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UpGameIn

ACCESSIBILITY GUIDEBOOK

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Accessibility in Games

"Accessibility means that all players regardless of their abilities, age, education, culture etc are able to understand the rules and mechanics and play the game."

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INTRODUCTION

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General Introduction

According to recent estimates from the World Health Organization (WHO), around 1 billion people worldwide are living with disabilities that affect their daily lives. This number is rising due to factors like aging, accidents, and wars/conflicts. However, it is not an accurate number, as many individuals choose not to report their disabilities due to social stigma and exclusion (Baltzar et al., 2023). Many individuals remain undiagnosed.

Disabilities span various types, including motor, cognitive, visual, hearing and, motor, mobility disabilities, each of which can create unique access barriers.

Market share gamers

The gaming industry has been steadily expanding, with an estimated 2.8 billion gamers worldwide generating $180 billion in revenue in 2021, and this growth is anticipated to persist. Notably, individuals with disabilities make up around 20% of the gaming community. Reports indicate that most people with disabilities continue to play games despite the obstacles and challenges they encounter.

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Definitions of accessibility

Oxford's Learner's dictionary defines accessibility as "how easy something is to reach, enter, use, see, etc." It is a very open definition that can be applied to various contexts.

Equitas – the International Center for human Rights Education is "ensuring the ability for everyone, regardless of disability, to have access, use and benefit from their environment... Accessibility means having the necessary conditions to reduce or eliminate the barriers that hinder the full and effective participation of persons with disabilities on an equal basis with others."

The University of Virginia defines accessibility as the "the degree to which a product, device, program, service, resource, or environment is available to a given user." In today's digital culture, accessibility extends to the digital realm as well and can be defined as "when technology has been designed in a way so that it can be accessed by all users. This includes electronic documents, websites, software, hardware, video, audio, and other digital assets."

Lastly, the Interaction Design Foundation defines accessibility as "the concept of whether a product or service can be used by everyone—however they encounter it. Accessibility laws exist to aid people with disabilities, but designers should try to accommodate all potential users in many contexts of use anyway. To do so has firm benefits—notably better designs for all."

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Definitions of accessibility

The aforementioned definitions share some commonalities. Firstly, all definitions focus on making things accessible to anyone regardless of their ability span or certain circumstances. The second common point is the removal of all barriers expressed as full participation in an experience as well as free availability and ease of use. In the digital realm, accessibility emphasizes unobstructed benefit from technology. Moreover, accessibility is context-independent as it is a concept that can be applied beyond one area, encompassing different settings such as education, technology, services. The majority of definitions focus on or imply accessibility for people with disabilities. Lastly, accessibility is closely linked to user centered design, making the design process a means to accommodate everyone regardless of the way they interact with a particular product or service.

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These definitions, however, differ in their scope. Oxford's Learner's Dictionary offers a broader open definition that can be applied to various contexts. Equitas's definition focuses solely on removing barriers for people with disabilities whereas the University of Virginia definition focuses on both physical and digital accessibility. The Interaction Design Foundation mentions that accessibility should be focused for all users, not just those with disabilities, across diverse contexts. In terms of digital focus, the University of Virginia and Interaction Design Foundation mention digital accessibility, covering websites, software, and technology, while Equitas and Oxford are more focused on general accessibility. The dimension on creating a relevant regulatory framework is based on.

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Definitions of accessibility

The International Game Developers Association (IGDA) claims that the boundaries posed are the result of the social model of disability that means that disability is the result of most matched interactions and that designers and game developers can control whether an interaction is disabling or not.

Gaming industry and disability

Gramennos et al., mention that game accessibility is a relatively not explored territory and up to recent times it is mainly a concern of related organizations representing people with disabilities eg associations of blind or people with visual impairments,

Even though researchers and developers have been making some improvements in designing for accessibility, many individuals still face barriers in participating in games. 66% of gamers with an impairment declare that they face barriers or issues (eg.seniors) related to gaming, mentioning as the biggest barrier the affordability of suitable assistive or adaptive technology. It is indicative that 40% of disabled gamers have bought games they haven't been able to play due to poor accessibility (Scope, 2020). Game communities are also an issue since 40% of disabled gamers have experienced negative attitudes from other gamers.

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Gaming industry and disability

On a survey conducted in the UK, it was noted that:

- 66% of gamers with disabilities or conditions report encountering barriers or challenges while gaming.
- The primary obstacle was the cost of appropriate assistive or adaptive technology.
- The most commonly utilized assistive technologies include sound options and sensitivity adjustments for controllers.
- Half of disabled gamers indicate that accessibility information about a game influences their purchasing decisions.
- 40% of disabled gamers have purchased games they were ultimately unable to play due to inadequate accessibility features.
- Additionally, 40% of disabled gamers have faced negative attitudes from other gamers concerning their disabilities, impairments, or conditions.

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ACCESSIBILITY

In Games

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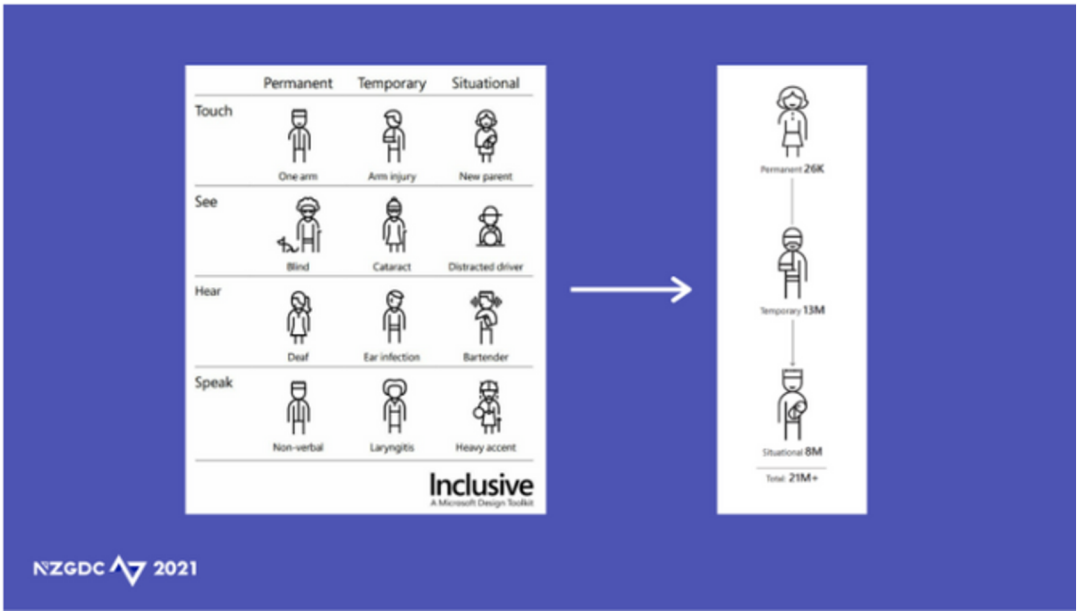
Accessibility in games

Morgan Baker defines accessibility in games as "breaking down barriers to ensure that everyone has an enjoyable player experience." In the framework of the UpGameIn project accessibility is defined as ensuring that all players regardless of their abilities, age, education, culture etc are able to understand the rules and mechanics and play the game.

As Baker points out, "accessibility is neither expensive nor consuming to do on the very minimal level. Any developer has the ability and tools to make games accessible".

IGDA claims that games cannot be accessible to everyone but all games can be made more accessible to a wider audience of people while maintaining the game experience and essence. Baker mentions that there are many types of accessibility.

Based on the reasons of the need (Baker) identifies:



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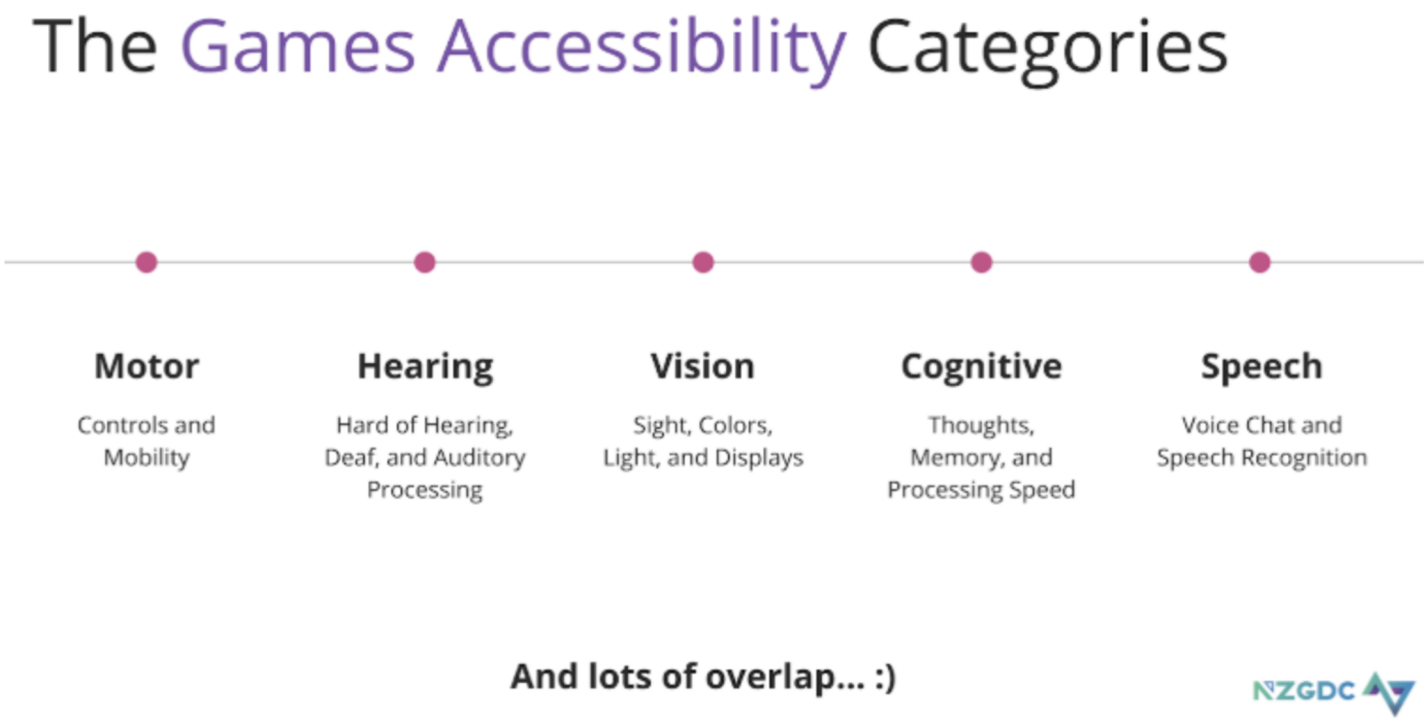
The First category that falls under the reason for needs is permanent which focuses on individuals facing a long-term condition that doesn't change, such as someone with a physical disability like paralysis or a congenital condition affecting mobility. The second is temporary, which involves individuals facing short-term conditions like a broken arm, a recovering injury, or an infection that impairs their usual abilities. The situational category affects individuals who may benefit from accessibility features in certain contexts, even if they don't face a permanent or temporary condition for example a parent holding a child.



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Baker also introduces 5 categories of game accessibility (for video games) with many of them to overlap. Below, we will list the 5 categories and try to provide examples beyond the video games.

The **first** category is motor accessibility. For Baker, in the context of video games, motor accessibility is linked to controls and mobility features. Game developer websites define motor related limitations as those to restrict the "free movement of the body - such as being born with a single hand or temporarily losing mobility on one hand due to an accident."

The **second** category is linked with accessibility features for those facing hearing impairments including deafness, low hearing and loss of hearing due to prior injuries (permanent) or due to exposure to loud sounds (temporary).

The **third** category is linked with visual impairments that can span from: blindness, low vision, color blindness and visual processing disorders.

The **fourth** category is cognitive accessibility that is linked to an individual's memory or processing speed, limited attention span, problem solving skills etc.

Lastly, the **fifth** category is linked to speech accessibility that is linked with voice chat and speech recognition.

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Baltazar et al., introduce another type of accessibility, the social accessibility noting at the same time that there have been advancements in "technical" accessibility but not to social ones. They define social accessibility as "a larger approach centered around both functional usability and social use situations of technology, and how both can be facilitated. The aim is not to merely provide technical usability and access, but to recognize and account for the social context of said access and how it can impact the content being consumed".

Table 2 Selected Disability Measures (Number in thousands)

Disability Level from Census	Barrier Type	Age 0-14 60,605	Age 15-24 39,453	Age 25-64 149,031	Age > 64 33,742	All Age 282,831
Motor Impaired - difficulty grasping objects						
severe	critical	(147)	130	310	331	918
not severe	non-critical	(433)	382	283	2,647	3,745
Visually Impaired - difficulty seeing words/ letters						
severe	critical	42	210	762	951	1,965
not severe	non-critical	147	383	2,987	2,852	6,369
Hearing Impaired - difficulty hearing conversation						
severe	non-critical	39	155	418	506	1,118
Hearing or Cognitive Impaired - difficulty with speech						
severe	non-critical	135	123	313	156	727
Cognitive Impaired - cognitive limitations						
learning disability	non-critical	1,082	1,217	2,036	154	4,489
mental retardation	critical	226	339	827	55	1,447
alzheimer, senility, dementia	critical	n/a	30	648	1,259	1,937
other mental or emotional	non-critical	256	483	2,140	352	3,231
Totals						
all disabilities	critical	415	709	2,547	2,596	6,267
all disabilities	non-critical	2,092	2,743	8,177	6,667	25,946
all disabilities	all barrier	2,507	3,452	10,724	9,263	32,213

Why is accessibility in games important?

Game accessibility is important for a variety of reasons, some of them might be:

- player satisfaction
- larger market shares
- opportunity to learn and practice new skills
- wider application of games in game based learning

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TOOLKIT

For game Accessibility

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Toolkit for Game Accessibility

Game accessibility guidelines in digital games

On the website gameaccessibilityguidelines.com, one can find guidelines on how to design accessible games resulting from a "collaborative effort between a group of studios, specialists and academics, to produce a straightforward developer friendly reference for ways to avoid unnecessarily excluding players, and ensure that games are just as fun for as wide a range of people as possible" (disclaimer included in the website).

They have created 3 sets of guidelines:

- **Basic**: This set of guidelines is relatively simple to implement, can be applied in a variety of contexts and nearly all game mechanics.
- **Intermediate**: This set of guidelines involves some planning and effort from the game designer's point of view but generally can be characterized as good overall game design principles.
- **Advanced**: This set of guidelines is the most complex one proposing modifications tailored for severe impairments or specific, niche mechanics.

Below, you may find a basic list of the guidelines for digital games, deriving mostly from gameaccessibilityguidelines.com, framework.

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Game accessibility guidelines in digital games

Motor:

Include an option to adjust the game speed:
This refers to people having difficulties in reacting quickly or processing information (seniors or people with intellectual disabilities). Slowing down the speed, allows for them to understand and react to what is going on during the game. It also is related to issues players might face with precise timing (e.g. slowing the game down).

Include toggle/slider for any haptics:
Haptics can be a useful aid for accessibility but may be caused in long term discomfort, pain or even injury especially for individuals diagnosed with carpal tunnel or sensory processing impairments. It would be useful to have an option to turn off haptic or offer sliders that can adjust haptic strength.

Ensure interactive elements/virtual controls are large and well spaced, particularly on small or touch screens:
Extensive research has been banned on touch hot areas, with 2,4cm to be the ideal size for touch screens. When it comes to smaller phones screens, it seems to be impractical with 0,96cm. For people with reduced vision it might also be difficult to use this minimum size. Also, people with reduced accuracy will face similar difficulties.Buttons should also be placed not that close to each other. In the case that they have to be placed really closely, they need to be larger.
In cursor driven interfaces, individuals with reduced accuracy may face difficulties on targeting certain objects.

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Include an option to adjust the sensitivity of controls:
When it comes to sensitivity of controllers, there is not a level one-size-fits-all. Some individuals may face a restricted range of motor abilities so they would require very high sensitivity. On the contrary, others may face reduced accuracy so they would require very low sensitivity. A majority of players might use alternative equipment as input devices eg head mouse. The established sensitivity controls of computers might be accessed only by advanced users. Last but not least, different games may require different levels of sensitivity.

Ensure that all areas of the user interface can be accessed using the same input method as the gameplay:
For instance, if players can choose between a keyboard or a joy-pad, make sure that all menus are navigable using both options. Similarly, if the gameplay relies exclusively on motion controls, the game designer should make sure that all menus can also be operated entirely through motion controls.

Ensure controls are as simple as possible, or provide a simpler alternative:
When a player has to use complex control schemes, it might require players to exert higher degrees of their motor and cognitive skills. A recommendation would be to avoid using buttons/keys in general. Also the use of a complex combination of buttons can result easily in excluding some players due to difficulty of use.
Of course, that does not mean that complex controls should be completely avoided, but game designers should have in mind to provide simpler alternatives.

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Allow controls to be remapped/reconfigured:
This characteristic is mostly associated with users facing motor impairments regardless if they are permanent, temporary or situational. Being able to replace controls into positions that are easier for them to reach and use (e.g. with a single hand or resting on a table-top). Players might also have different preferences from what a game designer thought as prerequisite e.g. different arrangements in keyboards.

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Game accessibility guidelines in digital games

Cognitive:

Avoid flickering images and repetitive patterns:
This might affect people suffering from photosensitive epileptic seizures. Seizures cannot be completely avoided but designers can take into account certain triggers such as e.g. to avoid sequences of flashing images lasting more than 5 seconds, 3 flashes/second that are displayed on more than 25% of the screen, repeated patterns or text that moves appearing on more than 25% of the screen, static patterns or text that cover more than 40% of the screen.
Since seizure cannot be completely avoided it is recommended to describe if possible some of the triggers eg 'screen flash effects', 'effects intensity', etc.

Allow players to progress through text prompts at their own pace:
Difficulty in reading is extremely common (14% of adults have a reading age of below 11 years) and there are individual differences on reading speeds and ability. Adding to this, as players get easily distracted, they tend to miss critical information. For these reasons, there can be no set speed for displayed texts. It is suggested to dismiss textual information when acted on by a player. If this is not an option, players must be able to replay or step back. If players need to communicate via chat, it is suggested that messages can be browsed back without jumping automatically to newer messages when they appear.

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Include interactive tutorials:
Even if it is not considered the best design solution, they are preferred to a simple instruction screen. Interacting as requested provides a cognitive association about certain action and it is less demanding on use of short term memory.

Use simple clear language:
Low reading skills is rarely discussed compared to other impairments despite the fact that it might be linked to certain conditions like dyslexia, mainly due to the stigma that it is surrounding it.. To surpass this obstacle, it is advised to aim for simple and clear language avoiding unwanted complexity or length unless it is required.

Allow the game to be started without the need to navigate through multiple levels of menus:
Incorporating complex menus in games can be challenging for people with conditions such as dyspraxia or impaired short-term memory. Providing a quick start option can make a game more accessible to a wider span of players.

Use simple clear text formatting:
For short texts to be visually accessible, using clean, sans serif fonts placed over a simple background improves their readability. When it is required to use larger pieces of text, it is recommended to use mixed case instead of all cups, with left alignment, 1.5x line spacing, and limit lines to around 70 characters for better readability. Dyslexia friendly fonts might be helpful.

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Use an easily readable default font size:
Small text size is not readable for individuals with vision impairments whether they are medical or situational. Font size adjustment options might be ideal, but not always feasible. Setting a large default size might be a good starting point. For instance, Amazon TV's guidelines recommend a minimum of 28px for 1080p screens, suitable for users with 20/20 vision, but it’s best to exceed this size to accommodate several vision impairments. Smaller fonts can make individuals with dyslexia have difficulties to read as well, since smaller letter sizes make their shapes less distinct.

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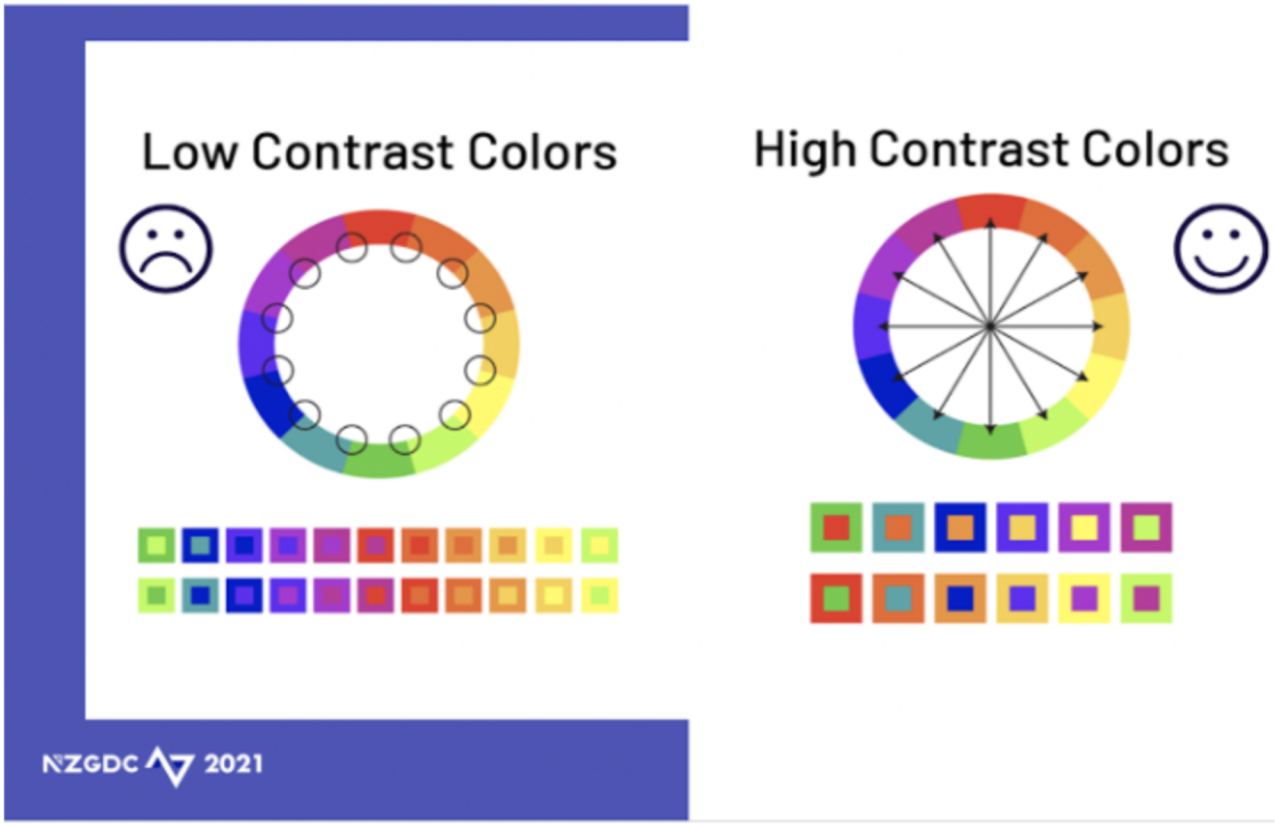
Game accessibility guidelines in digital games

Vision:

Provide high contrast between text/UI and background: When it comes to UI design, contrast is a critical feature especially for people with vision impairments like contrast sensitivity loss and colorblindness. Contrast assists individuals to view screens in environmental situations e.g. excess sunlight or using equipment such as low-quality screens. Texts as well as UI elements need to be placed on high-contrast backgrounds with a contrast ratio of at least 4.5:1. Outlines and shadows could be also used for better separation.



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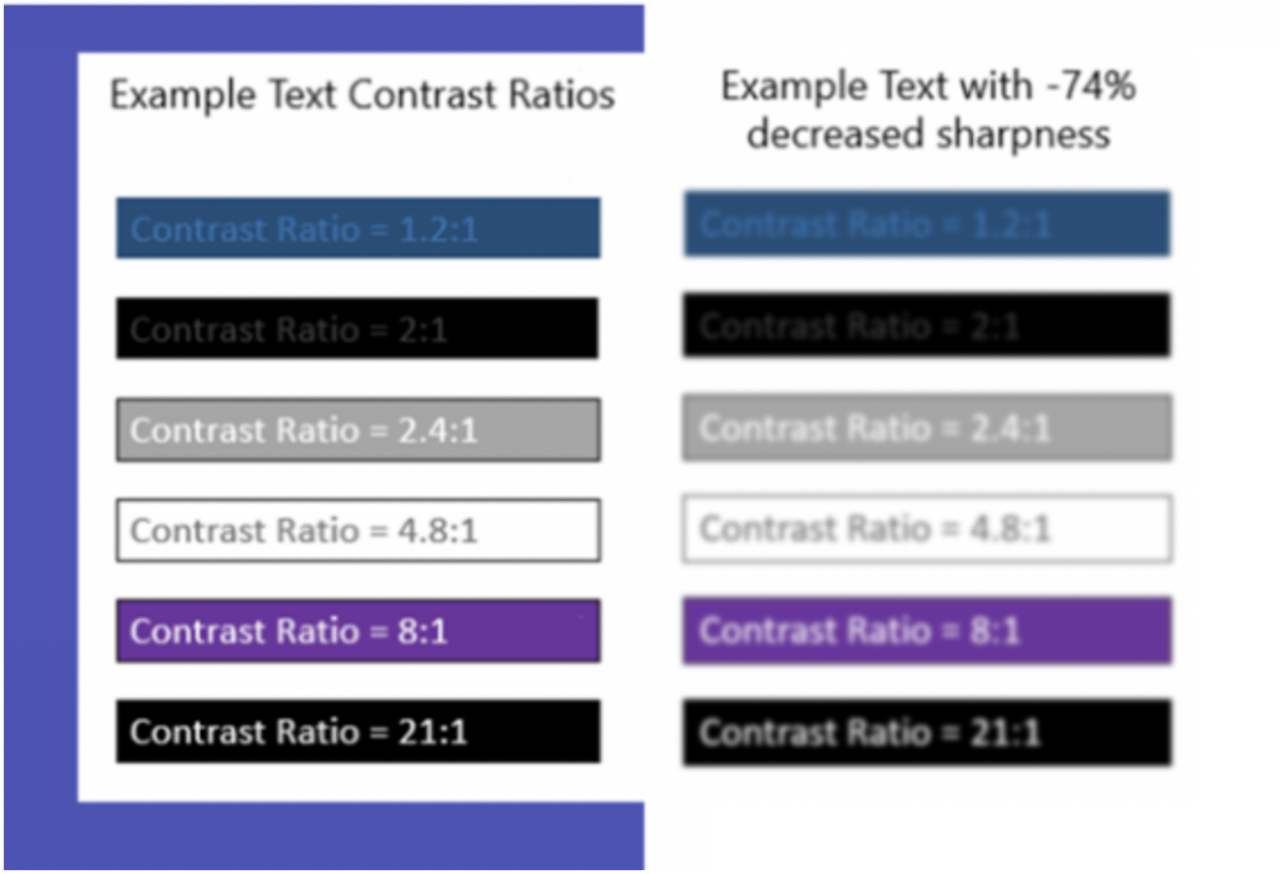

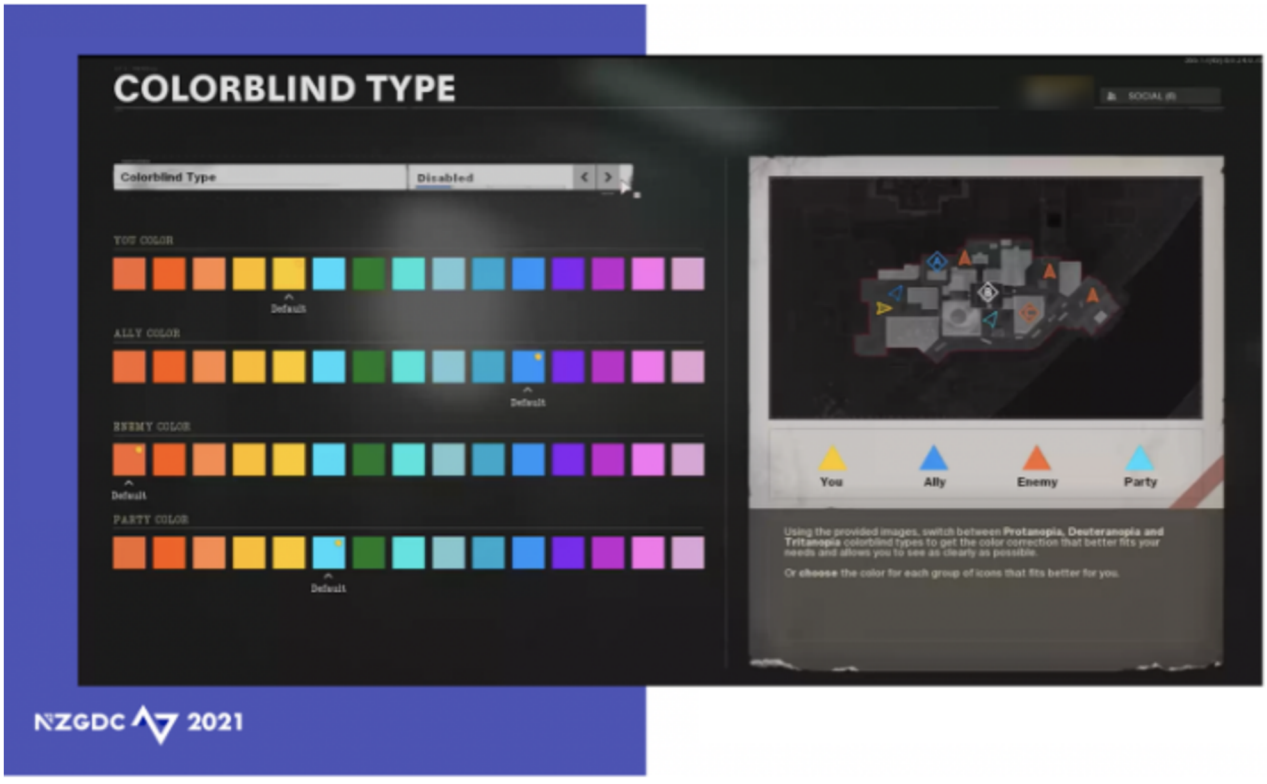

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Game accessibility guidelines in digital games

Use simple clear text formatting (see above)

Use an easily readable default font size (see above)

Avoid VR simulation sickness triggers: It is a very significant issue in VR experiences since the immersion can cause various symptoms from mild discomfort to incapacitation. If an individual has faced poor VR experiences, it is very likely to deny using such platforms again. To reduce VR sickness, player control should be prioritized by allowing individuals to align camera and head movement and making use of options like teleportation or rotation. It is also suggested to limit peripheral vision while the player is moving, avoiding fast head movements etc. The game designer might also offer by default a comfort player mode, which can be turned off by the player's preference.

Ensure no essential information is conveyed by a fixed color alone: Color Blindness, particularly red-green colorblindness, can affect individuals while playing making it essential to use color alongside other cues like text, symbols, or patterns. If there are color-dependent elements in a game (e.g., team colors) designers may offer colorblind-friendly palettes e.g.,orange vs. blue alongside custom options along with contrast. There are certain simulators that can help game designers test their games for accessibility.

1* Simulation sickness occurs when there's a mismatch between what your visual and vestibular systems are telling your brain, such as when your eyes perceive motion, but your body feels stationary.

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Game accessibility guidelines in digital games

Ensure interactive elements/virtual controls are large and well spaced, particularly on small or touch screens (see above)

Offer a wide choice of difficulty levels:
Offering a basic difficulty choice is required. All level adjustments should accommodate players of all abilities, from the most skilled to those needing the most help, without using demeaning labels for easier modes and without reducing the engagement and overall experience for all players. Some suggestions would be to allow adjustments on specific game elements like enemy speed, AI behavior, or puzzle complexity.

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Game accessibility guidelines in digital games

Hearing:

If any subtitles/captions are used, present them in a clear, easy to read way:
To address any complaints related to subtitles, designers should make sure that text is at least 46px at 1080p, and is placed against a solid or semi-opaque background having either an outline or shadow. Subtitles should be limited to 40 characters per line with a maximum of two lines per subtitle. Additionally, subtitles should be accurate, avoid overlapping or clashing with rest UI elements, and use a clear, mixed-case font.
Readability is crucial, particularly for users with hearing impairments. It is also important or non-native speakers. Of course, subtitles can be customized in terms of font style so as to balance readability and individual aesthetic preferences.

Ensure no essential information is conveyed by sounds alone:
Relying also on sound to convey critical information for the game-play limits a game's accessibility for players both with hearing impairments or for those playing in noisy environments, using poor equipment or need to mute the sound while playing. Subtitles usually convey spoken dialogue. Non verbal sounds e.g. sirens also need to be conveyed with alternative visual cues. Such as icons, effects or text.

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Provide separate volume controls or mutes for effects, speech and background / music:
People with hearing loss can miss specific frequencies for this reason, making independent volume control crucial. Certain visual elements or challenges should be paired with individual sounds, especially when visual cues are hard to detect. Too many simultaneous sounds can overwhelm players on a cognitive level especially, those with auditory processing disorders. Offering sliders for different audio elements, can help tailor the auditory experience to the individual needs.

Game accessibility guidelines in digital games

Speech:
Ensure that speech input is not required, and included only as a supplementary / alternative input method:
Relying solely on speech recognition excludes players who are physically unable to speak, those whose speech isn't clear enough for voice recognition, or those who have cognitive difficulties with language. To ensure inclusivity, offer alternative controls or menu options for all voice commands.

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Game accessibility guidelines in digital games

General:
Provide details of accessibility features in-game
Provide details of accessibility features on packaging and/or website

Game accessibility guidelines (physical games)

Here are some key features of accessible tabletop games making deductions from guidelines for digital games.

Visual Accessibility:
Large Print: Using larger fonts for cards, rules, and game boards makes it easier for people with low vision to read and play.

High Contrast: Strong color contrasts between text and background, and between different game components, help players with visual impairments distinguish elements.

Tactile Markers: Adding braille or raised textures to cards or game pieces allows players with visual impairments to identify them by touch.

Colorblind-Friendly Design: Choosing colors that can be easily distinguished by people with colorblindness, or using symbols and patterns in addition to colors.

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Game accessibility guidelines (physical games)

Auditory Accessibility:
Alternative to auditory cues: Providing visual or tactile alternatives for games that rely heavily on sound, such as using a flashing light instead of a buzzer.

Clear and Concise Rules: Writing rules in a clear and concise manner, using simple language and avoiding jargon, makes them easier to understand for people with cognitive disabilities.

Game accessibility guidelines (physical games)

Motor Accessibility:
Easy to Manipulate Components: Using larger game pieces, cards that are easy to hold and shuffle, and components with textured surfaces can make it easier for people with motor impairments to play.

Adaptable Game Boards: Game boards that can be adjusted or tilted can make them more accessible for players with limited reach or mobility.

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Game accessibility guidelines (physical games)

Cognitive Accessibility:
Simplified Rules: Offering a simplified version of the rules or a beginner mode can make the game more accessible to players with cognitive disabilities.

Visual Aids: Providing visual aids, such as diagrams or flowcharts, can help players understand the rules and gameplay.

Reduced Complexity: Designing games with simpler mechanics and fewer rules can make them less overwhelming for players with cognitive overload.

Game accessibility guidelines (physical games)

Other Important Considerations:
Social Accessibility: Creating games that encourage social interaction and cooperation can help players with social anxiety or communication difficulties feel more comfortable.

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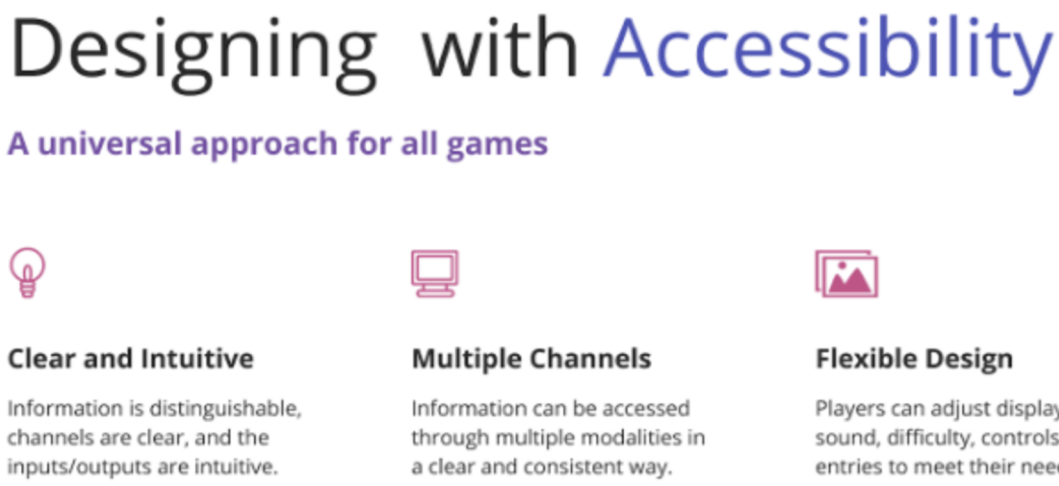
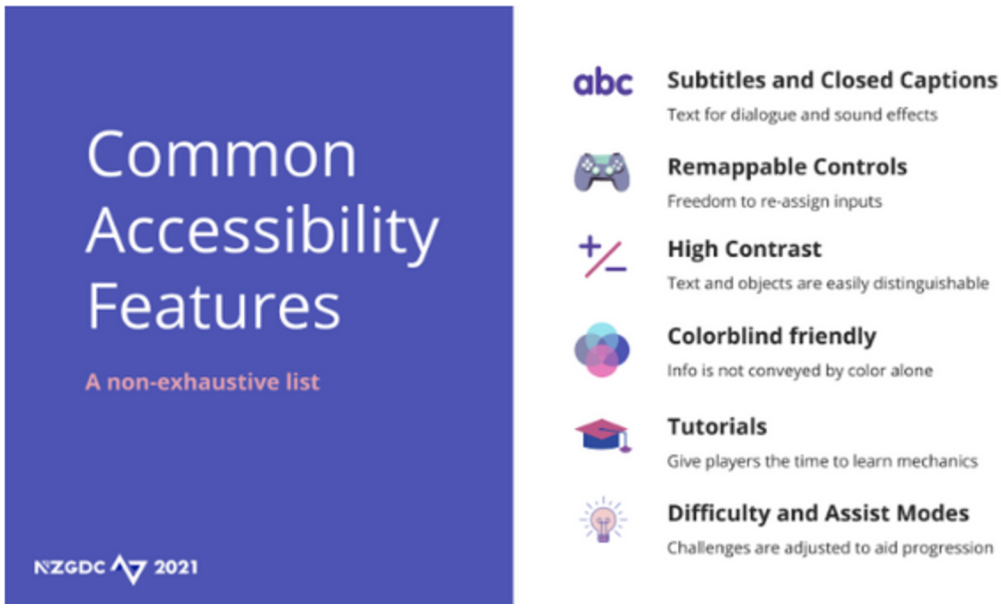
Universal Design for all games



Morgan L. Baker is a Game Accessibility and Inclusivity specialist and has extensive experience in the field. Through her research she proposes a universal design approach for all games. She proposes a short list of common accessibility features among all game types.



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ACCESSIBILITY and player experience

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Accessibility and Player Experience

Accessibility features aim to immerse players without destroying the gamer's experience.
David Eng mentions that the gaming experience can be broken down into six major areas that game designers should reflect in are the following:

Motivation:
While ideating or designing a game one should reflect on why a player would play the game. For instance, playing a serious game might be a smaller part of a class or work life. Two areas might affect this reasoning: a player's interest and demonstrating competencies. In that way players keep playing the game and improve themselves.

Meaningful Choices:
While playing, players come through many decision points that are meaningful to them. In this way, they can show their abilities in decision making that can be broken down into 3 areas: Agency, strategy and tactics. Agency can be defined as a player's ability to make a choice. A player's choices of course have an impact on the strategy and tactics they wish to implement. Strategy can be defined as the "culmination of a series of choices that affect a game state". Tactics can be described as the "result of player's choices that affect the overall game state or other players for a limited amount of time".

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Fun:
It is the most subjective area of player experience that can never be planned 100%. The combination of all the aforementioned areas can have a significant impact on fun experience.

Balance:
Balance is linked with the engagement of a player. All players should remain enraged on the game for a large amount of time dividing the duration of play in instances with higher or lower engagement of the game.

Usability:
When considering the usability, Dane Eng mentions that one should reflect on the following questions: "What is happening in the game?" – linked to core game mechanics, " What is happening to players?" and "What actions can players take?

- Motivation
- Meaningful Choices
- Fun
- Balance
- Usability

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Regarding the gaming experience and accessibility, AbleGamers use the Accessibility Player Experiences (APX) triangle, an approach recommended to design video games and interactive media that prioritize accessibility for players with diverse needs. It breaks down to 3 components:

A - Accessibility:

This component focuses on ensuring that the game is accessible to a broad range of players, including those with disabilities. This mainly involves implementing accessibility guidelines as the ones that will be presented later.

P - Player Agency:

Player agency refers to the degree of control players have over their gaming experience. This includes allowing players to make choices regarding difficulty levels, gameplay styles, and how they interact with the game world. Providing options that enable players to tailor their experience helps accommodate varying abilities and preferences.

X - Experience:

The experience aspect focuses on the overall enjoyment and engagement of players. This involves not only making the game functional for all players but also ensuring it is enjoyable and immersive. Designers should consider how accessibility features can enhance the experience rather than detract from it, ensuring that all players can enjoy the game fully.

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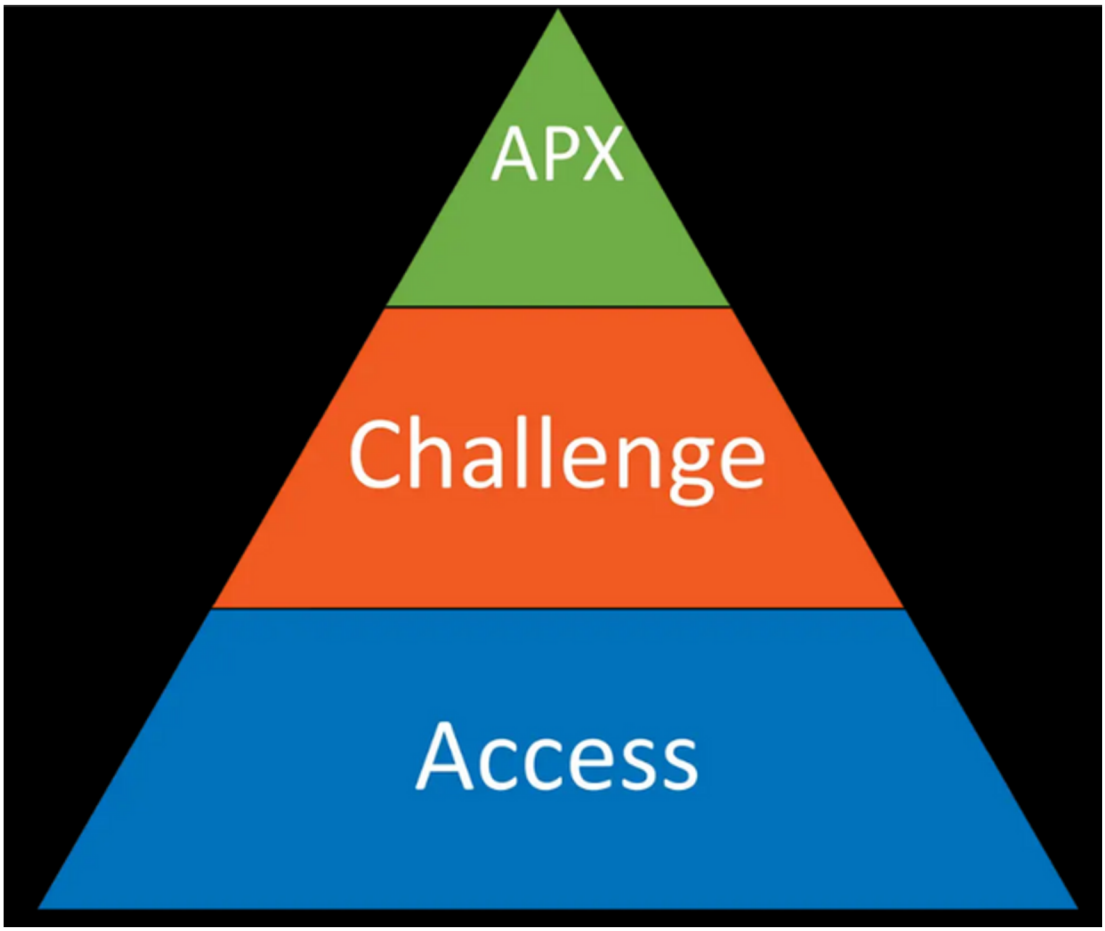

https://accessible.games/accessible-player-experiences/design-patterns/

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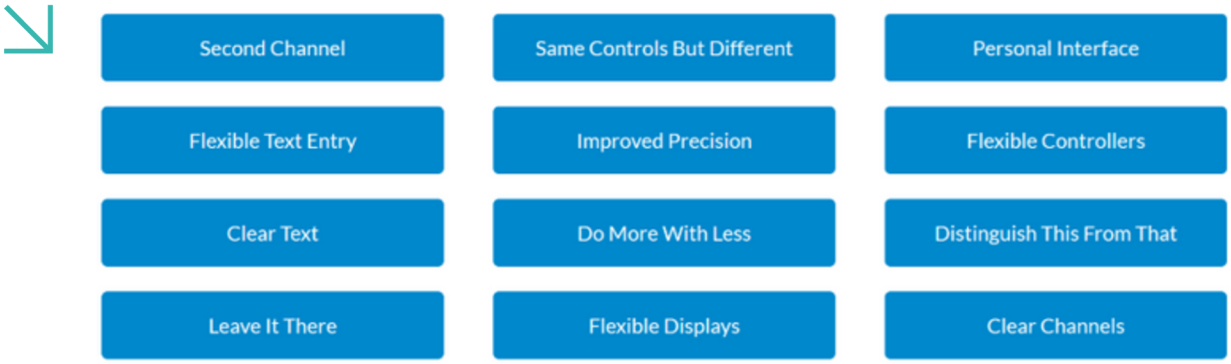

Every game designer has on their hand 12 tools to apply the APX framework.

In order to apply the APX framework, game designers need to:

- conduct user testing with players of varying abilities to gather feedback on accessibility features and overall experience.
- stay informed about accessibility guidelines and best practices in the gaming industry.
- foster an inclusive community by providing resources and support for players who may have difficulty accessing the game.

By integrating the APX framework into the design process, developers can create more inclusive and enjoyable gaming experiences for all players, promoting diversity and accessibility within the gaming community.

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ACCESSIBILITY

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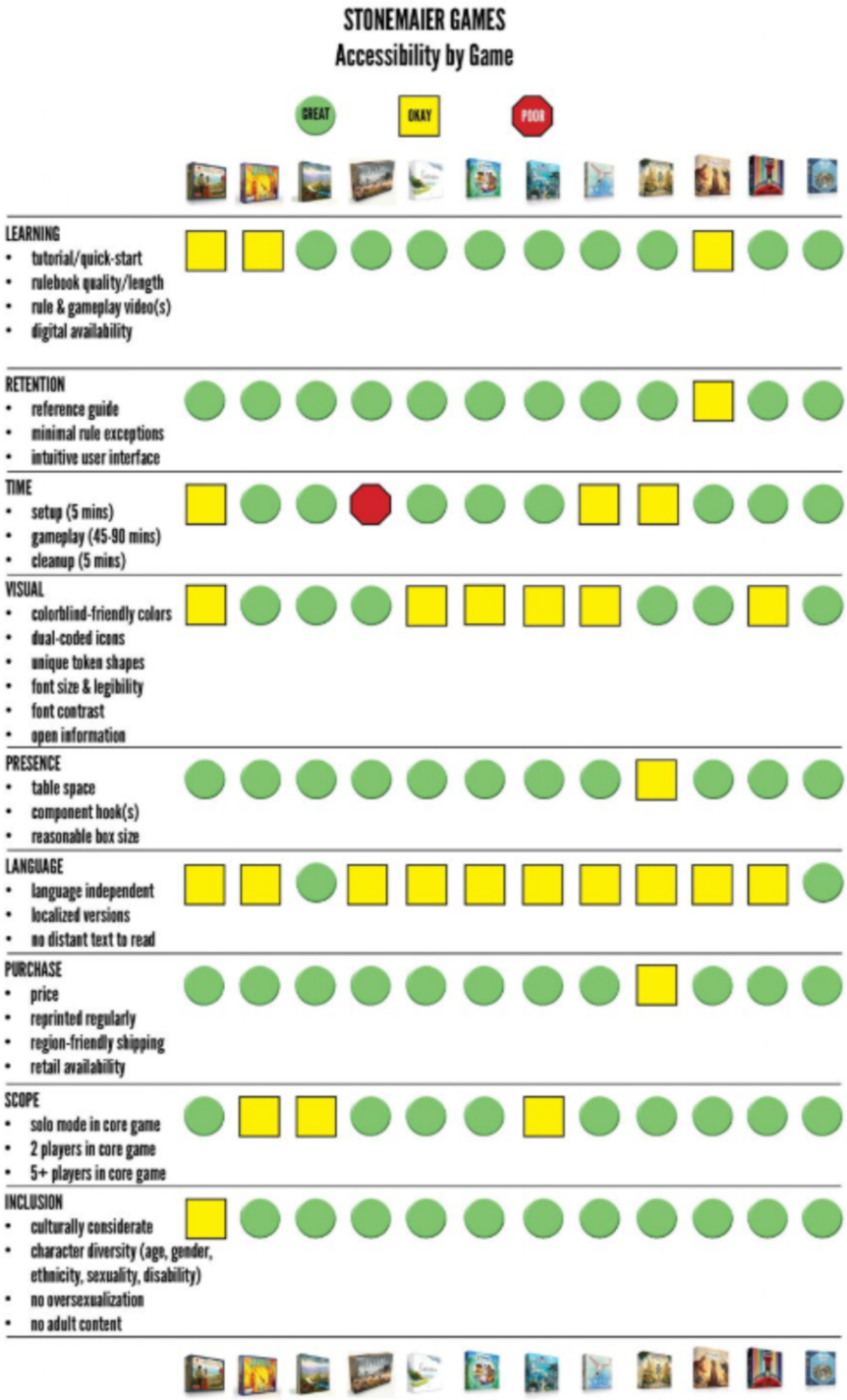
Accessibility Evaluation

In this chapter, we will focus on how designers can evaluate/measure the accessibility of their games.



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Above, you may find a checklist provided by Stonemaier games focusing on certain game elements such as:

- Learning (tutorial, rulebook length, rule video, digital version)
- Retention (reference guide, minimal exceptions, intuitive user interface)
- Time (setup, playing time, cleanup)
- Visuals (dual-coded icons, uniquely shaped tokens, font size, font contrast, lack of hidden info and distant text)
- Presence (table space, component hook, reasonable box size)
- Language (independence, localized versions)
- Purchase (price, reprinted regularly, buy from publisher, buy from retailers, regional fulfillment centers)
- Scope (player count: solo, 2-player, 5+ players)
- Inclusion (culturally considerate, character diversity [age, gender, ethnicity, sexuality], no oversexualization, no adult content)

In a relevant literature review about evaluating the accessibility of game, Fortes et al., identified the following dimensions to be explored:

- player experience.
- engagement
- fun
- enjoyment
- levels of cognitive load
- playability
- game accessibility development

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In general game designers can test their games by taking into account several dimensions such as:

- User research: conduct user research with the target audience(s). This involves observing, interviewing, and surveying real or potential players to better understand their needs, preferences, motivations, and potential challenges that might arise as well as possible accessibility issues and solutions that could work best for the target audience.
- Use Accessibility testing tools such as Color Contrast Analyzer, the NVDA Screen Reader, and the Gamepad Tester. All these tools allow designers to identify and resolve technical problems related to aspects like color contrast, text readability, keyboard navigation, captions, and audio levels. Accessibility testing tools can also assist in simulating various user scenarios, such as using a screen reader, switch controller, or low vision mode.

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ACCESSIBILITY GOOD PRACTICES

By Challedu

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Example 1 - Love Game

Name/title: ID-GAMES serious games - Love game

Webpage/source:	**https://www.idgames.eu/**
Company or organization that has developed the game	• Challedu, • PEKAMEA, • E- School, Asociația "Alianța pentru copii", • Lusófona University, • Specjalny Ośrodek Szkolno-Wychowawczy nr 1
Type of game	Board game (Digital material to print)
Description (about 1000 characters including spaces max)	The games have simple pictures that include a short description of the image, under them, so the message is easily understood, and if not, the keywords located under the picture will help the player make a question and get an answer from the "game master". Moreover, there are many levels that the game can be played, with the options being easy, easy and cooperative/competitive and hard and cooperative/competitive. These levels are connected with the level of the Intellectual disability (ID) of the players, along with their mood at the time. In other words, this game can support groups of players with different or distinct levels of ID. These features enhance the participation of the players in the game, making it attractive for them and engaged in it, while training many of their cognitive skills such as memory, creativity, and decision making. This fact is very important as the learnings of the game itself are crucial for their social and sexual education. It is accessible to different levels of ID, meaning that no one stays behind or with lack of education in the fields above.
Groups they represent	Adjustable Difficulty Levels (People with Intellectual Disabilities)

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Example 1-Love Game

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Example 2 - Specialites

Name/title: Specialites

Webpage/source:	https://projectbridge.eu/ https://tabletopia.com/login?redirect=%2fworkshop%2fgames%2fbidge%2f1-8players-specialites-gr%2ftest
Company or organization that has developed the game	• Challedu, • Panellinia Omospondia Nosou Alzheimer kai Sinafon Diatarachon, • Anziani e non solo Società Cooperativa Sociale, • Asociatia Habilitas – Centru de Resurse si Formare Profesionala, • University of Western Macedonia
Type of game	Physical game (Digital materials you can print) and also available online through Tabletopia.com
Description (about 1000 characters including spaces max)	The game's rules are easily adjustable to the abilities of people with Dementia (pwD), through the levels of difficulty (easy, medium, hard level) that go along with the level of Dementia that pwD have. Moreover, during the COVID-19, that social distancing was a reality and people could not visit each other, Challedu organized online board game workshops, so that seniors/pwD could play this game with their family, without being in the same space or missing any joy of being connected with the others. The pwD and young people or professional caregivers of pwD playing these games, are able to become fully immersed in the game, while adjusting it to the actual needs and mood of the players, making it ideal for pwD to play and enjoy without feeling confused or becoming tired by the complexity of it.

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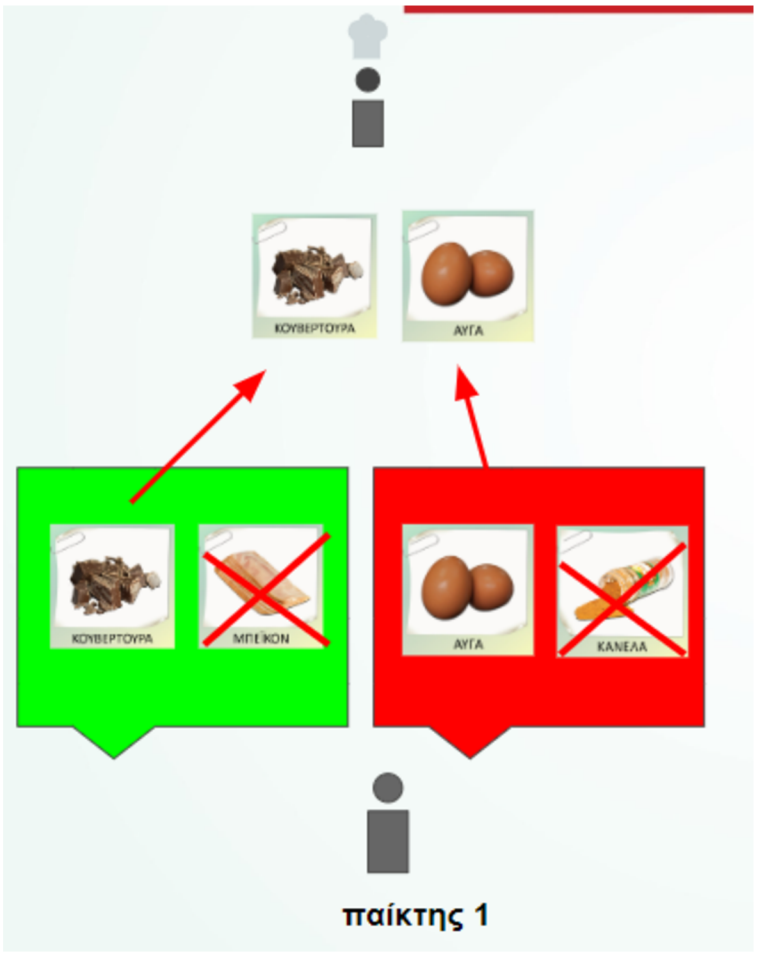
Example 2 - Specialites

Name/title: Specialites

Description (about 1000 characters including spaces max)	Moreover, the "game master" or the Chef in this instance, can be any player, as long as they find the correct recipes, so this game is allowing everyone to take the lead and guide the rest of the players through the game, with the appropriate support by the organizing team if needed. After playing Specialites with caregivers of pwD and pwD, we handed out questionnaires and we received answers that the game was simple and understandable for pwD as well as their caregivers and they both enjoyed the process, along with the fact that the objective of the game (recipes for cooking) was a subject that is close to the players of the game.
Groups they represent	Adjustable Difficulty Levels for people with Dementia



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Example 3 - Legends of Disability - Digital Version

Name/title: Legends of Disability - Digital Version

Webpage/source:	https://drive.google.com/drive/folders/10JzJU3obAizxo79k8Z_580qXA8oxadkf?usp=sharing https://drive.google.com/drive/folders/1-4q803q9KXM7LmnnMjGAGrLIkWpK6wlq?usp=sharing
Company or organization that has developed the game	• Challedu, • Best Buddies Greece, • Perpato, • Frodizo
Type of game	FREE on website Role model based Digital Game
Description (about 1000 characters including spaces max)	The game promotes accessibility by focusing on individuals with disabilities, fostering understanding and respect. Its interactive format encourages active engagement, making learning memorable. Players can try again after incorrect answers, creating a supportive atmosphere. Diverse categories, like theater and cinema, arts etc ensure relatable and accessible content for different interests. Also, the fact that the game has 2 modes (easy/difficult) adds another element of accessibility in the game. For example, if the category indicated by the wheel is "Music," players might see cards of Ray Charles, a blind musician, and another less-known individual. Players must identify Ray, reinforcing his contributions to the music. The game provides brief bios, celebrating achievements of the disabled individuals. If they choose incorrectly, they can try again. This feature enhances the overall feeling of the game, making it appealing to seniors, people with dementia/disability.

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Example 3 - Legends of Disability - Digital Version

Groups they represent

- Audio Descriptions
- Simple graphic design
- Adjustable Difficulty levels

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ACCESSIBILITY GOOD PRACTICES

By Escape4change

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Example 1 - **Blank**

Name/title: Blank

Webpage/source:	https://www.meeplelikeus.co.uk/blank-2017/
Company or organization that has developed the game	• Designer: Henri Kermarrec • Publisher: The Creativity Hub
Type of game	A light, Social card game
Description (about 1000 characters including spaces max)	Blank is a card game where players create the rules themselves. After each game, the winning player adds a rule card to the deck, making each set of cards unique. The game features a wide variety of illustrated cards with minimal text, allowing players to draw or write their own rules, adapting the experience to the abilities and preferences of the group. • Verbal Communication: Possible but not required, making the game suitable for players of different nationalities or those who may have difficulty communicating effectively. • Color Accessibility: Ensured, as the only colors present are on the cards, all marked with the appropriate symbol. Experience Difficulty: Managed by the group playing, making the experience highly adaptable and inclusive.
Groups they represent	• Rules Defined by Players: Extremely Inclusive • Minimal and Non-binding Text: Limited text is present and not mandatory. • Non-essential Linguistic Component: Verbal communication is not required. • Social Interaction at the Core: The experience centers around social interaction.

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Example 1 - **Blank**

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Example 2 - Karuba

Name/title: Karuba

Webpage/source:	https://boardgamegeek.com/boardgame/183251/karuba
Company or organization that has developed the game	• Creators: Rüdiger Dorn • Publisher: Conclave Editora
Type of game	A light, family tile-laying race game
Description (about 1000 characters including spaces max)	Karuba is a tile-laying race board game where players build their own paths and then compete to collect as many points as possible. • Simple Rule Set: The rules are straightforward, with colors not used as an information channel. All terrain tiles and player tokens are identified by numbers or specific shapes. • Competitive Yet Balanced: Despite its competitive nature, the scoring system supports recovery, keeping all players close in score. • Optional Competitiveness: Players can choose to ignore the competitive aspect and focus solely on building their own paths without concerning themselves with the actions of others.
Groups they represent	• Color-blind Friendly • Simple Rules: Easy to learn. • Player- chosen Difficulty: Difficulty of the experience is chosen by the player. • Text-Free: Minimal to no text required. • Minimal Calculations: Limited need for calculations.

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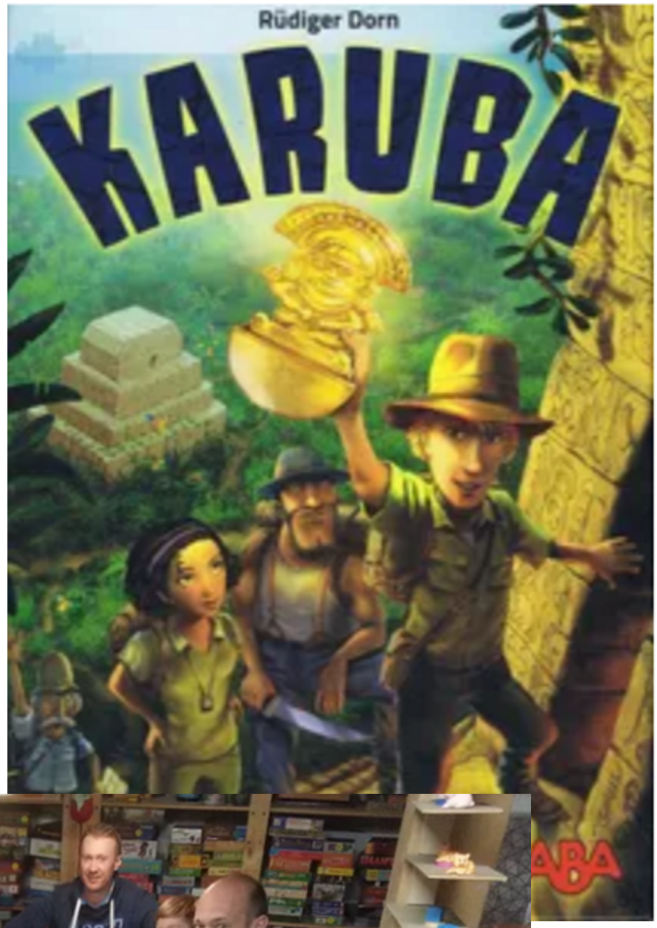
Example 2 - Karuba



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ACCESSIBILITY GOOD PRACTICES

By Fantazmat Foundation

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Example 1 - Spellbound

Name/title: Spellbound

Webpage/source:	https://scenariofestival.se/wp-content/uploads/2018/11/bjergtaget-spellbound-scenariotext.pdf
Company or organization that has developed the game	• Maria & Jeppe Bergmann Hamming
Type of game	A LARP about Humans and Undergrounders, about luring and being lured, about losing yourself and remembering and about finding your way back home. And it's about those things that bring you back home: Faith, Love & Hope.
Description (about 1000 characters including spaces max)	The accessibility of the game relies heavily on the fact that interactions within its bounds are non-verbal and entirely based on movement/dance There is one Game Master initiating scenes as per scenario's instructions, yet aside from that, all manner of activities happen via moving. This allows players to focus on body language expression, closeness and other more physical aspects of communication. While the game benefits players, mostly in regard to that area of life, it also mitigates fear of dancing and moving outside the normalized fashion.
Groups they represent	• General Public

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Example 1 - **Spellbound**

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Example 2 - Crossing Borders

Name/title: Crossing Borders

Webpage/source:	https://download.alexandria.dk/files/scenario/4007/crossing_borders.pdf
Company or organization that has developed the game	• Claus Raasted
Type of game	LARP about neighbours from hell.
Description (about 1000 characters including spaces max)	The game is short and deals with a topic of neighbours coexisting together and having difficulties in doing so. The strength of this game is that it relies on common topics which can be found in every culture and thus can bring together people of various backgrounds. It is also written in a short format, with the rules being easy to digest . It is written in a very short in both preparation and play, thanks to the open-source document with clearly-written rules to follow
Groups they represent	• General Public

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ACCESSIBILITY GOOD PRACTICES

By Odd Statue Games

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Example 1 - Codenames: Pictures

Name/title: Codenames: Pictures

Webpage/source:	https://boardgamegeek.com/boardgame/198773/codenames-pictures
Company or organization that has developed the game	• Designed by: Vlaada Chvátil, • First published by: Czech Games Edition.
Type of game	A light-weight, Party type of game.
Description (about 1000 characters including spaces max)	Codenames: Pictures differs from the original Codenames in that the secret agents in the game are no longer represented by words, but by surrealistic universal images that contain multiple elements. This turns the game into a total language independent game, making it playable even by a group of people with diverse native languages; a much-appreciated accessibility feature by the community. It also uses colorblind-friendly palettes for codes and clues, making it easy for players with visual impairments to adapt, and equally enjoy the game. Furthermore, the game does not rely on any culturally specific knowledge, making it accessible for players from various backgrounds.
Groups they represent	• Neutral Theme/Presence – Universal Appeal • Colorblind Friendly • Simple Rules – Easy To Teach • Language Independent • Teamwork Spirit & Social Interaction • Theme with Abstract Clues – Imagination Flexibility • Skill Building (Deduction & Clue-Interpretation Skills)

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Example 2 - Mysterium

Name/title: Mysterium

Webpage/source:	https://boardgamegeek.com/boardgame/181304/mysterium
Company or organization that has developed the game	Designed by: Oleksandr Nevskiy & Oleg Sidorenko, First published by: Libellud.
Type of game	A medium-weight, Thematic type of game.
Description (about 1000 characters including spaces max)	In this game players are mediums, trying to solve a crime case by finding the right cards of: suspect, location, and murder weapon. One player, acting as a ghost, communicates with the mediums and helps them through visions, which are represented by surrealistic illustrations. This mechanism encourages the use of visual imagination, making the game engaging for players with different cognitive styles. Furthermore, its abstract nature of game clues allows for flexible interpretation and inclusivity of diverse thought processes. Mysterium is totally language independent, utilizing images rather than text-heavy clues, making it accessible to non-readers. Because of its cooperative nature, new players can join and learn the game as they play, with the help of a more experienced player. Lastly, the game provides three difficulty levels to suit different players' skills and experience. Variable difficulty ensures that players of various ages and experience levels can enjoy the game, promoting intergenerational play.
Groups they represent	• Language Independent • Adjustable Difficulty Levels • Teamwork Spirit & Group Success • Theme with Abstract Clues – Imagination Flexibility • Promotes Intergenerational Play • Skill Building (Deduction & Clue-Interpretation Skills)

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Example 2 - Hanabi

Name/title: Hanabi

Webpage/source:	https://boardgamegeek.com/boardgame/98778/hanabi
Company or organization that has developed the game	Designed by: Antoine Bauza, First published by: Les 12 Singes.
Type of game	A light-weight, Family type of game.
Description (about 1000 characters including spaces max)	Hanabi involves simple and intuitive gameplay that does not rely on text or extensive reading. Players try to create the perfect fireworks show as a team, by placing cards on the table in the correct order. The twist is, you hold your cards so that they're visible only to other players! By assisting each other through hints regarding the numbers or the colors of the cards, players work together towards a common goal. This can be particularly engaging for players who find competitive games daunting or appreciate the sense of community and shared achievement. The game also uses color indications combined with unique symbols to assist colorblind players. This integration ensures that all players can actively participate and contribute, making it equally engaging for a broad audience. Additionally, its minimal components, simple rules, generic theme, and cooperative play make it suitable for players of varying ages and skill levels, favoring social interaction and inclusivity through its accessible design.
Groups they represent	• Neutral Theme/Presence – Universal Appeal • Colorblind Friendly • Simple Rules – Easy To Teach • Language Independent • Adjustable Difficulty Levels • Teamwork Spirit & Group Success • Skill Building (Deduction & Clue-Interpretation Skills)

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Example 2 - Hanabi

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RESOURCES

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Useful resources

- https://accessiblegamesdatabase.com/
- https://www.un.org/en/webaccessibility/
- https://medium.com/tealmedia/designing-for-accessibility-the-ultimate-in-ux-e366165d0db7
- https://www.bbc.com/news/newsbeat-67591204
- https://www.youtube.com/watch?v=NDD_vSfkrVI

UserWay: https://userway.org/blog/accessible-games/
AccessiblyApp: https://accessiblyapp.com/blog/video-game-accessibility/

Wikipedia: https://en.wikipedia.org/wiki/Game_accessibility
https://scholarspace.manoa.hawaii.edu/server/api/core/bitstreams/870c06b3-826e-47b5-89b0-6c4b94c3e156/content

Audyssey magazine: the oldest *gaming magazine* for people interested in blind-accessible *games*, courtesy of Kelly Sapergia
http://fog.audiogames.net/audyssey/

Deafgamers:https://deafgamers.com/
GamesForTheBlind.com 7 and BSC GAMES 8 for the blind, Arcess9 and Brillsoft 10 for the motor-impaired).
Currently, the most prominent organized international effort related to game accessibility is the Game Accessibility Special Interest Group 11 of the International Game Developers Association (IGDA).
https://dl.acm.org/doi/abs/10.1145/3490149.3501327
https://link.springer.com/article/10.1007/s00500-024-09827-4

Xbox Accessibility Guidelines: https://learn.microsoft.com/en-us/gaming/accessibility/guideline

Meeple Like Us: https://meeplelikeus.co.uk/

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Useful resources

- **The Dice Tower:** https://www.dicetower.com/

RNIB: https://www.rnib.org.uk/

Colorblind Games: https://colorblindgames.com/

The Game Crafter: https://www.thegamecrafter.com/

BoardGameGeek: https://boardgamegeek.com/

Training materials

- https://learn.microsoft.com/en-us/training/paths/gaming-accessibility-fundamentals/

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UpGameIn

ACCESSIBILITY GUIDEBOOK

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ESCAPE 4 CHANGE

fantazmat

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