesignideas.pbworks.com/w/page/97590854/FrontPage>
- **Practice:** Take a look at it and see how you can apply it to your teaching.

Presentations and hearing loss: strategies for inclusiveness



- Tips and techniques for making a presentation without excluding people with hearing loss.
 - <https://www.boisestate.edu/accessibility/presentations-hearing-loss-strategies-inclusiveness/>
- **Practice:** Try it when presenting next practices.

Media and materials: Guidelines



- Developed and maintained by UDL on Campus by CAST, this resource provides guidelines for developing and using media and materials in accord with the principles of Universal Design for Learning, including such media and materials as video, audio, images, text, web conferencing, open educational resources, and ePubs (digital books).
 - http://udloncampus.cast.org/page/media_landing#.Vx-t3eaGOiw
- **Practice:** Take a look at it and discuss how you can apply it to your teaching.

- About Universal Design for Learning (UDL)
- UDL Guidelines
- Tools and tricks
- UDL Checklist Technology
- Practical issues

How do you teach?



- A checklist to determine how well your teaching methods align with the principles of Universal Design for Learning.
 - https://d25vtythmttl3o.cloudfront.net/uploads/sites/187/files/2015/07/how_do_you_teach_checklist.pdf
- **Practice:** Fill in it it and discuss about your results.

A checklist for inclusive teaching



- Produced by DO-IT (Disabilities, Opportunities, Internetworking, and Technology) at Washington State University, this checklist exchanged course design for the average student with course design for potential students who have broad ranges with respect to ability, disability, age, reading level, learning style, native language, race, and ethnicity.
 - <https://www.washington.edu/doit/equal-access-universal-design-instruction>
- **Practice:** Take a look at it and discuss how you can apply it to your teaching.

20 tips for teaching an accessible online course



- Covers both the design of course materials and instructional methods. Produced by DO-IT (Disabilities, Opportunities, Internetworking, and Technology) as part of the DO-IT AccessCyberlearning project.
 - <https://www.washington.edu/doit/20-tips-teaching-accessible-online-course>
- **Practice:** Take a look at it and discuss how you can apply it to your teaching.

- About Universal Design for Learning (UDL)
- UDL Guidelines
- Tools and tricks
- UDL Checklist Technology
- Practical issues

Key questions to consider when planning lessons



- Think about **how learners will engage with the lesson**.
 - Does the lesson provide options that can help all learners:
 - Regulate their own learning?
 - Sustain effort and motivation?
 - Engage and interest all learners?
- Think about **how information is presented to learners**.
 - Does the information provide options that help all learners:
 - Reach higher levels of comprehension and understanding?
 - Understand the symbols and expressions?
 - Perceive what needs to be learned?
- Think about **how learners are expected to act strategically and express themselves**.
 - Does the activity provide options that help all learners:
 - Act strategically?
 - Express themselves fluently?
 - Physically respond?

Some suggested videos (I)



- Thinking and teaching after UDL:
<https://www.youtube.com/watch?v=f8BcndY2Y0M>
- Lesson Planning Overview:
https://www.youtube.com/watch?v=UtVgS-U_n2Q
- Lesson planning and Goals:
<https://www.youtube.com/watch?v=oYEwu8rbHWM>
- Setting goals and lesson planning:
<https://www.youtube.com/watch?v=stCnD2zgckM>
- Multiple pathways to achieve the goal:
<https://www.youtube.com/watch?v=1S6FqjOxCPs>
- Multiple ways to teach to the goal:
<https://www.youtube.com/watch?v=Gck6hGVEzWA>

Some suggested videos (II)



- Developmentally appropriate goals:
https://www.youtube.com/watch?v=wIYIU__fYI4
- Lesson planning and Assessment:
<https://www.youtube.com/watch?v=CgstZcutmm4>
- Summative and formative assessments:
<https://www.youtube.com/watch?v=4sVreR-HWjM>
- Evaluations to help students plan learning goals:
<https://www.youtube.com/watch?v=WSKveCSTMSA>
- Ways to assess students:
<https://www.youtube.com/watch?v=8bWT4m8GaLU>
- The five parts of an assessment important when designing for construct relevance:
https://youtu.be/nU3IV_vLp1I

Some suggested videos (III)



- Planning assessments:
<https://www.youtube.com/watch?v=cBXhZFqxfpo>
- Using UDL Guidelines to check instructional methods:
<https://www.youtube.com/watch?v=Rh8CgPhW9-U>
- Lesson planning and Materials:
<https://www.youtube.com/watch?v=D9fpAZZ-9s0>
- Materials and student choice:
<https://www.youtube.com/watch?v=pOwv8XSOWoU>

References



- The UDL Guidelines. <https://udlguidelines.cast.org/>
- Clusive: Center on Inclusive Software for Learning. <https://clusive.cast.org/>
- Accessibility/UDL: Guides, Instructions, Checklists, and Tools.
<https://www.boisestate.edu/ctl/inclusive-excellence/guides-instructions-checklists-and-tools/>

Thank you for your attention



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Universal Design for Learning (UDL)

Nestor Garay-Vitoria, Associate Professor

March 06, 2023



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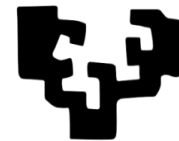
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Barrier Walkthrough Method

Myriam Arrue, Associate Professor

Training Event Donostia-San Sebastián March 6-10, 2023



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Barrier Walkthrough Method

Defined by Dr. Giorgio Brajnik in 2011

Associate Professor

University of Udine (Italy)

Adaptation of heuristic walkthrough
method for usability

Objective: fill the gap concerning
of web accessibility evaluation

- Research shows that users face to accessibility barriers even though web pages conforms to accessibility guidelines/standards.
- Main reasons:
 - Conformance testing is difficult to apply correctly
 - User testing may detect accessibility-in-use barriers but is complex
- Barrier Walkthrough Method adapts the heuristic walkthrough method used for usability investigations.
 - Principles are replaced by barriers.
- A **barrier** is any condition that hinders the user's progress towards achievement of a goal. It is described by:
 - the category of user and the type of disability
 - the type of assistive technology being used
 - the failure mode, that is the activity/task that is hindered and how it is hindered, and
 - which features in the page raise the barrier.

Method:

1. to define the relevant **user categories**
2. to define the relevant **goals**, and hence the relevant pages to be tested and the relevant **scenarios** to be considered
3. to cross **check relevant barriers** with the selected pages, and
4. to determine the **severity** of each barrier.

User categories:

- Blind persons
- Low-vision users
- Deaf users
- Color-blind users
- Motor impaired users
- Cognitive disabilities
- Users of browsers where JavaScript is disabled
- Users with Photosensitive Epilepsy
- Search engines

User goals:

- many possible user goals
- the most frequently feature/sought information
- the most valuable information
- select some of the tasks (i.e. paths)
- the shortest route, requiring less knowledge

Method:

1. to define the relevant **user categories**
2. to define the relevant **goals**, and hence the relevant pages to be tested and the relevant **scenarios** to be considered
3. to cross **check relevant barriers** with the selected pages, and
4. to determine the **severity** of each barrier.

Barriers:

List grouped by user categories

Severity:

Estimated based on the **impact** of the barrier on:
Effectiveness, productivity, satisfaction, security

And **persistence**

Scale 1-3

[BarrierWalkthroughMethod](https://www.ptuk.edu.ps/projects/edu4all/)

Impact	Persistence	Severity
1	1/2	Minor
2	1/2	Significant
1/3	3	Critical
3	1/3	Critical

Procedure

1. first, all evaluators should **agree on the user categories** to consider and on the **scenarios**
2. each evaluator should **explore those pages and get familiar** with possible goals and interaction mechanisms of the site
3. **each evaluator** independently from the other ones, should cross all pages with all barriers, and **rate severity of each barrier**
4. eventually, **the evaluators meet** once more and merge their problems into a single list, and assign to each problem **a single severity score**.

Task

In groups of 3, apply the Barrier Walkthrough Method to some web pages of your institution (e.g., website of your department, personal website, course website, degree website, etc.)

1. **Agree on the user categories** to consider and on the **scenarios** (e.g., searching for certain information, enrolling to a course... think about the possible paths)
2. Each one in the group should **explore those pages and get familiar** with possible goals and interaction mechanisms of the site
3. Each one in the group independently from the other ones, should cross all pages with all barriers, and **rate severity of each barrier** (using the corresponding sheet)
4. Finally, merge the findings into a single list, and assign to each problem **a single severity score**.
5. **Upload the results to the online course and get ready to present your results.**



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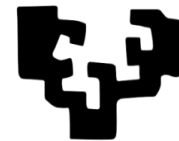
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Accessible .docx and .pdf documents & .ppt presentations

Myriam Arrue, Associate Professor

Training Event Donostia-San Sebastián March 6-10, 2023



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Accessible .docx and .pdf

General accessibility concepts in .docx and .pdf
Practical exercises

Accessible .ppt presentations

General accessibility concepts in .ppt
Practical exercises

- **General** recommendations:
 - Include an index with the structure of the document.
 - Use of clear and simple language.
 - Include a glossary, whenever necessary, especially for large documents.
 - Explanation of the abbreviations, the first time they appear, and include them in the corresponding glossary.
- Recommendations for improving the **readability** of the text:
 - Left Alignment (Not Justified)
 - Line spacing 1.5
 - Space between paragraphs: 1.5 the space between lines
 - Use sans serif font (eg Verdana)

- **Accessibility** issues:

Specify the **primary language** of the document.

Mark **language changes** in the text.

Minimum **color contrast** 4.5:1. Maximum contrast white and black

Information available with and **without color**

Links inserted as hyperlinks and with meaningful text on its own

Use **styles** and header structure markup

Respect the consistency of the **information structure**:

Styles are assigned hierarchically according to levels: Heading 1, Heading 2, Heading 3

At least there must always be a "Title 1"

Levels cannot be skipped. For example, from "Heading 1" to "Heading 3"

There cannot be headings without textual content (for example a "Heading 2" style line break)

- **Accessibility** issues:

ALWAYS check the consistency of the header structure with
“navigation map”

Heading styles are NOT USED to highlight content.

Task 1

1. Download the NOT accesible document from the online course (Not Accesible Document).
2. Check the document and correct the issues commented in these slides.

- .. **More Accessibility** issues:

Enumerated or not enumerated **lists** must be created through the tool designed for it and never through tabs or spaces.

Lists must be **nested** correctly.

Use header markers in **tables**.

- Activate “Repeat as header row on each page”

- Disable “Allow split rows between pages”

- only the first row be marked as header rows

Complex tables require **additional accessibility measures** (association between data cells and header cells) that cannot be done directly from Word and would imply post-editing of the PDF document.

- Restructure **complex tables** to convert them into simple tables or divide them into several simple tables (only the first row of headers) if you want to avoid later editing the PDF document.

- .. **More Accessibility** issues:

Align **images and objects** with the text.

Include **alt text** (for non-text elements)

All **images and figures** in the document must have an alternative (even if this is empty in the case of decorative images).

It is considered a decorative image when it does not provide relevant information for understanding the context.

Task 2

1. Check the document and correct the issues commented in these slides.
2. Save the new version of document.

Task 3

In groups of 3, apply the presented techniques for improving the accessibility of any material you have in .docx document.

1. **Agree on the material** to be improved.
2. Each one in the group should **review the general recommendation** for creating documents **and check** them in the selected document.
3. Each one in the group should **review the accessibility issues** to be considered for creating documents **and check** them in the selected document.
4. Finally, merge the findings and **correct** the document.
5. **Upload the before/after documents to the online course and get ready to present your work.**

- **From .docx to .pdf:**

It is the best way to get an accessible .pdf document if the .docs document is accessible

Issues to take into considerations (options when generating .pdf):

Check “Create bookmarks”, to generate the PDF bookmarks.

Choose the "Headings" option if the document headings are going to be used to generate the bookmarks (most common option).

Check to include "Document properties", so that the properties of the Word document are also included in the PDF document.

Choose “Document structure tags for accessibility”.

Task 4

1. Generate two versions of .pdf document based on the accessible example .docx document with checked options and without checked options.
2. Compare both .pdf documents (check properties of both documents)

- **Is a .pdf document generated from an accessible .docx document accessible?**

Task 5

1. Check the accessibility of the generated .pdf (the one with tags)

- **There are certain characteristics of the PDF document that are not defined during the PDF generation process:**

Language of the document (*File - Properties*)

Language changes (*Tags - Properties*)

Title (*File – Properties – Description – Initial View – Window Options - Show – Document Title*)

Labels for forms

Verify reading order (*Navigation bar – Order, Read aloud*)

Accessible security (*Document Properties - Allow screen readers*)

Task 6

1. Correct the accessibility issues in the example .pdf document.
2. Check the accessibility.

- **Checking the accessibility of .pdf documents**

Step 1. Does document have text?

Try selecting text using a mouse, or select all text using Edit > “Select All” from the Acrobat menu.

Step 2. Is document tagged?

Go to File Properties. In the bottom left corner of the Document Properties dialog, see the “Tagged PDF” field.

Step 3. Check for any lingering errors.

Run the accessibility checker that is built in to Acrobat Pro. Select Tools > Accessibility > “Full Check” then read the report and follow the prompts.

Task 7

1. Check the accessibility issues in the example syllabusScanned.pdf document.
2. Try to correct the accessibility issues.

1. Convert to text.
2. Create tags/bookmarks.
3. Correct other accessibility issues.

[Guidelines to create and verify accesibility of pdf documents.](https://www.ptuk.edu.ps/projects/edu4all/)

Task 8

In groups of 3, apply the presented techniques for generating the accessible .pdf document from the .docx document elaborated in Task 3.

1. Generate the .pdf document based on the accessible .docx document.
2. Each one in the group should **check the accessibility of the document.**
4. Merge the findings and **correct** the document.
5. **Upload the before/after documents to the online course and get ready to present your work.**

- **General** accessibility recommendations:

identify document language

use headings

use lists

use meaningful hyperlinks

add alternate text for images

use simple tables

use sans serif font

use high contrast background/font

- **Accessibility** issues:

1. Use built-in slide templates

Built-in slide layout templates are designed with accessibility in mind. Avoid selecting a blank slide and adding text boxes as these elements may not be recognized by assistive technology, and reading order will be compromised. Instead, select the drop-down “New Slide” option from the Home tab and choose a layout that best fits.

2. Use unique slide titles

People who use a screen reader skim slide titles to navigate; they can quickly scan through a list of slide titles and go right to the slide they want. Using unique slide titles allows users to clearly understand which slide they are on. Avoid using the same title for slides that have spill-over information, consider including additional information such as ‘Slide Title 1 of 2’.

- **Accessibility** issues:

3. Set reading order of slide contents

Screen readers can read the elements of a slide in the order they were added, this may be very different from the order in which things appear visually on screen. To make sure everyone reads the contents in the order you intend, it is important to check the reading order by using the Selection Pane. To do this, from the Home tab select the “Arrange” drop-down and click on “Selection Pane...” From this new window, you can drag elements to adjust the reading order of the contents on the slide. The reading order in the Selection Pane should be arranged from the bottom up, the title should be at the very bottom with subsequent content moving upward.

- **Accessibility** issues:

4. Links

Since PowerPoint is meant to be a visual medium but also functions as a document archive, the best practice would be to include a smart link within the body of the text and also include the non-linked text of the URL. In this way, the smart link is searchable by screen reader users, and the URL can be referred to during the live presentation for folks to follow.

- **Accessibility** issues:

5. Alt text and grouped images

As always, make sure images include alt text. PowerPoint has the ability to group multiple images into a single, flat image. This allows the user to assign alt-text to a group of related images rather than assigning alt-text to each image element. To group images, select all of the items you would like to group by holding the Control key for Windows or the Command key for Mac, and click on each item. From the Graphics Format tab, click on the Group drop-down menu and select 'Group.' This will flatten the image and allow the user to assign alt-text to the group image.

- **Accessibility** issues:

6. Tables

Use tables to represent tabular data and not for layout purposes

Do not use nested tables, split cells, merge cells

Define header rows in the table properties

(Design - Table Style Options - tick Header Row)

Consider contrast issues

[Guidelines for accessible .ppt presentations](#)

Task 9

1. Check the accessibility issues in the example “NOT accessible presentation”.
2. Try to correct the accessibility issues.

Task 10

In groups of 3, apply the presented techniques for generating an accessible .ppt document.

1. Select one .ppt of your own material in the group to make it accessible. (e.g., slides in [Kurose computer networking slides](#))
2. Each one in the group should **check the accessibility of the presentation.**
4. Merge the findings and **correct** the slides.
5. **Upload the before/after presentations to the online course and get ready to present your work.**



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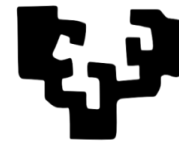
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Edu4ALL

Making charts and sheets more accessible

Xabier Gardeazabal, Research Assistant

March 07th, 2023



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- Motivation

- General guidelines

- Colours

- Tables & spreadsheets

- File formats

- Motivation

- General guidelines

- Colours

- Tables & spreadsheets

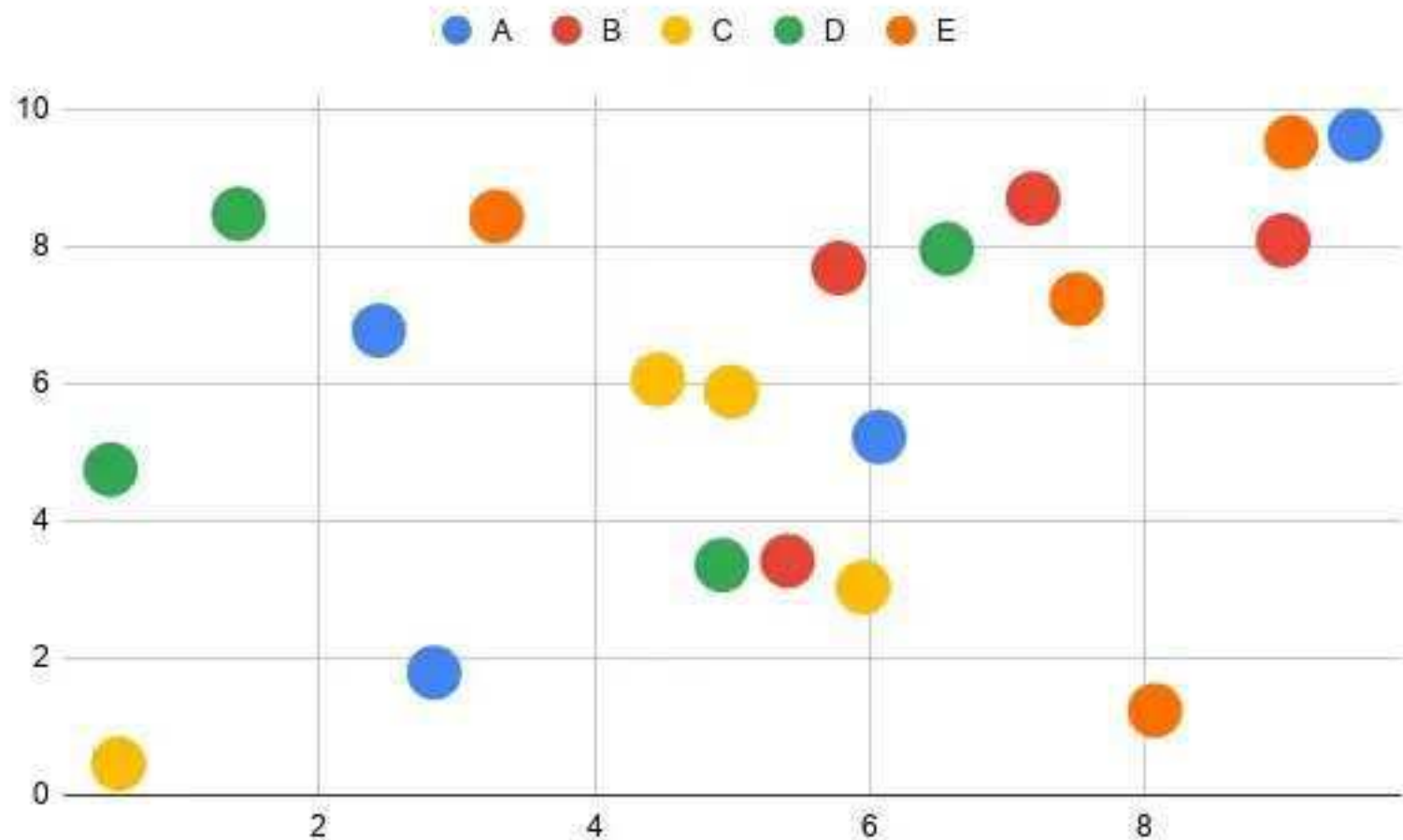
- File formats



Why care to make charts & figures accessible?

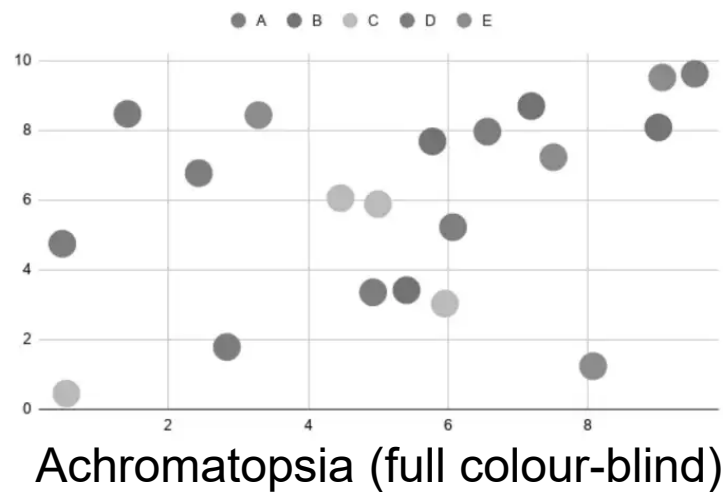
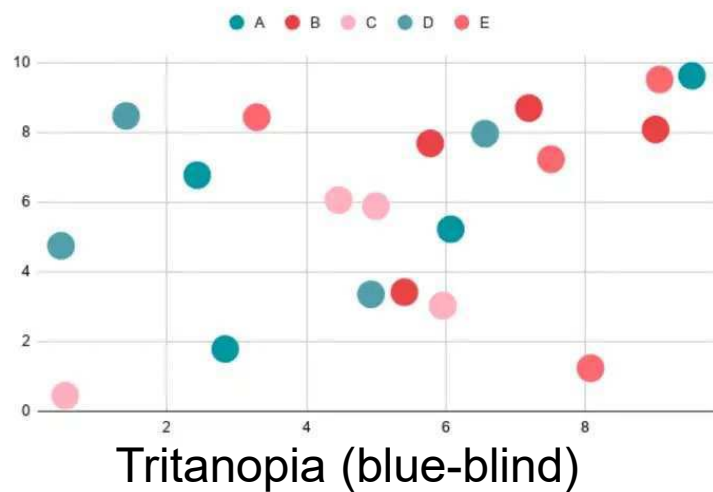
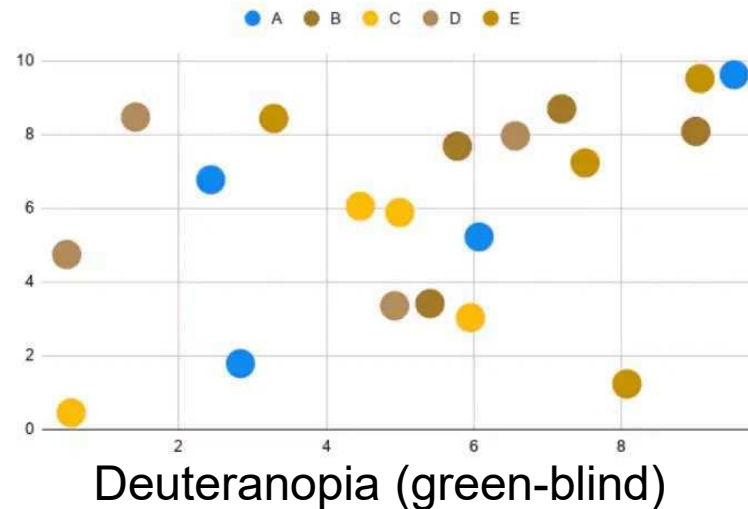
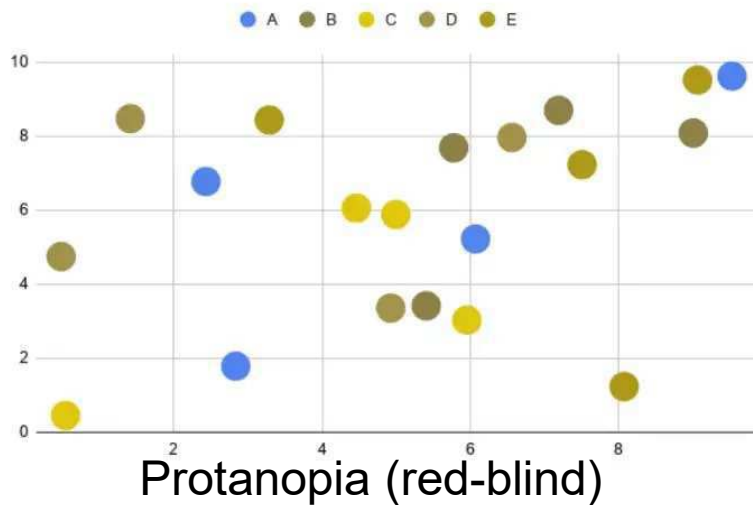


- A seemingly normal chart may be incomprehensible for colourblind people





Why care to make charts & figures accessible? (2)



Motivation: Why care to make accessible data visualisations?



- *“The cost and effort required to make accessible [whatever] is too expensive and/or time consuming, just for the benefit of a handful of people”.*

— An accessibility denier

- Well, if empathy alone does not make it for you, I got news for you...
- It is NOT just a few people that would benefit from more accessible [anything]
 - Indeed, in the long run, you will also need accessible [something], sooner or later
 - You are (most provably) benefitting from accessible [something] already, you fool!
- Colourblind people are not the only having problems interpreting plotted data:
 - The ability to see colour also decreases with age
 - Black-and-white printing or sunlight shining on a device screen
 - Charts clogged with too many data variables become unreadable
 - Text becomes indistinguishable due to low resolution or small print
- Remember that whether something is disabling or not depends on the situation, environment, technology, etc. **We're ALL disabled at some point.**
 - It is important to support permanently disabled people, but it is also important to remember that accessibility helps us all!

JPEG compression is no joke



This accessibility issue affects everyone, even you!



- Motivation

- General guidelines

- Colours

- Tables & spreadsheets

- File Formats

General guidelines to make charts and figures accessible



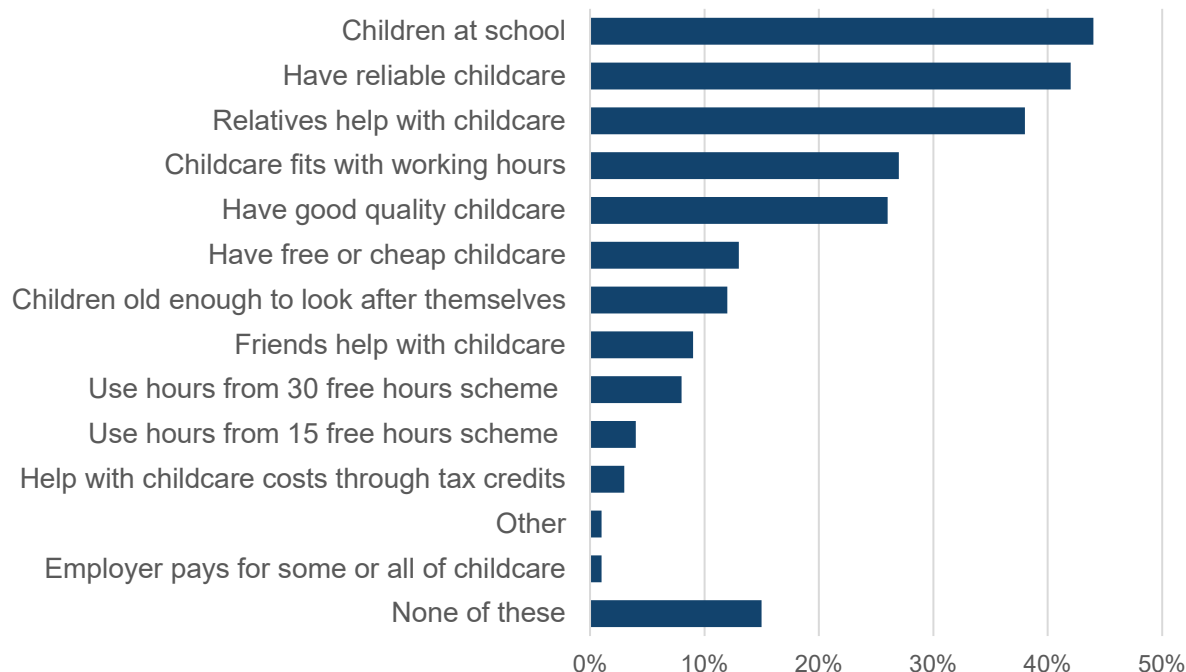
- Use clear and descriptive titles
- Provide detailed and concise alternative text descriptions
- Use direct labelling of data (instead of a legend)
- Use white space to help distinguish elements of your visualisation
- Use colour-blind safe and contrasting colours
- Avoid using colour as the sole means of conveying information
- Make the chart keyboard accessible (if possible)
- Show data tables alongside charts or provide links to download it
- Test with assistive technologies (screen readers)

How can you keep up with so many details? (and, the devil is in the details)



Develop a critical thinking habit with your audience's ease of access in mind

Figure 1: Percentage of mothers of children aged 0 to 14 in paid work who stated the listed childcare arrangement helped them go to work, England, 2021



How would you describe this chart over the phone?

School is the most commonly stated childcare arrangement that helps mothers work



Is this a good alternative text?

Suggested alternative text:

The most commonly stated childcare arrangement that helped mothers go to work was children being at school (44% stated this).

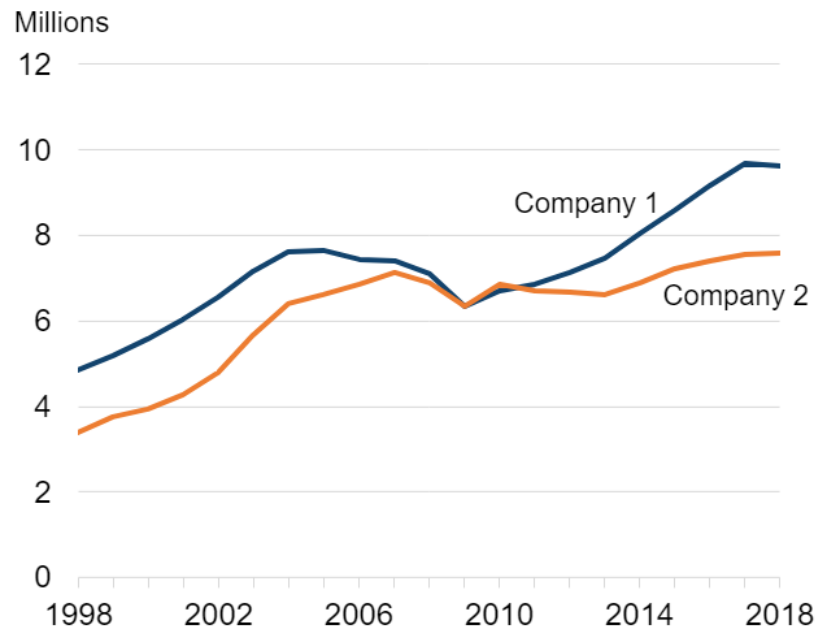
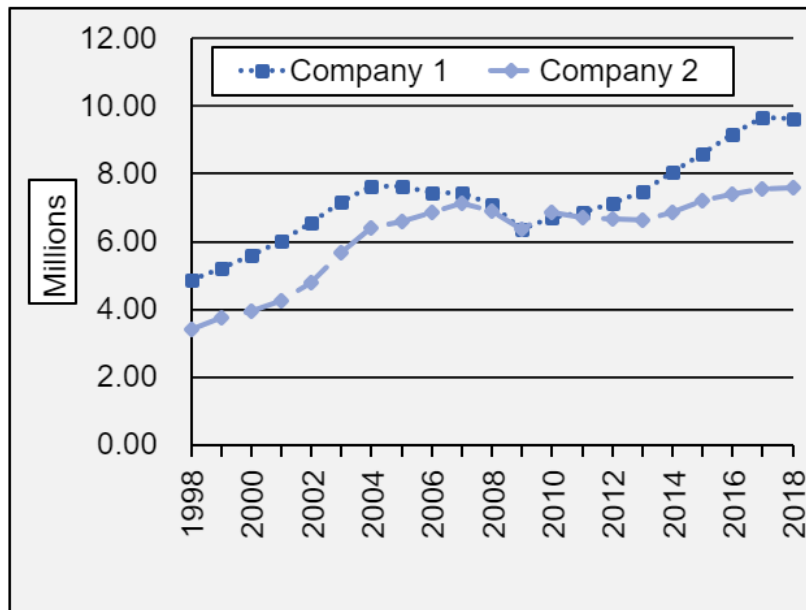
Having reliable childcare or relatives to help were also popular (42% and 38% respectively).

Using hours from the 30 hours free childcare scheme was stated by 8%, while 4% stated using the 15 free hours scheme.

The least common arrangement was employer pays for some or all childcare (1%).



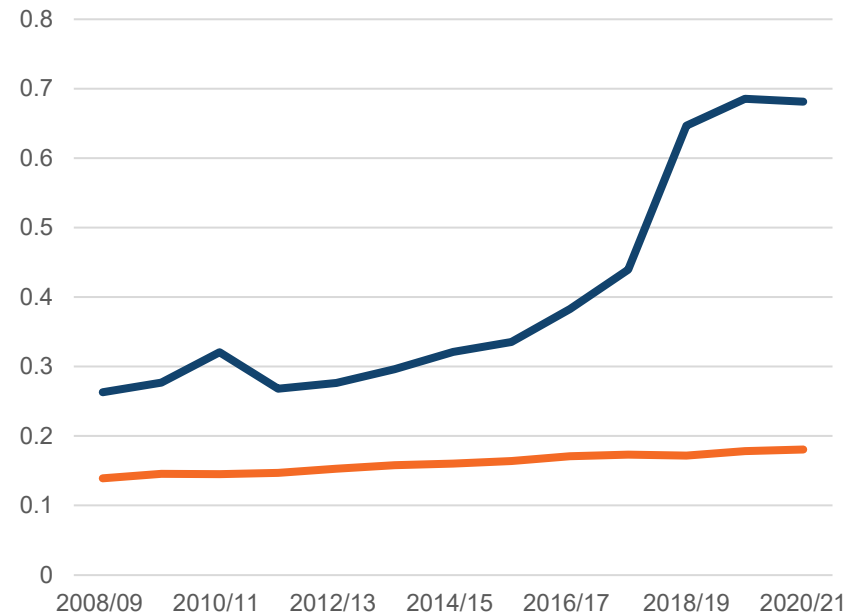
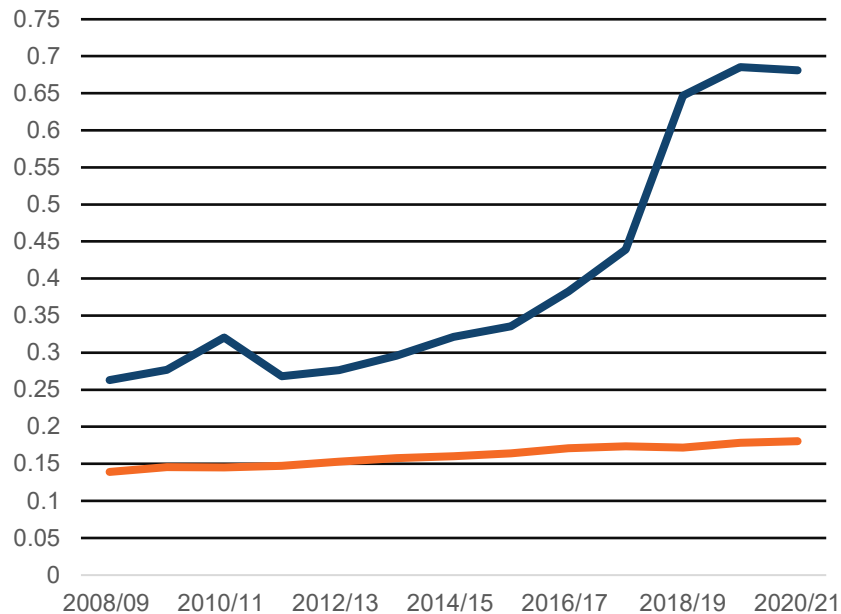
Keep it simple: Less is more!



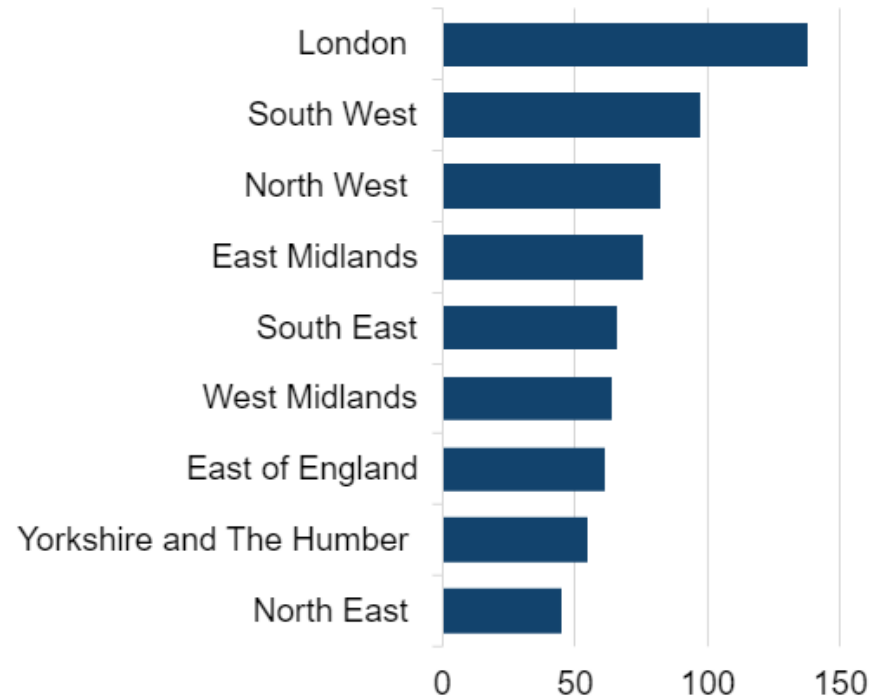
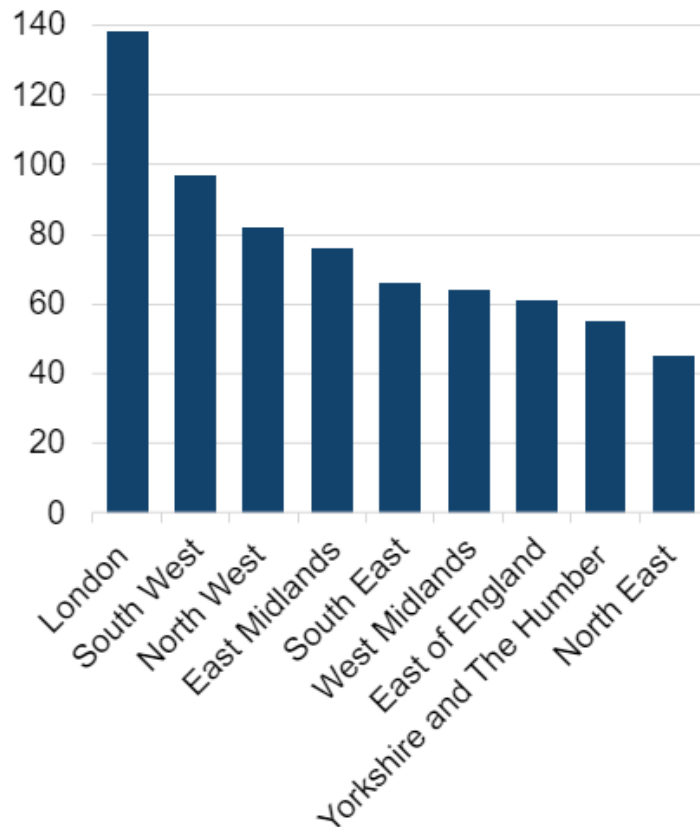
Keep it simple: Less is more! (2)



- Don't use too many gridlines and keep them a light grey colour.
 - Low contrasting grey is OK in these cases as the gridlines are not entirely necessary, just useful



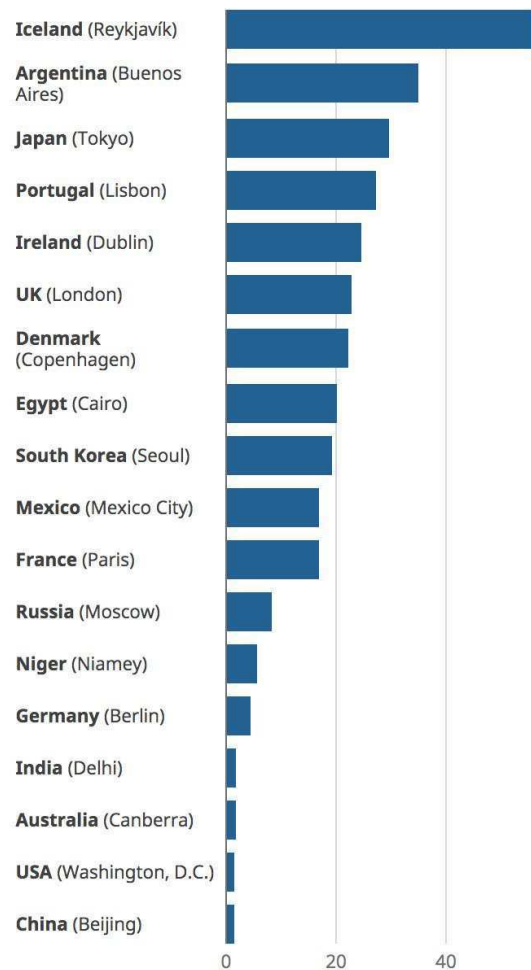
Text at an angle is hard to read



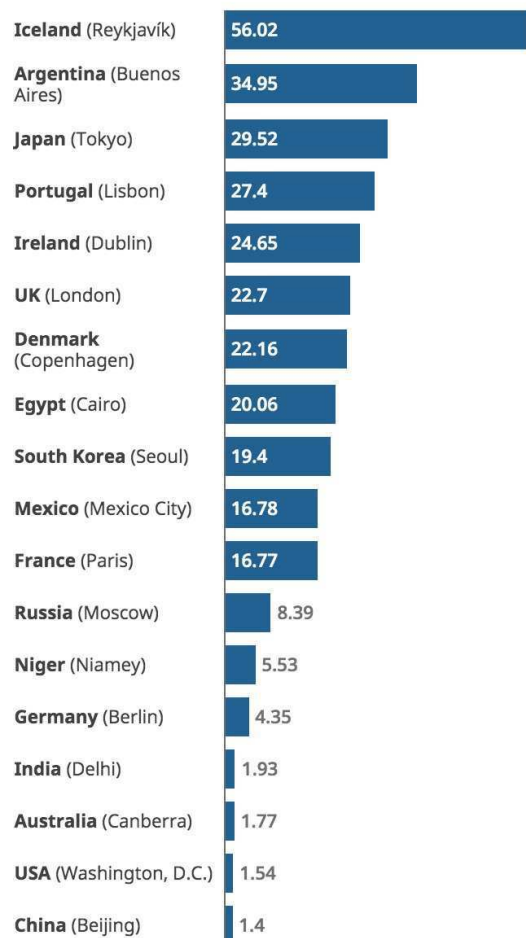
Where would you put value labels?



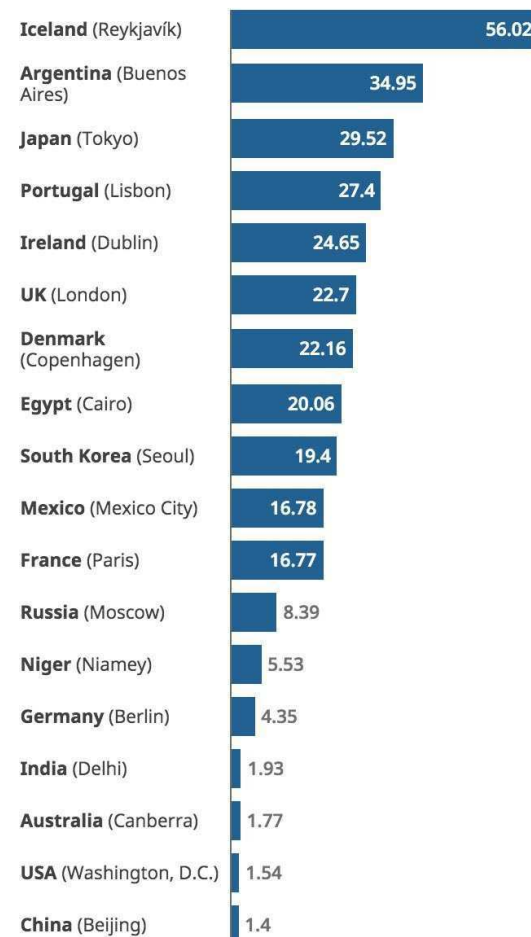
Share of population that lives in the capital, in urban areas and in rural areas, of selected countries, 2014.



Share of population that lives in the capital, in urban areas and in rural areas, of selected countries, 2014.



Share of population that lives in the capital, in urban areas and in rural areas, of selected countries, 2014.



- Motivation

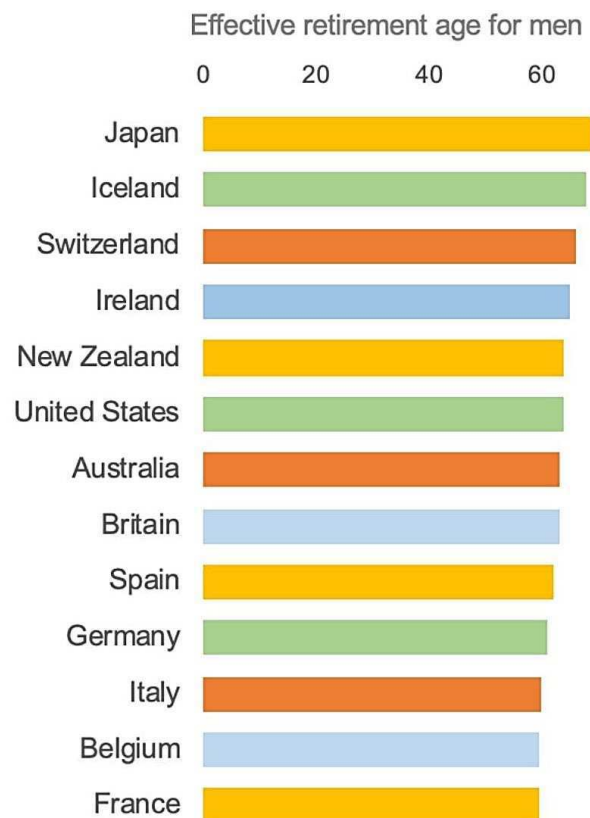
- General guidelines

- Colours

- Tables & spreadsheets

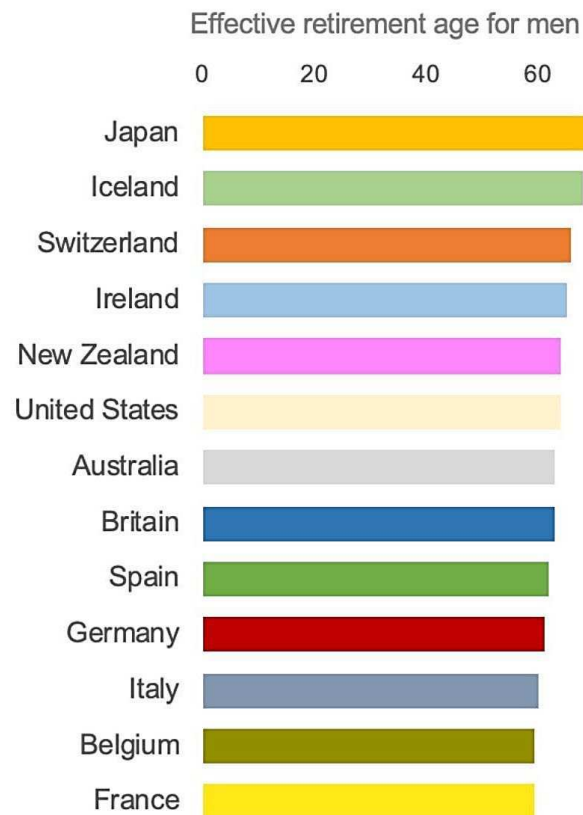
- File formats

Meaningless colours



Data: The Economist, 26 Nov 2005.

Too many colours (still meaningless)



Data: The Economist, 26 Nov 2005.

What to consider when using colour in charts



- Consider low vision and colour blindness
- Use a plain background (never use an image as a background)
- Limit the number of colours you use
 - Do you really need all those colours? Do they make your message clearer?
- Use colour consistently
 - If you have a series of charts, assign the same colour to the same variable in each chart
- Consider colour contrast ratios (and meet the minimum WCAG 2.1 recommendation)
- Avoid colours with pre-existing meaning
 - Green, Yellow and Red are potentially problematic when used in cases where the colour's job is to simply provide distinction against others around it
 - Take advantage of colour associations to things (blue=water, green=grass)
 - Remember that colours can also have cultural associations that vary across cultures

Recommendations for inclusive colour sequences

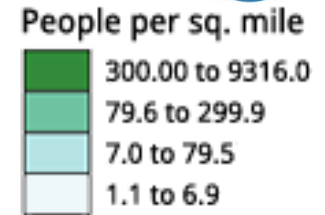


- Limit the number of data series you show
 - Tip: hide or combine several less relevant data series into one
- Use a predictable colour sequence (and be consistent)
- Follow the WCAG 2.1 recommendations for contrast:
 - Text must have at least a 4.5 to 1 contrast ratio with its background
 - All adjacent colours in graphics need at least a 3 to 1 contrast ratio
 - Colour is not the only visual means of communicating information
 - Understanding the content does not only rely only shape, colour and size
- Use simulators of colour blindness and discard the indistinguishable colours
- Choose a colour-sequence to maximise contrast across all adjacent data-series
 - Colours that are adjacent to each other need to be discernible for people with colour blindness (in addition to the text-to-background colour contrast)

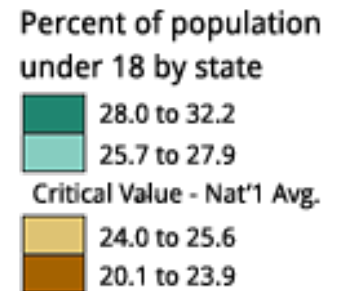
Types of colour schemes for data visualisation



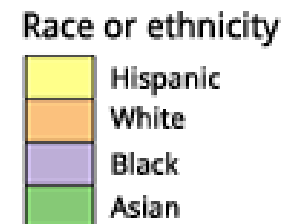
- **Sequential schemes** are suited to ordered data that progress from low to high. Lightness steps dominate the look of these schemes, with light colours for low data values and dark colours for high data values.



- **Diverging schemes** put equal emphasis on mid-range critical values and extremes at both ends of the data range. The critical class or break in the middle of the legend is emphasised with light colours and low and high extremes are emphasised with dark colours that have contrasting hues.



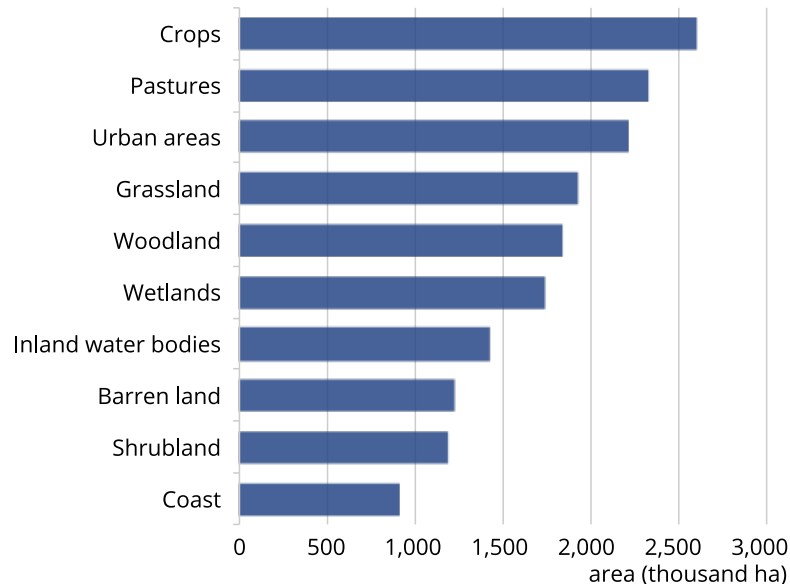
- **Qualitative schemes** do not imply magnitude differences between legend classes, and hues are used to create the primary visual differences between classes. Qualitative schemes are best suited to representing nominal or categorical data (those that are unrelated to one another).
 - REMEMBER: don't rely on different colours unless necessary.
 - Otherwise, try to group (if possible) similar categorical data by using different shades of the same colour.



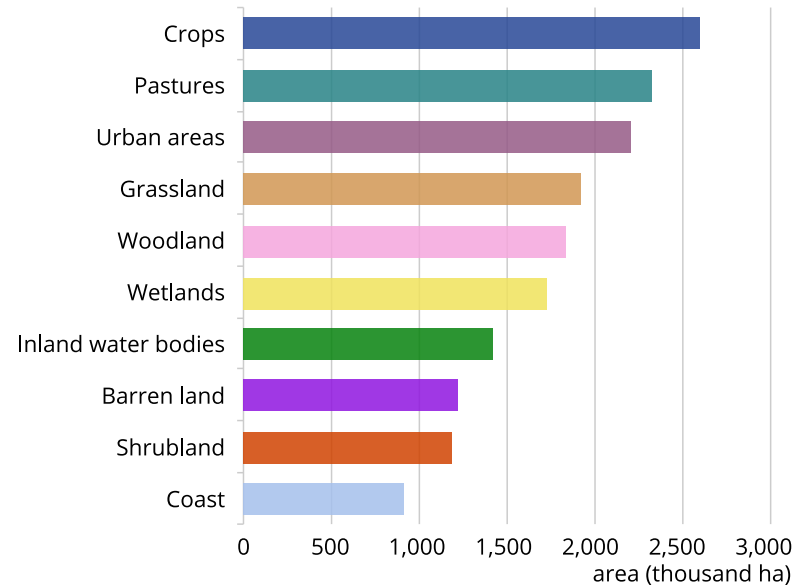
Using colour in bar charts



- Example of how to use colour for categorical data that **cannot** be grouped



Good

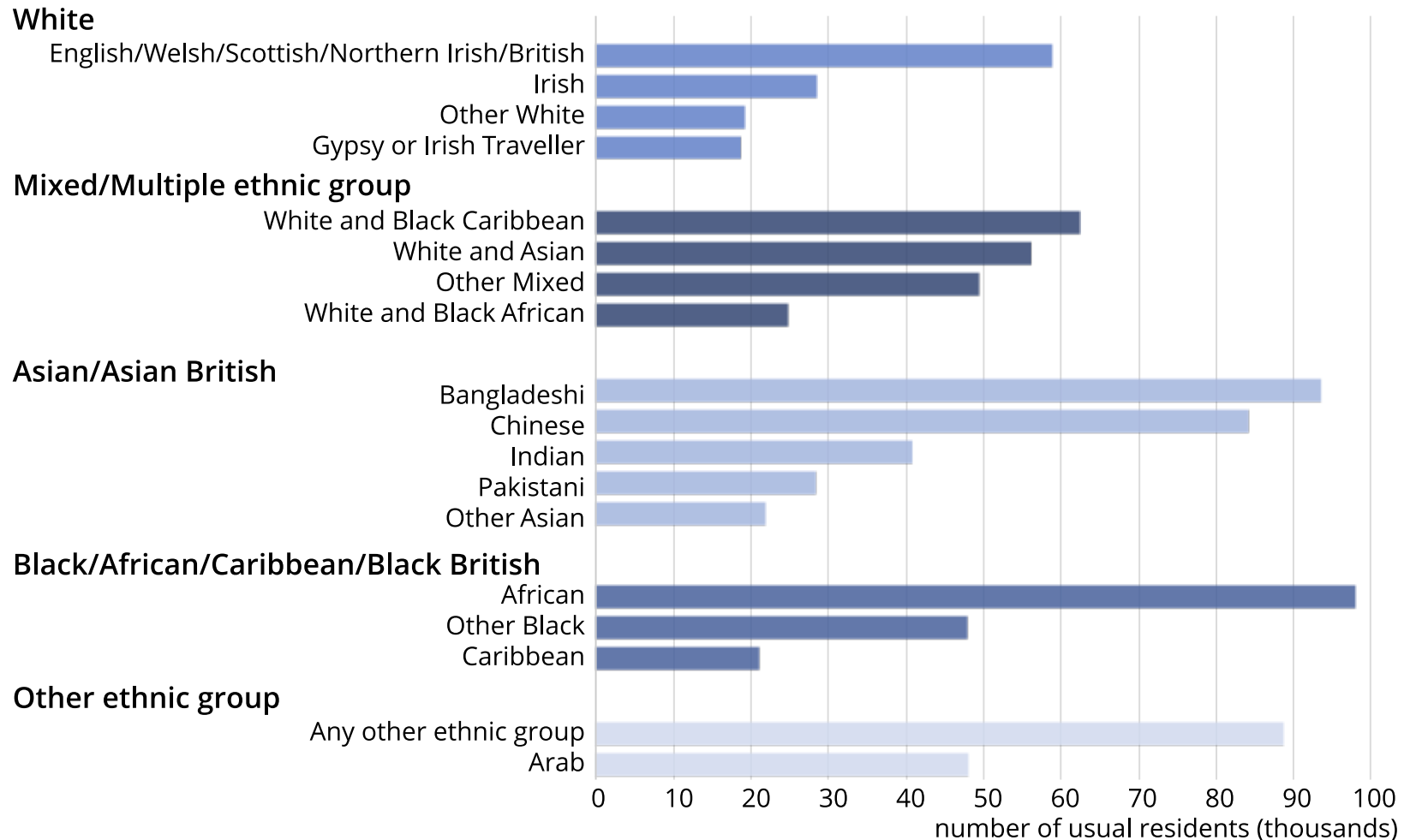


Bad

Using colour in bar charts (2)



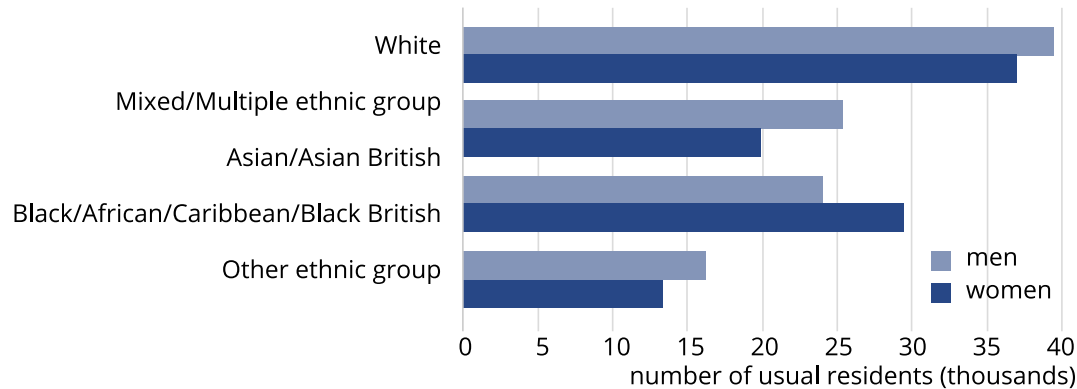
- Example of how to use colour for categorical data that can be grouped



Using colour in bar charts (3)



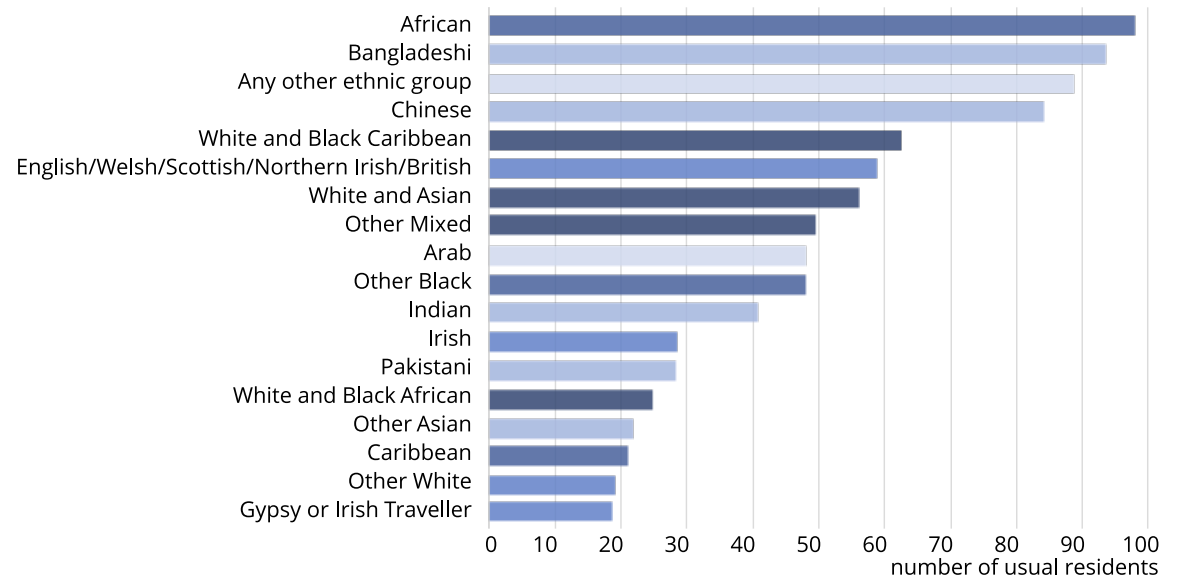
- Example of how to use colour for categorical data that **can** be grouped



Use colour when sub-categories are common across broad categories to show secondary relationships in the data.

Good

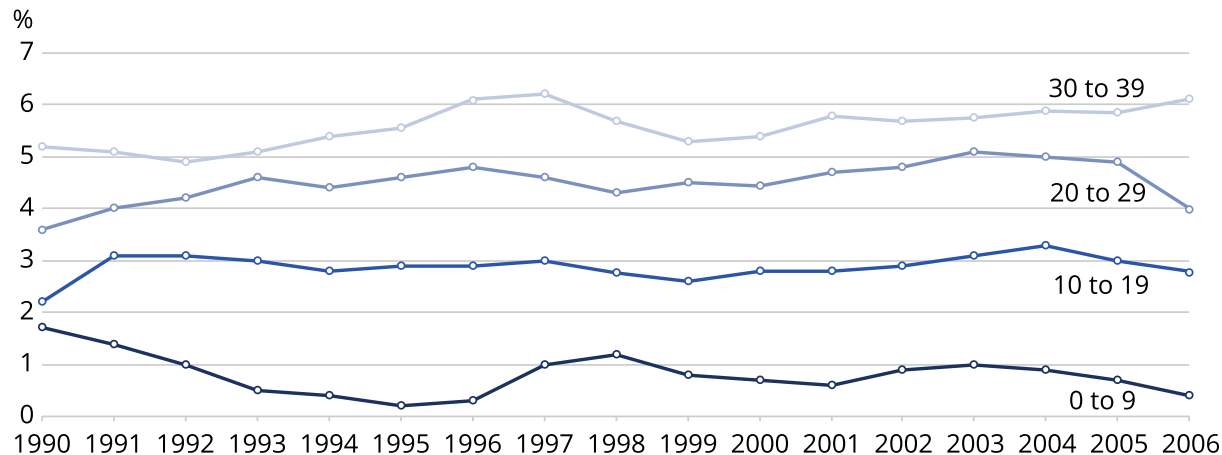
Bad



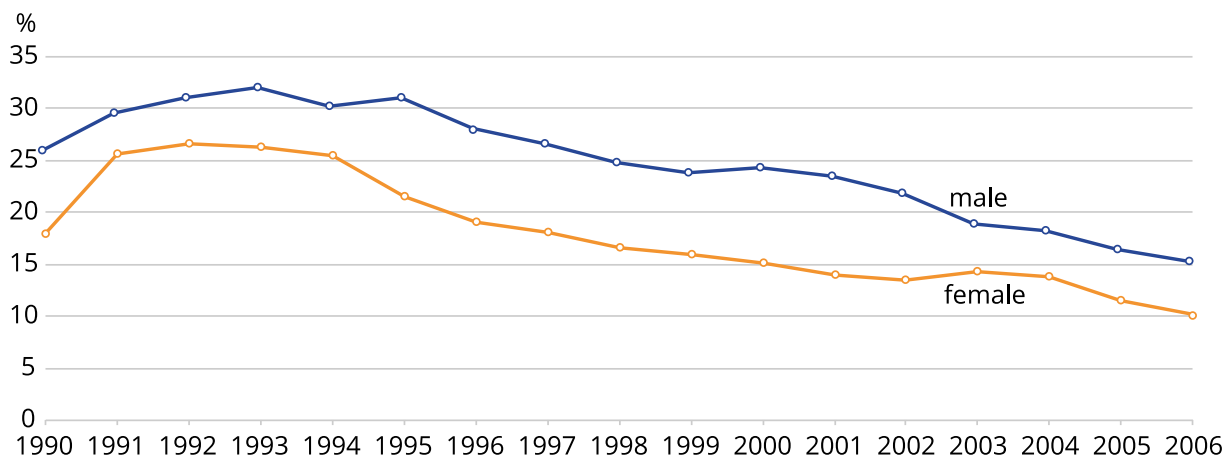
Using colour in line charts



- If the data has an implied order, for example, age ranges, use different shades of one colour, or colours with different luminance values, but the same hue and saturation.



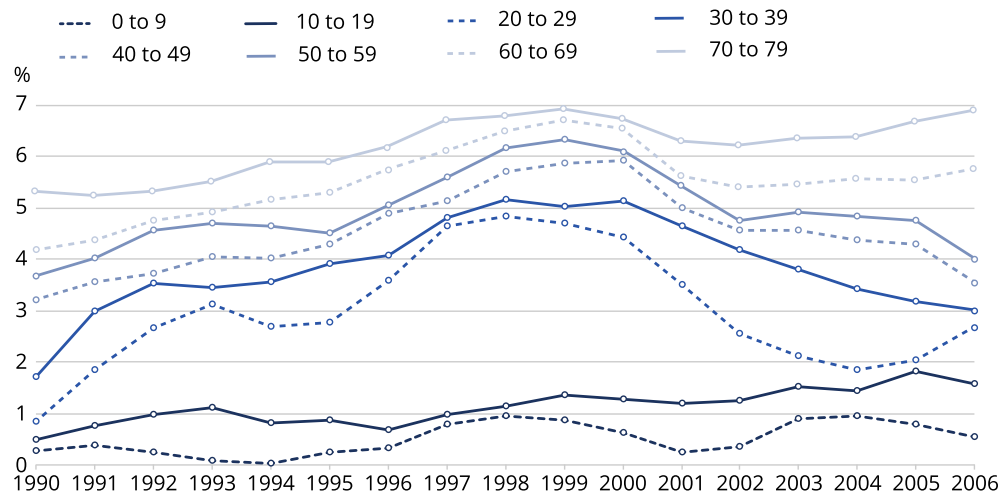
- If the data has no implied order, for example, male and female, different colours (hues) can be used.



Using colour and texture/patterns in line charts

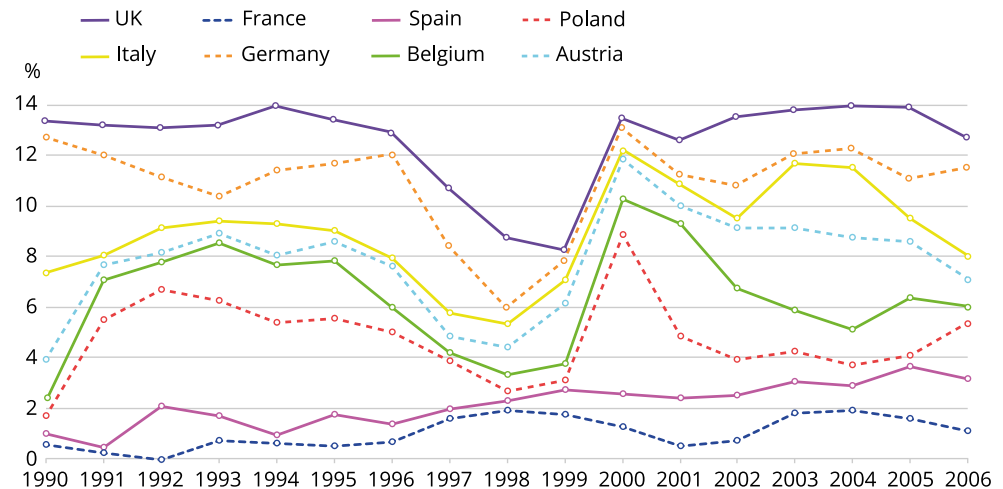


- Try to avoid using more than four shades of one colour on a line chart without using another mechanism to differentiate between them



Example of chart where data categories can be ordered

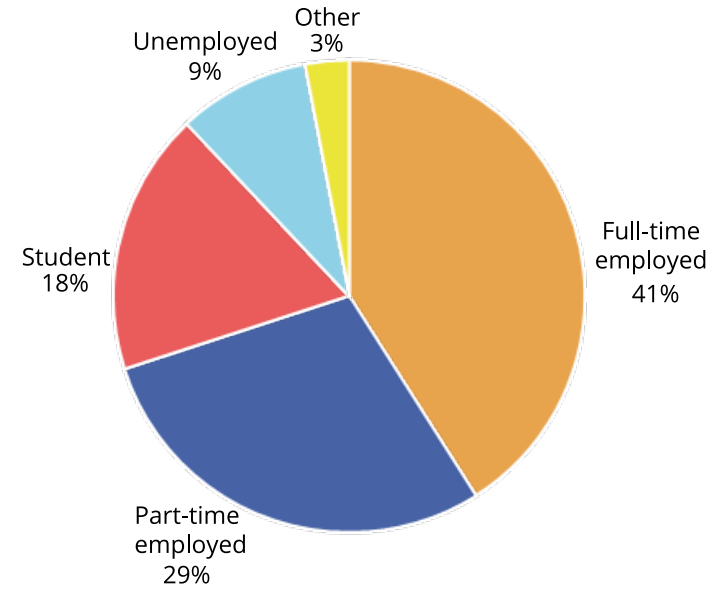
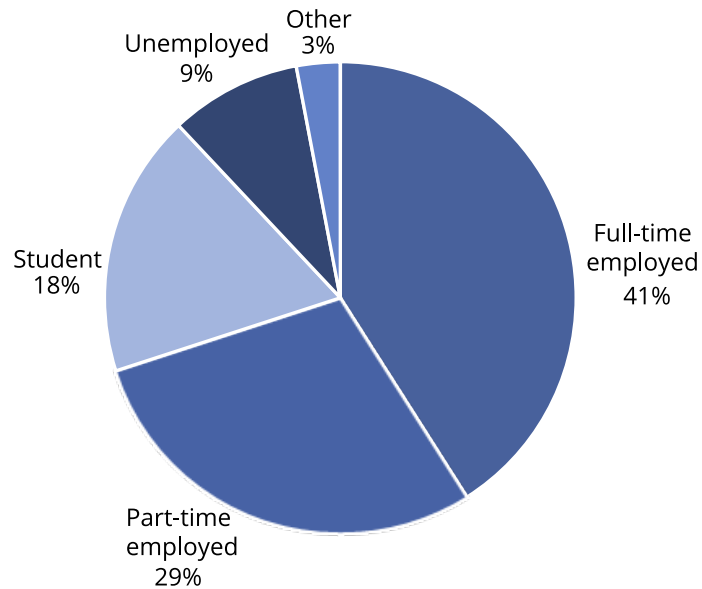
Example of chart where data categories cannot be ordered



Using colour in pie charts



- Different shades of one colour, or colours with different luminance values, or different colours (hues) can be used in pie charts.



What meaning colours are associated with

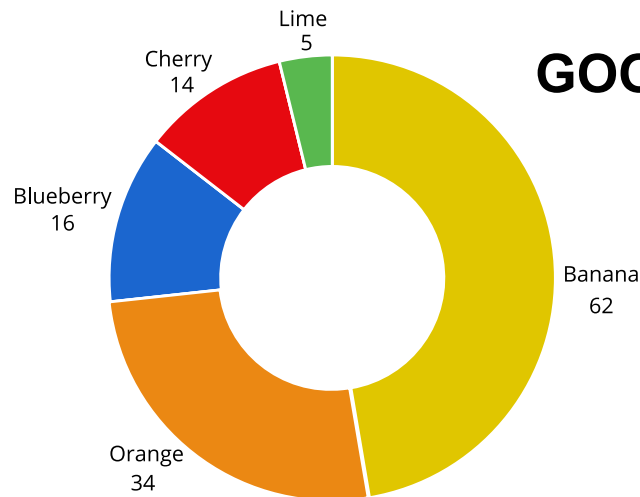


- Certain colours have different meaning associated with them
- This meaning may vary dependent on context, culture, etc.

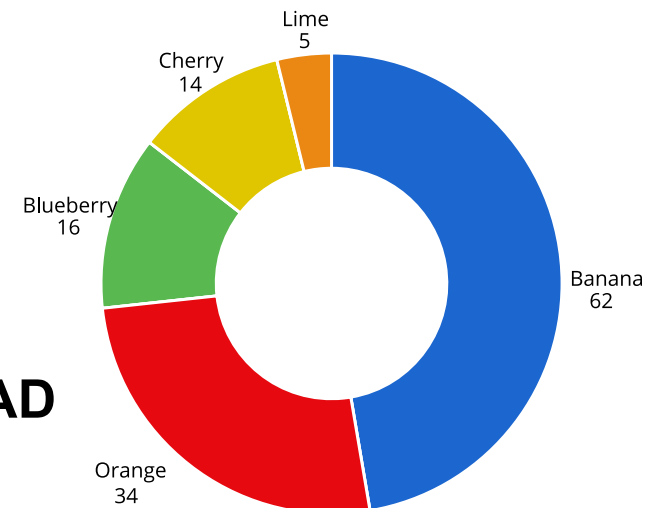
For example:

- red: caution, anger, love, negative (in finance), hot
- orange: warm, autumn
- yellow: happy, fun, young
- green: nature, calm, good luck, positive (in finance)
- blue: stability, professional, cold, trust, intelligence
- purple: wealth, mystical, decadent
- brown: rustic, practical, warm, vintage
- white: sterile, innocence, peace, truth, cleanliness
- black: sophistication, death, night, contemporary
- multi-colour: international, all inclusive, multicultural

GOOD



BAD

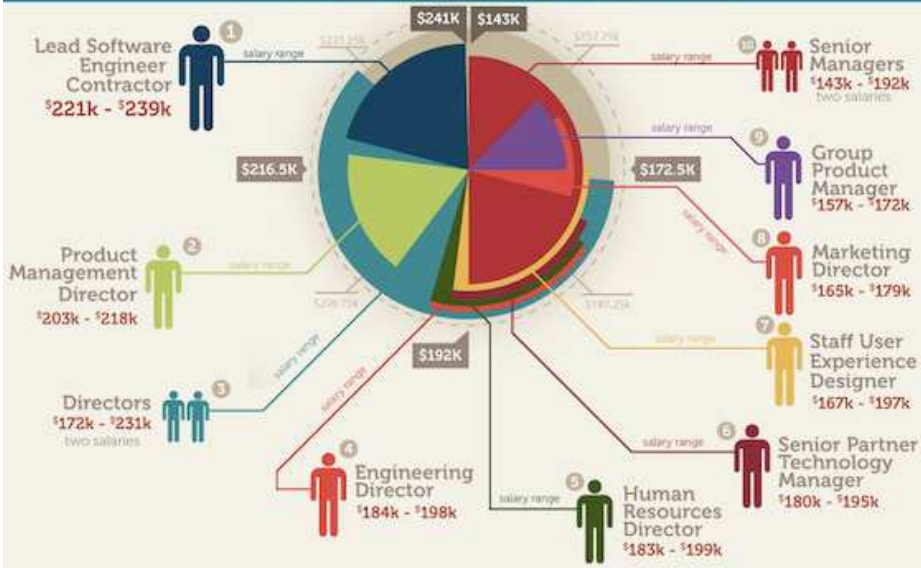


Speaking of pie charts... avoid them if possible

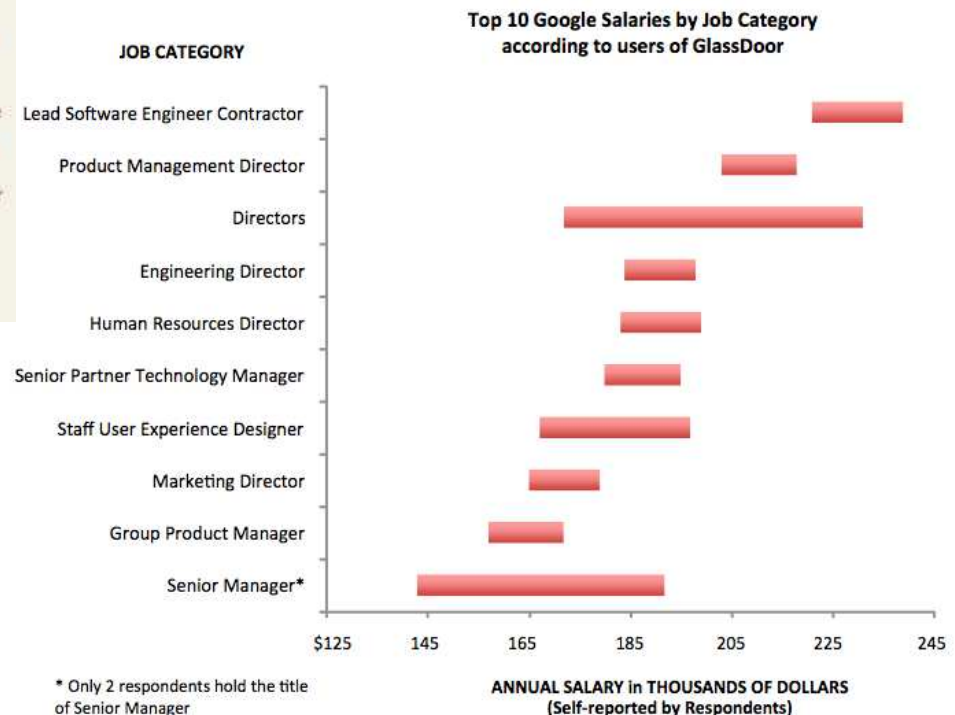


top 10 salaries at Google™

RANGE FROM \$143,000 TO \$241,000 PER YEAR.



It's amazing how much extra stuff (colours, text, shapes, lines, labels, etc.) is needed when you use pie charts.



Colourblind-friendly palettes and palette generators



- David Nichols' "**Coloring for Colorblindness**" guide
 - <https://davidmathlogic.com/colorblind>
- **Color Brewer**: color advice for cartography data visualisation
 - <https://colorbrewer2.org>
- **Sussex Colour Contrast Cards**
 - http://www.sussex.ac.uk/tel/resource/tel_website/accessiblecontrast
- **Sasha Trubetskoy's palette**
 - <https://sashamaps.net/docs/resources/20-colors/>

Tools for creating accessible palettes:

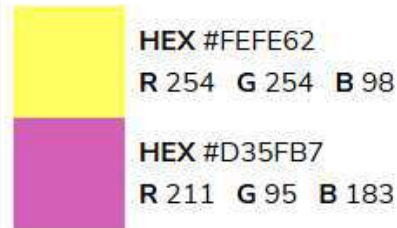
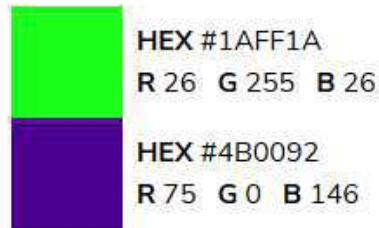
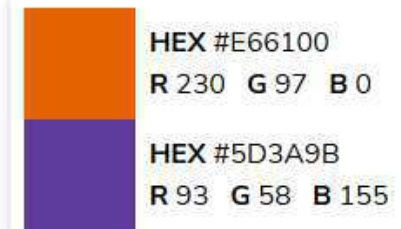
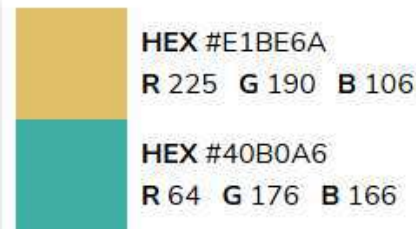
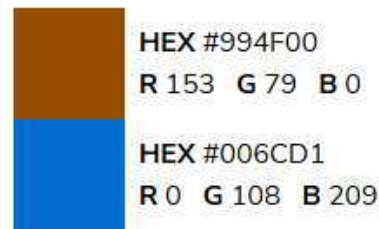
- **Chroma.js Color Palette Helper**: <https://www.vis4.net/palettes/>
- **Adobe Color Accessibility Tools**: <https://color.adobe.com/create/color-accessibility>
- **i want hue**: <https://medialab.github.io/iwanthue/>

Accessible colour palettes



- Here are 8 pairs of contrasting colours which maintain their contrast for people who are colourblind.

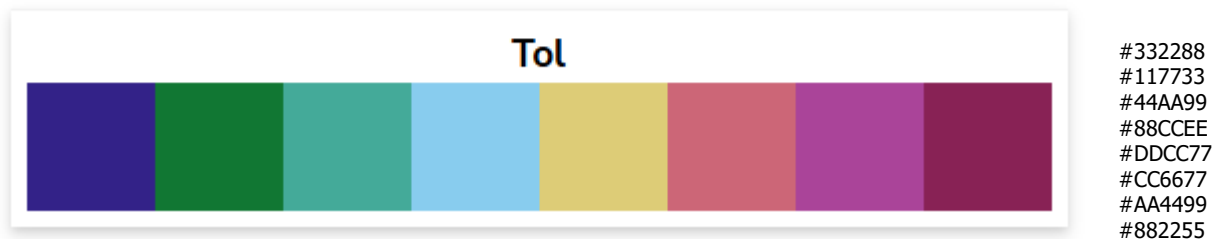
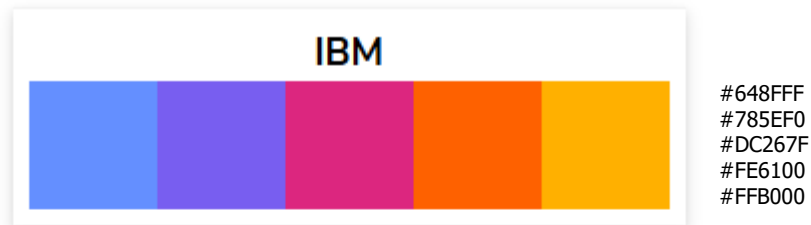
Source: <https://davidmathlogic.com/colorblind>



Accessible colour palettes (2)



- A number of colour palettes have been developed with the intention of being accessible to people who are colourblind. Three of them appear below, from the [IBM Design Library](#), [Bang Wong](#), and [Paul Tol](#) respectively.



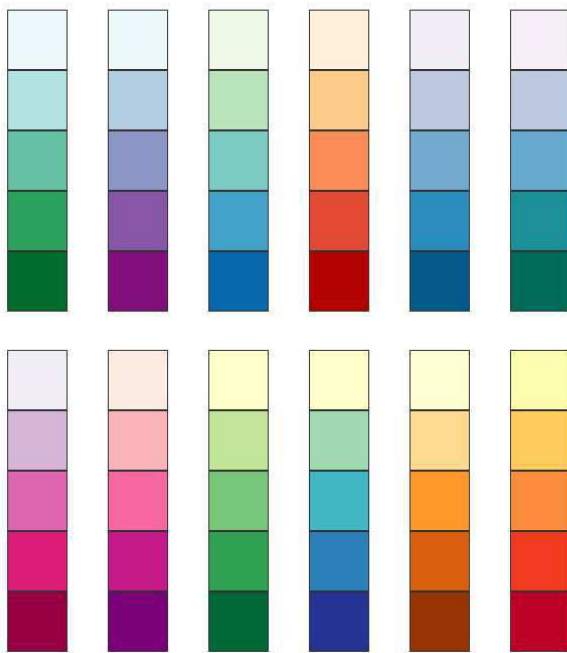
Demo: Color Brewer



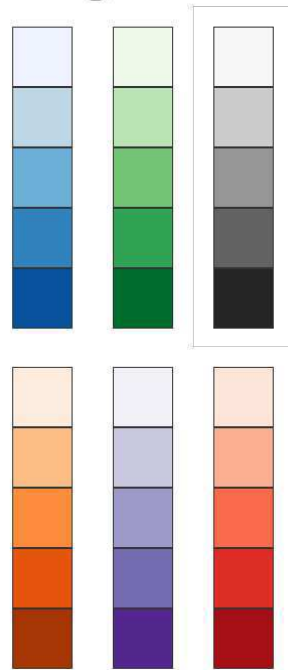
- Example palettes by Color Brewer

Sequential data

Multi-hue:



Single hue:



Diverging data



Qualitative data

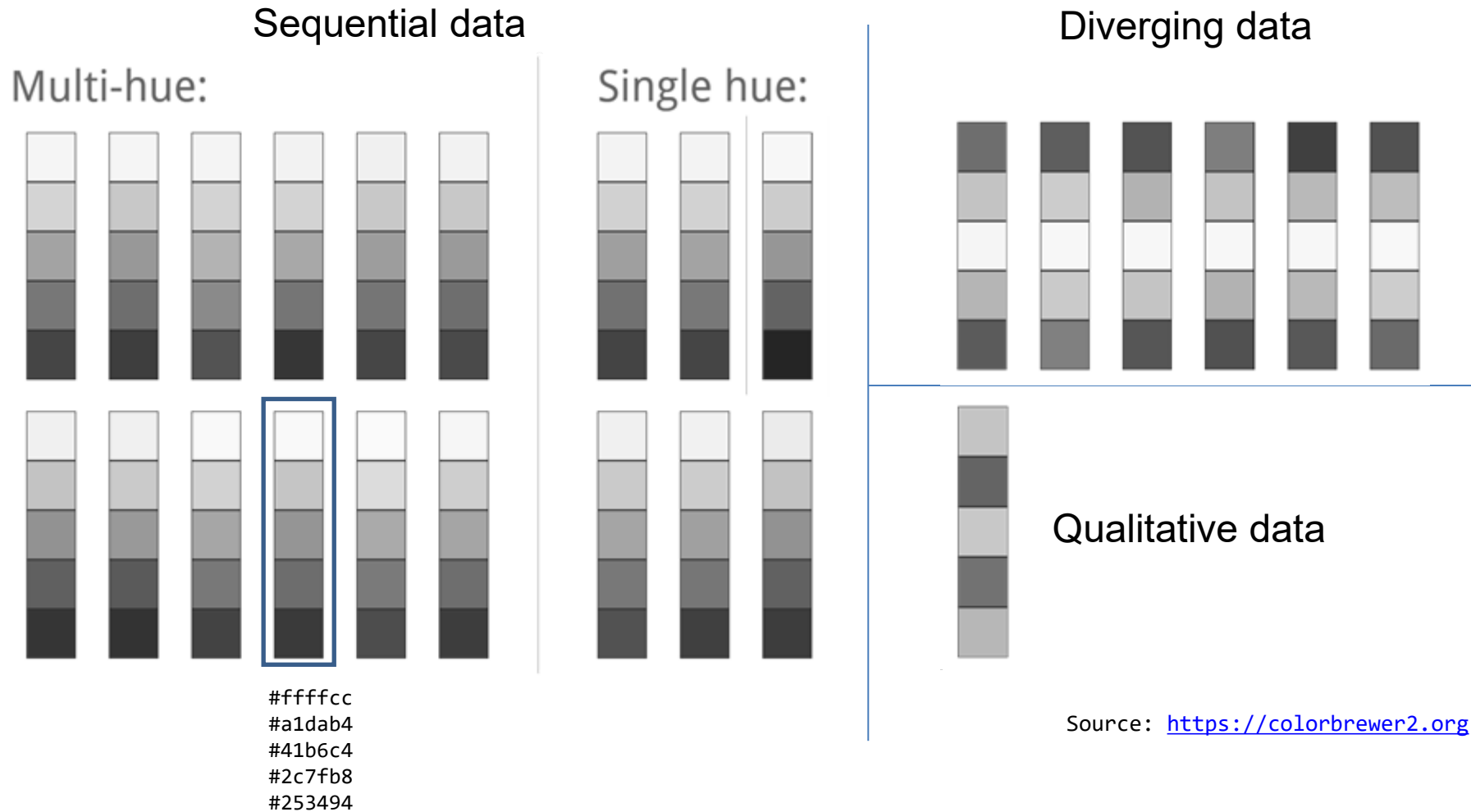


Source: <https://colorbrewer2.org>

Demo: Color Brewer (2)



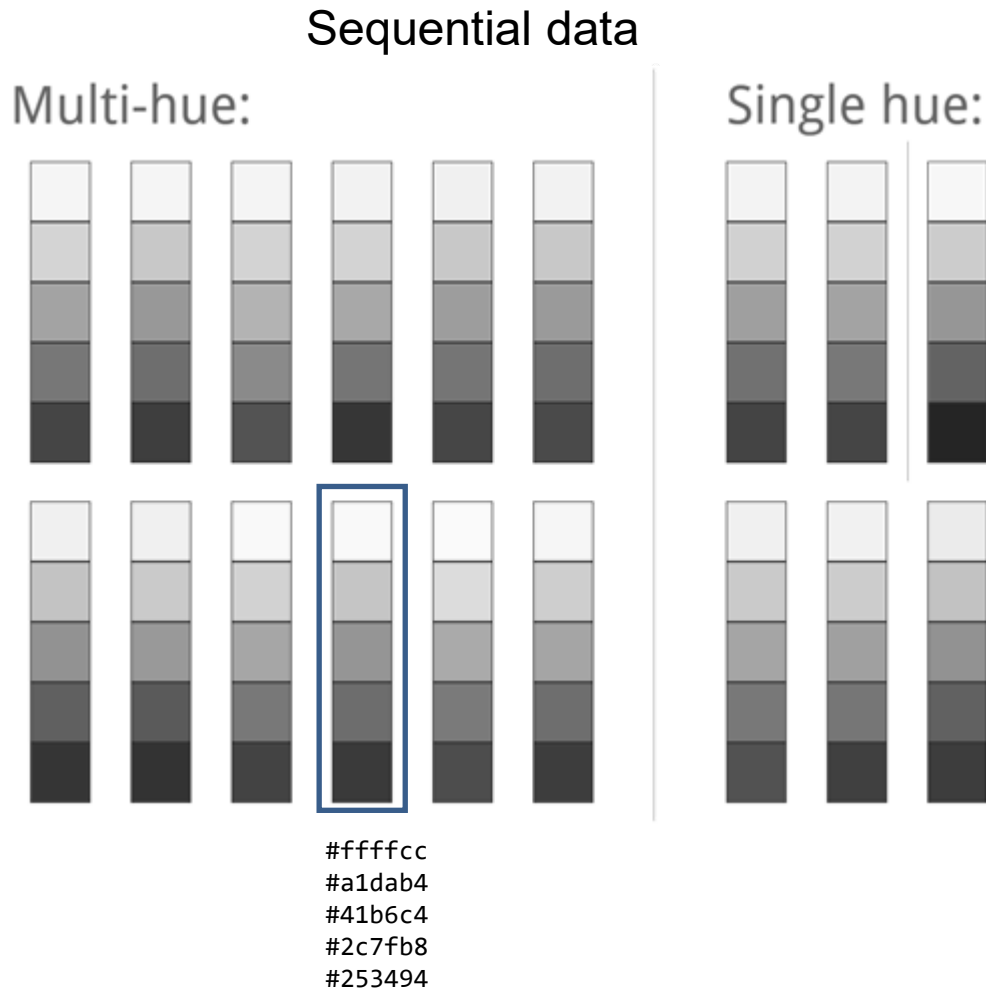
- Example palettes by Color Brewer: which palette yields more accessibility?



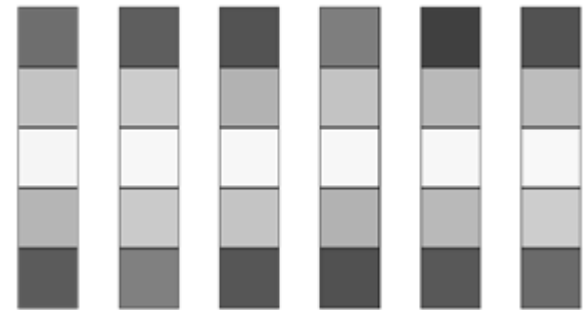
Demo: Color Brewer (3)



- Example palettes by Color Brewer:



Diverging data

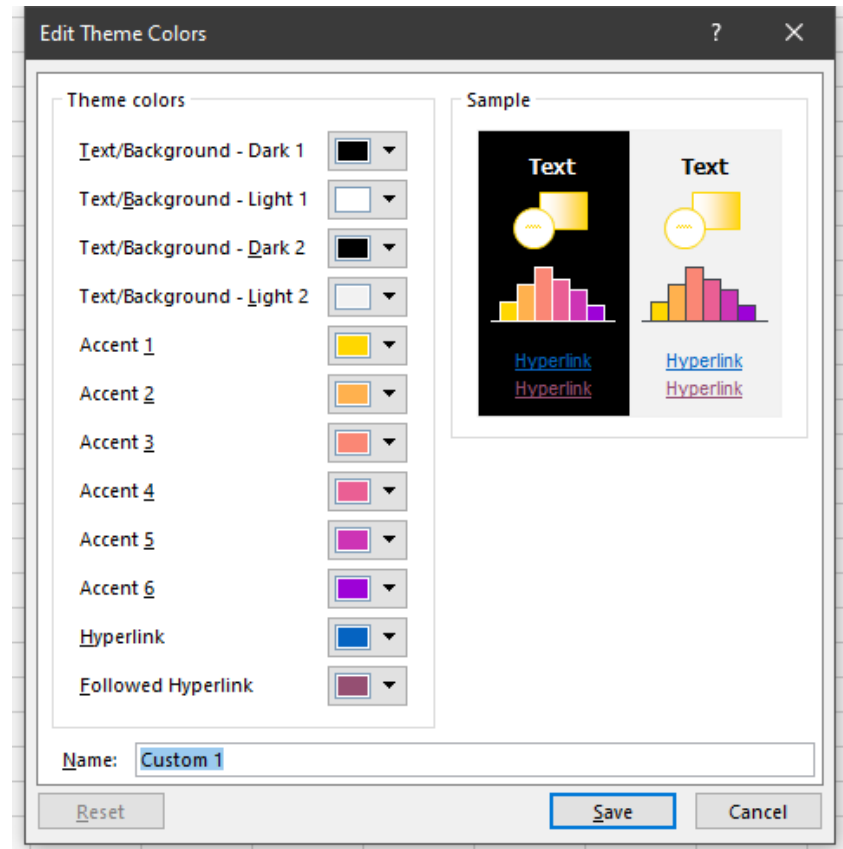
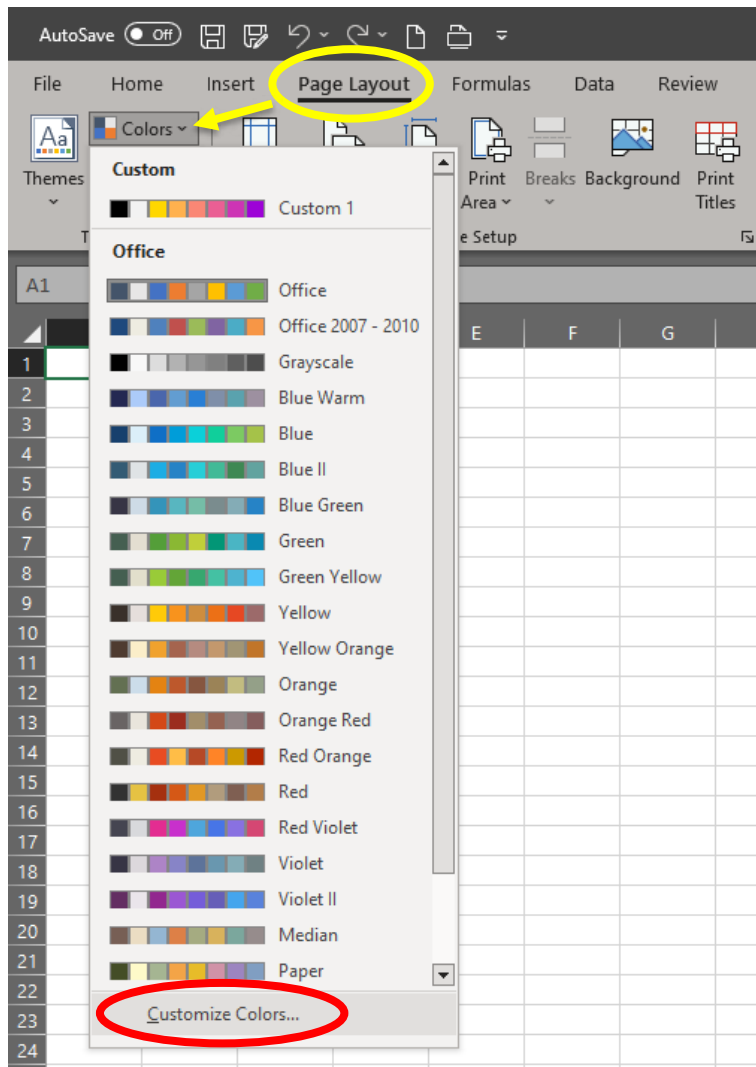


Qualitative data



Source: <https://colorbrewer2.org>

Add your color palettes to Excel (and other *MS Office* programs)



Colour-blindness simulators & contrast checking tools



- **Coblis - Color BLindness Simulator** (online)
 - <https://www.color-blindness.com/coblis-color-blindness-simulator/>
- **Color Oracle** (Windows, Mac & Linux)
 - <https://colororacle.org/>
- **WebAIM Contrast Checker** (online)
 - <https://webaim.org/resources/contrastchecker/>
- **CCA - Colour Contrast Analyser** (Windows & Mac)
 - <https://www.tpgi.com/color-contrast-checker/>

PRACTICE (10')



Try and experiment with the
aforementioned tools

WCAG 3.0 will change contrast calculation and scores



- Watch out! The new WCAG 3.0 guidelines are being drafted
- “**Visual contrast of text**” is a migration of WCAG 2.1 with significant updates
<https://www.w3.org/TR/wcag-3.0/#visual-contrast-of-text>
- New calculations of contrast and corresponding scores will be based on the *Accessible Perceptual Contrast Algorithm (APCA)*
 - APCA tool: <https://www.myndex.com/APCA/>
 - Further reading on APCA: <https://github.com/Myndex>

The image shows the APCA Contrast Calculator interface. It features a central 'CONTRAST' box displaying 'Lc 75.6'. To the left, under 'TEXT / ICON COLOR', is a color picker for #1234b0 (rgb(18,52,176)). To the right, under 'BACKGROUND COLOR', is a color picker for #e9e4d0 (rgb(233,228,208)). Below these are horizontal sliders for color selection. At the bottom, a table shows font usage examples for sizes 200, 300 (Light), 400 (Normal), 500, 600, and 700 (Bold). The text 'The lazy grey dog slept in the field of flowers without a care in the world' is shown in various sizes and weights. A note states: 'All font sizes are in CSS px • Reference font shown with colors at actual size & weight'.

- Motivation

- General guidelines

- Colours

- Tables & spreadsheets

- File formats

- Statistics usually deal with two types of tables: demonstration tables and reference tables
- Demonstration tables are useful when:
 - you want users to compare values
 - you want to include values and measures such as percentages or indices
 - you want to include summary statistics such as averages or totals
 - you need to show values of very different sizes in the same display
(for example values in the tens and values in the millions)
- Charts should be used when you want to show patterns, trends and relationships.
- Use reference tables when you want to supply large amounts of data for further analysis.
 - Generally, these should be published within the document and not as attachments or downloads
 - Or should they?
- **You should never publish images of tables**
 - These will fail the WCAG 2.1 Accessibility Success Criterion 1.4.5 (images of text)

Note: the instructions below will depend on which version of Microsoft Word you have

- When making tables in Microsoft Word you should use the 'insert table' tool
- You should also make sure that:
 - The table has a defined header row
(highlight the header row and click the blue 'Table Design' tab and then click the 'Header row' checkbox on the top left)
 - The checkbox that says 'Repeat as header row' is checked in table properties if your table runs across multiple pages
 - The checkbox that says 'Allow row to break across pages' is not checked
 - The reading order of the table is sensible by tabbing through the table content
- You may also add alt-text in the table properties (although it's not strictly necessary for tables)
- When exporting your document to PDF format, make sure it is marked-up correctly.
 - More information on how to tag tables in PDF documents: <https://www.w3.org/TR/WCAG20-TECHS/PDF6.html>

Accessible spreadsheets in Excel



- Follow Microsoft's guide: "[Make your Excel documents accessible to people with disabilities](https://support.microsoft.com/en-us/office/make-your-excel-documents-accessible-to-people-with-disabilities-6cc05fc5-1314-48b5-8eb3-683e49b3e593)":
 - Avoid common accessibility issues (provide alt text and avoid low contrasting colours)
 - Give all worksheets unique names and remove blank worksheets
 - Rename default names generated by excel with more descriptive ones
e.g., "Table 1", "Figure 1", "Sheet 1", "Column 1", etc.
 - Never leave blank cells (especially A1), rows, nor columns
 - If you need more whitespace, adjust the line spacing, row height and column width
 - Use simple table structures and avoid merging/splitting cells
 - Always specify column header information
On the Table Design tab, in the Table Style Options group, select the Header Row checkbox.
 - Use only one header row
 - Create new columns or use separate tabs for each category if needed
 - Avoid using colour alone to convey meaning (e.g., using red to highlight important values)
 - Use text labels wherever possible
- Microsoft Office's accessibility checker is your friend. Use it!

References:

- <https://www.gov.uk/guidance/creating-and-sharing-spreadsheets>
- <https://support.microsoft.com/en-us/office/make-your-excel-documents-accessible-to-people-with-disabilities-6cc05fc5-1314-48b5-8eb3-683e49b3e593>

Accessible spreadsheets in Excel (2)



- Try to avoid freezing rows and columns
 - This can limit the navigable space of the spreadsheet, and it affects even more to users who are using an increased zoom level, a low resolution or a device with a smaller screen.
 - If your spreadsheet is read-only, users might not be able to adjust frozen row and column sizes to suit their viewing needs.
- Check for hidden data
 - Before publishing or sharing spreadsheets, you must unhide all tabs
- Consider using open file formats
 - The open file format for spreadsheets is Open Document Spreadsheet (ODS).
- Choose the right software for the task
 - Old versions of Excel (97-2003) have a row limit of around 65,000 rows
 - Spreadsheets might not be suitable for technical users who want to perform detailed analysis on the information or combine it with other data. These users typically need data in machine-readable formats which they can use with programming tools with minimal data manipulation. In these cases, it might be more appropriate to publish your data as a CSV file.
 - Also, if you need to share your spreadsheet with people using earlier versions of Excel, Microsoft has [guidance on making your file backwards compatible](#).
- Accessibility VS usability
 - Sometimes the advice and best practices for improving the usability of spreadsheets overlaps with the advice for accessibility. Sometimes they contradict.

References:

- <https://www.gov.uk/guidance/creating-and-sharing-spreadsheets>
- <https://analysisfunction.civilservice.gov.uk/policy-store/releasing-statistics-in-spreadsheets/>

Accessible spreadsheets in Excel: Cell A1



- A screen reader starts reading any worksheet from cell A1
- If you have a table on the worksheet, A1 should preferably be the title of the table
- If the sheet is long or complex, add instructions or an overview of the sheet in cell A1
 - Screen reader users will get a presentation to your worksheet and how to use it
- **Instructional text in cell A1 can be transparent** (by matching the background colour)
 - This will hide it to the average user, but allows it to be read by screen readers.
- Alternatively, use a “cover page” (the first workbook sheet)
 - Here you may include author name or department, publication date, content description, version number of the spreadsheet, etc.
- Bonus tool:

Making spreadsheets accessible: a checklist of the basics

<https://analysisfunction.civilservice.gov.uk/policy-store/making-spreadsheets-accessible-a-brief-checklist-of-the-basics/>

- Motivation

- General guidelines

- Colours

- Tables & spreadsheets

- File formats

Images of charts and figures



- If source data is available, don't copy & paste the chart as an image
 - *MS Office* supports the same chart/figure format across all its programs
- If source data is unavailable, try to grab the source file of the chart/figure
 - This should provide the best image-quality
- Avoid screen-capturing at all costs, as this lowers the resolution of images
- If possible, use the SVG image format



Use SVG when possible



- Scalable Vector Graphics (SVG) is an XML-based vector image format for defining two-dimensional graphics, having support for interactivity and animation.
 - The SVG specification is an open standard developed by the World Wide Web Consortium since 1999.
 - SVG images are defined in a vector graphics format and stored in XML text files
- Vectorial image formats allow scaling up or down without loss of quality
 - This can help users with low vision make sense of an image at a size that best suits their needs.
- The text content of an SVG image can be read by screen readers
- Disadvantages of vector graphics:
 - Not suitable for encoding photographs of the “real world”
 - Minor drawing errors become visible when zooming too much
- Further reading: Accessibility Features of SVG (W3C)
<https://www.w3.org/TR/2000/NOTE-SVG-access-20000807/>

Accessible web screenshots (in SVG)



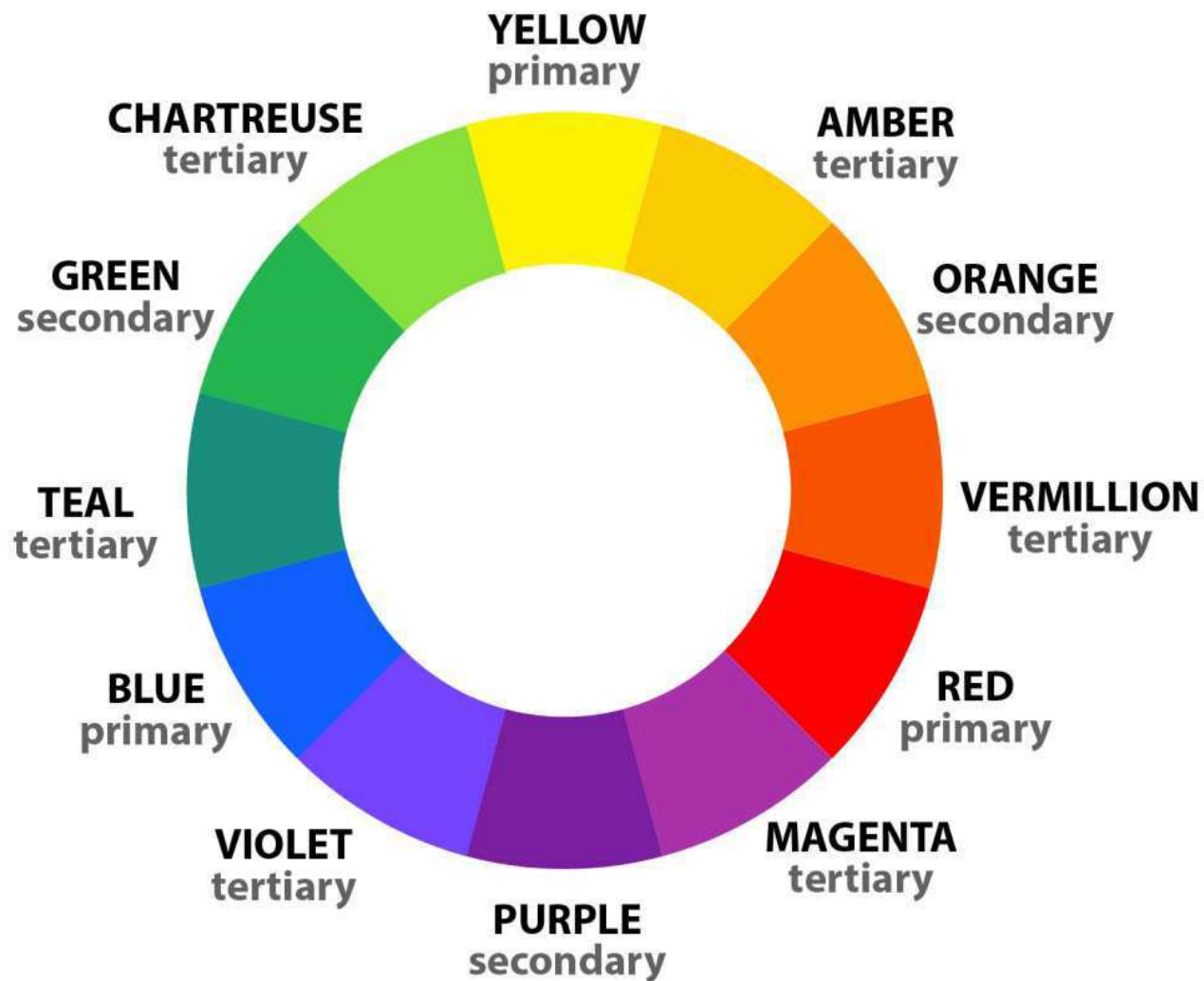
- From <https://github.com/felixfbecker/svg-screenshots>
 - Firefox: <https://addons.mozilla.org/en-US/firefox/addon/svg-screenshots/>
 - Chrome: <https://chrome.google.com/webstore/detail/svg-screenshot/nfakpcpmhhilkdpphcjgnokknbpdlhg>

Q&A

Backup slides



Colour theory: traditional colour wheel





Colour theory: Hue, Saturation & Value



HUE



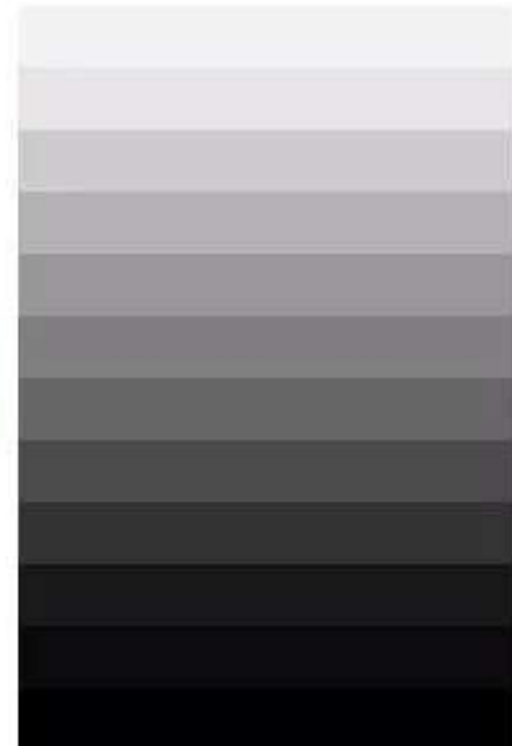
Hue is just another word for colour, and it generally refers to a specific slice of the colour wheel.

SATURATION



Saturation is the intensity of a colour. Highly saturated colours are those that appear bright and pure. Desaturated colours are ones that look dull, muted, or grayed out.

VALUE



Value (or brightness) is the lightness or darkness of a colour compared to a scale of grays that goes from near black to near white.



Colour-models, colour-spaces, RGB, RYB, CMYK, HSL...



- A colour model is an abstract mathematical model describing the way colours can be represented as tuples of numbers, typically as three (RGB) or four (CMYK) values or colour components.
- When this model is associated with a precise description of how the components are to be interpreted (viewing conditions, etc.), taking account of visual perception, the resulting set of colours is called "colour space."
- Additive and subtractive colour models
 - Media that transmit light (such as television) use additive colour mixing with primary colours of red, green, and blue, each of which stimulates one of the three types of the eye's colour receptors with as little stimulation as possible of the other two. This is called "RGB" colour space.
 - It is possible to achieve a large range of colours seen by humans by combining cyan, magenta, and yellow transparent dyes/inks on a white substrate. These are the subtractive primary colours. Often a fourth ink, black, is added to improve reproduction of some dark colours. This is called the "CMY" or "CMYK" colour space. RYB (an abbreviation of red–yellow–blue) is the traditional subtractive colour model used in art and applied design in which red, yellow, and blue pigments are considered primary colours.

References :

https://en.wikipedia.org/wiki/Color_model
https://en.wikipedia.org/wiki/Color_space



RGB vs. HEX Value vs. HSL



- There are a few approaches that can be taken when it comes to finding the perfect colour.
- RGB (red, green, blue) is a pigmentation gamut of these colours frequently utilised when designing websites and other digital platforms.
- HEX (hexadecimal), is a shorter code for RGB, and it is usually a number automatically generated by the program you're using.
- HSL (hue saturation lightness) is a user-friendly way to understand colour codes without having to decipher HEX codes or RGB.
- Consider utilising HSL to find the perfect colour if utilising RGB and HEX are challenging.

Meaning of colours in different cultures



	Western/ American	Japanese	Hindu	Native American	Chinese	Asian	Eastern European	Muslim	African	South American
Anger	Red		Black				Red		Red	
Art / Creativity			Blue							
Authority	Black									
Bad Luck		Black								
Balance		Orange		Black		Green				
Beauty	Purple									
Calm										
Celebration		Purple			Black					
Children	Pink					White				
Cold	Blue			Blue						
Compassion			Green							
Courage	Red	Yellow	Orange				Red			
Cowardice	Yellow									
Cruelty	Purple									
Danger	Red			Yellow						Red
Death	Black		White	Black	White			Grey		Green
Decadence	Purple									
Deceit		Yellow								
Desire	Red		Orange							
Earthy	Brown				Brown					
Energy	Yellow	Orange	Red							

Meaning of colours in different cultures (2)



	Western/ American	Japanese	Hindu	Native American	Chinese	Asian	Eastern European	Muslim	African	South American
Erotic	Red	Pink	Red							
Eternity	Black	Green				Green				
Evil	Black		Black			Black				
Excitement	Red									
Family					Orange	Green				
Femininity	Pink									
Fertility					Red					
Flamboyance	Purple	Orange				Purple				
Freedom	Blue									
Friendly	Orange			Grey						
Fun	Yellow		Yellow							
God		Purple						Green		
Gods			Blue							
Good Luck	Green				Red		Red	Green	Red	
Gratitude				Purple						
Growth	Green				Green					
Happiness	Yellow		Green	White	Red					
Healing	Blue			Orange						
Healthy		Pink			Yellow					
Heat	Red		Red				Red			
Heaven		Yellow						Green		

Meaning of colours in different cultures (3)



	Western/ American	Japanese	Hindu	Native American	Chinese	Asian	Eastern European	Muslim	African	South American
Holiness										
Illness										
Insight										
Intelligence										
Intuition										
Religion										
Jealousy										
Joy										
Learning										
Life										
Love										
Loyalty										
Luxury										
Marriage										
Modesty										
Money										
Mourning										
Mystery										
Nature										
Passion										
Peace										

Meaning of colours in different cultures (4)



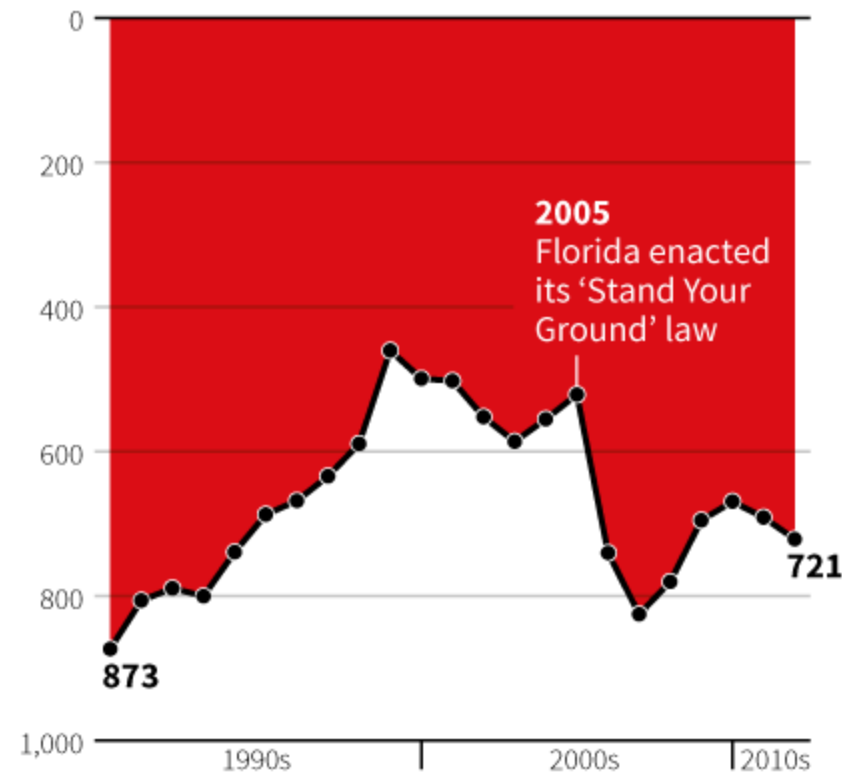
	Western/ American	Japanese	Hindu	Native American	Chinese	Asian	Eastern European	Muslim	African	South American
Penance			Black			Black				
Power						Yellow	Red			
Personal Power	Purple		Yellow	Green						
Purity					White			Blue		
Radicalism	Red						Red			
Rational	Blue	Blue								
Reliable	Brown	Grey								
Repels Evil	Yellow	Red	Yellow		Green	Yellow				
Respect	Grey	White		Blue	Yellow					
Royalty					Yellow					
Self-cultivation				Black		Black				
Strength		Red				Yellow		Yellow		
Style	Black	Black								
Success				Red	Red	Red			Green	Red
Trouble				Blue						Blue
Truce					White		White			
Trust							White			
Unhappiness	Blue	Black		Blue						
Virtue	Purple									
Warmth		Orange								
Wisdom		Purple	Purple	Brown			Blue			

Art-sy and beautiful data viz that are still bad



Gun deaths in Florida

Number of murders committed using firearms

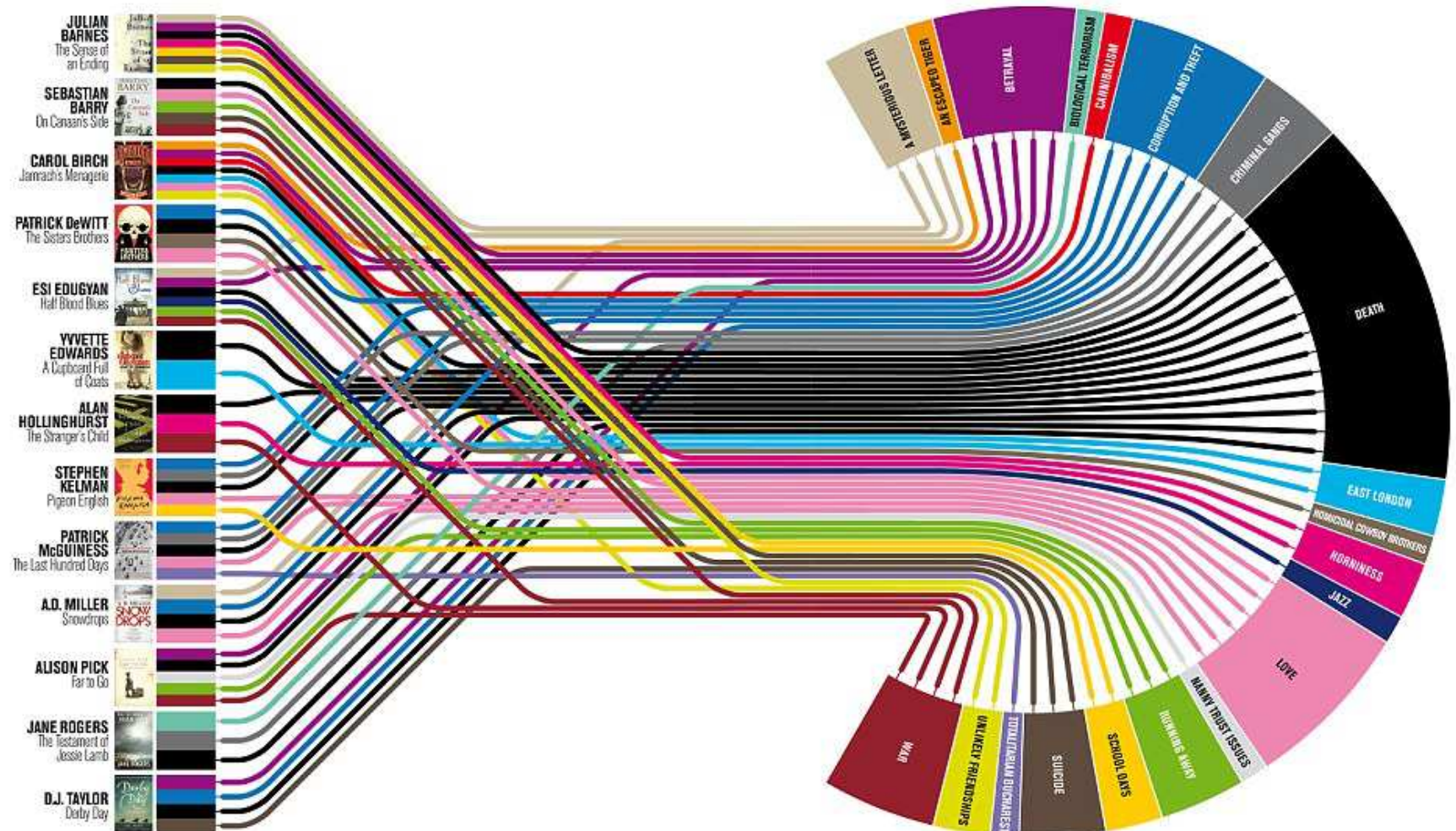


Source: Florida Department of Law Enforcement

C. Chan 16/02/2014

REUTERS

Art-sy and beautiful data viz that are still bad (2)



Plot lines

What makes a prize-winning novel? As Julian Barnes wins the Booker Prize, Delayed Gratification's Johanna Kamradt charts the themes of this year's longlisters.

With thanks to the author of the chart

Art-sy and beautiful data viz that are still bad (3)





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Making charts and sheets more accessible

Xabier Gardeazabal, Research Assistant

March 07th, 2023



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How to create accessible tweets

Nestor Garay-Vitoria, Associate Professor

March 07, 2023



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- About Twitter
- Messages or tweets
- Tweets with links
- Tweets with images
- Tweets with videos
- First steps to create accessible content on Twitter

- About Twitter
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Introduction (I)



- Twitter is a platform for sending and publishing short messages (tweets) used by many public administrations.
 - <https://twitter.com/>
- In 2020, Twitter created a team dedicated to making the Twitter app accessible to people with disabilities.
- The list of accessibility features of Twitter is updated quarterly and includes features that could be considered usability best practices.
 - <https://help.twitter.com/en/using-twitter/accessibility-features>
- The content of UPV/EHU tweets must comply with the Level A and AA conformity criteria of WCAG 2.1, so when sending and posting a message from our account we will have to pay attention in certain respects to make the content accessible.
- For tweets with videos, the criteria to see in the Accessibility in videos session apply.

- **Success Criterion 1.1.1 Non-text Content.** Level A. All non-text content that is presented to the user has a text alternative that serves the equivalent purpose
 - All non-textual content should have a short textual alternative that, whenever possible, provides the same information or serves the same purpose as non-textual content.
 - The textual alternatives of the image groups that transmit a single information together are provided in one of the images and describe the whole group, leaving the rest of the images as decorative.
 - Decorative images must have an empty alternative text and lack a title, or are included from the style sheets, so that they can be ignored by the assistive products.
- **Success Criterion 1.4.1 Use of Color.** Level A. Color is not used as the only visual means of conveying information, indicating an action, prompting a response, or distinguishing a visual element. Objective: Ensure that all users have access to information transmitted by color.
 - Color should not be used in images as the only visual medium for transmitting information.

- **Success Criterion 1.4.3 Contrast (minimum).** Level AA. The visual presentation of text and images of text has a contrast ratio of at least 4.5:1. Objective: Provide enough contrast between the foreground and the background so people with low vision can read the content.
 - The normal text (size below 18 points or 14 points and bold) and the normal text in images should have a contrast to the background color of at least 4.5:1.
 - Large text (larger than 18 points or 14 points and bold) and large text in images should have a contrast with the background color of at least 3:1.
- **Success Criterion 2.4.4 Link Purpose (In Context).** Level A. The purpose of each link can be determined from the link text alone or from the link text together with its programmatically determined link context, except where the purpose of the link would be ambiguous to users in general. Objective: Help users understand the purpose of each link so they can decide to follow the link or not.
 - Links should identify their function or destination in the link text itself or by using the link text next to their immediate context.

- About Twitter
- Messages or tweets
- Tweets with links
- Tweets with images
- Tweets with videos
- First steps to create accessible content on Twitter

Messages or Tweets



- A general message or tweet is a text that can contain up to 280 characters (there are longer tweets up to 4,000 characters).
 - Status tweets, mentions, replies and retweets also exist.
- Clear and simple language should be used.
- A tweet can have links and up to 4 images or a video.
- If images or video are available, they will be previewed, and otherwise if possible the link will be previewed (if there are several links, the last possible one will be previewed).
- Example of tweet with two image previews:



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Tweets with links (I)



- Links may be included in tweets.
- It is advisable to include in the tweet a descriptive text that serves the user to contextualize the link.
- Any link will occupy 23 characters in our tweet, even if the original link has fewer characters.
 - This is because any link is processed and becomes an "http://t.co" link.
- Example of tweet with a link:



Tweets with links (II)



- If the page we link has the required metadata (these are twitter defined metadata with the title, description, image and alternative text of the image to be shown), the link will be displayed as a Twitter Card becoming much more attractive.
 - <https://developer.twitter.com/en/docs/twitter-for-websites/cards/overview/abouts-cards>
- Example of link to a page with the metadata of a Twitter card type "Summary Card":



Tweets with links (III)



- Example of link to a page with the metadata of a Twitter card type "Summary Card" with large image:




- About Twitter
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- Tweets with videos
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- Twitter only allows images up to 5 MB and with .gif, .jpeg, or .png extension.
- When selecting the image to upload to a tweet, it should be borne in mind that the images should not use color as the only visual medium to transmit information
 - For example, if we upload a graph the way to differentiate the different elements of the graph should not be just color because in that case users who cannot differentiate the colors will lose information.
- In addition, if the images transmit textual information, the contrast requirements between text and background must be met:
- To be accessible, it is essential to add a description that will be part of the alternative text of the image, unless it is a decorative image (in this case the empty description must be left).
 - The image description can reach 1000 characters, and must convey the same information as the image.

Tweets with images (II)



- To add an image to a tweet you have to click the Add image icon on twitter and select the file with the image from our device. 
- A twitter can contain up to 4 images.
- We must add a description to each image, which conveys the same information as the image, except for decorative images.
- In groups of images that transmit a single information together, we will include the description in one of the images in a way that encompasses the whole group, leaving the rest of the images as decorative.
- To add a description to an image, once we have the image included in the tweet, click "Add description" / "Add descriptions".
 - <https://help.twitter.com/en/using-twitter/picture-descriptions>

Tweets with images (III)



- A screen with the image (or the first image if there is more than one) will appear to be able to enter the description that will be part of the alternative text of the image.
- If there are multiple images, a few arrows will appear to scroll through each of them by filling out the description. Once finished, click "Save."
- Now we will see the tweet with a tag "Alt" in the images with description. The lower part shows the number of images with description.



- About Twitter
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- First steps to create accessible content on Twitter

Tweets with videos (I)



- Twitter lets you upload videos up to 512MB, and 140 seconds (2 minutes and 20 seconds).
- They must have .mp4 extension (coded with h264 and AAC) or .mov.
 - <https://help.twitter.com/en/using-twitter/twitter-videos>
- To comply with the accessibility standards our videos must have subtitles.
- Twitter adds automatic subtitles for audios and videos (YouTube style) uploaded since 2021.
- To include a video in a tweet you can upload a video file with the subtitles embedded in the video itself (to do so it will be necessary to edit the video in advance with an appropriate tool and embed in the subtitles).
- Subtitles and captions can be added to your videos by uploading valid subtitle files (in the SRT format):
 - <https://help.twitter.com/en/using-twitter/upload-caption-srt-file>

Tweets with videos (II)



- Alternatively, if you want to tweet a video, you can share a video from YouTube that includes the subtitles.
- In this case you will have to include in the tweet the descriptive title of the video and the url to the video of YouTube, twitter will automatically include the player preview the video including in the image the icon of the "play" so that the user knows that it is a video.



@ Solo las personas que menciones podrán responder



Twittear

Tweets with videos (III)



- Once you click on "Tweet" you will see the tweet posted:

El Real Decreto de accesibilidad de sitios web y APPs del Sector Público



- Clicking on the video will open on the YouTube player, allowing the user to use the subtitles.

El Real Decreto de accesibilidad de sitios web y APPs del Sector Público



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- Tweets with videos
- First steps to create accessible content on Twitter

First steps with accessible content on Twitter



- A Twitter account is a prerequisite for these exercises.
- **Exercise 1:** Create three tweets, each linking one page. Check that some of the pages are prepared with the metadata required by Twitter for Twitter Card and visualize in a more attractive way.
- **Exercise 2:** Create a tweet with 4 images including the corresponding description in each of them.
- **Exercise 3:** Create a tweet with a link to a YouTube video that has subtitles. Remember to include in the tweet the video's descriptive title to place the user in the corresponding context.

References



- Web Content Accessibility Guidelines (WCAG) 2.1.
<https://www.w3.org/TR/WCAG21/>
- M. Arrue, N. Garay-Vitoria. Editing and generating accessible Web content (in Basque and Spanish). <https://egelapi.ehu.eus/>
- Twitter. <https://twitter.com/>
- Accessibility features of Twitter. <https://help.twitter.com/en/using-twitter/accessibility-features>

Thank you for your attention



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How to create accessible tweets

Nestor Garay-Vitoria, Associate Professor

March 07, 2023



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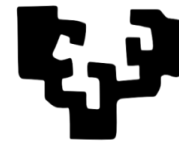
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Making accessible videos

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March 08th, 2023



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Why care to make accessible videos?



- People with good hearing can easily overhear other people's conversations, gain access to education, and participate in meetings and social events, while deaf people either do not receive this spontaneous information or must work very hard to get it.
- Full and equal communication access is a basic human right for everyone, not a privilege, especially for deaf people.
- Deaf people are disabled by society's attitudinal barriers as much as by physical ones.
- Even people with good hearing find themselves in situations that make it hard for them to hear or understand audio or each other. So alternative methods of communication can help them, too.

Everyone benefits from captions, including you!



- Depending on where you live, you may have seen captions on TV in public places (such as gyms, bars, and airports), on many movie DVDs, in online videos, or on the electronic displays of public transport systems.
- Many people think of captioning as something that is used only in those situations, but with more awareness and more efforts to make captioning universal, it can be used to make any aural information accessible, anytime and anywhere.
- You don't even have to be deaf to rely on text to get information. The world is noisy. People mumble, and audio quality is often poor. People listening to foreign speech find it easier to follow along with same-language captions, which can also help them improve their new language skills. There are many ways we can apply captioning in various areas of our lives once it is more widely available.



- Globally, hearing loss affects about 10% of the population to some degree.
- Hearing loss increases with age:
 - In those between 20 and 35, the rates of hearing loss are 3%
 - In those 44 to 55 it is 11%
 - In those 65 to 85 it is 43%.
- Subtitles are primarily intended to serve viewers with loss of hearing, but they are used by a wide range of people: around 10% of broadcast viewers use subtitles regularly, increasing to 35% for some online content.
 - The majority of these viewers are not hard of hearing.

Sources:

- Oishi N, Schacht J (June 2011). "Emerging treatments for noise-induced hearing loss". *Expert Opinion on Emerging Drugs*. **16** (2): 235–45.
- Lasak JM, Allen P, McVay T, Lewis D (March 2014). "Hearing loss: diagnosis and management". *Primary Care*. **41** (1): 19–31.
- <https://www.bbc.co.uk/accessibility/forproducts/guides/subtitles/>

Captions VS Subtitles. Are they the same?



- **Subtitles** are designed to support hearing people who might not understand the original language. They are a tool for **internationalisation** (not accessibility), and they often lack speaker IDs and sound descriptions and consequently, **subtitles aren't necessarily accessible**.
- **Captions** are considered as part of **accessibility** and designed for deaf people to access aural information in the same language with accessibility elements such as speaker identifications, sound descriptions etc.
- With captions, we can **embed a lot of contextual details** that are somehow lost between the lines when translated from audio to text — be it sarcasm, music information, synthetic voice, background noise, or unexpected interruptions.

What is good captioning?



- Captioning without care is inadequate
 - It is not enough to just add words
- Just using speech recognition software for captioning is NOT good enough
 - Automatic software cannot produce quality transcriptions on its own
- Captions need to be of good quality, with speaker identifications, sound descriptions, and proper grammar and punctuation.
 - They need to be verbatim, easy to read, synchronised with speech, well-formatted, and properly chunked—among many other things.

- Good subtitling is an art that requires negotiating conflicting requirements.
- Generally, you should aim for subtitles that are faithful to the audio.
 - However, you will need to balance this against considerations such as:
the action on the screen, speed of speech or editing and visual content.
- For example, if you subtitle a scene where a character is speaking rapidly, these are some of the decisions you may have to make:
 - Can viewers read the subtitles at the rate of speech?
 - Should you edit out some words to allow more time?
 - Can subtitles carry over to the next scene so they 'catch up' with the speaker?
 - Should you use one, two or three lines of subtitles?
 - Should you change the position of the subtitle to avoid obscuring important visual information or to indicate the speaker?
- Clearly, it is not possible (or advisable) to provide a set of hard rules that cover all situations.

Guidelines: editing text



- Prefer verbatim (literal) transcription
- Don't simplify
- Retain speaker's first and last words
(these are most obvious to lip-readers who will feel cheated if these words are removed)
- Include illegible text of the video in subtitles
- Do not edit out strong language

Guidelines: line breaks, timing



- A maximum subtitle length of two lines is recommended
(three lines may be used if you are confident that no important picture information will be obscured)
- Break lines at natural points
- The recommended subtitle speed is 160-180 words-per-minute (WPM)
- Give more time for unfamiliar words
- Use consistent timing

Guidelines: synchronisation



- Match subtitle to speech onset
 - Disappearance should coincide roughly with the end of the corresponding speech segment
- Match subtitle to pace of speaking
- Match subtitles to shot
 - Merge subtitles for short shots
 - Avoid extending a subtitle into the next shot when the speaker has stopped speaking, particularly if this is a dramatic reaction shot.

Guidelines: Identifying speakers



- Colours
 - This is the preferred method that should be used in most cases
- Single quotes
 - Used to indicate an out-of-vision speaker
- Arrows
 - Used to indicate the direction of out-of-vision sounds (infrequently used)
- Labels
 - Can be used to resolve ambiguity as to who is speaking.
- Dashes
 - A legacy technique. Use with colour when unavoidable only.

Guidelines: colours



- Use white text over a black background
- Speaker colours, in order of priority:

Colour	RGB hex
White	#FFFFFF
Yellow	#FFFF00
Cyan	#00FFFF
Green	#00FF00

Guidelines: font and size



- Follow common sense and intuition
- Consider your audience's screen size and resolution
 - e.g., phone devices VS projector

Decouple Audio Track and Subtitles



- We might be assuming that viewers prefer to read subtitles in the same language as the original video track, but that's not necessarily the case.
- Allow viewers to **freely choose their preference** without any assumptions on our end. Whenever possible, decouple settings for the audio track and subtitles/captions.

A subtitling workflow (only using YouTube)



1. Record video
(or download a video file from the internet)
2. Upload to YouTube
(privately, so nobody else can watch it, yet)
3. Go take a coffee while automatic captions are being generated
(from 5 minutes up to 15-30 minutes depending on video length and language)
4. Fix typos, wrong words, etc. in transcription
5. Adjust line widths, line breaks, and timings
6. [optional] Generate automatic translations
(and then repeat step 4 for each translation)
7. Download subtitles (or share video URL)

My subtitling workflow (YouTube + SubtitleEdit)



1. Record video
2. Upload to YouTube
3. Go take a coffee while automatic captions are being generated
4. Fix typos, wrong words, etc. in transcription
5. Download subtitle file and open it in **SubtitleEdit**
6. Adjust line widths, line breaks, and timings
7. [optional] Generate automatic translations (within SubtitleEdit)
8. [optional] Merge two languages into one subtitle file
9. [optional] “Burn” or embed a subtitle file onto the video
10. [optional] Upload subtitle file(s) to YouTube

Which subtitle formats should I use?



- The choice of the subtitle format you use is not trivial
- You need to arrange subtitles according to a very precise coding
- Choosing the format that best suits your needs will help you to :
 - Save time in your subtitling work, by using a format accepted by all your platforms
 - Optimize the appearance of your subtitles, by selecting a format that gives you more freedom to customise
 - Avoid technical problems with display and compatibility with your tools

Beyond captions: audio description



- Audio description is a separate narrative audio track to the original video
- It describes important visual content not referenced in the original audio track
 - People who are blind can understand much of a video's content by listening to its audio. However, if a video includes content that is only presented visually (e.g., on-screen text, or key actions that are not obvious from the audio) this visual information must be described.
- Audio description benefits people with blindness or low vision.
- It also benefits users who are visually distracted (e.g., watching a video in the background while multitasking)

Integrated description: avoiding the need for audio description



- The need for audio description can be avoided by ensuring all important visual information is communicated verbally in the original video!!!
- The alternatives are:
 - 1. To record a separate audio description track yourself, and either:
 - a) Embed the new track within the original video file
 - b) Upload two versions of the video (original and audio described)
 - 2. To outsource the generation of the audio description track
 - 3. Wait (a few years?) for your browser to fully adopt the HTML5 specification, which includes support for automatic generation of audio description from captions

Accessible fonts



- **Atkinson Hyperlegible Font**
 - <https://brailleinstitute.org/freefont>

Q & A



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Accessibility in moodle courses

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March 09th, 2023

Apologies



- Inconvenients in Moodle registration
 - EHU security policies
 - Moodle
 - Services not in English

Learning Management Systems



- Moodle: is open source under the [GPL license](#).

Everything we produce is available for you to download and use for free.

- Plugins for accessibility
 - Blackboard Ally!!!
- Languages

Accessible course design



- [Headings](#)
- [Hyperlinks](#)
 - [Consistent link behaviour](#)
 - [Descriptive links](#)
- [Text](#)
- [See also](#)

Big discovery!!

Your turn to work on moodle



- These days you have attended workshops on how to prepare accessible content.
- Today you have learned how to design accessible moodle courses.
- Now it is your turn prepare a moodle course with the materials you think are most worth working on.
- This is why today you appear as teachers in the moodle course. You can make changes!

That's all folks!



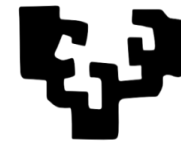


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Accessibility in moodle courses

Edurne Larraza Mediluze, Associate Professor

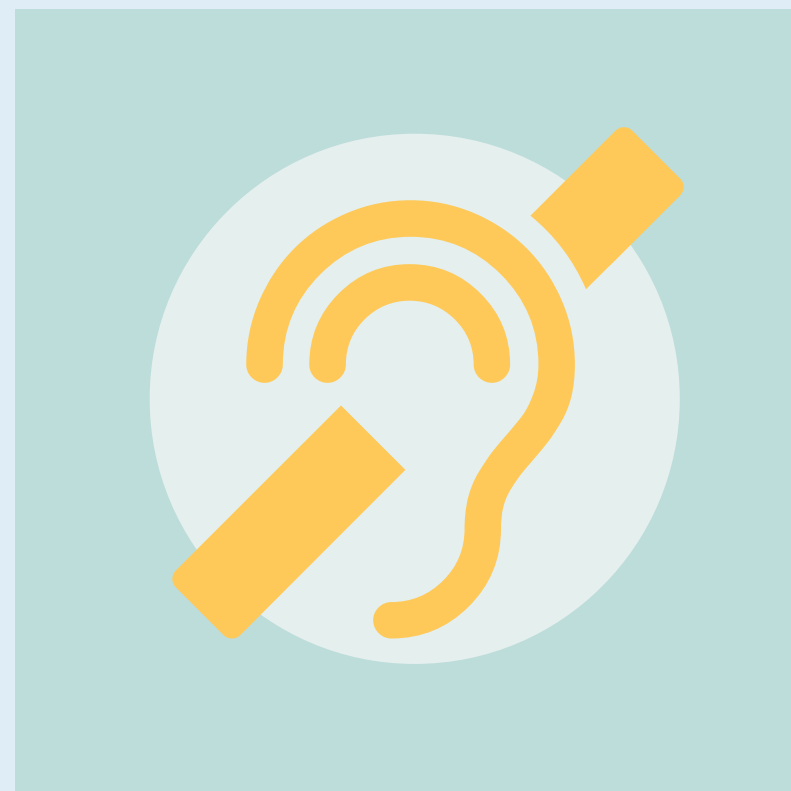
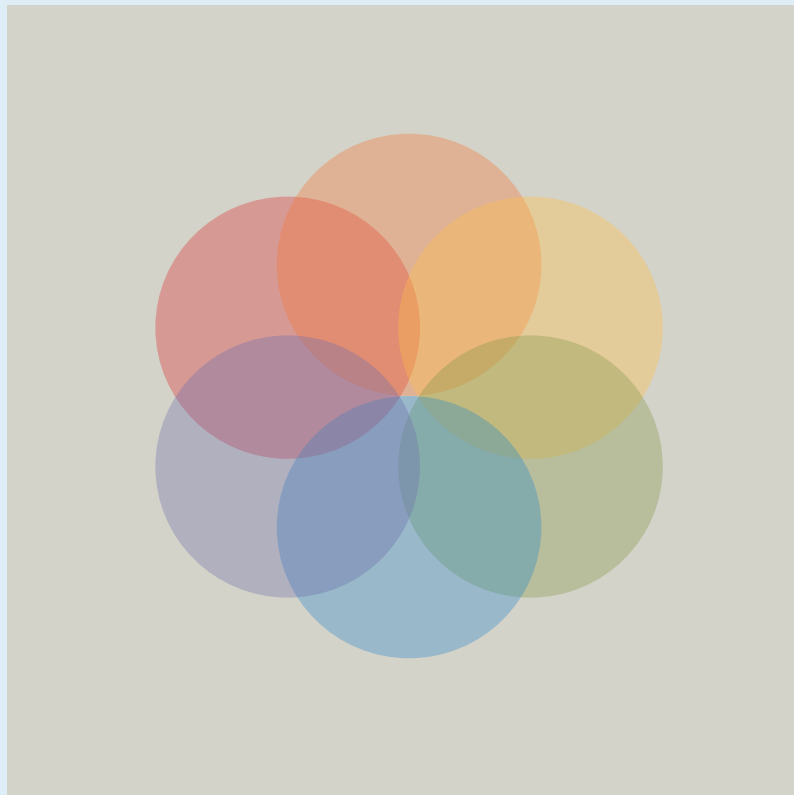


University of the Basque Country

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Unibertsitatea

March 09th, 2023

Designing for accessibility



Designing for users on the autistic spectrum



Do...

use simple colours



write in plain language

Do this

use simple sentences and bullets



make buttons descriptive

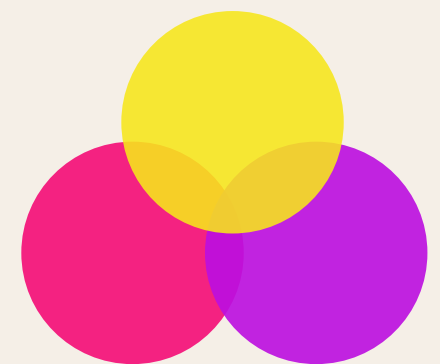
Attach files

build simple and consistent layouts



Don't...

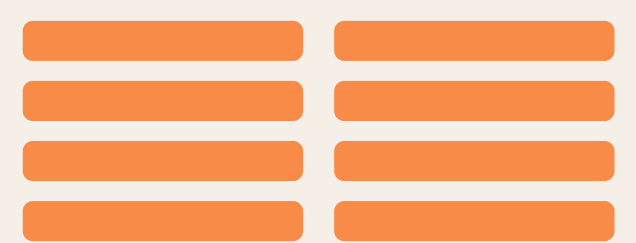
use bright contrasting colours



use figures of speech and idioms



create a wall of text



make buttons vague and unpredictable

Click here!

build complex and cluttered layouts



Designing for users of screen readers



Do...

describe images and provide transcripts for video

`<alt>`

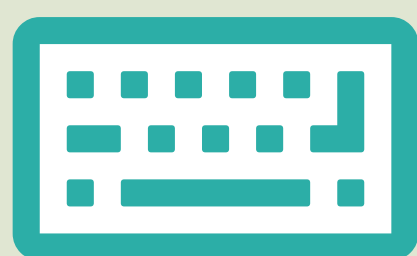
follow a linear logical layout



structure content using HTML5

`<h1>`
`<nav>`
`<label>`

build for keyboard use only



write descriptive links and headings

[Contact us](#)

Don't...

only show information in an image or video



spread content all over a page



rely on text size and placement for structure

36pt, bold
Header

force mouse or screen use



write uninformative links and headings

[Click here](#)



Designing for users with low vision



Do...

use good colour contrasts and a readable font size



publish all information on web pages



use a combination of colour, shapes and text

Start

follow a linear, logical layout

200% magnification



put buttons and notifications in context



Don't...

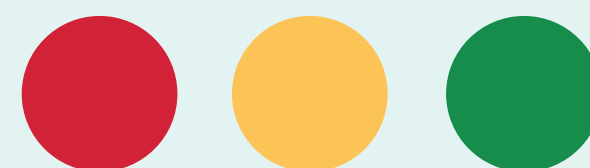
use low colour contrasts and small font size



bury information in downloads



only use colour to convey meaning



spread content all over a page

200% magnification



separate actions from their context



Designing for users with dyslexia

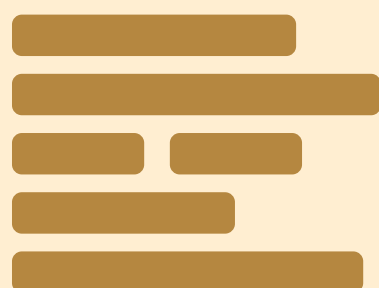


Do...

use images and diagrams to support text



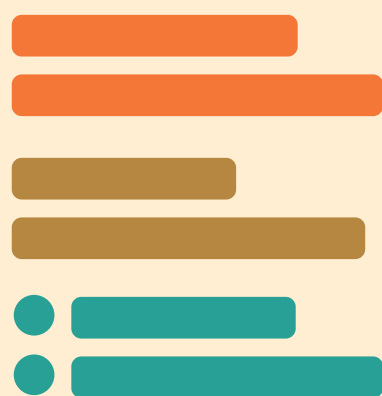
align text to the left and keep a consistent layout



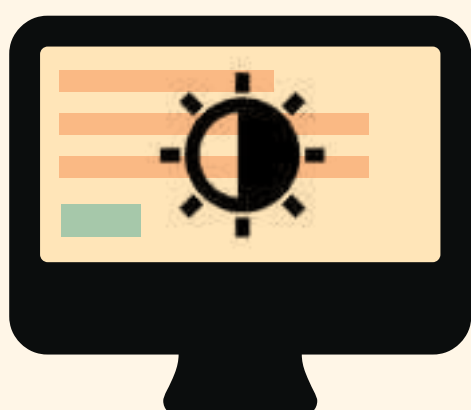
consider producing materials in other formats (for example audio or video)



keep content short, clear and simple



let users change the contrast between background and text



Don't...

use large blocks of heavy text



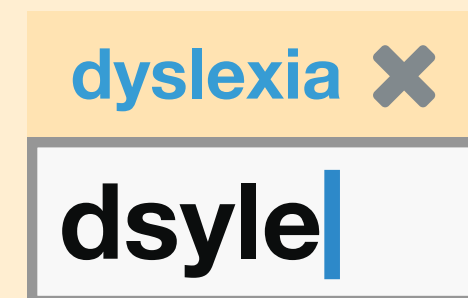
underline words, use italics or write in capitals

DON'T DO THIS

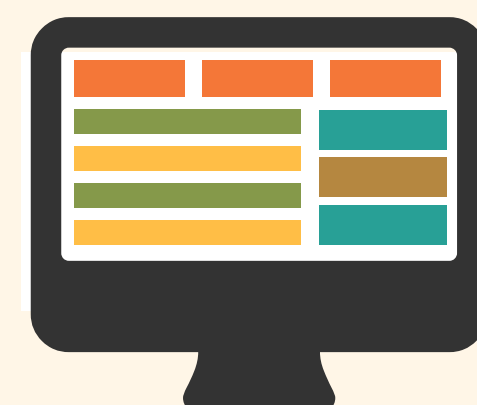
force users to remember things from previous pages - give reminders and prompts



rely on accurate spelling - use autocorrect or provide suggestions



put too much information in one place

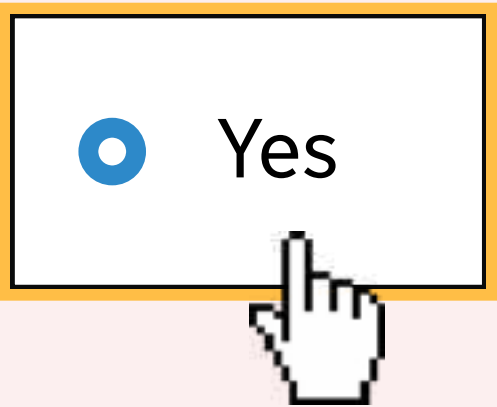


Designing for users with physical or motor disabilities

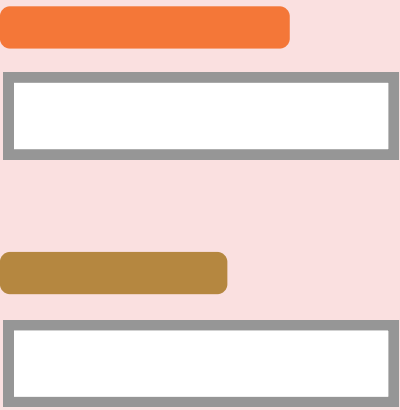


Do...

make large clickable actions



give clickable elements space



design for keyboard or speech only use



design with mobile and touchscreen in mind

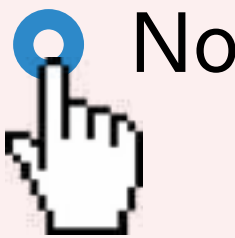


provide shortcuts

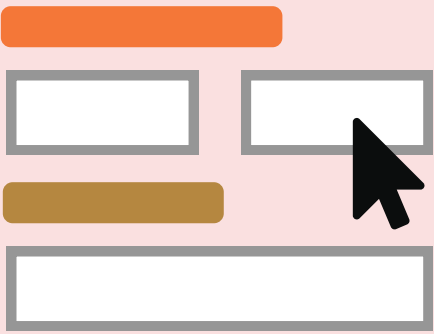
Postcode

Don't...

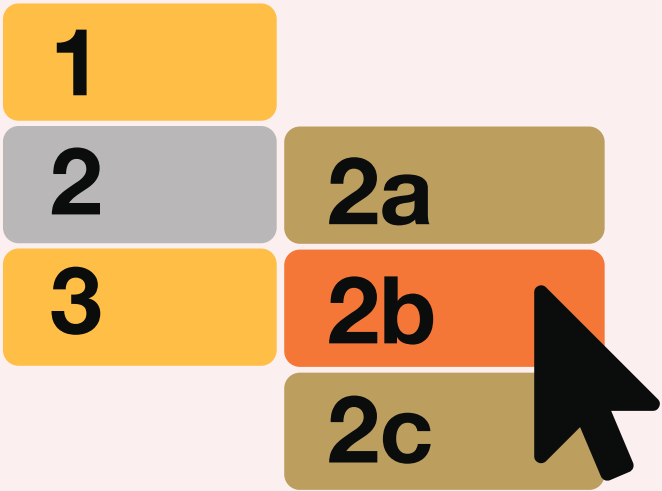
demand precision



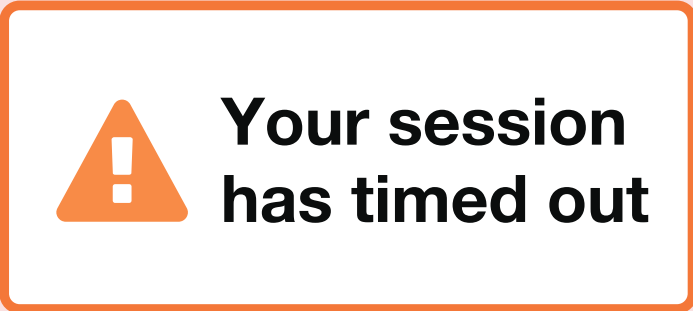
bunch interactions together



make dynamic content that requires a lot of mouse movement



have short time out windows



tire users with lots of typing and scrolling

Address

Designing for users who are deaf or hard of hearing



Do...

Don't...

write in plain language

Do this

use complicated words or figures of speech



use subtitles or provide transcripts for videos



put content in audio or video only



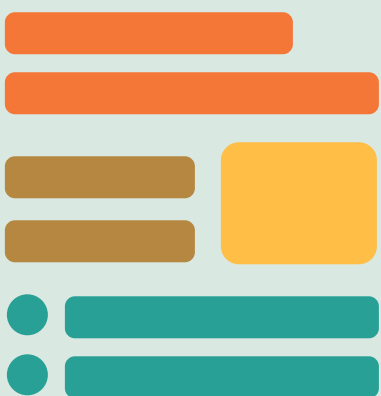
use a linear, logical layout



make complex layouts and menus



break up content with sub-headings, images and videos



make users read long blocks of content



let users ask for their preferred communication support when booking appointments



make telephone the only means of contact for users



Designing for users with anxiety

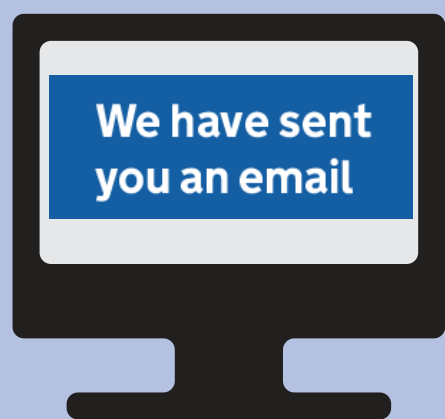


Do...

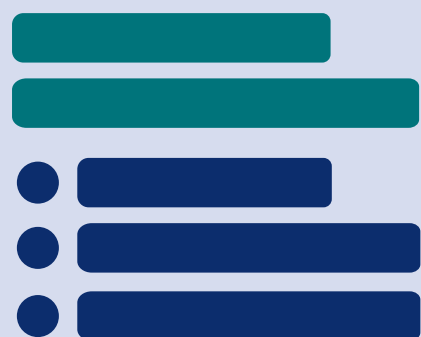
give users enough time to complete an action



explain what will happen after completing a service



make important information clear



give users the support they need to complete a service

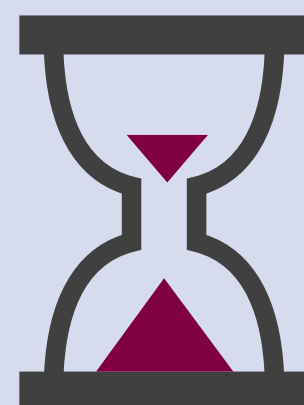


let users check their answers before they submit them

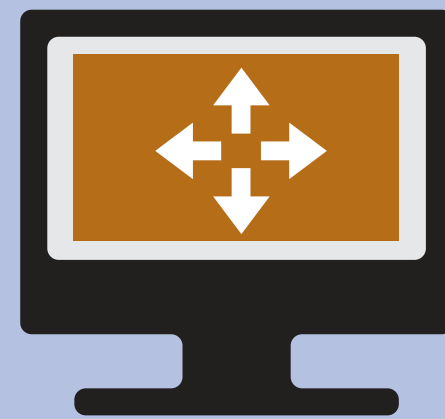


Don't...

rush users or set impractical time limits



leave users confused about next steps or timeframes



leave users uncertain about the consequences of their actions



make support or help hard to access



leave users questioning what answers they gave



Home Office Digital's goal is to make exceptional services for everyone.

Understanding accessibility means we can build services that work for everyone, whatever their access need.

These posters show how you can make your service accessible for different access needs.

Email access@digital.homeoffice.gov.uk to get involved and help make Home Office Digital services accessible by default

