

User’s Manual Ballyland Magic App © Sonokids 2020

# 1. The Ballyland Magic App

The Sonokids Ballyland Magic App is a hands-on, playful and supportive educational tool, with which children who are blind or have low vision can learn and practice touch screen gestures for interaction by way of VoiceOver, the built-in screen reader on iOS devices. The app enables children to safely try and practice a number of (navigational) touch gestures for VoiceOver in an interactive game environment. The app features the popular Ballylanders and uses built-in speech by real voices.

Note: if you have Zoom enabled in the Accessibility Settings of your iDevice, please turn that off before you start the app.

# 2. VoiceOver

VoiceOver is the built-in screen reader on iOS devices, such as the iPad. VoiceOver can be turned on in the device’s Accessibility settings. To effectively use VoiceOver to operate the iPad, a child needs to know specific touch gestures that are different from the standard gestures that a sighted person would use to navigate a touch screen. For touch gestures to be properly identified by VoiceOver, they need to be performed in a very precise and specific way. For learning purposes, the Ballyland Magic app simulates VoiceOver, without actually using it. This has the following advantages:

* The learning environment is specifically tailored to the needs of young children who are blind and who are novice users of a mobile touch screen device
* Developmental requirements are taken into consideration: Skills such as finger dexterity, timing and precision can be gradually built up by a novice user, without him or her having to meet VoiceOver’s default settings from the start
* The element of risk is removed: The child can explore, learn and practice touch gestures without mistakes or inaccuracies in these gestures leading to problems/unwanted responses from the interface.

# 3. Supporting the child’s learning

## 3.1 General

Although it has been demonstrated that children can be left to play with the app on their own, supervision is recommended, by a parent, carer, teacher, or older friend/sibling. All the movements on a touch screen device need to be very small, fine and light, and touch gestures need to be precise. Support may therefore be required to help the child to perform the touch gestures correctly. The app offers a fun learning experience for all involved and is a great tool for sighted siblings of children with a vision impairment to learn about VoiceOver alongside their brother or sister.

The Ballyland Magic app is recommended for children with vision impairment, aged

* 5+ years - Learning with guidance and supervision
* 6+ years - Intermittent supervision and independent practice

Live interaction data tracks the child’s progress, and short instructions are provided in the text box at the bottom of the screen. This will enable you to provide the best support for the child to successfully progress through each level.

Please note that the Magic app is designed to give a non-response (not a negative response) to the incorrect performance of a gesture. Correct performance of the gesture results in positive feedback. When the child tries to make a requested touch gesture and nothing happens, please try to assess what the child is doing incorrectly, and gently guide him or her along, to achieve the best learning outcome.

## 3.2 Before starting with the app

### 3.2.1 Tips for using the iPad with a child who has vision impairment

* In most other apps other than the Ballyland Magic app, a child who is blind will be required to use VoiceOver to control and navigate the interface. The Ballyland Magic app uses self-voicing, and VoiceOver needs to be turned OFF
* When playing with the Magic app, the iPad needs to be kept in “Landscape Mode” (as opposed to “Portrait Mode”). This means having the Home button either to the left or to the right. When the child has an additional hearing impairment, the fact that the loudspeaker of the iPad is positioned on the side of the Home button may affect the choice for left or right position of the Home button. Another thing to consider is consistency for orientation purposes, as all other buttons on the device will always be consistently in the same place
* Touch gestures can be made anywhere on the active screen of a mobile touch screen device, and should be light and small.
* Note that a sound alert indicates an ‘empty cell’ or a ‘virtual wall’: you try to move to where there is nothing anymore
* The outer edge of the iPad is not part of the active screen. As a child who is blind will not be able to see where the active screen starts, it is advised to use a case (skin) that covers the inactive border (bezel)
* A child with low vision may find an iPad with a white border around the black screen easier to use.

### 3.2.2 Development of other skills

It is important to be aware of possible limitations in fine motor skills of very young children, who need practice and support to develop these skills. It is recommended to help the child to develop a number of skills, and introduce a number of intellectual concepts before starting to use the app. Fine hand movements, finger isolation, rhythm and tapping can be practiced on a musical instrument, such as a musical keyboard, drums or xylophone. And you can discuss/prepare some of these important concepts that are assumed in the process of learning with the app:

* Quick and slow (rhythm, speed)
* Soft and hard (tapping touch)
* Soft and loud (sound of tapping, volume),
* Spatial concepts (such as the corners, top, bottom of the screen)
* Directional concepts (left, right movements).

## 3.3 Supporting the child as a parent or teacher with vision impairment

For the Ballyand Magic app the iPad needs to be kept in “Landscape Mode” (as opposed to “Portrait Mode”). This means having the Home button either to the left or to the right.

VoiceOver is not to be used inside the app. Parents or teachers with visual impairments who use VoiceOver to open the Ballyland Magic app can use the app’s accessible navigation. Please make sure that the triple click Home function on your iDevice is set to turn VoiceOver on and off. You can adjust this in the Settings of the iDevice.
The app’s accessible navigation can only be turned on and off at the Main Menu of the app, which is the landing page. There, VoiceOver reads the instructions to first turn OFF VoiceOver, and to then turn ON the accessible navigation (only in this specific order). To repeat the VoiceOver instructions, swipe up with two fingers. After you turn off VoiceOver, flick up with one finger, to turn on the accessible navigation.
When the accessible navigation is turned ON, this activates:

1. The self-voicing menus in the app. Flick right/left with one finger through the menu items, and double tap to open
2. “Hot spot” in the bottom right corner of the screen. Do a double tap in that space to go back to the Main Menu. Note that the space for tapping is about 2 cm x 2 cm wide. You can use it in all levels, excluding menu pages. Tip: go to the right bottom corner of the iPad, put the top part of the thumb of your right hand against the bottom edge. Bend/curl up your middle finger and press the left side of the bent tip against the right edge of the iPad. Then when you tap with your stretched index finger, it should land perfectly on the hot spot on the iPad.

Turn VoiceOver back on when you exit the app. Press the Home button to exit. Press the Home button twice to get to the app switcher and do a three finger flick up, to close the app. Closing the app ensures that on your return it always starts at the Main Menu.

Although the app provides self-voicing instructions as you go, it is recommended to download the short instructions for each level from the [Ballyland website](http://www.ballyland.com/mobile/app-short-on-screen-instructions.php) so that at any stage during the gameplay you can easily check what the child is required to do.

# 4. Options Menu for adjustable settings

Menus within the app have been designed to be hard to open accidentally by the child.

To open the “Options Menu”, double tap the red button at the top left corner of the screen.

The Options Menu provides options to:

* Go to Main Menu
* Skip Intro speech
* Replay intro speech
* Go to previous Page
* Go to next page

When the text box of a scene mentions that something is 'adjustable’, it is a setting that can be adjusted in the Options Menu. Details of such adjustable settings will be discussed per Scene.

# 5. Scenes and gestures in the Ballyland Magic App

The Magic app consists of four multi-level Scenes, introducing the following navigational touch gestures:

* Finger drag
* Double tap
* Single finger double tap
* Single finger flick left
* Single finger flick right
* Three finger flick left
* Three finger flick right.

## 5.1 Scene 1: Preparing for the show

* Introduction and Song
* Level 1 – Exploring the stage – finger drag
* Level 2 – Meet and greet – finger drag and double tap (slow tempo allowed)
* Level 3 – Getting ready – finger drag and double tap (moderate tempo allowed)
* Level 4 – Tap Tap song (3 increasing levels of speed)
* Level 5 – Final preparations – finger drag and double tap (from here on, double tap only works with the VoiceOver norm of a default maximum gap of 0,1 seconds).

### 5.1.1 Introduction and Song

Some children may already be familiar with the Ballylanders through the Ballyland software for keyboarding, or through Ballyland story apps such as “Ballyland Stay Still, Squeaky!”, or Ballyland CosmoBally in Space. But these five fun characters living in a basket in Ballyland are also properly (re)introduced in the app.
As they are introduced one by one, the child can hear their voice and their signature sound, which will help to identify them inside the app. In the Introduction you can magnify the Ballylanders’ images with the pinch open gesture, to give children with low vision a better view.

* Ballicopter is a little, red guy. A ball with a propeller on his head, he can fly like a helicopter.
* Babballoony is a purple, blown up balloon.
* Tinkleball is a pretty, pink ball with a little bell on top.
* Squeaky is a colourful, bouncy ball.
* Wheelie is a blue ball on wheels, like a little car, and he likes to go fast.

The introduction also gives a short explanation about the meaning of magic.
The song immerses the child in the atmosphere of the app.

### 5.1.2 Scene 1, Level 1-4

Finger drag, which is introduced in Scene 1, is of particular importance to enable a user with vision impairment to scan the touch screen and explore what is shown on there: developing spatial awareness on the touch screen. Finger drag implies that the child puts the fingertip of one finger on the screen and then lightly drags the finger around the screen, without lifting it up. This interaction (‘touch’) will result in audio feedback from the device. The purpose is to have the child’s finger drag gesture work in harmony with his or her listening skills, because that is what VoiceOver is all about. The goal is that through this process, the child explores and discovers everything on the screen, and tries to create a ‘mental map’, remembering what is located where on the screen. As long as the child is able to do this, in principle, he or she can finger drag in any direction. Visually orientated people sometimes tend to guide the child to use a linear, left-to-right dragging movement, but this is not perse necessary. In the first levels of this scene, the child should be encouraged to carefully hear out all the audio feedback from his or her interaction with the screen. Once the child becomes an experienced user of VoiceOver, he or she will know what to listen out for, and will be able to respond quicker, even interrupting the speech. Note: the drag gesture should be kept fine and light (some children who are blind may be tempted to make the dragging movement very big, as if they have to drag a heavy object along).

### 5.1.3 Scene 1, level 1:

* Gesture: Finger drag
* Specs: Keep finger on the screen while dragging.
* Goal: Find and hear out each of the 5 Ballylanders at least 2 times.

This first level is designed to make the child slow down and take time to listen, when dragging a finger around the screen: the score only counts when you hear out each Ballylander at least 2 times.

Note: From scene 1, level 5, double tap only works with the VoiceOver default gap of 0,5 seconds.

### 5.1.4 Scene 1, level 2:

* Gesture: Finger drag to put in focus, then double tap anywhere on the screen to open.
* Specs: Default double tap gap = 2 sec. (adjustable)
* Goal: Find and open each of the 5 Ballylanders at least 2 times

The ‘touch’ of a finger drag gesture enables selecting the item under your finger by way of a double tap. Double tap involves a quick repeat of one tap, which itself involves a quick putting down and lifting up of the fingertip in the screen. The child can put a Ballylander in focus by way of finger drag. Once something is in focus, the double tap to open can be done anywhere on the screen (there is no need to tap on the image of the Ballylanders).
Tip: if you can hear the fingers tapping on the screen, it means that the gesture is too loud and big.

In Scene 1, level 2 and 3, the Magic app leaves room for the child to use a rather slow double tap. The so-called double tap gap, is 2 sec. in level 2, and 1 sec. in level 3. It can be made longer in the Options Menu if the child still struggles to get a double tap quick enough to be properly registered. Note that in VoiceOver, the default double tap gap is actually only 0.5 seconds (from iOS 9 this can be adjusted). To help the child to get to this speed, the tap-tap song in level 4 offers three increasing speeds. From Scene 1 level 5 onwards, only double taps done as quickly as the “VoiceOver gap” (0.5 sec.) interact with the app.

### 5.1.5 Scene 1, level 3:

* Gesture: Finger drag to put in focus, then double tap with one finger to open.
* Specs: Default double tap gap = 1 sec. (adjustable)
* Goal: Find and open each of the 5 Ballylanders at least 2 times

In the Options Menu the time (gap) between the taps in the double tap can be made longer, to suit the learning child’s needs.

### 5.1.6 Scene 1, level 4:

The default setting for this level is 10 correct double taps before the end of each part of the song. This number can be adjusted in the Options Menu, to suit the child’s level of skills, and enable him or her to move through the speeds. However, it is essential to encourage the child to keep practicing this level, until he or she easily manages to do 10+ correct double taps for each speed. This Level offers the popular TapTap song, which is presented in three speeds. The double tap needs to be performed correctly in the fastest speed, for the gesture to be correctly identified by VoiceOver in the future. The speed of the ‘tap tap’ in Level 4A is slower than the speed of the tap tap in Level 3. This is to allow for a better flow of the song.

Scene 1, level 4A:

* Gesture: Double tap in sync with ‘tap tap’ of song.
* Specs: Double tap gap = 2 seconds. Tap light and soft. Avoid dragging movement of finger.
* Goal: Minimum of 10 correct double taps (adjustable)

Scene 1, level 4B:

* Gesture: Double tap in sync with ‘tap tap’ of song.
* Specs: Double tap gap = 1 sec. Tap light, but precise. Double taps can be made throughout song.
* Goal: Minimum of 10 correct double taps (adjustable).

Scene 1, level 4C:

* Gesture: Double tap with only one finger, in sync with ‘tap tap’ of song.
* Specs: Double tap gap = 0.5 sec. Double taps can be made throughout song.
* Goal: Minimum of 10 correct double taps (adjustable).

### 5.1.7 Scene 1, level 5:

* Gesture: Finger drag to put in focus, then double tap with one finger to open.
* Specs: Double tap gap = 0.5 sec.
* Goal: Open each of the 5 Ballylanders and 4 musicians at least one time.

The fixed double tap gap is now the VoiceOver default value of 0.5 sec. and will remain so for the rest of the app.

## 5.2 Scene 2: Practicing for the Show

* Level 1: Check the stage – one finger flick left or right
* Level 2: Practicing – one finger flick left or right and double tap
* Level 3: Last rehearsal – one finger flick left or right and double tap (extended)

The flick gesture involves placing a finger on the screen and quickly swiping it in the desired direction. The flick gesture to the right and left with one finger, can be done anywhere on the screen. Encourage the child to use the flick gesture both to the right and to the left. The one finger flick gesture is a way to quickly move through items on the screen.

### 5.2.1 Scene 2, level 1:

* Gesture: Flick with one finger, to the right and to the left.
* Specs: On double tap (not instructed) the Ballylanders’ response will be curt.
* Goal: Flick in both directions and find each of the 5 Ballylanders at least 2 times.

### 5.2.2 Scene 2, level 2:

* Gesture: Flick with one finger to the right and to the left to put in focus, then double tap to open.
* Specs: Quick double tap anywhere on the screen.
* Goal: Flick to and open each of the 5 Ballylanders at least two times.

The level starts with “Ballicopter” being spoken, which means that he is in focus. A possible strategy in this level is start with double tap on Ballicopter, then flick once, and do a double tap, moving through all the Ballylanders one at a time. Then repeat the last one (Wheelie), and keep flicking left/double tap through all of them for the second time.

### 5.2.3 Scene 2, level 3:

* Gesture: Flick with one finger to the right and to the left to put in focus, then double tap to open.
* Specs: Quick double tap anywhere on the screen.
* Goal: Flick to and open each of the 5 Ballylanders plus 4 musicians at least one time.

This level involves not just the five Ballylanders but also four instruments, bringing the total of items to 9. It is a good idea to encourage the child to change the direction of the flick gesture at some point, for practice. A possible strategy is to first flick to the right, through all of them, without doing a double tap. Then when the last item (Xylophone) is in focus, double tap, and return with the flick gesture to the left, this time opening each item by doing a double tap anywhere on the screen when each is in focus.

## 5.3 Scene 3: The Magic Book

* Gesture: Flick with three fingers to the left and the right.
* Specs: An audio signal indicates that there are no more pages in that direction.
* Goal: Flick to page 1 and 5 at least two times. On any page, vary between a flick left or right, to magically change the colours in the story.

This is a single level scene: a two-way magic story of the Cat, the Hat and the Mouse.
To navigate through the pages, the child needs to use the Flick gesture to the right and to the left, with three fingers. To complete this Scene, the child needs to flick to and from the first and last page at least two times.

To change direction of the three finger flick gesture some people prefer to turn their wrist and hand around. It is also possible to keep the three fingers lined up vertically, or horizontally when making the flick gesture. As long as the gesture works effectively, there is no specific way in which the three finger flick gesture needs to be performed. The only golden rules are that three fingers need to be used, and that you need to do the flick gesture in a straight horizontal line. In future use of VoiceOver, a slight deviation up or down from the horizontal line will see a three finger flick identified as a flick up or down instead.

Please encourage the child to change direction in the three finger flick gesture on any page of the story. This will add to the entertainment because it will make the colours in the story magically change.

A sound alert at both ends of the story indicates reaching an empty cell, or a “virtual wall”. When this sound is heard, the child needs to change the direction of moving through the pages. The story continues from left to right and from right to left.

## 5.4 Scene 4: The Magic Show

The Magic Show can be used to assess the child’s current level of skills. If specific touch gestures still prove to be (too) difficult for the child, the app is a perfect tool to refine and further those skills. Please see [paragraph 6.1](#_6.1_VoiceOver_skills) for further details.
Note that the Magic show has to be enjoyed as a whole, which means that you can’t return or move forward to a specific act in the show.

The touch gestures for the Magic Show are:

* Act 1: Ballicopter

Finger drag, find Ballicopter, single-finger double tap to open

* Act 2: Babballoony

Flick gesture to the right with one finger, single-finger double tap to open

* Act 3: Tinkleball

Flick gesture to the left with one finger, single-finger double tap to open

* Act 4: Squeaky

Flick gesture to the right, with three fingers

* Act 5: Wheelie

Flick gesture to the left, with three fingers

* Finale, Magic Show Orchestra

Tap in sync with the ‘tap tap’ in the song, or just listen and enjoy!

# 6. Learning outcomes

## 6.1 VoiceOver skills

It has been demonstrated that the skills learnt in the app are transferable to applications that use VoiceOver. Thus, in principle, the successful completion of the Magic app gives a child with vision impairment a headstart in the use of a mobile iOS touch screen device. From using the app, the child will be able to develop a proper understanding of the concept of touch gestures and audio feedback working seamlessly together. It is important to note however, that children’s personal background and cognitive and physical development, as well as the continuing effort put into practicing with the app, may result in varying levels of actual touch gesturing skills. It is therefore up to you, supporting the child, to assess whether he or she has really consolidated the skills, and is ready to move on to VoiceOver-based applications and activities or not.

The ‘Grand Finale’ of the app, the Magic Show, consists of short acts by the Ballylanders, which are activated by the child’s interaction and effective performance of the learnt gestures. The Magic Show can thus be used to get a good indication of the child’s current level of touch gesturing skills. However, it needs to be proven that skills are consolidated and internalised, before the child is ready to tackle VoiceOver.

If during play in the Magic app the child struggles to get to the target score of correct double taps, or needs several attempts to flick through the pages of the Magic book, it is important to keep practicing until the gesture basically always works. Adjusting the settings to make the task slightly easier is supportive during the early learning process. But at the end of this process, to have effective skills for future use with VoiceOver, the child should be able to get to the target of each level easily and with a “perfect score”.

A good next step after the Magic app, would be for the child to use Apple’s “VoiceOver Practice” feature, which can be found on an iOS mobile device when VoiceOver is switched on, under General>Accessibility>VoiceOver. If the child experiences problems in the identification of gestures in VoiceOver Practice, it is recommended to return to the Magic app and encourage the child to practice some gestures more extensively

## 6.2 Other Learning Outcomes

* Listening skills. These are essential for anyone to be able to use VoiceOver. The Magic app supports the development of listening skills, and encourages the child to slow down and listen
* Fine motor skills development. The Magic app supports gradual learning and improvement of touch gestures, speed and timing, and building of the required fine motor skills to perform these gestures
* Memory skills. The location and content data that is collected by dragging a finger across the screen while getting audio feedback, needs to be processed and memorised for effective and efficient use of VoiceOver
* Conceptual understanding. Quick and slow (rhythm, speed); Soft and hard (tapping touch); Soft and loud (sound of tapping, volume); Spatial concepts (corners, top, bottom of the screen); Directional concepts (left, right movements); Magic Show.
* Independence and empowerment.