Designing Inclusive Games

BBC TESTRONIC laboratories

This document introduces a refreshed set of guidelines for inclusive BBC gaming content.

Inclusive game design focuses on making the best game for the widest possible audience.

01 Checklist

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Introduction

		NA	Done
I1	All instructions should be delivered by images, text and audio		
I2	Instructions should not auto-advance, allowing the player to read and progress at their own pace		
I3	Allow players to replay any instructions and/or tutorial levels		
I4	Subtitles should be enabled by default, or able to be turned on before any content is begun		
I5	Any complex interactions used to control the game must be visualised using animation		

Menus

M1	Games should allow players to get to gameplay without complex menus		
M2	Ensure menu items are stationary		

Controls

C1	All game sections should provide both keyboard and mouse control schemes		
C2	Avoid complex control interactions wherever possible		
C3	If more than one input method is implemented, each control scheme should be visualised and fully described		
C4	If non-arrow key controls are included, allow controls to be re-mapped		
C5	If camera or speech input is implemented, ensure optional alternative control schemes are available		

Gameplay

G1	Allow players to choose a difficulty level. If the game increases in difficulty, ensure it begins easily		
G2	Provide on-screen and audio reminders of current objectives during play		
G3	If the player fails multiple times, provide hints or provide an auto-pass feature allowing them to progress		
G4	Ensure interactive element size is suitable, and elements are well spaced		

Audio

A1	All sound assets should be distinct from each other		
A2	Provide separate volume controls for background music and sound effects		
A3	Utilise brand-specific audio to help identify characters and places		

Visual

V1	No content should flicker more than 3 times per second		
V2	The game should not utilise only colours to differentiate states/objects. If this is not possible, offer a colourblind mode		
V3	Allow players to reduce the visual complexity of the screen		
V4	Text should be presented in a readable font and format		
V5	Captions should be presented with a uniform high contrast, and presented at a words-per-minute suitable for the audience		
V6	Interactive objects/elements should stand out clearly from the background		

02 Game Elements

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03 Best Practice: Introduction

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I1

All instructions should be delivered by images, text *and* audio

WHY?
Utilising images, text *and* audio to describe the instructions in full will ensure players with cognitive impairments will have less trouble understanding how to play the game, and will be appreciated by all other players as well.

HOW?

- **Images and text should describe the instructions in full independently, such that players can use one or the other to learn. Audio instructions should be a word-for-word voice over of the instruction text.**

- **Not following these guidelines makes games inaccessible to many players, see CBeebies Bob the Builder: Project Build it! for an example.**

I2

Instructions should not auto-advance, allowing the player to read and progress at their own pace

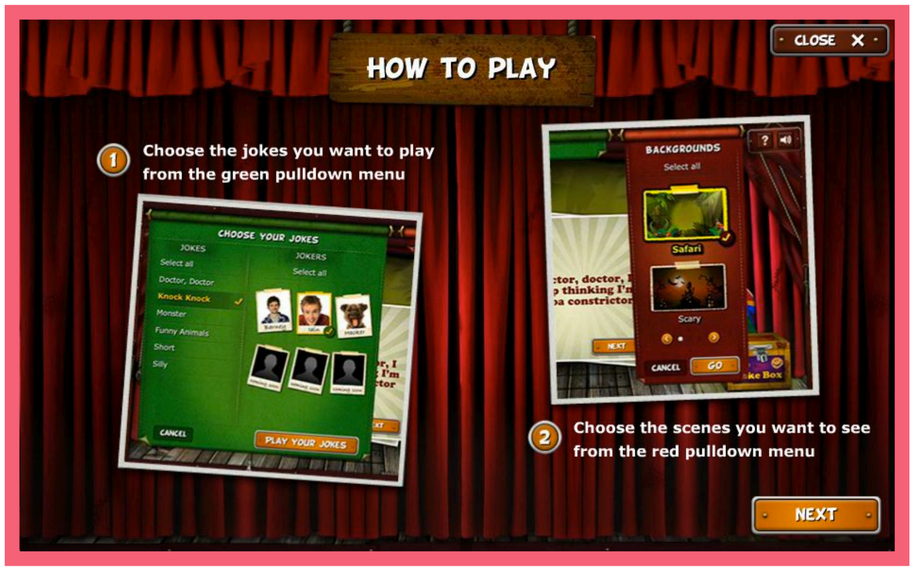
WHY?
Allowing players to step through instructions at their own pace ensures players with visual or cognitive impairments are able to take their time and absorb the instructions without missing anything, or feeling pressured.

HOW?

- **Instructions should not auto-advance. It should be clear which button to click to advance through instructions if they are delivered on multiple pages.**

- **CBBC Crack A Joke provides instructions two-at-a-time, advanced manually.**

- **Auto-advancing tutorials like CBBC Capture the Crown put unnecessary pressure on the player to read, understand and remember instructions.**



CBBC Crack A Joke

I3

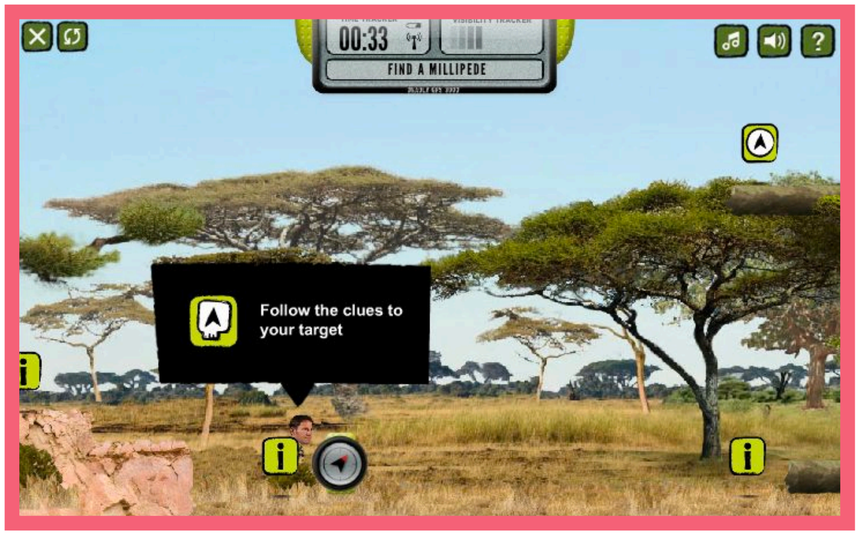
Allow players to replay any instructions and/or tutorial levels

WHY?
Ensuring instructional text and narrative can be replayed or reviewed will aid players with cognitive impairments who will be able to check what they are being asked to do or how to do it easily.

HOW?

- **Providing a persistent help icon allows players to revisit the instructions at any time. If a dedicated tutorial is created, players should be able to revisit it from the main menu or level select screen.**

- **CBBC Deadly Planet allows players to walk their character through the tutorial, with each bubble revealing an instruction. Players are free to move backwards and forwards through the instructions.**



CBBC Deadly Planet

I4

Subtitles should be enabled by default, or able to be turned on before any content is begun

WHY?

Players can miss vital narrative or instructional information by including non-captioned content before being given the option to enable subtitles.

HOW?

- **By allowing players to switch captions on before content starts, or by turning on captions by default, information loss can be avoided. In order to continue to support players who use captions, no content should be delivered by audio alone.**

- **CBeebies I Can Cook provides a voice-over with associated subtitles from the beginning of the game.**

- **In contrast, players will miss out on information at the start of Andy's Wild Adventure Game, as the content begins before players have time to activate subtitles.**

CBeebies I Can Cook

I5

Any complex interactions used to control the game must be visualised using animation

WHY?
Describing gestures using text isn't reliable enough for many players to reliably interpret and execute the actions the game requires.

HOW?

- **Visualisations and demonstrations of gestures are essential, ensuring that games never rely solely on text descriptions of gestures (e.g. *"swipe left to avoid the monsters"*).**

- **Smooth animation is typically more reliable than stop-frame type visualisations of movement.**

- **CBBC Canary Escape uses a simple animation in conjunction with the game to explain the action of pressing the space bar.**

CBBC Canary Escape

04 Best Practice: Menus

M1

Games should allow players to get to gameplay without complex menus

WHY?
Getting to gameplay without complex menus ensures players with motor control or cognitive impairments won't have to struggle through several screens. All other players will appreciate being able to get playing quickly.

HOW?

- **Avoid asking players to make choices which are unnecessary (e.g. selecting an item from a list of one), or which they won't understand (eg. choose a special ability).**

- **Keep menu items to a minimum, and ordered linearly, not in a grid arrangement where possible.**

- **CBBC Capture the Crown needs just one click on 'Play' to launch the game and begin the tutorial. Even if options are not enabled, menus can be overwhelming visually - see CBBC Hero Squad.**

CBBC Capture The Crown

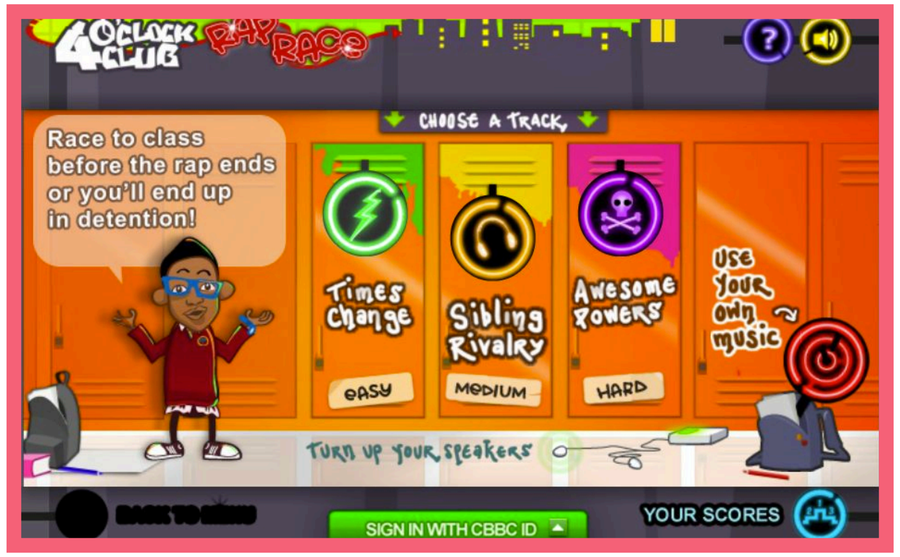
M2

Ensure menu items are stationary

WHY?
For players with visual or cognitive impairments, non-stationary elements make reliably targeting and clicking difficult.

HOW?

- **Ensure that menu items are stationary.**
- **Consider increasing the active area around smaller interactive items in order to make selection easier.**
- **Ensure menu items can be clearly identified from the other elements on the screen.**
- **CBBC 4 O'Clock Rap Race uses a consistent, high-contrast language to communicate clickable elements, and has enlarged active areas for many elements.**



CBBC 4 O'Clock Club Rap Race

05 Best Practice: Controls

C1

All game sections should provide both keyboard and mouse control schemes

WHY?
Enabling players to choose input types adds valuable flexibility. Supporting both mouse and keyboard as independent input options adds choice for motor-impaired players.

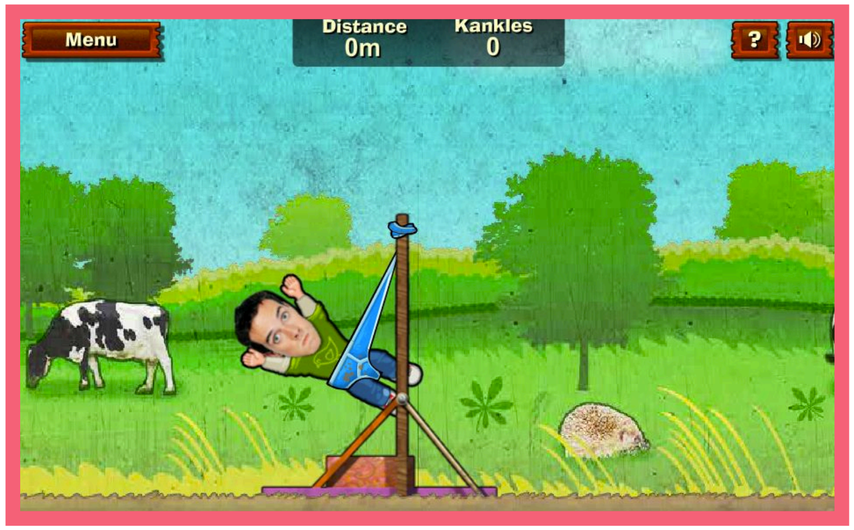
HOW?

- **Where possible, alternative control schemes should be included, allowing players to use keyboard or mouse.**

- **Consider how one scheme could be made more accessible than the other.**

- **CBBC Moo Spew provides both keyboard and mouse options with identical gameplay, while BBC Dick 'n' Dom Let Rip! provides a 'regular' control scheme using only the mouse, and a more accessible, one-button control scheme using only the keyboard.**

CBBC Moo Spew



CBBC Dick n Dom Let Rip!

C2

Avoid complex control interactions wherever possible

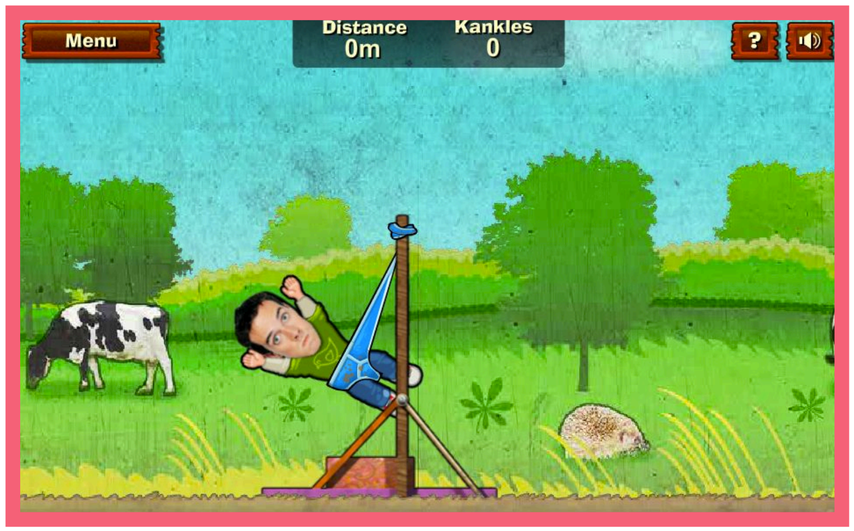
WHY?
By avoiding complex interactions games can accommodate a wider audience of players with cognitive or motor difficulties.

HOW?

- **Controls should be as *minimal* as possible, removing any unnecessary movement between keys, or any skilled movement which is secondary to the core game. Where complex interactions can be removed or *replaced* with simpler interactions, they should be.**

- **Bytesize Questionaut uses only point and click interactions. In contrast, the addition of a 'run forward' button in Deadly Dash 2 adds additional and unnecessary complexity which may alienate players.**

- **Where complex interactions cannot be avoided, simpler alternatives should be considered, such as Dick 'n' Dom Let Rip!'s spacebar-only input.**



CBBC Dick n Dom Let Rip!

C3

If more than one input method is implemented, each control scheme should be visualised and fully described

WHY?
Alternative control schemes add flexibility, but also need to be usable in their activation. Providing descriptions and visualisations of alternatives enable understandable use of the options by carers or players.

HOW?

- **For games which implement keyboard and mouse control schemes (beyond keyboard tabbing control) these should be outlined in the game help.**

- **Descriptions should include full descriptions (not simply “use the keyboard or the mouse”), and make use of images to support understanding.**

C4

If non-arrow key controls are included, allow controls to be re-mapped

WHY?
Allowing players to remap keyboard keys provides flexibility for players' motor abilities, and enables a wider range of accessible equipment to be employed.

HOW?

- **Any non-arrow key used in the game should allow remapping to other keys or the mouse click.**
- **For touchscreen games with on-screen controls, elements should be movable by the user.**
- **Where appropriate, WASD keys should be enabled in addition to the ⬅⬆⬇➡ keys to enable players to swap hands, or utilise alternative devices.**
- **Where remapping is implemented, user's settings should be remembered between sessions.**

C5

If camera or speech input is implemented, ensure optional alternative control schemes are available

WHY?
Camera and voice input place barriers for players with speech, motor and many other impairments.

HOW?

- **Where possible, traditional keyboard and mouse controls should be provided as an alternative to voice or camera input.**

CBBC Staring Contest games

- **CBBC Staring Contest offers a keyboard alternative to the camera-based mechanic.**

06 Best Practice: Gameplay

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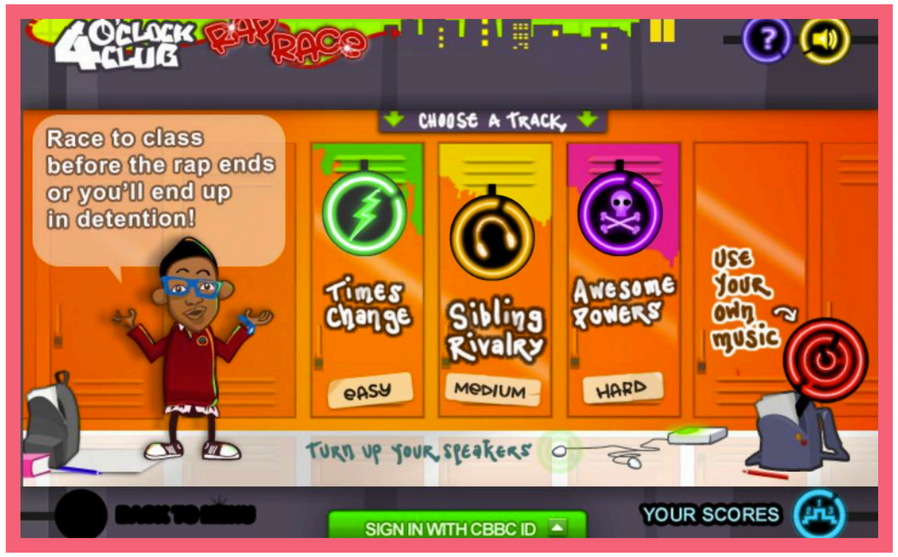
G1

Allow players to choose a difficulty level. If the game increases in difficulty, ensure it begins easily

WHY?
For players of differing abilities, providing multiple levels of difficulty can make the difference between a playable and unplayable game. Ensuring that 'easy mode' is easy enough is also important, especially for games with adaptive difficulty.

HOW?

- **Implement a number of differing difficulty levels.**
- **Easy mode should represent a significantly lower challenge.**
- **For games with increasing difficulty, ensure they begin at an easy level.**
- **CBBC 4 O'Clock Rap Race offers three difficulty levels, while Canary Escape starts with an easy section before becoming more difficult.**



CBBC 4 O'Clock Club Rap Race

G2

Provide both on-screen and audio reminders of current objectives during play

WHY?
Games can often benefit from providing players with a reminder of their current objective during play. This not only helps players whose memory or cognition may be affected by impairment, but also provides assistance to others.

HOW?

- **Utilise audio and visual cues to reinforce the objective of the game throughout play, and especially if objectives change frequently.**

- **CBBC Pup World includes a permanent visual and textual reminder of the current objective.**

CBBC Pup World

G3

If the player fails multiple times, provide hints or provide an auto-pass feature allowing them to progress

WHY?
Both providing hints and auto-advancing stuck players, where appropriate, allows players with motor or cognitive difficulties to bypass minor challenges to continue on with the game.

HOW?

- **If it is possible to fail in the game, programmatically detecting incorrect input, multiple failures, or other indicators of repeated failures can lead to assistance provided to the player.**

- **Assistance can include hints, auto-advancing, or other game-specific help (e.g. extra power-ups). Each should be delivered by audio, text and image.**

- **Auto-advancing must be implemented with careful consideration for players' confidence, and to avoid confusion.**

G4

Ensure interactive element size is suitable, and elements are well spaced

WHY?
Precisely targeting objects with the mouse is made more difficult for players with motor impairment if the elements are small, or too close together.

HOW?

- **Interactive elements should be approximately 6mm² for web content, and 1cm² for mobile content.**
- **Elements should be well spaced, ensuring that they have at least 5mm of space between them.**

07 Best Practice: Audio

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A1

Each audio prompt for events, interactions or feedback should be unique and distinct

WHY?
For many players, identifying and isolating audio prompts can be made difficult by using non-distinct or non-unique sounds.

HOW?

- **Audio prompts should be unique in both timbre *and* pitch, descriptive and distinct from each other, and convey as much information about the state of the game as is practical (e.g. changing from walking on grass to stone).**

- **Ensure that key game events (success, failure, life loss, etc.) have particularly unique and distinct audio prompts.**

- **CBBC Nev's Jam Buster includes a good selection of distinct sounds, and also allows the background music to be switched off.**

CBBC Nev's Jam Buster

A2

Provide separate volume controls for both background music and sound effects

WHY?
For players with cognitive or auditory impairment, background or ambient sound can make identifying and following speech more difficult. Providing separate volume controls enables players to reduce the auditory complexity of the game.

HOW?

- **Provide separate volume controls for background and sound effect audio.**
- **These can be implemented as volume sliders, or simply allow players to mute the audio streams with a single button.**
- **CBBC Staring Contest ensures that background audio does not interfere with the primarily voice-driven instructions and interactions.**

CBBC Staring Contest games

A3

Utilise brand-specific audio to help identify characters and places

WHY?
Utilising brand-specific audio assists players in understanding places, characters and actions within the game.

HOW?

- **If a character has a theme in a TV programme, replay the theme when introducing the character onscreen.**
- **Where possible, use brand-specific audio throughout the game to assist players.**

08 Best Practice: Visual

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V1

No content should flicker more than 3 times per second

WHY?
Individuals with photosensitive epilepsy can have seizures triggered by flickering or flashing in the 3 to 49 flashes per second (Hz) range, with a peak sensitivity at 20 flashes per second.

Games that include flickering content must place the following warning on the game's title screen before flickering content begins:

'Please note that this game includes materials that flicker and so may not be suitable for users with photosensitive epilepsy.'

For more information, visit the BBC screen flicker tool website.

V2

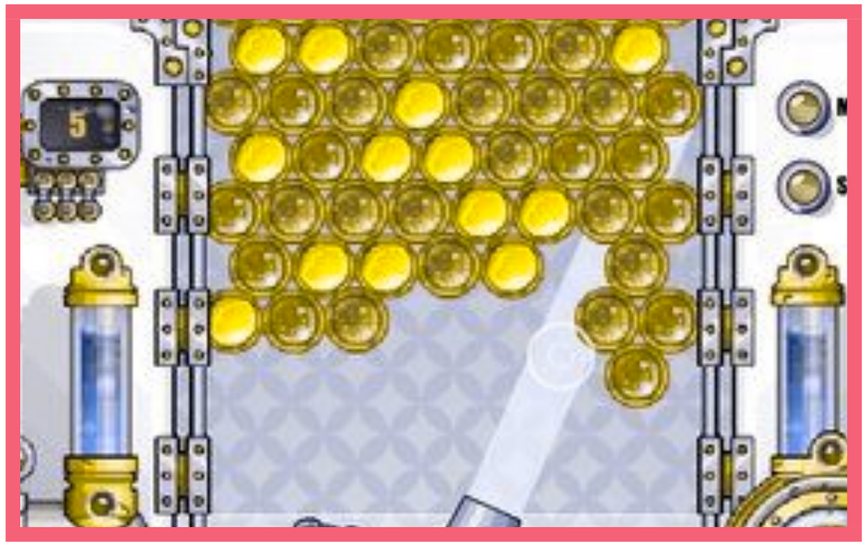
The game should not utilise only colours to differentiate states/objects. If this is not possible, offer a colourblind mode

WHY?
One in twelve males and one in twenty females are colourblind, most commonly red/green. If the game relies on differentiating colour that colourblind users cannot perceive, they cannot play your game.

CBBC Nev's Jam Buster

HOW?

- **Consider each element of the game. Ask, can the user only identify an item by its colour alone?**
- **Do not rely on colour to differentiate item states. For example CBBC's Nev's Jam Buster could have used shape or texture in addition to colour.**
- **Alternatively consider offering a 'colourblind' mode. Vischeck (vischeck.com) provide colourblind-friendly examples, simulation tools and more.**



CBBC Nev's Jam Buster - With deuteranope filter applied (a form of red/green colour deficit)

V3

Allow players to reduce the visual complexity of the screen

WHY?
Excessive animation and items on the screen can be very distracting for both visually impaired and some cognitive impairments and result in difficulty distinguishing the foreground.

HOW?

- **Provide options to turn off any additional visual detail.**
- **This could include animation on menu screens, but also in gameplay, such as offering options that hide non-interactive elements, disable screen-shake or flashing, or replace interactive elements with simplified alternatives.**
- **CBBC Championsheeps allows players to disable movement on the game selection screen.**

CBBC Championsheeps

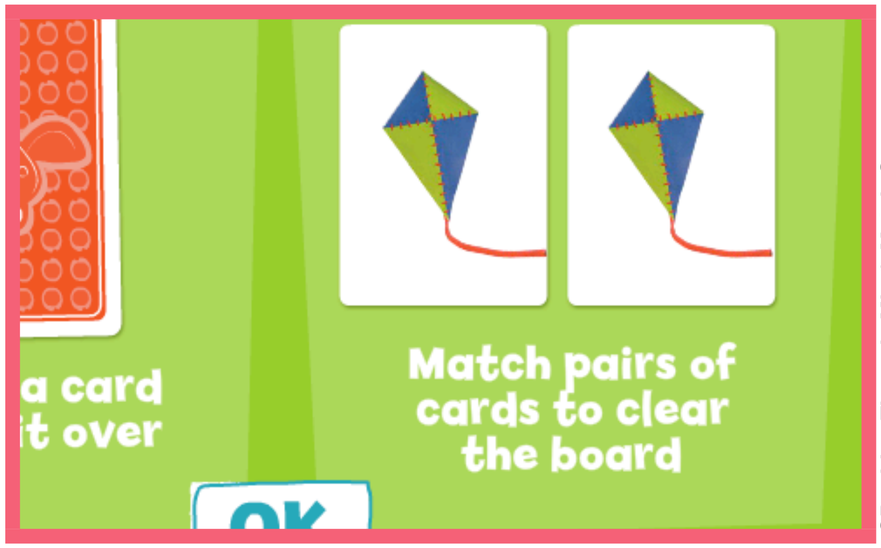
V4

Text should be presented in a readable font and format

WHY?
Players with visual or cognitive impairments may struggle to read text in games; ensuring text is presented in an easy-to-read format will reduce strain on players both before they start and during play.

HOW?

- Ensure text is large enough (ensure all text is at least 13px or larger, 13pt in Flash).
- Text should also be in a suitable width to aid absorption (text over 3 lines must be left aligned, and no wider than 34 characters, including spaces).
- See CBeebies Timmy's Mix & Match Game.



CBeebies Timmy's Mix & Match Game

V5

Captions should be presented with a uniform high contrast, and presented at a words-per-minute suitable for the audience

WHY?
Players with visual impairments will have difficulty reading captions with 'visual' noise, whilst players with either visual or cognitive impairments will struggle to keep up with captions that are above the target audience's reading speed.

CBeebies I Can Cook

HOW?

- **Use a uniform surrounding colour, or place captions in uniform-coloured boxes on the screen ("letter-boxed").**

- **Ensure the captions are presented with a suitable vocabulary and at a rate that ensures all players will be able to read and understand it (for 1 line, CBeebies need 5s, CBBC need 3.5s, adults need 3s).**

- **CBeebies I Can Cook has both simple language, clear text and a voice over.**

V6

Interactive objects/elements should stand out clearly from the background

WHY?
With so much going on in a game players with both cognitive and visual impairments often struggle to see or understand what screen elements deserve their attention.

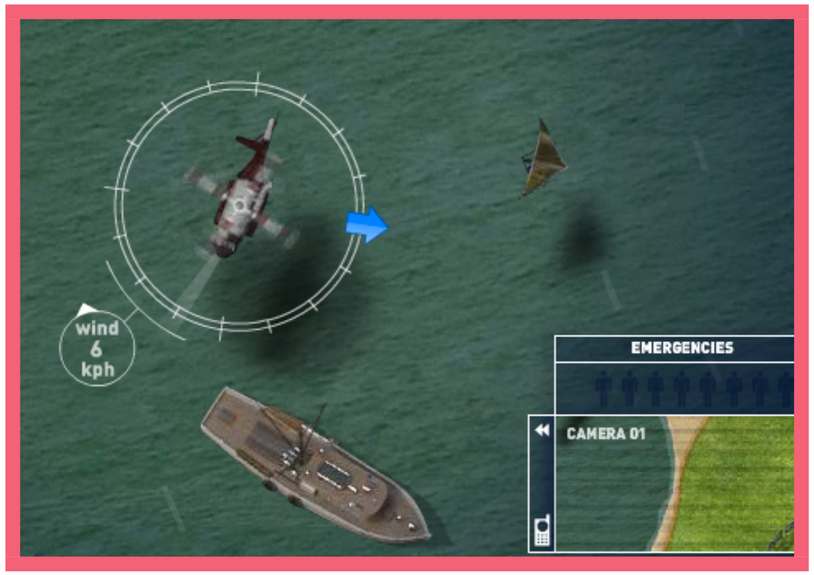
HOW?

- **Ensuring the interactive elements of a game stand out, using high contrast colours, movement or borders, easily identifiable shapes or reduced visual clutter.**

- **CBBC's Deadly Dash uses yellow and white boarders to help players identify what to attend to easily.**

- **CBBC's Hero Squad should clarify the difference between flying and ground level objects, players will struggle to identify which objects require attention.**

CBBC Deadly Dash



CBBC Hero Squad

09 Increasing Your Audience

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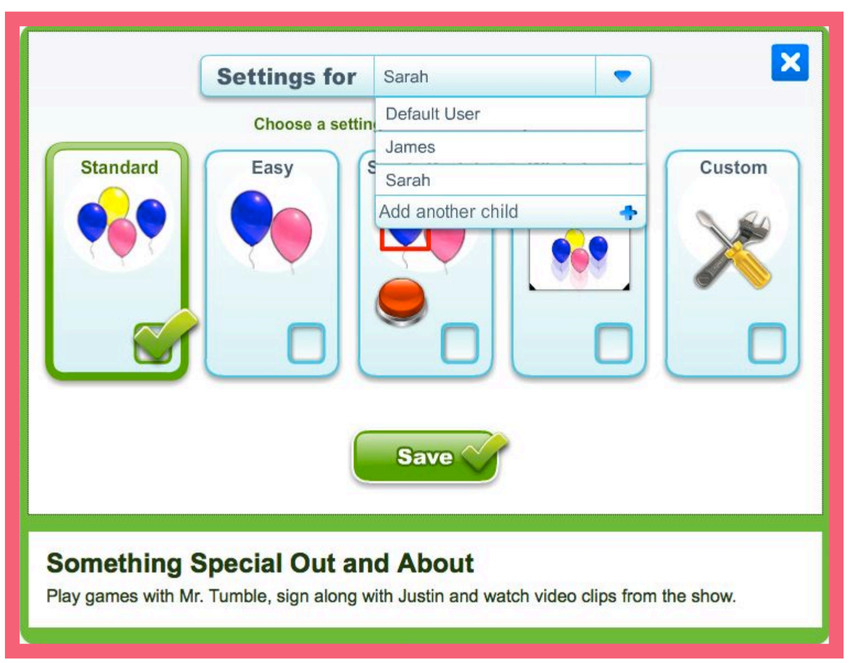
Having outlined a number of ways in which inclusive design can be implemented into BBC gaming content, this section details a number of accessibility-specific features which can further increase the size of audience available to your game.

Increasing your audience through menu design:

- In the menus, allow players to click or long-tap on menu items to listen to an audio description. This assists visually and cognitively impaired players, and also reduces player's reliance on interpreting icons and reading ability.

- Where possible, always offer a 'back' option in the same place on each page. This provides players with a simple and reliable method of undoing input mistakes, and navigating around the interface.

- For games with a number of control or graphical options, consider implementing player profiles to save and load settings for different users, just like CBeebies Something Special Out And About.



CBeebies Something Special

Increasing your audience through control design:

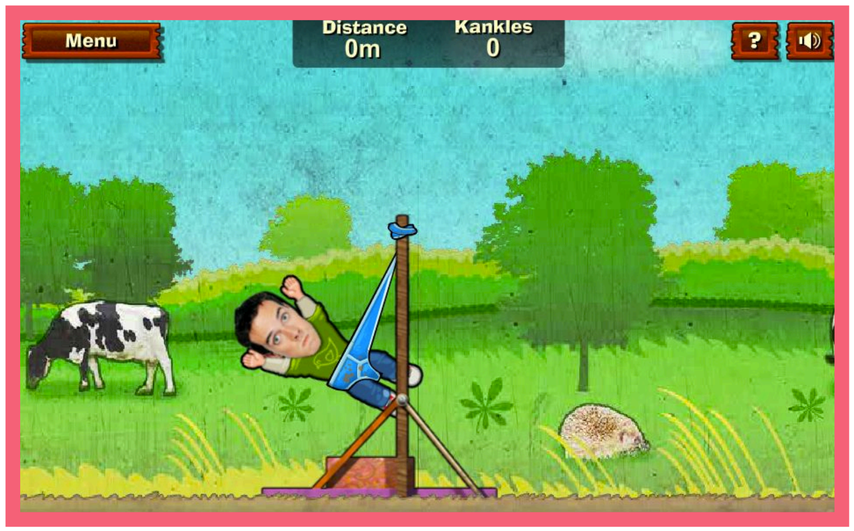
- Where possible, include support for native assistive technologies such as VoiceOver, Assistive Touch, and Explore By Touch.

- Unless it is required by the game design, ensure touch controls are not location dependent - they can occur anywhere on the screen. CBBC Dust by Dawn can be controlled from anywhere, including outside the game area on touch-screens.

- Implement a dedicated switch-mode, using just one button push/mouse click/touch to play, in order to assist motor-impaired players. CBBC Dick ‘n’ Dom Let Rip! provides a switch-mode.

- Where relevant, games should include control options to adjust the game to each user's needs; e.g. reducing mouse acceleration, removing camera shake, turning on snapping, etc.

CBBC Dust By Dawn



CBBC Dick n Dom Let Rip!

Increasing your audience through gameplay design:

- Many players will benefit from the ability to adjust the core game speed, thereby increasing reaction windows, and slowing the speed and visual complexity of the screen.

- Where possible, provide an area for users to practice without failure, e.g. practice mode, invincibility or a sandbox.

Increasing your audience through audio design:

- For games with dialogue that has more than one character on scene, provide a visual indicator of who is speaking both in video and interactive scenes. This assists both cognitively, visually and hearing-impaired players. CBBC Leonardo Game uses speech bubbles, but other implementations would be as useful.

- Implement full spoken voice-overs and audio description for all written text and prompting, including menus, just like CBBC Vet Set Go.

- Where technically possible, position sounds visually in the stereo field to best mimic the position of characters, objects or interactions on screen.

CBBC Leonardo Game

Increasing your audience through visual design:

- In order to support colourblind and visually imparied players, provide a high-contrast-mode with alternative assets which provide greater visual clarity and contrast.

- Provide players with a choice of colours for the game, e.g. setting text colour and/or the colour of important assets.

- For games with open-worlds or large environments, include a map, compass and/or other navigation aids to reduce reliance on players' memory.

10 End

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