

Accessibility on iOS

Developing for everyone

Session 210

Clare Kasemset

iOS Accessibility

What You Will Learn

What You Will Learn

Introduction to accessibility

What You Will Learn

Introduction to accessibility

- Accessibility features on iOS

What You Will Learn

Introduction to accessibility

- Accessibility features on iOS
- What's new

What You Will Learn

Introduction to accessibility

- Accessibility features on iOS
- What's new

Accessibility tutorial

What You Will Learn

Introduction to accessibility

- Accessibility features on iOS
- What's new

Accessibility tutorial

- Visual accommodations

What You Will Learn

Introduction to accessibility

- Accessibility features on iOS
- What's new

Accessibility tutorial

- Visual accommodations
- Semantic accessibility

Introduction to *Accessibility*

What Is Accessibility?



What Is Accessibility?

What Is Accessibility?



What Is Accessibility?



What Is Accessibility?



What Is Accessibility?





Physical and Motor Switch Control



Physical and Motor Switch Control



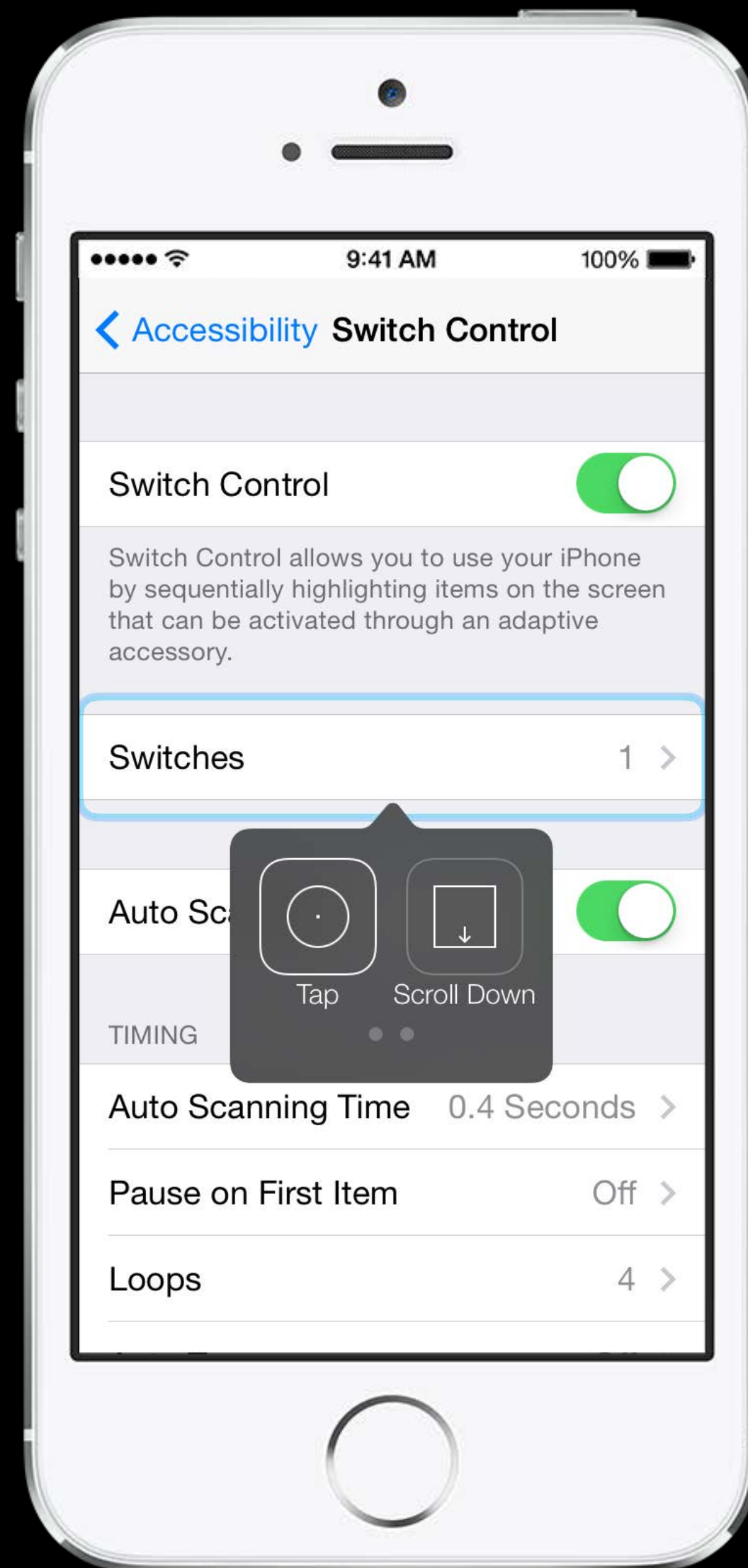
Physical and Motor Switch Control



Physical and Motor Switch Control



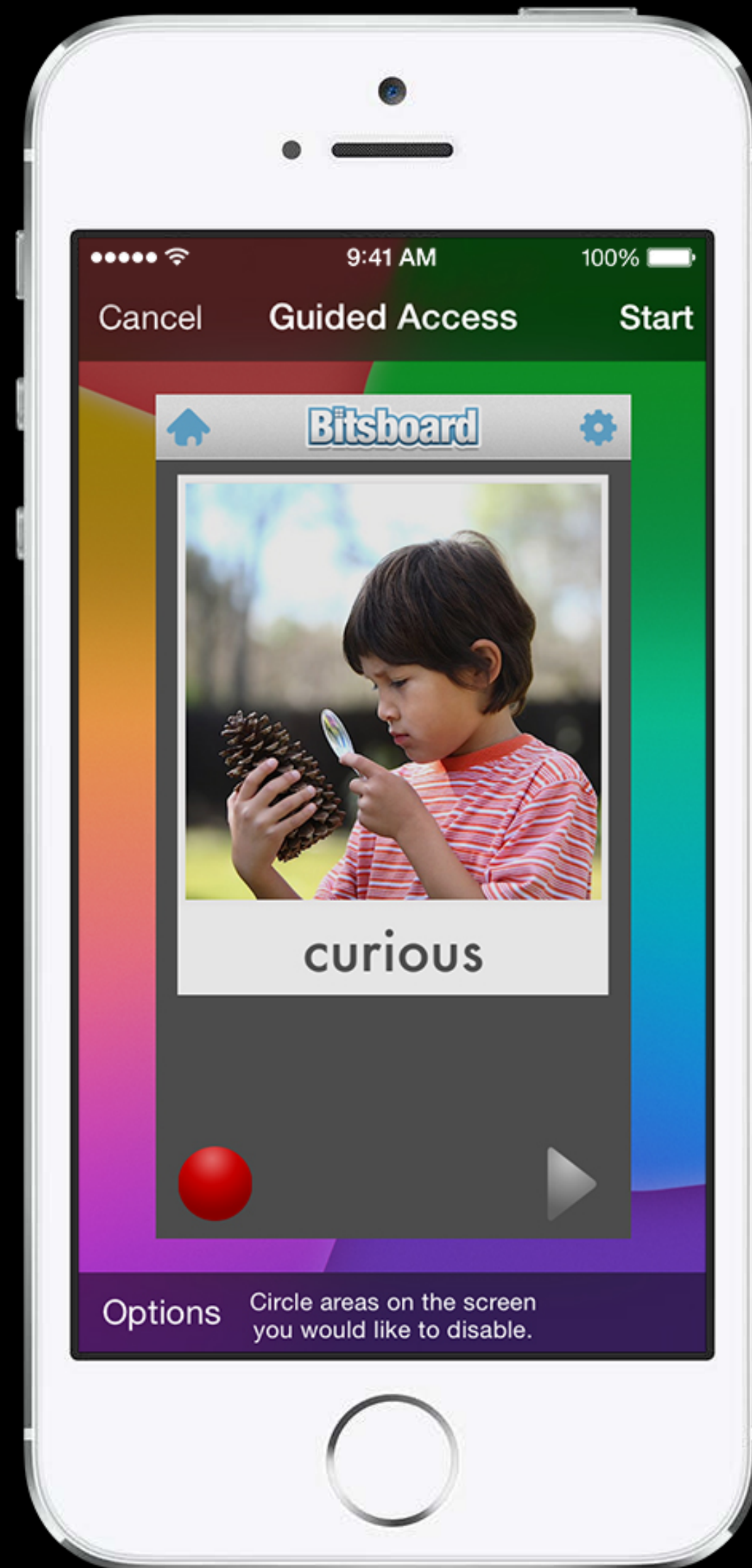
Physical and Motor Switch Control





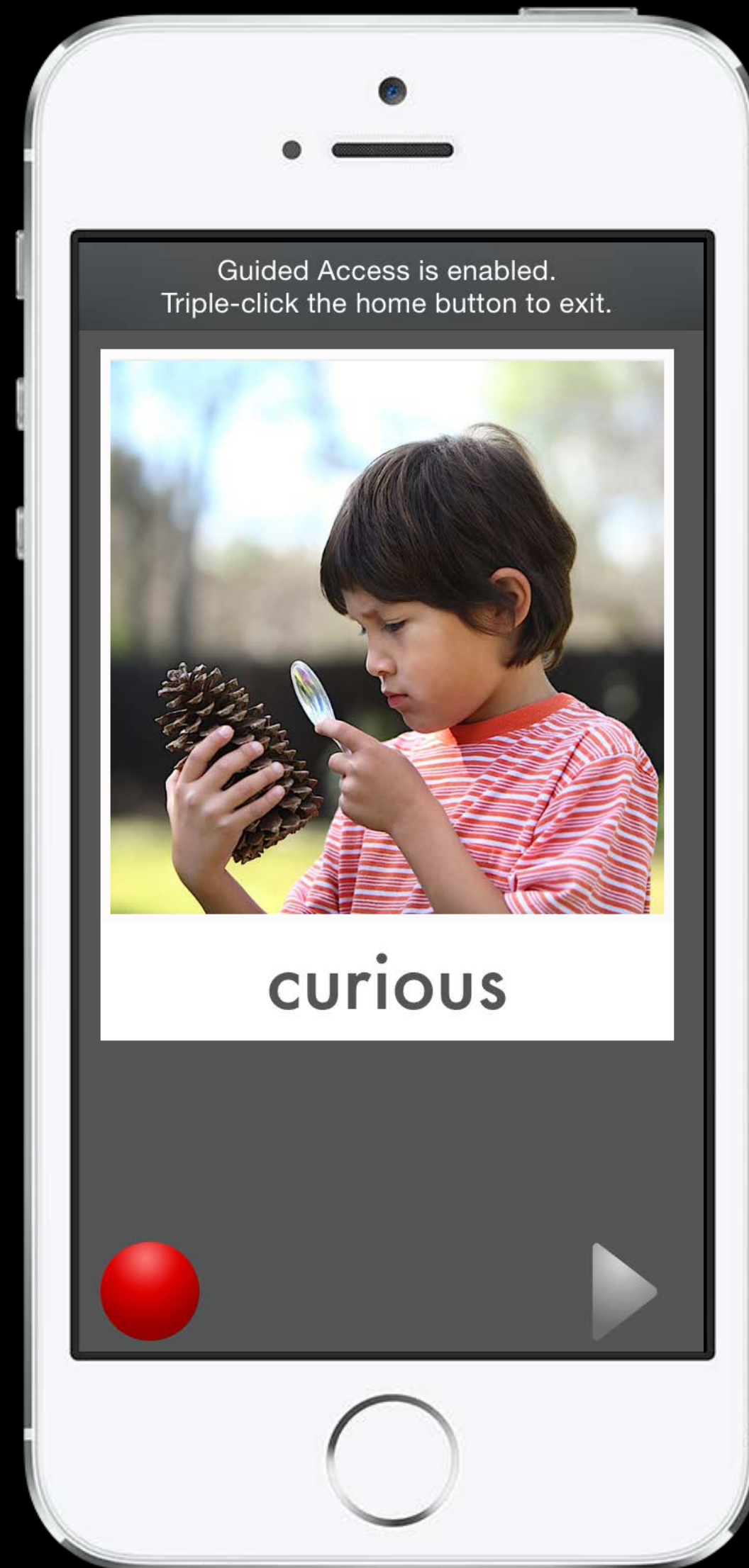
Learning

Guided Access



Learning

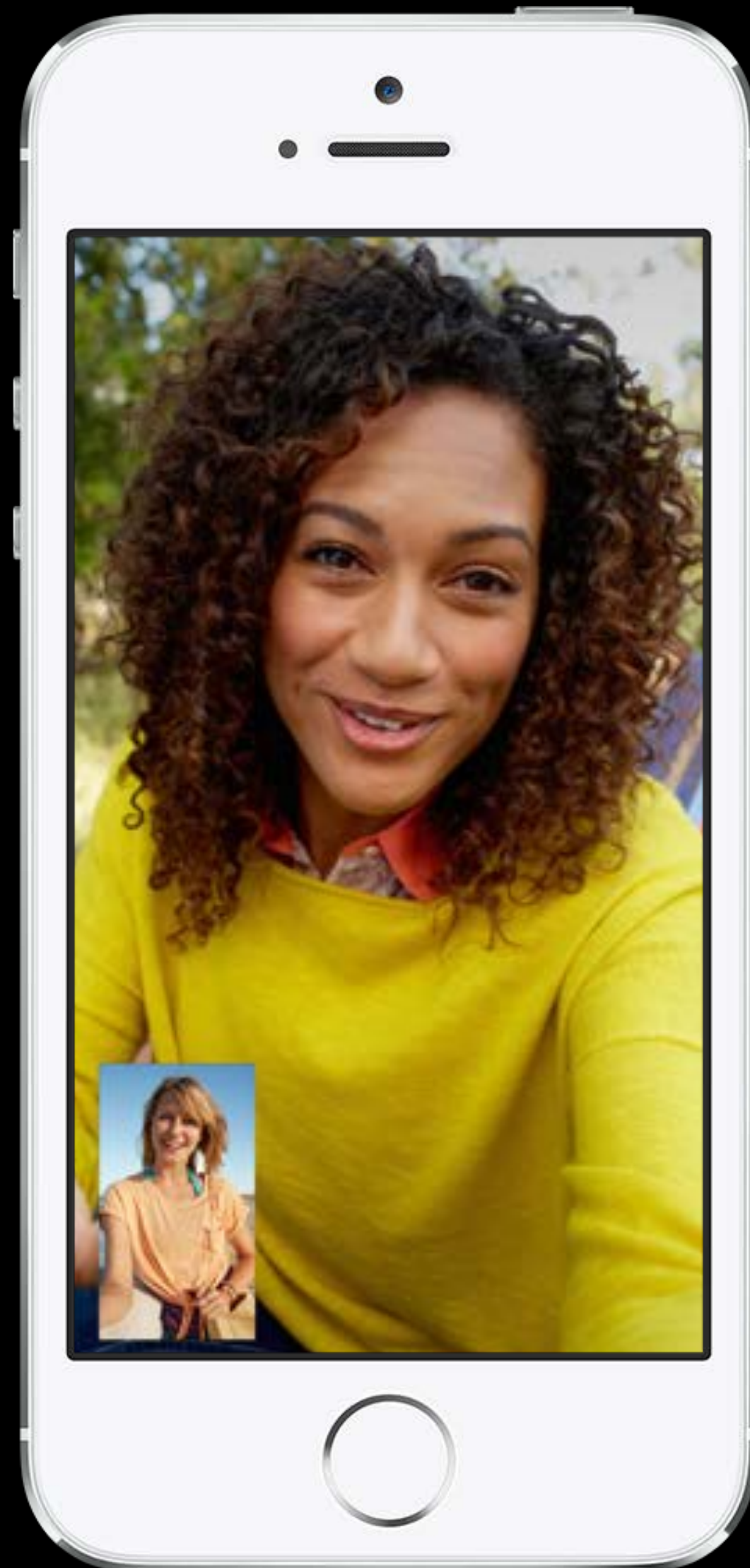
Guided Access





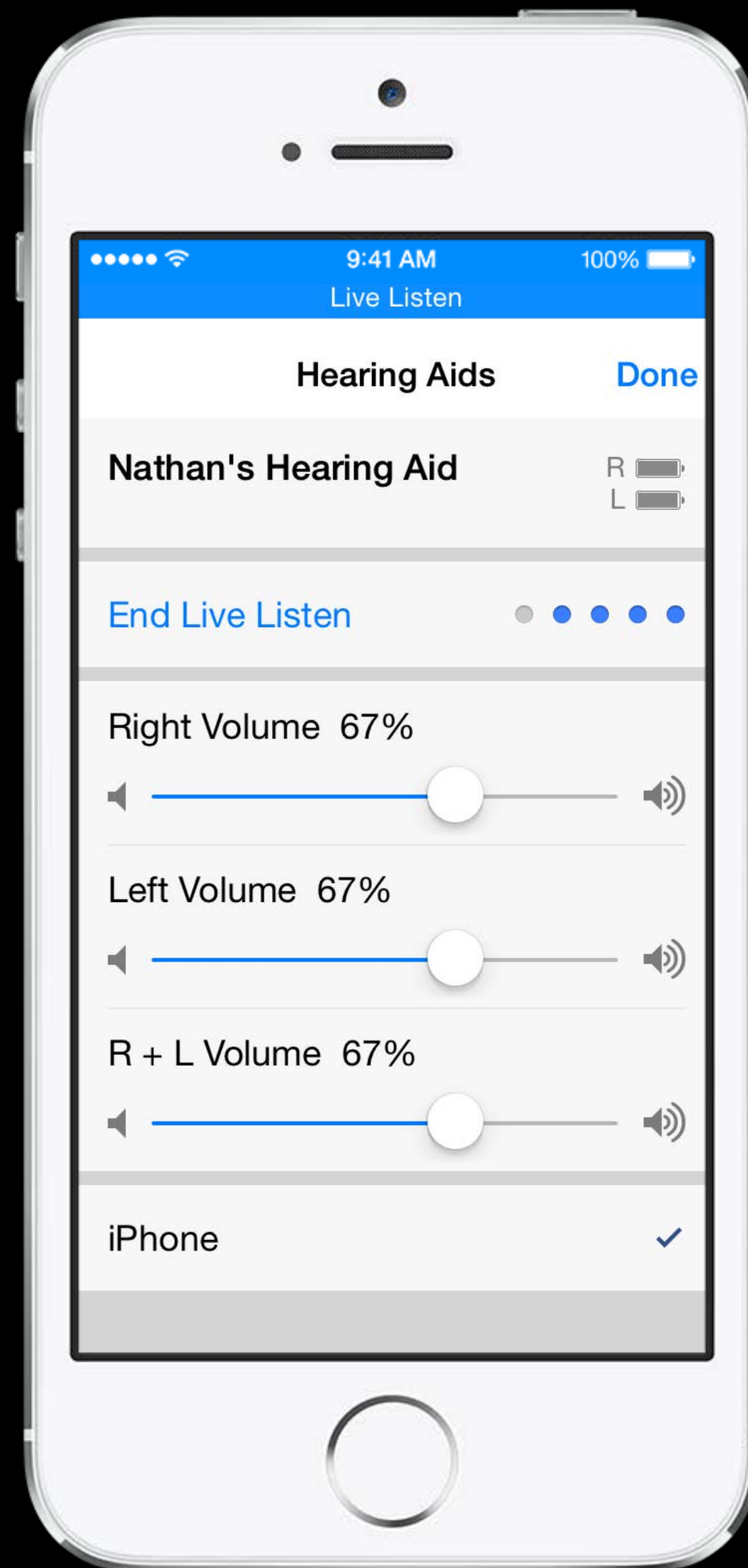
Hearing

Made for iPhone Hearing Aids



Hearing

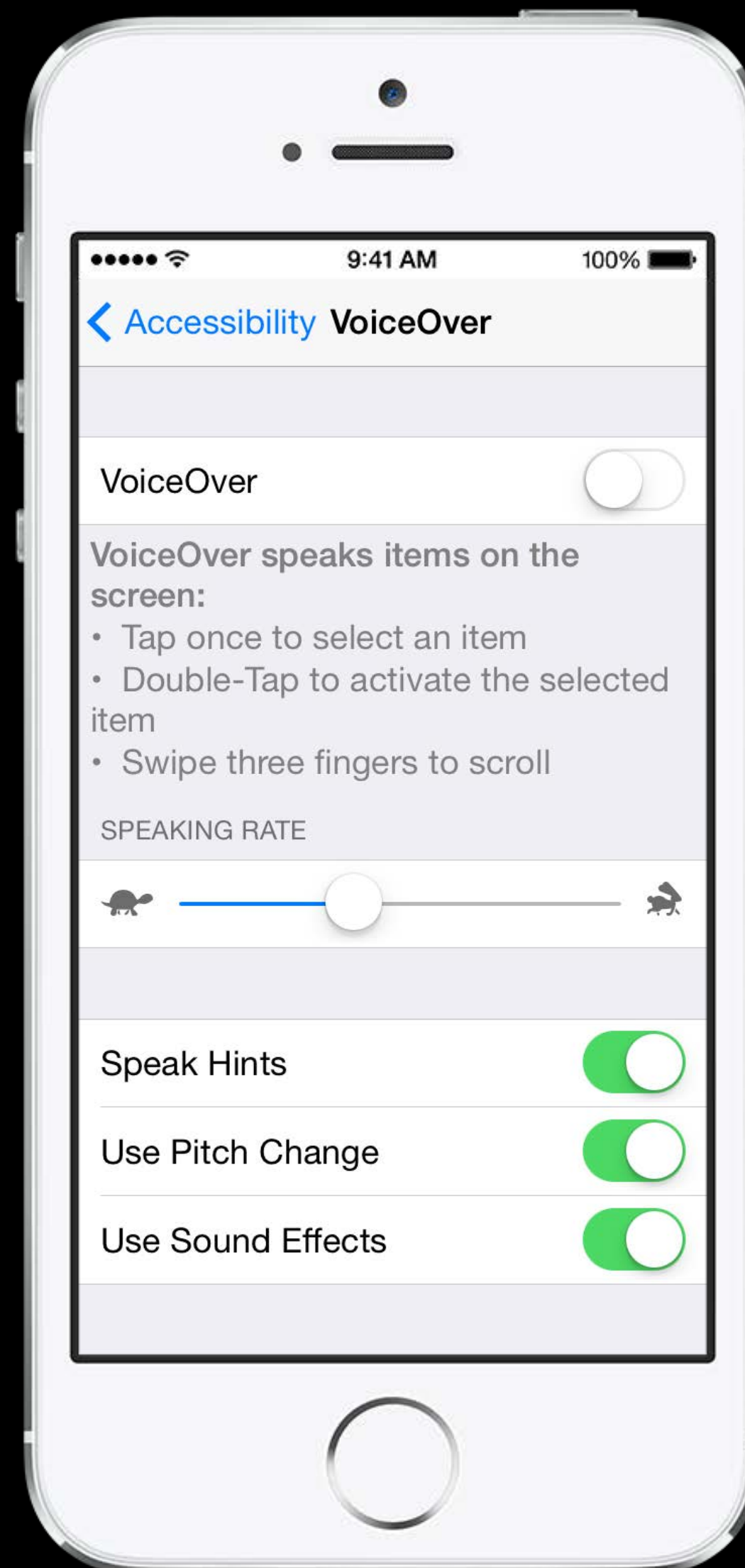
Made for iPhone Hearing Aids



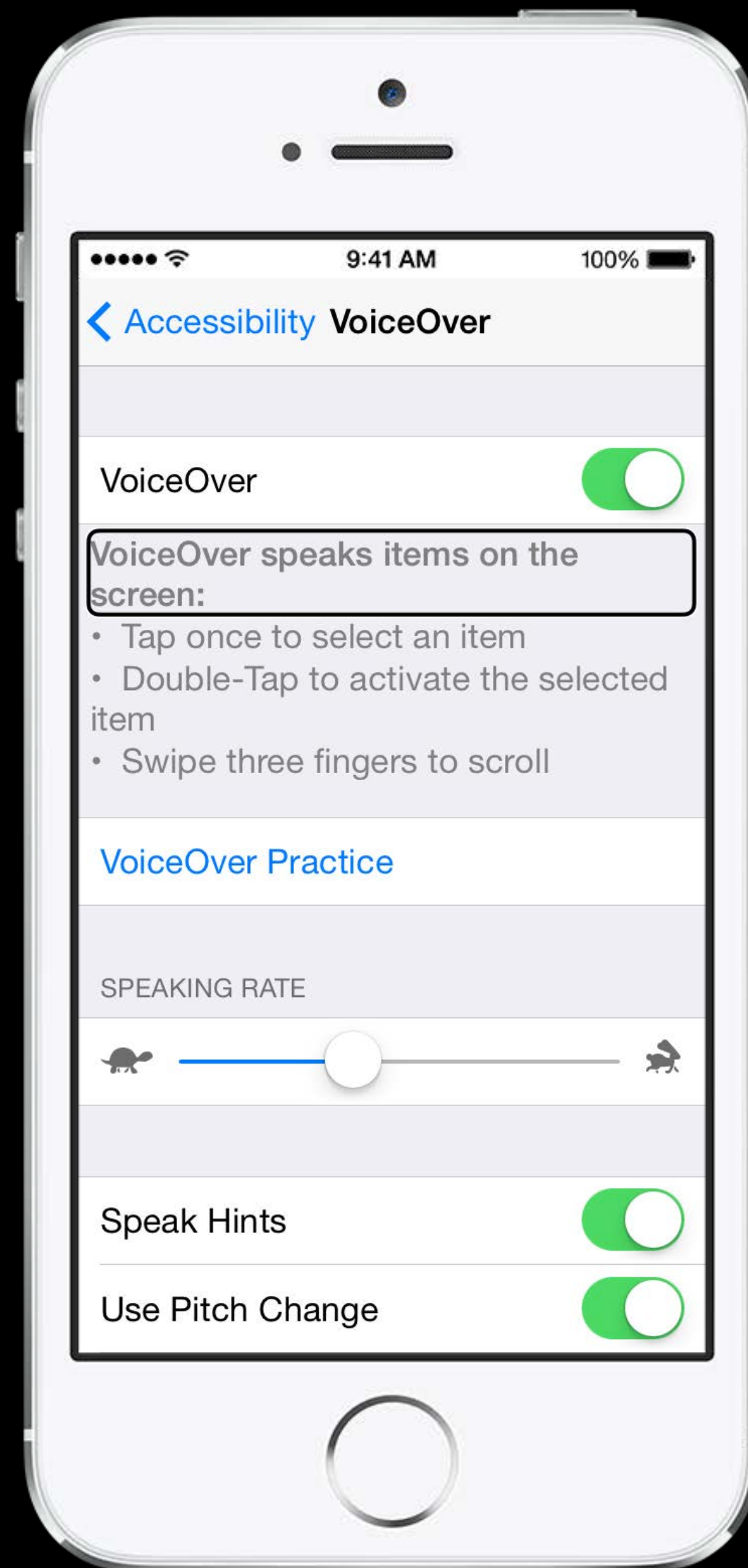


Vision

VoiceOver

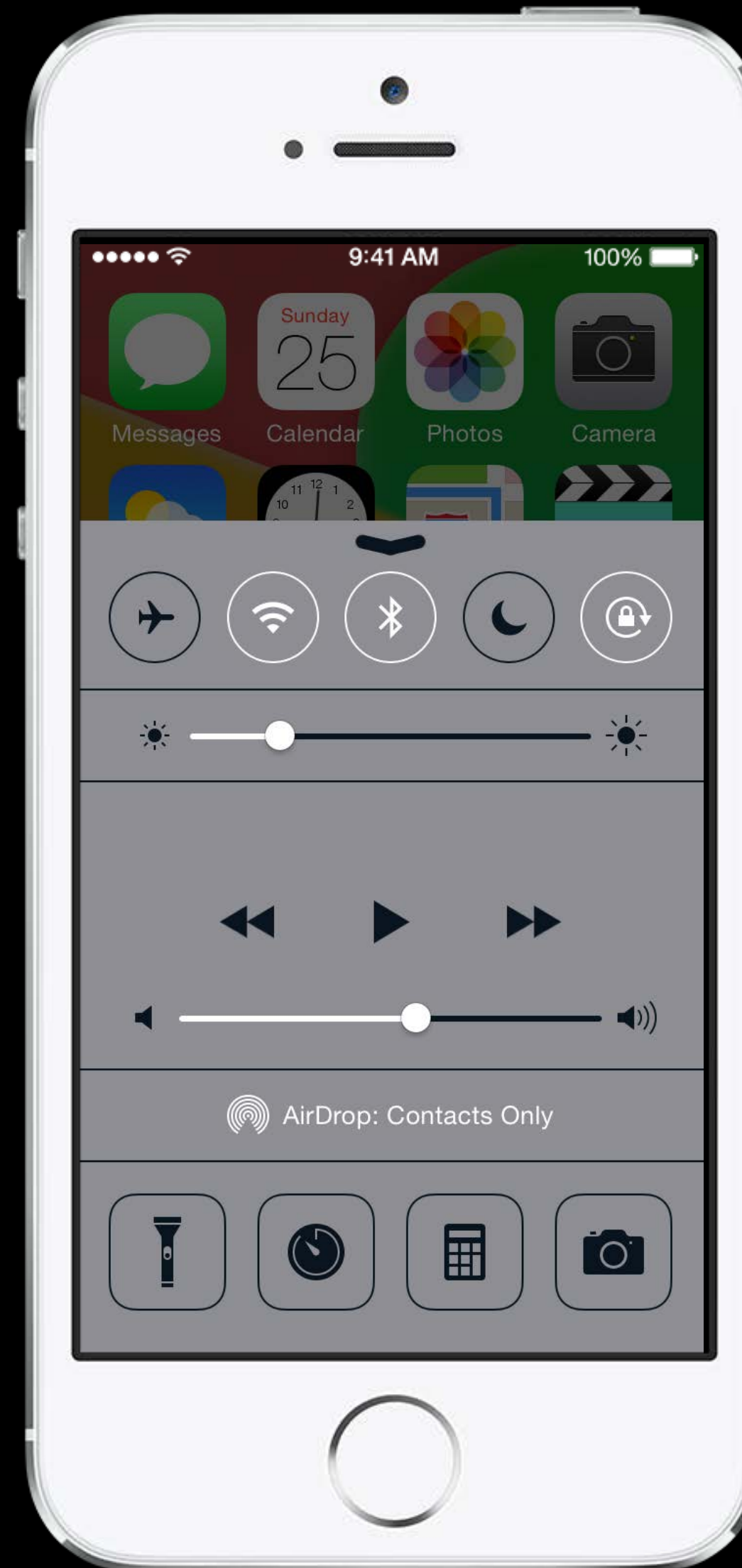
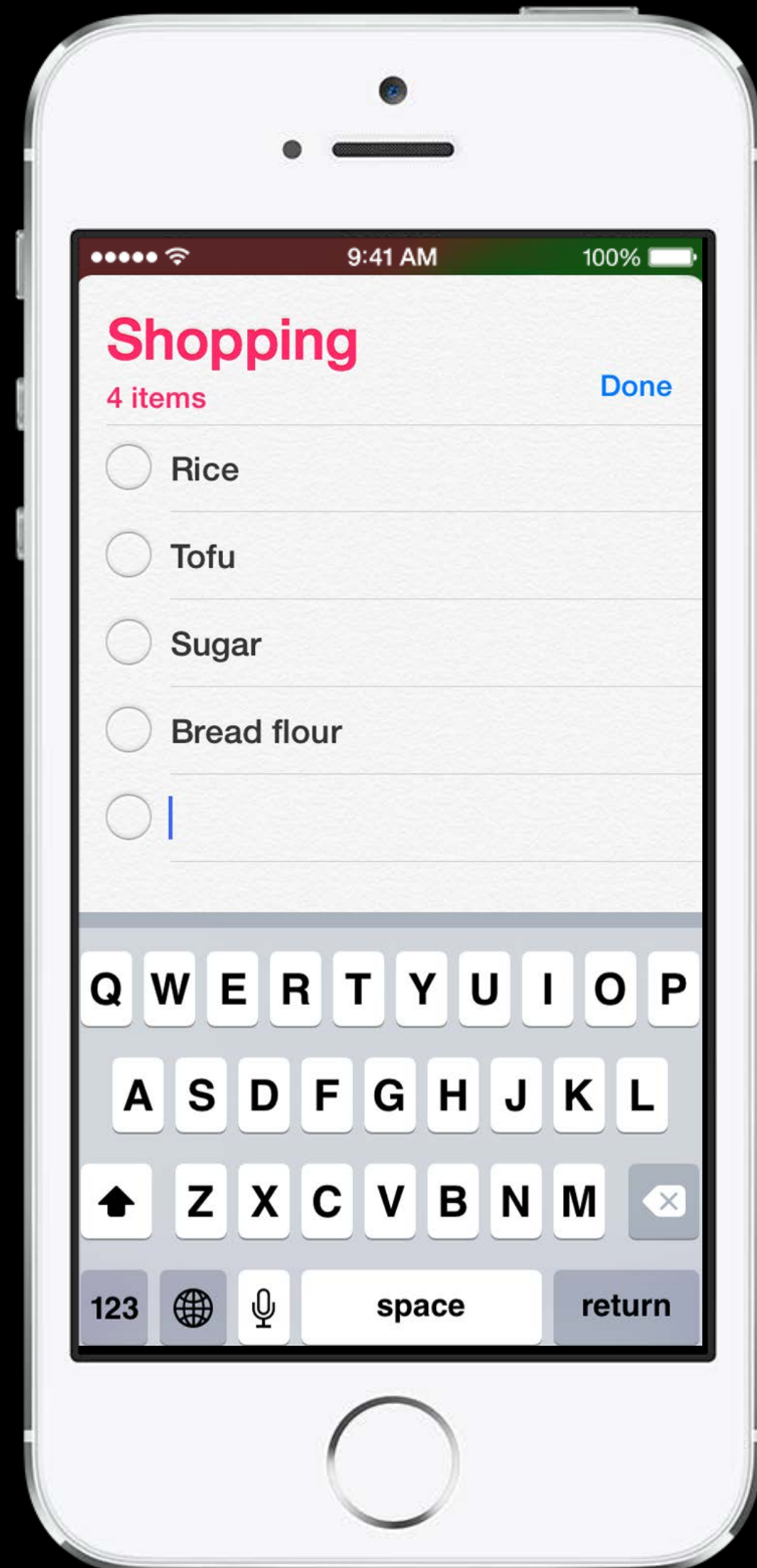


Vision VoiceOver



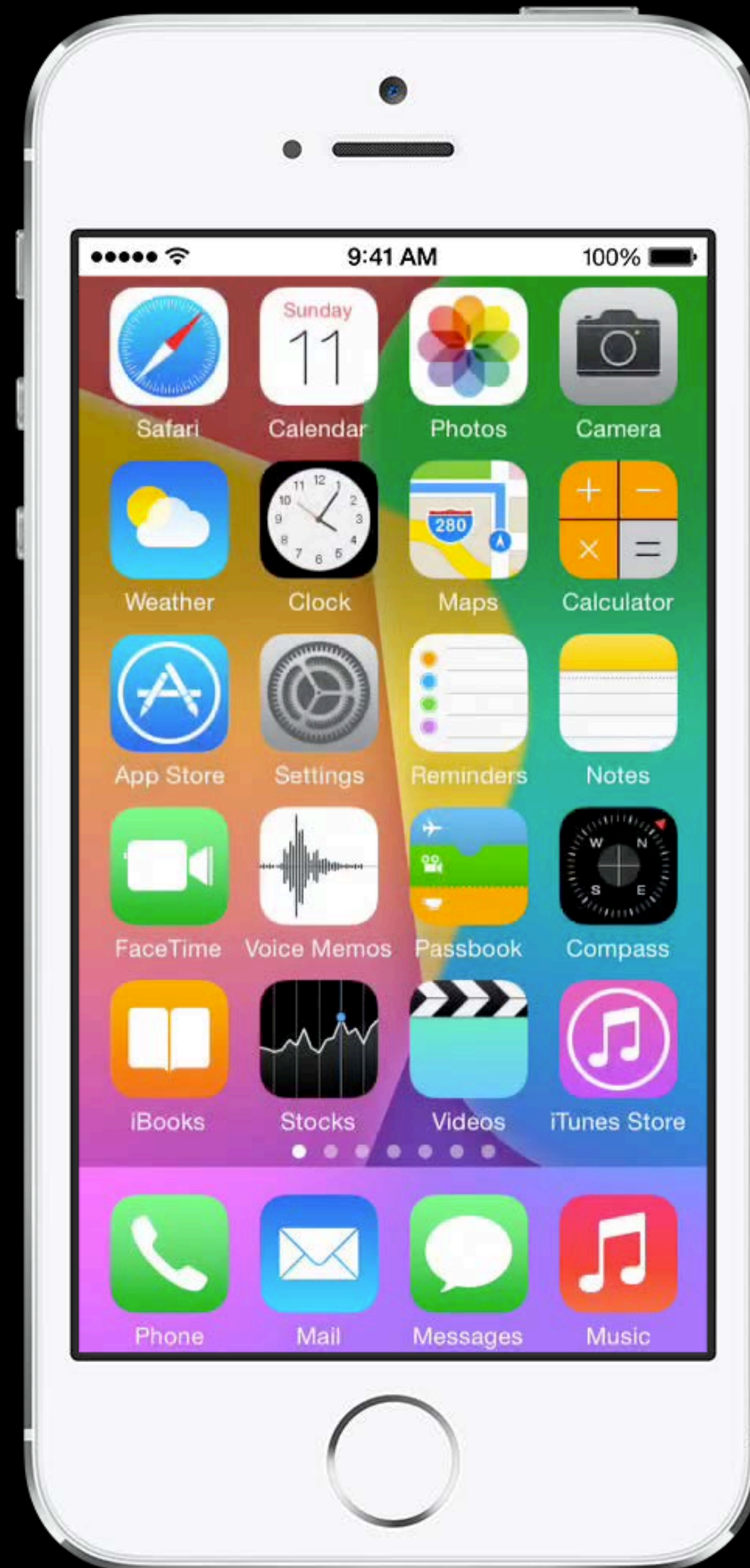
Vision

Low vision accommodations



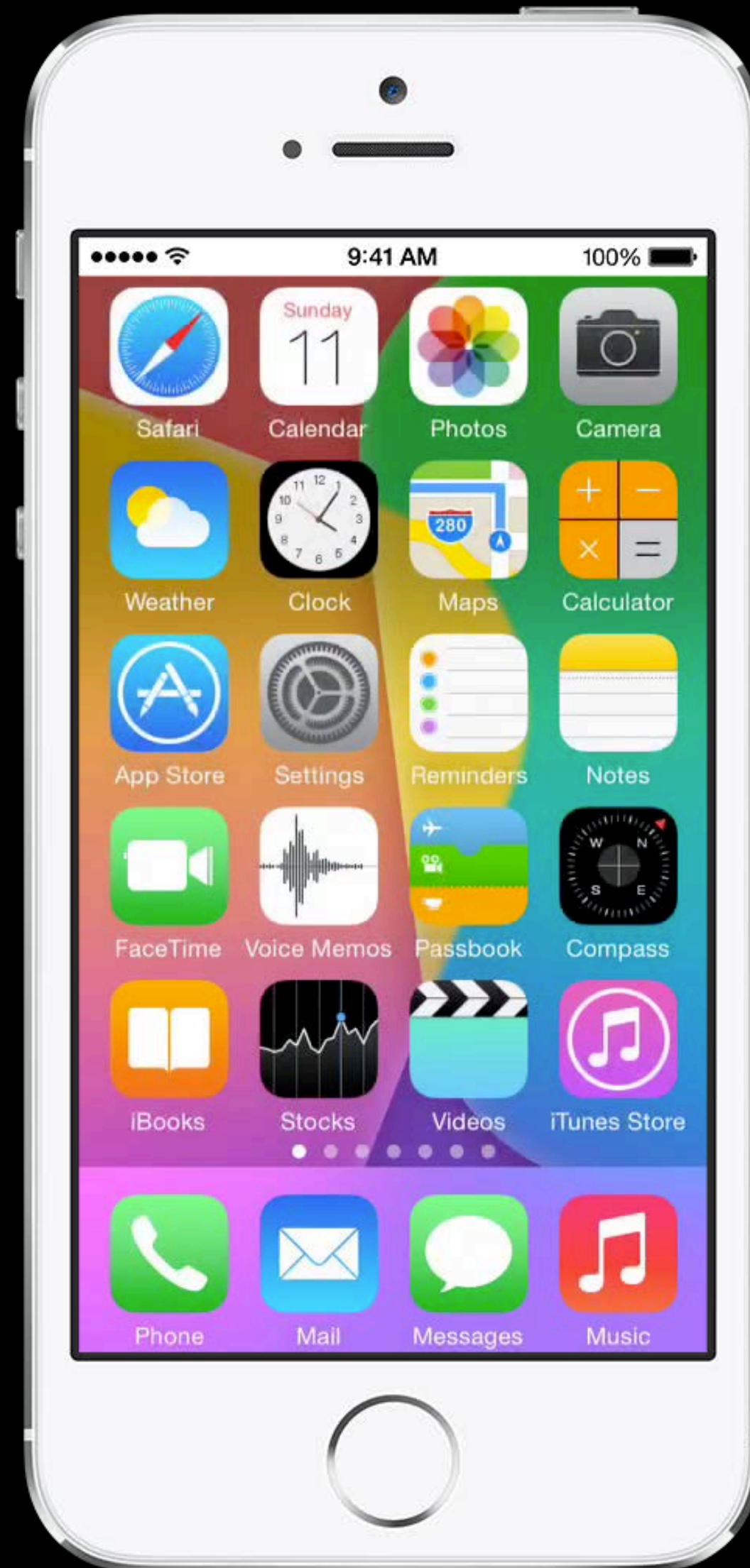
Vision

Reduce Motion



Vision

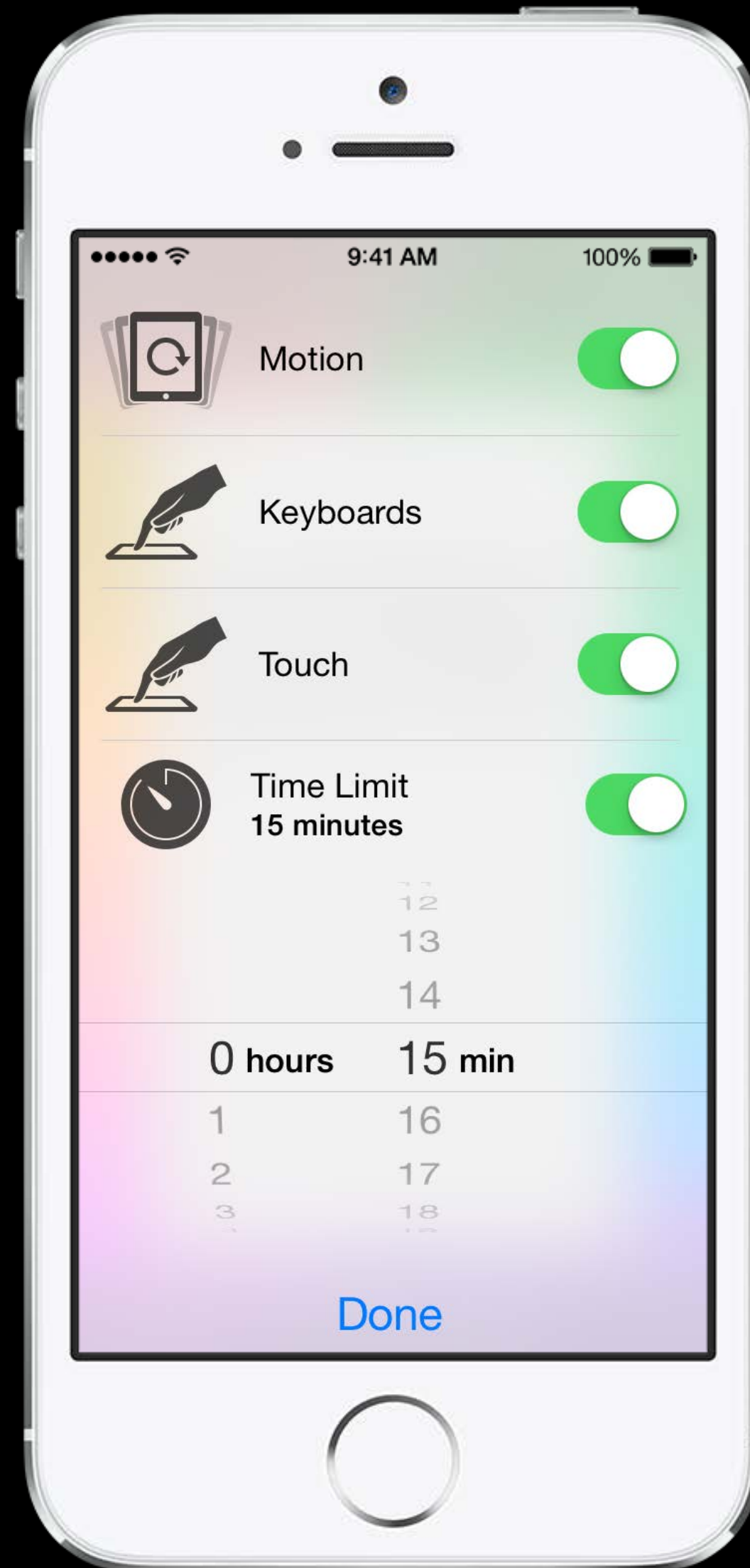
Reduce Motion



New Accessibility Features in iOS 8

Guided Access Time Limits

NEW



Alex

NEW



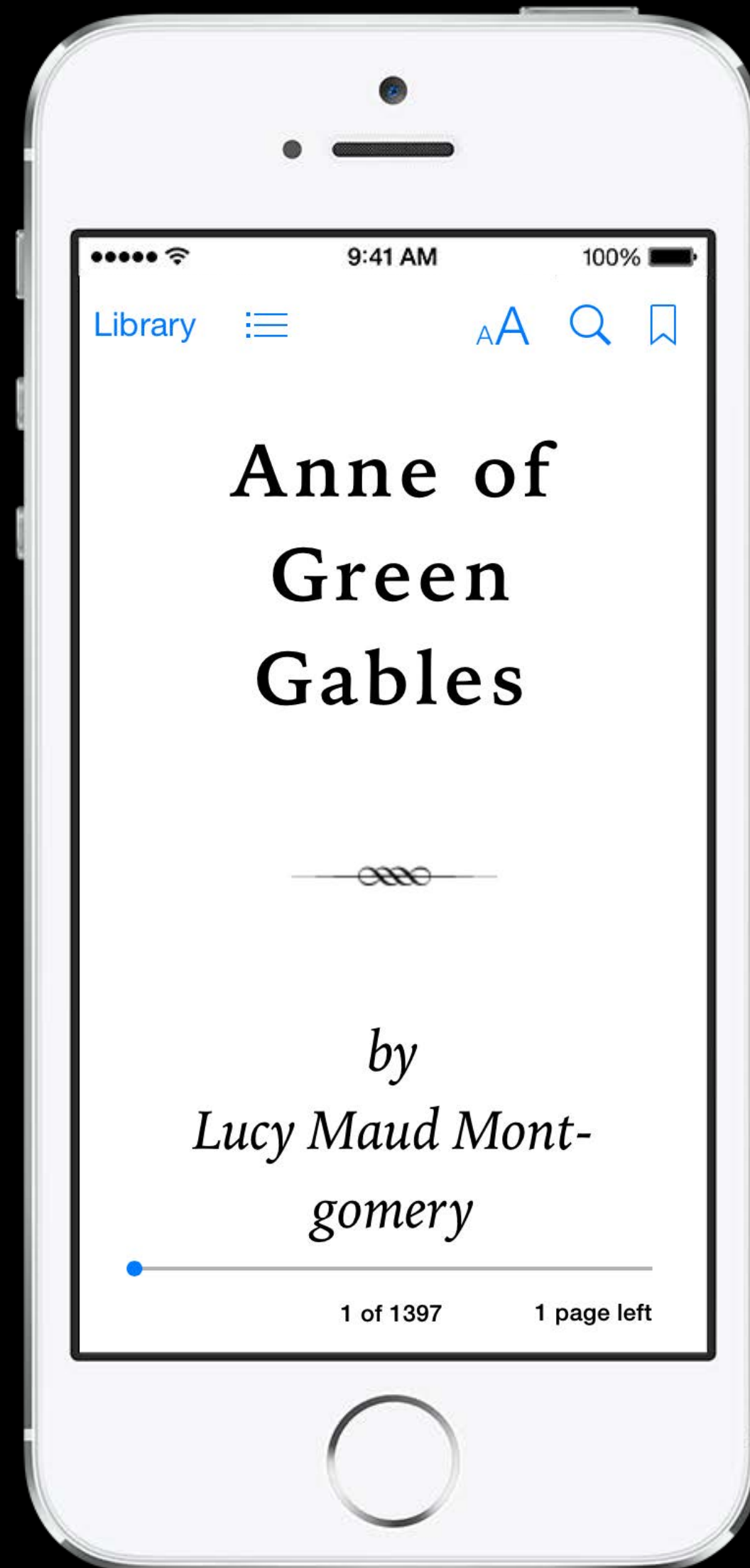
Alex

NEW



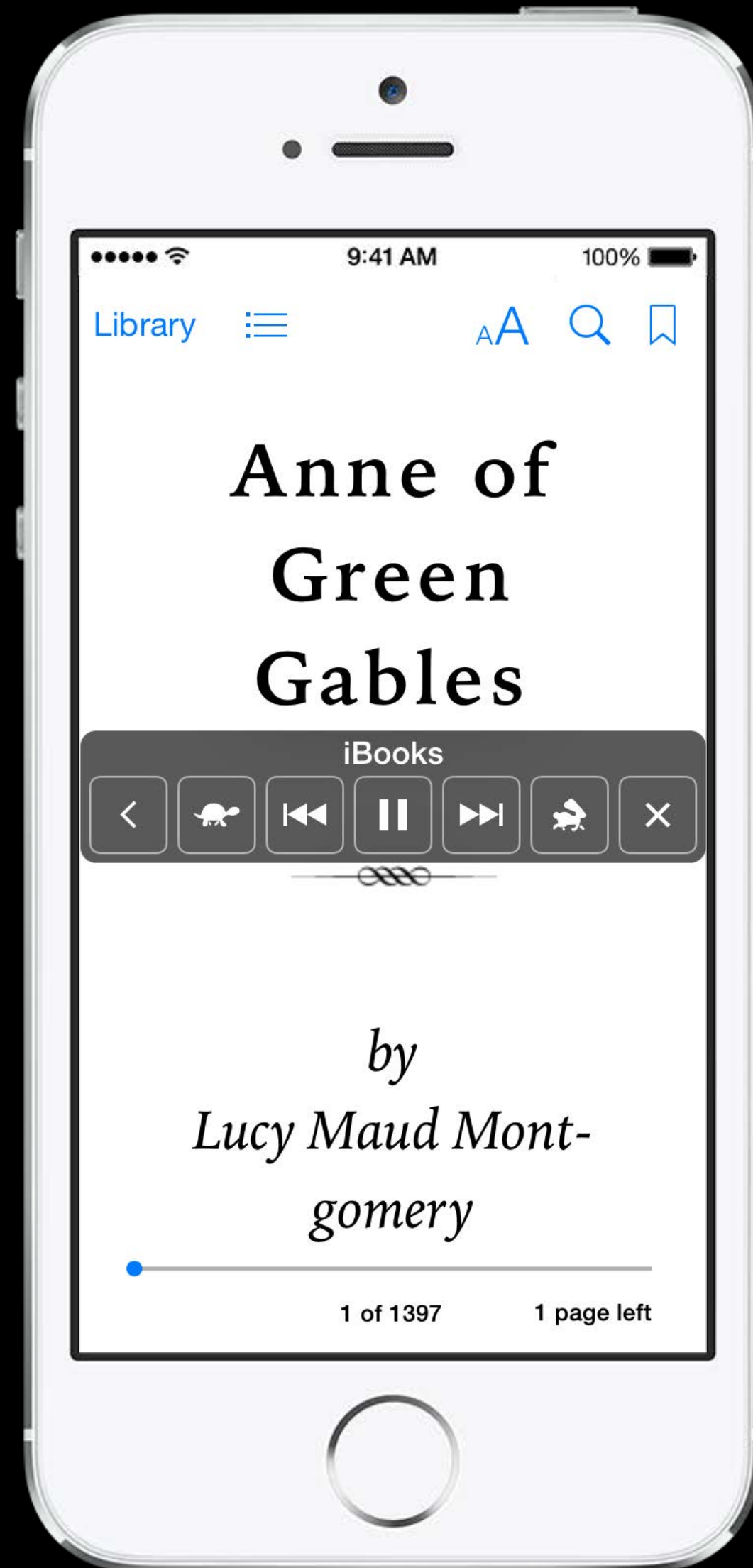
Speak Screen

NEW



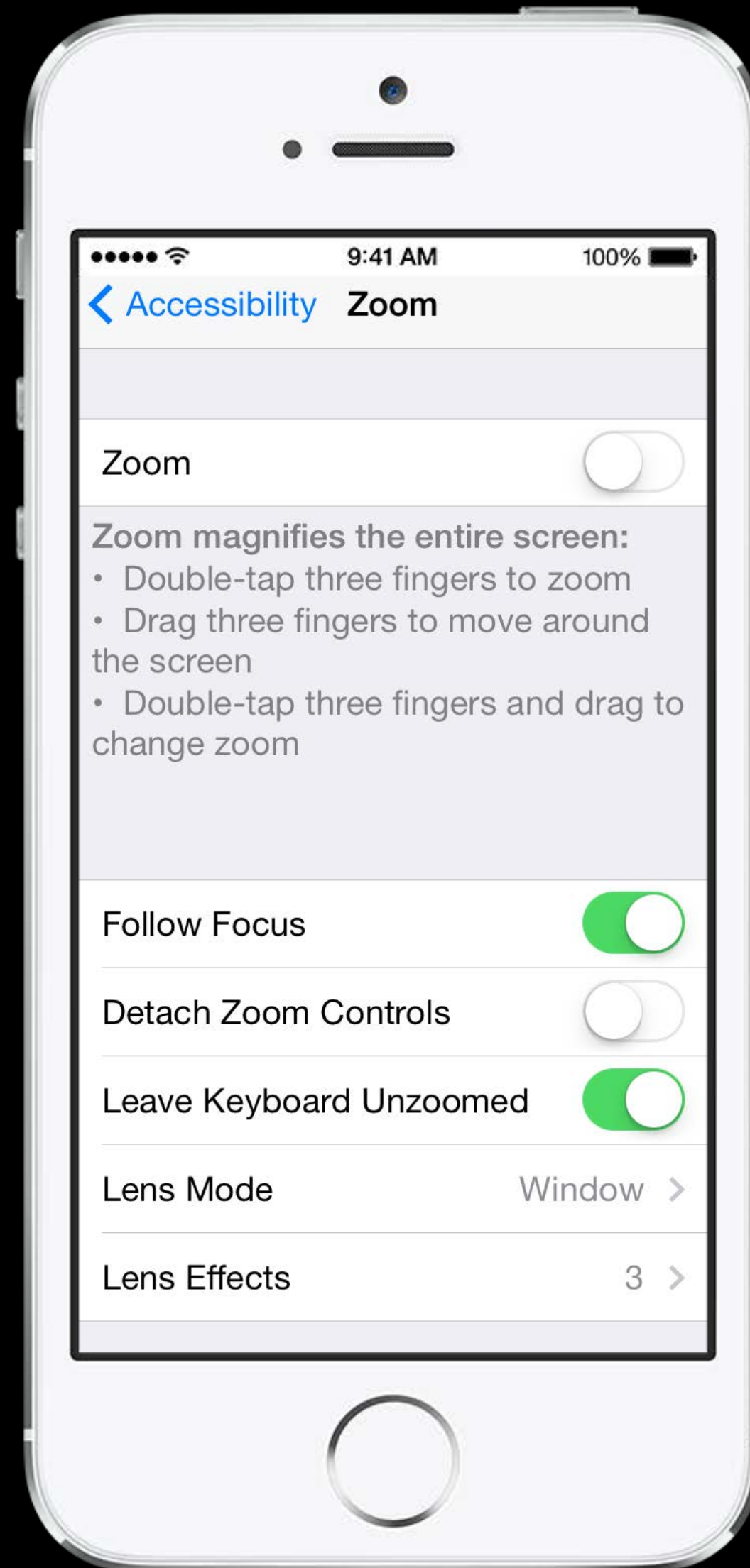
Speak Screen

NEW



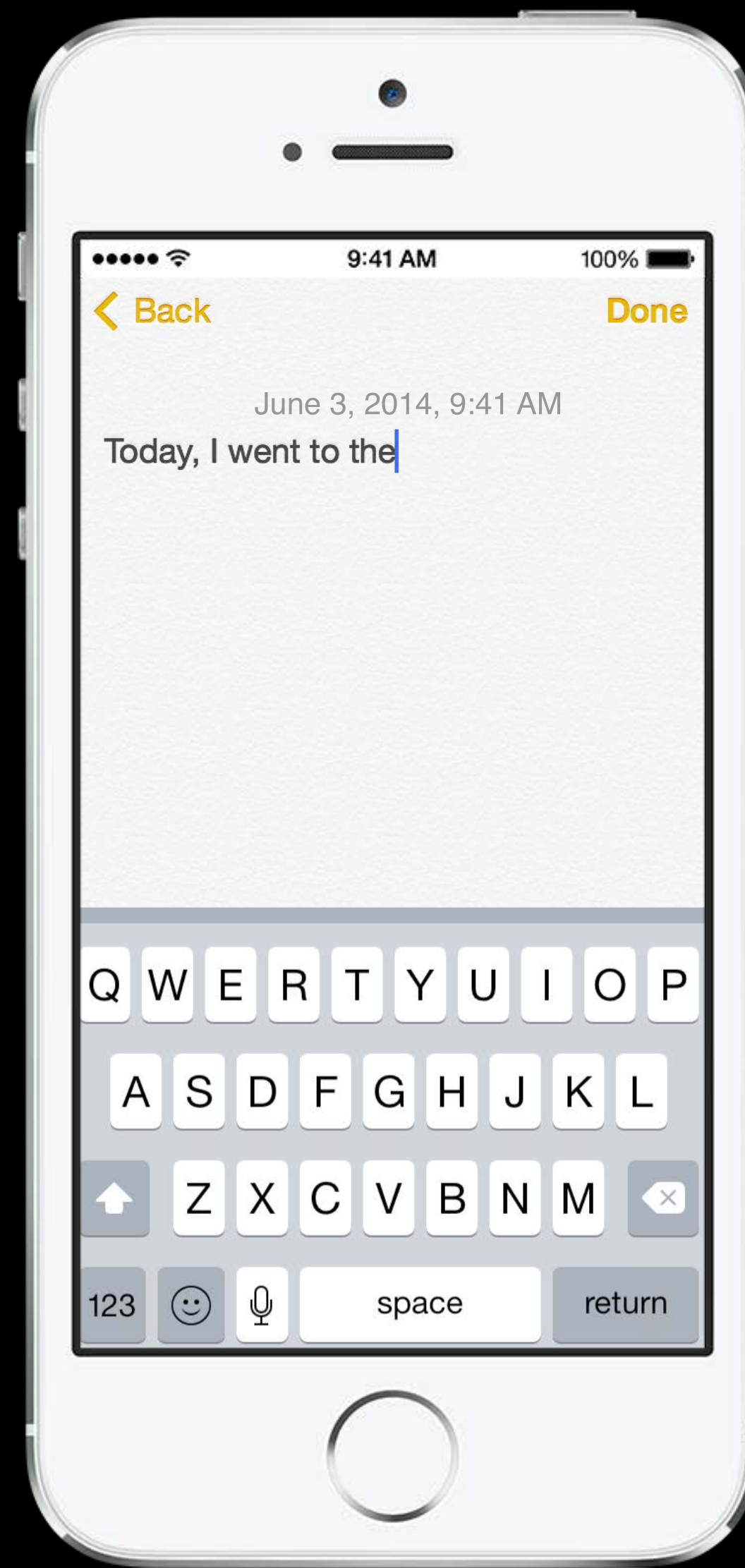
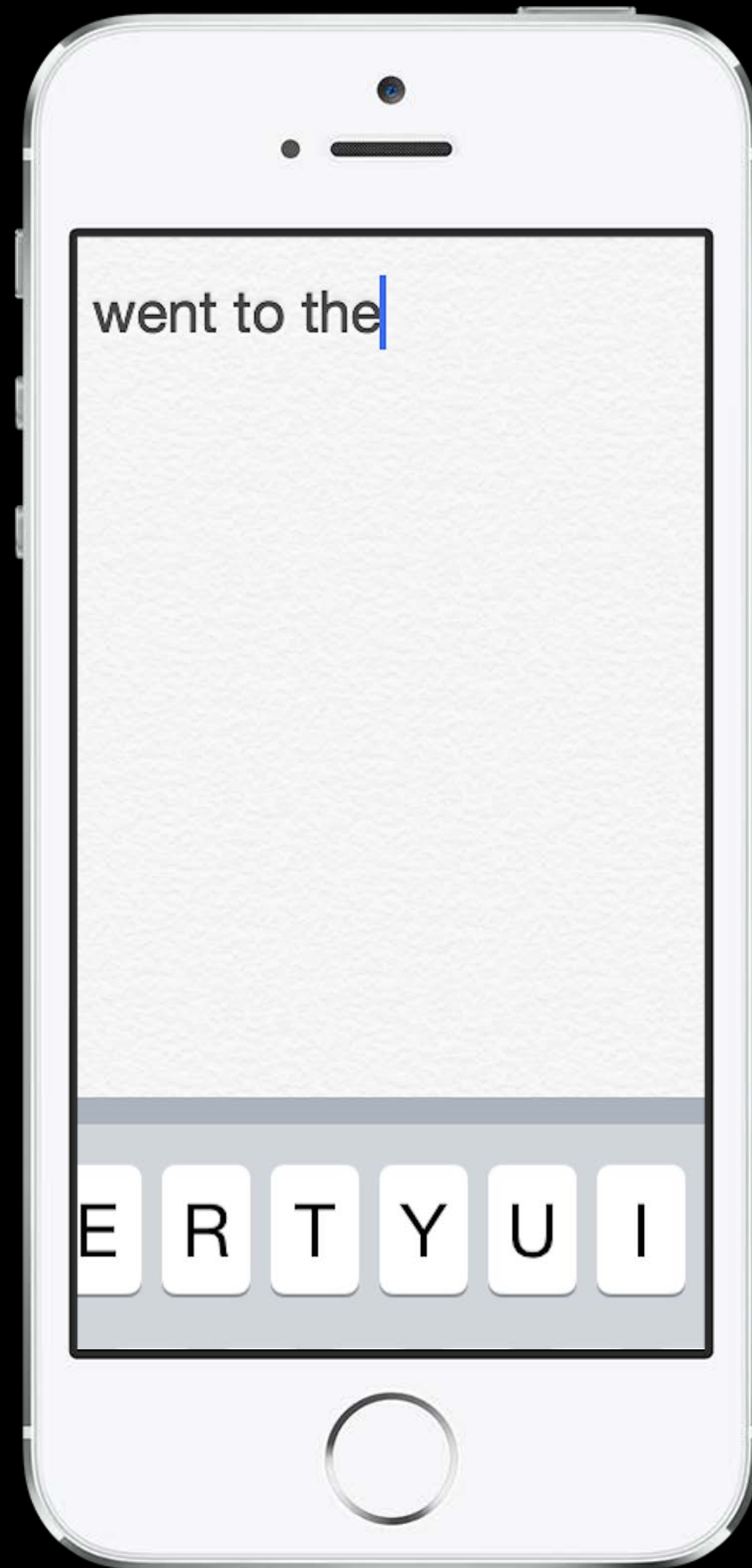
Zoom

NEW





Zoom



Demo

Zoom

Accessibility Tutorial

Accessibility Tutorial

Visual accommodations

Semantic accessibility

Visual Accommodations API



```
BOOL UIAccessibilityIsBoldTextEnabled();
```

```
BOOL UIAccessibilityIsReduceTransparencyEnabled();
```

```
BOOL UIAccessibilityDarkerSystemColorsEnabled();
```

```
BOOL UIAccessibilityIsReduceMotionEnabled();
```

Demo

Visual accommodations

Semantic Accessibility

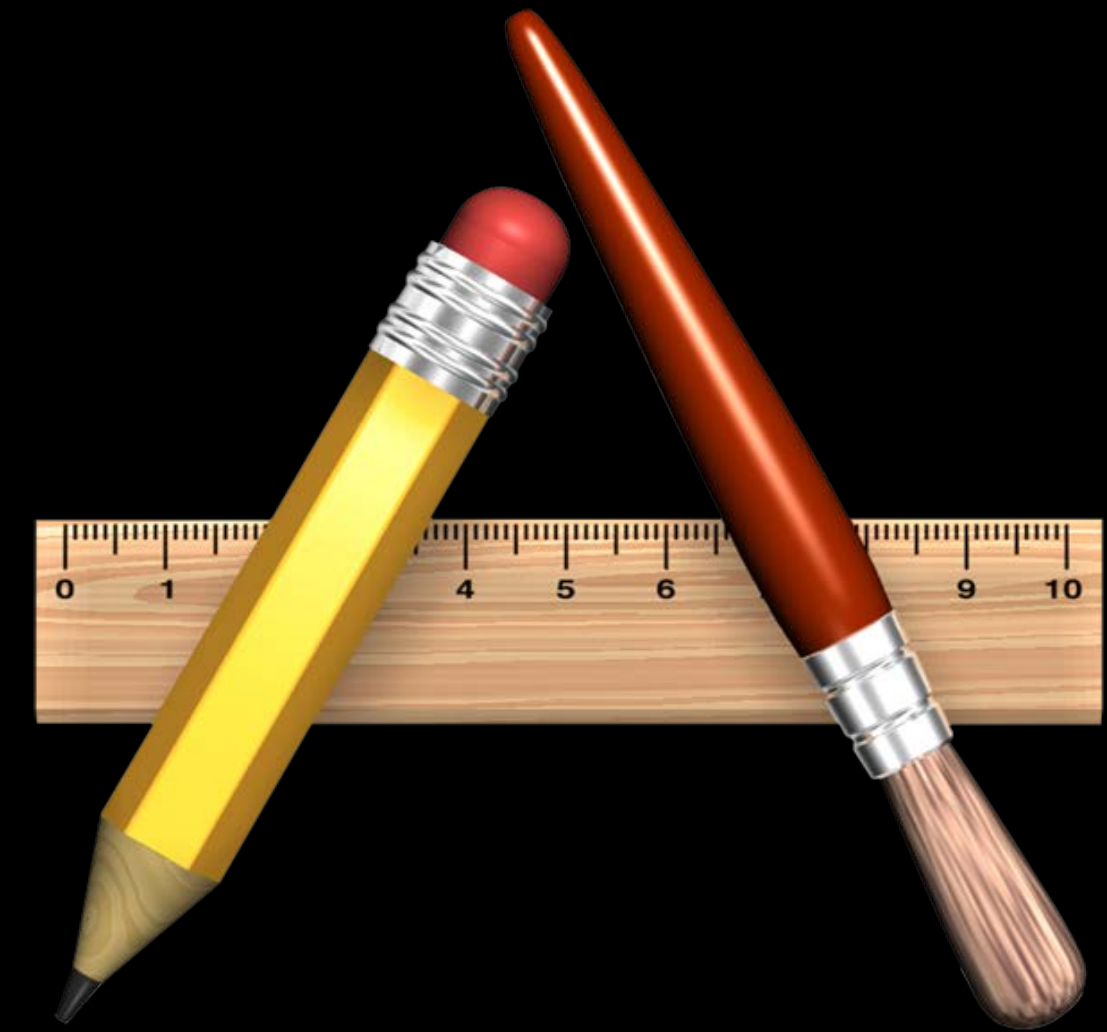
Semantic Accessibility



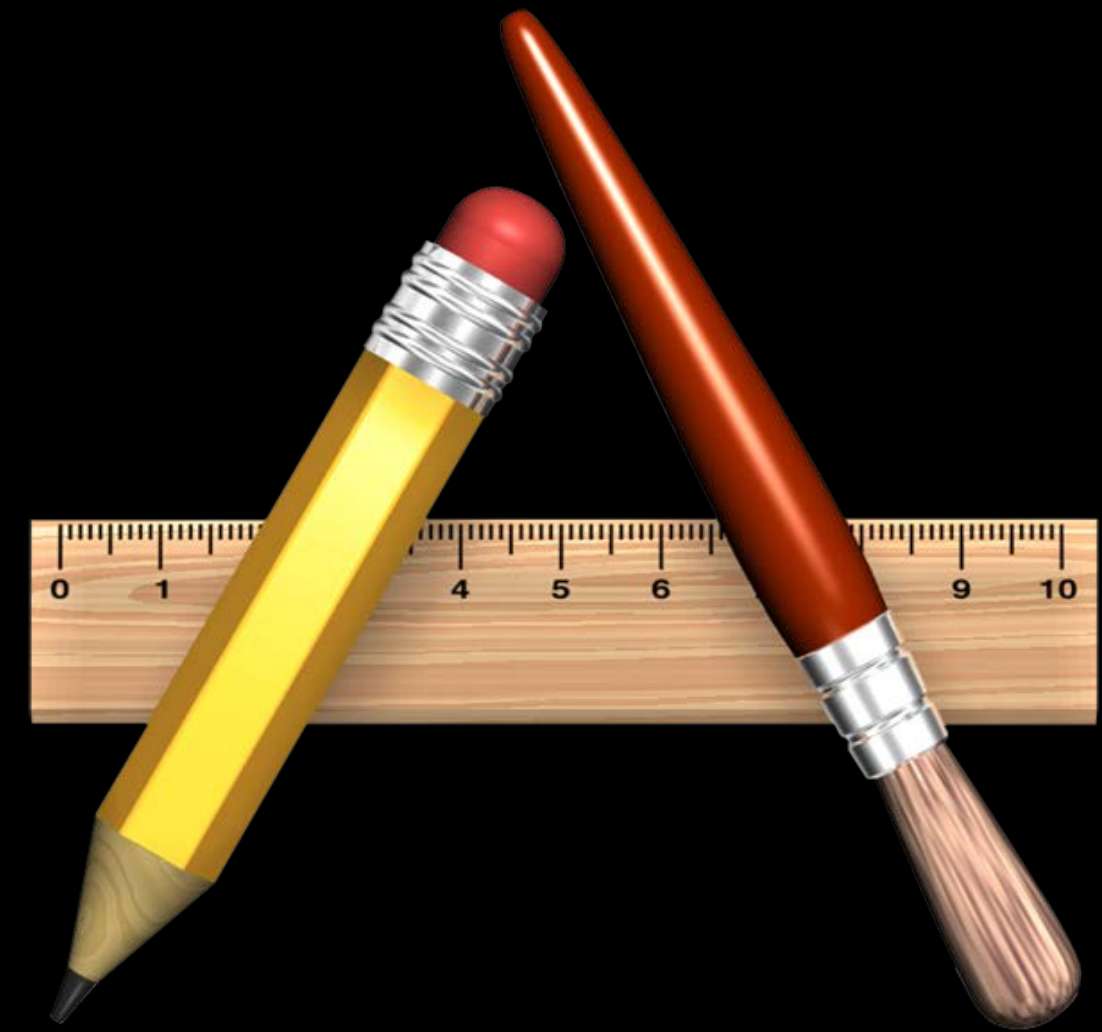
Semantic Accessibility



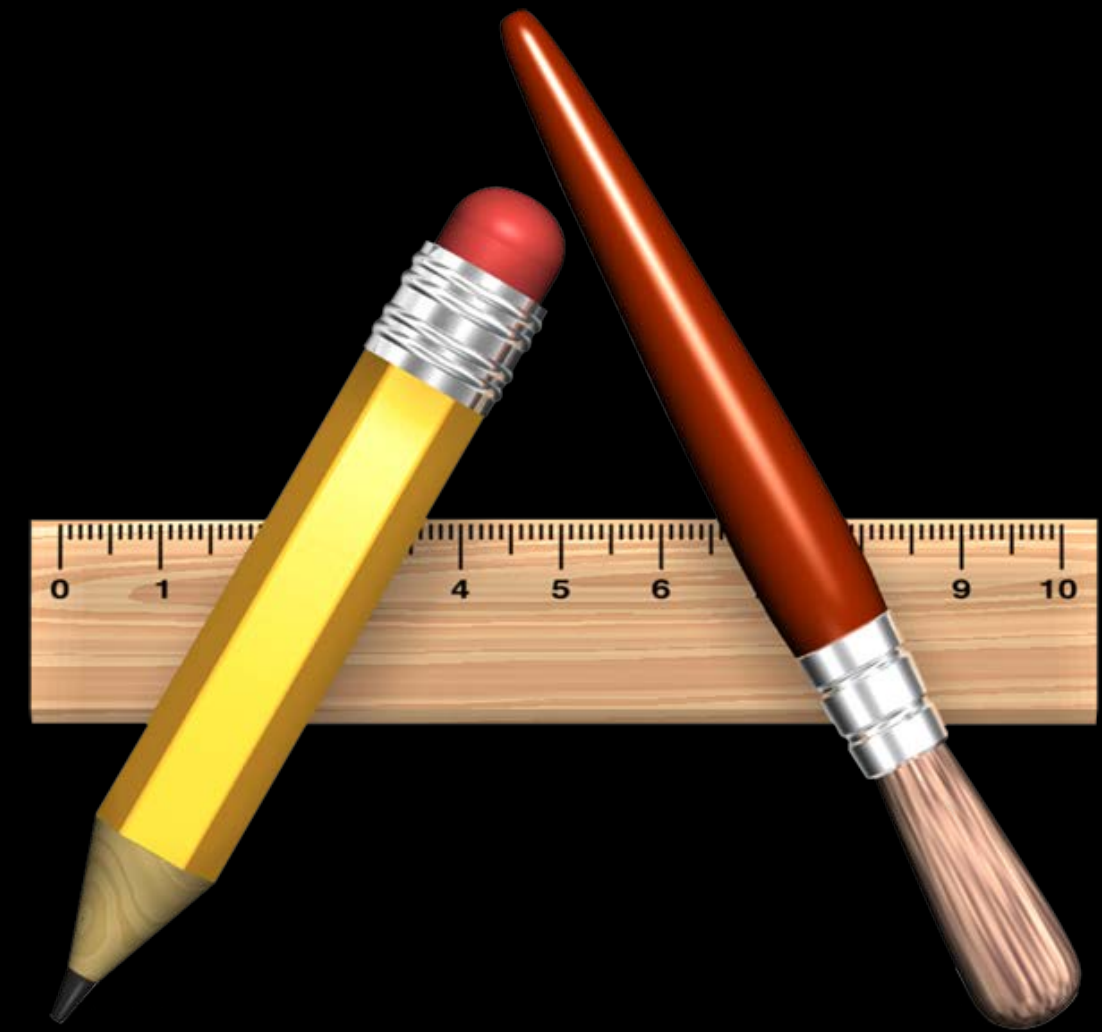
Semantic Accessibility



Semantic Accessibility

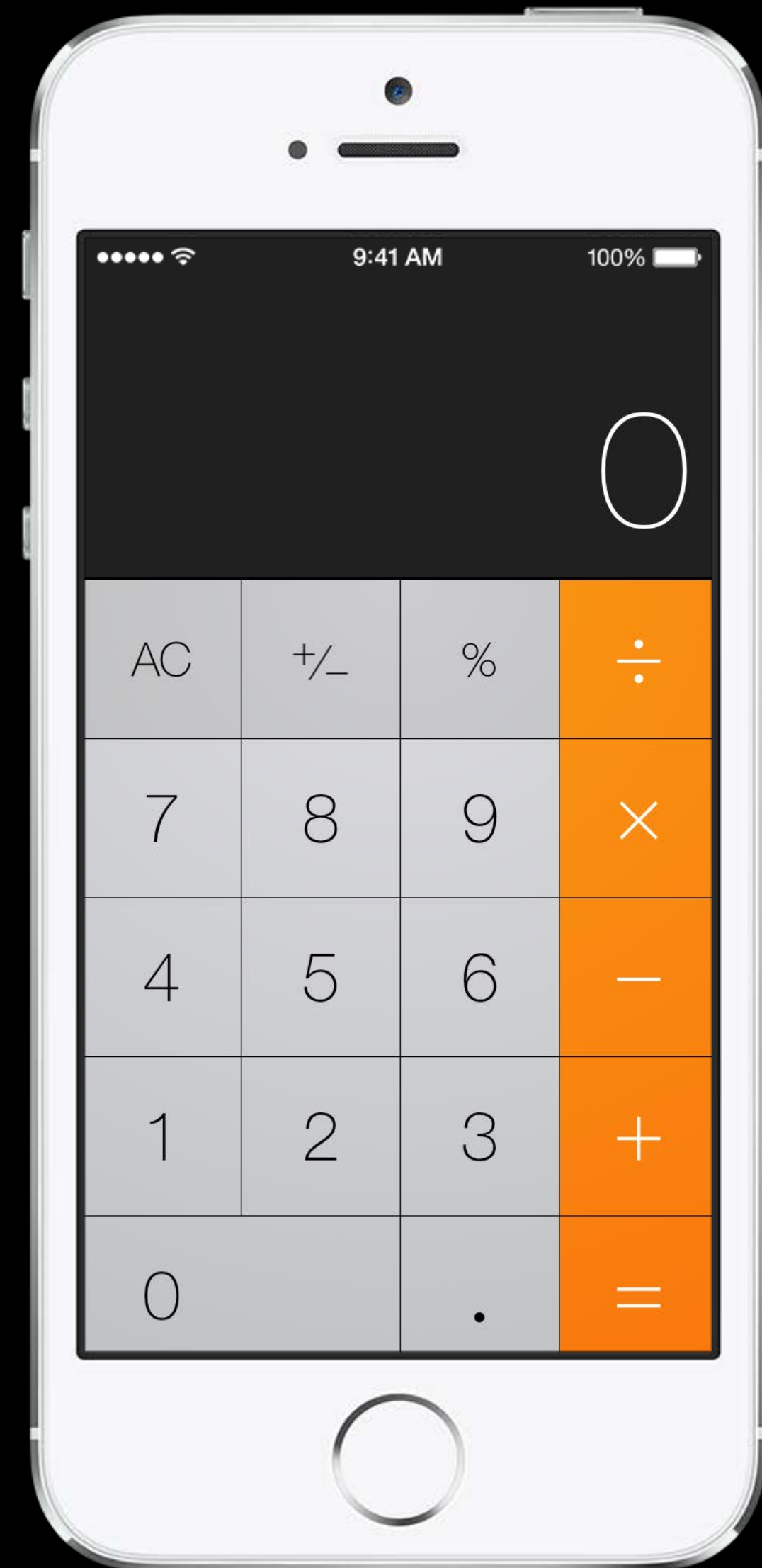


Semantic Accessibility



Semantic Accessibility

Example: VoiceOver

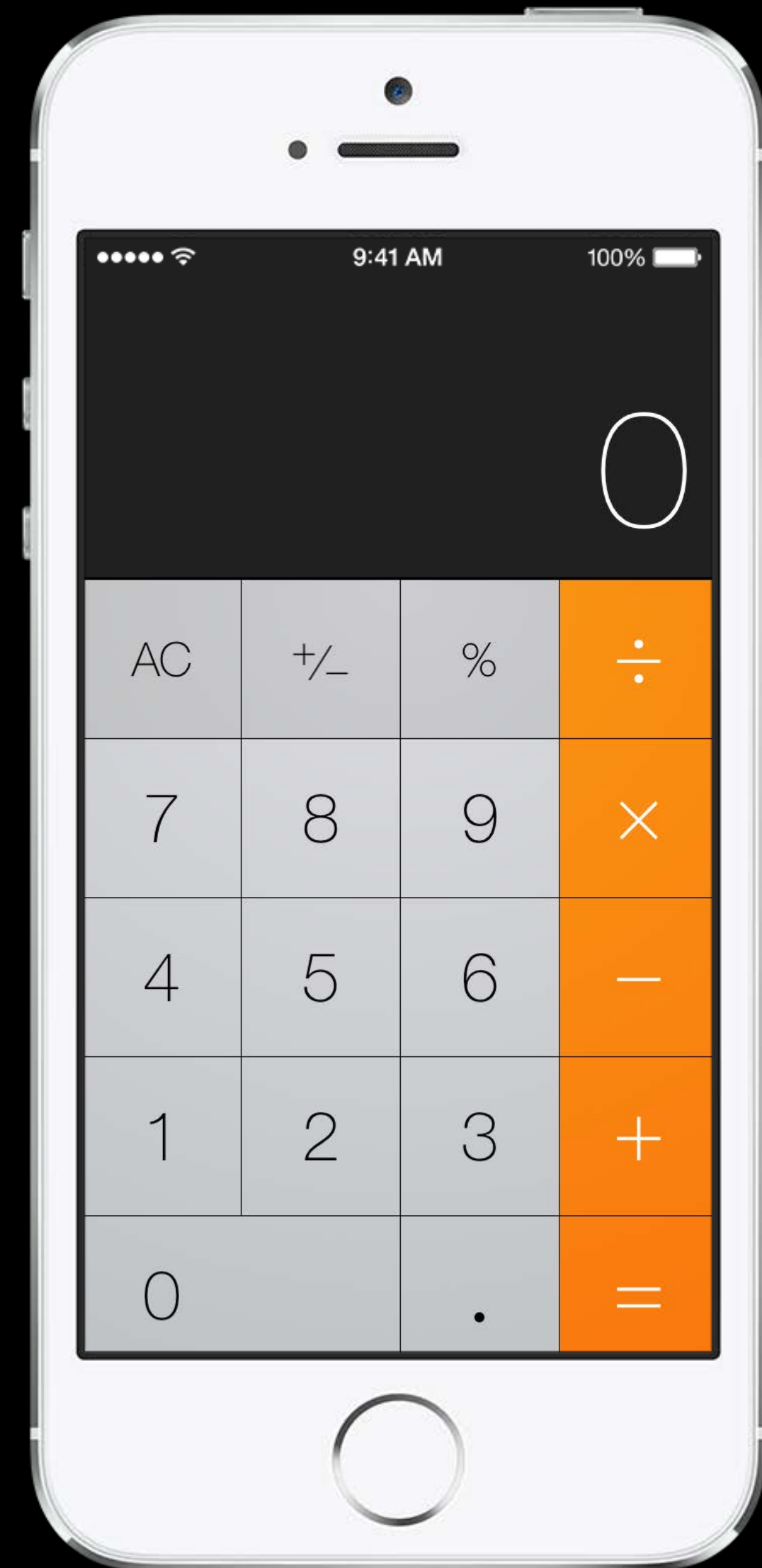


Semantic Accessibility

Example: VoiceOver

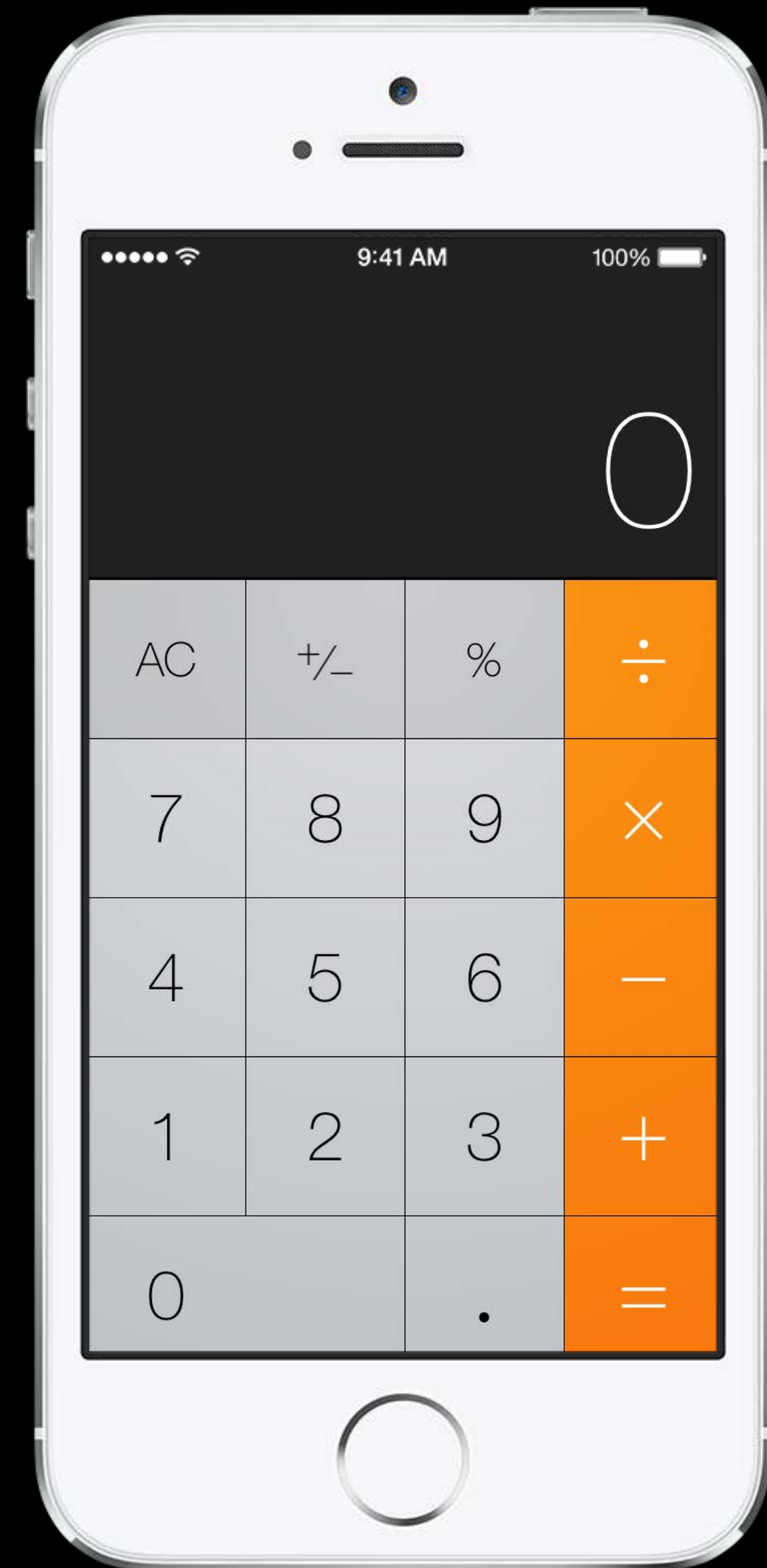
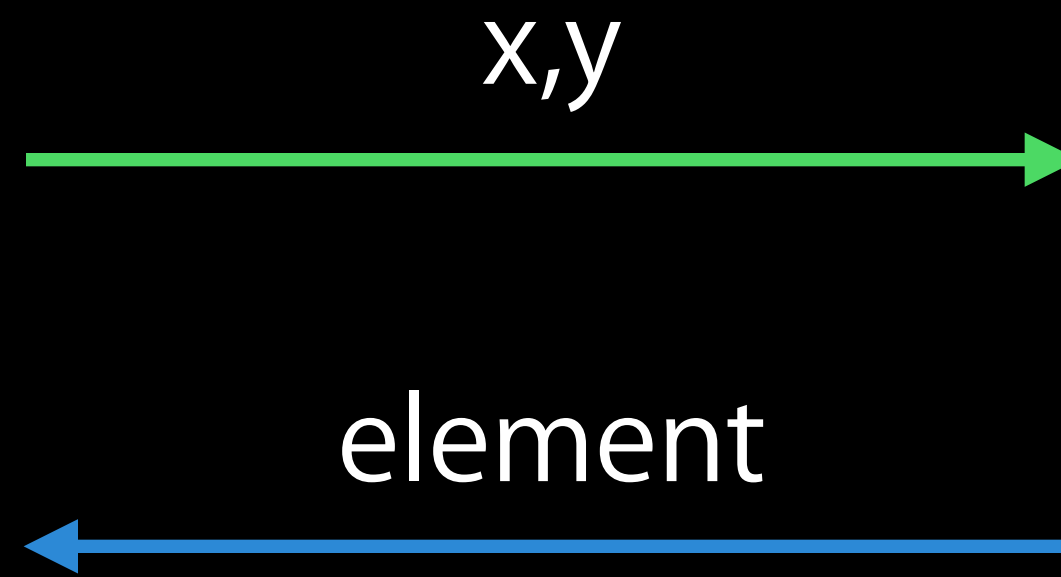


x,y



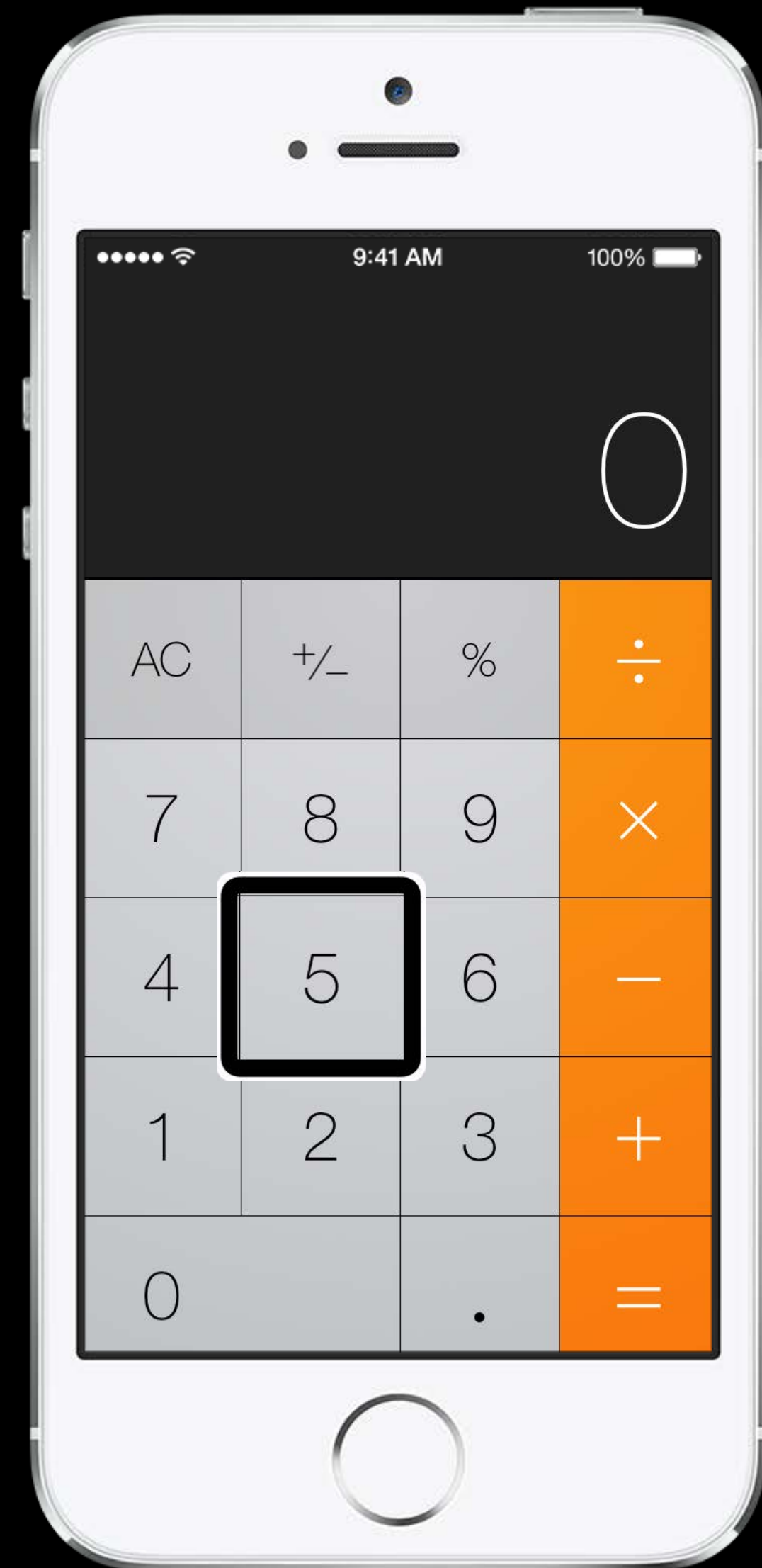
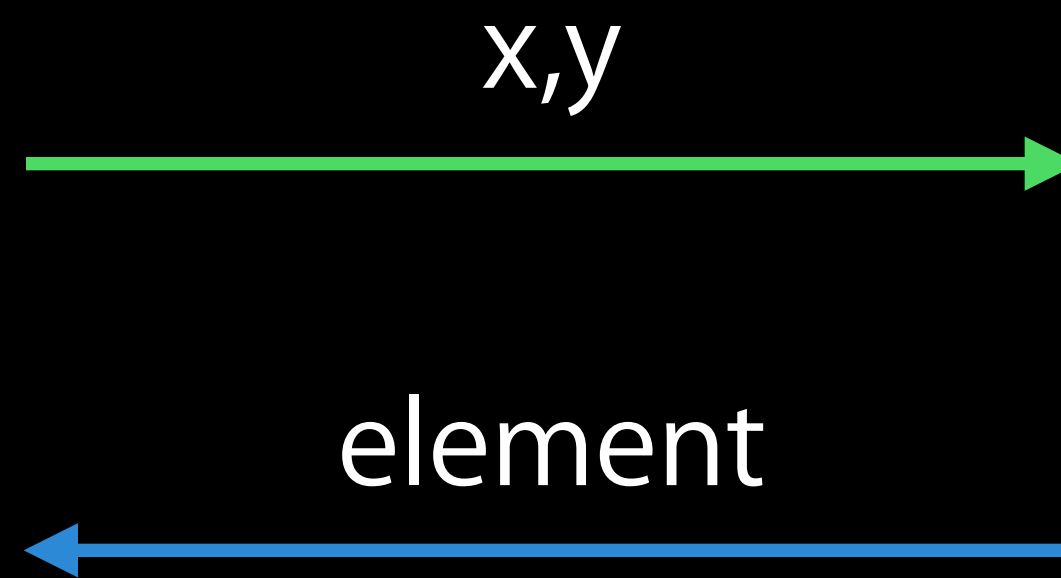
Semantic Accessibility

Example: VoiceOver



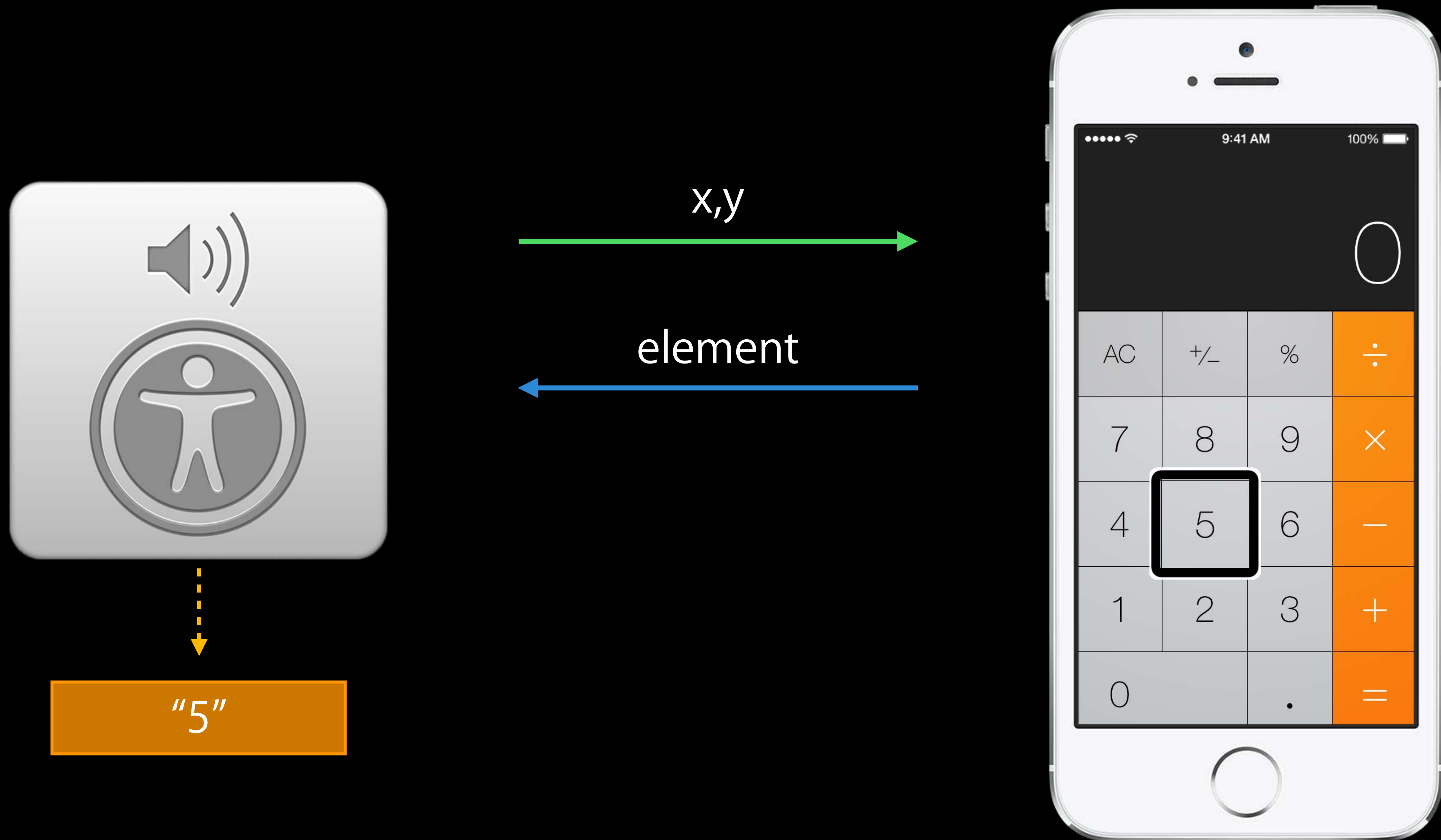
Semantic Accessibility

Example: VoiceOver



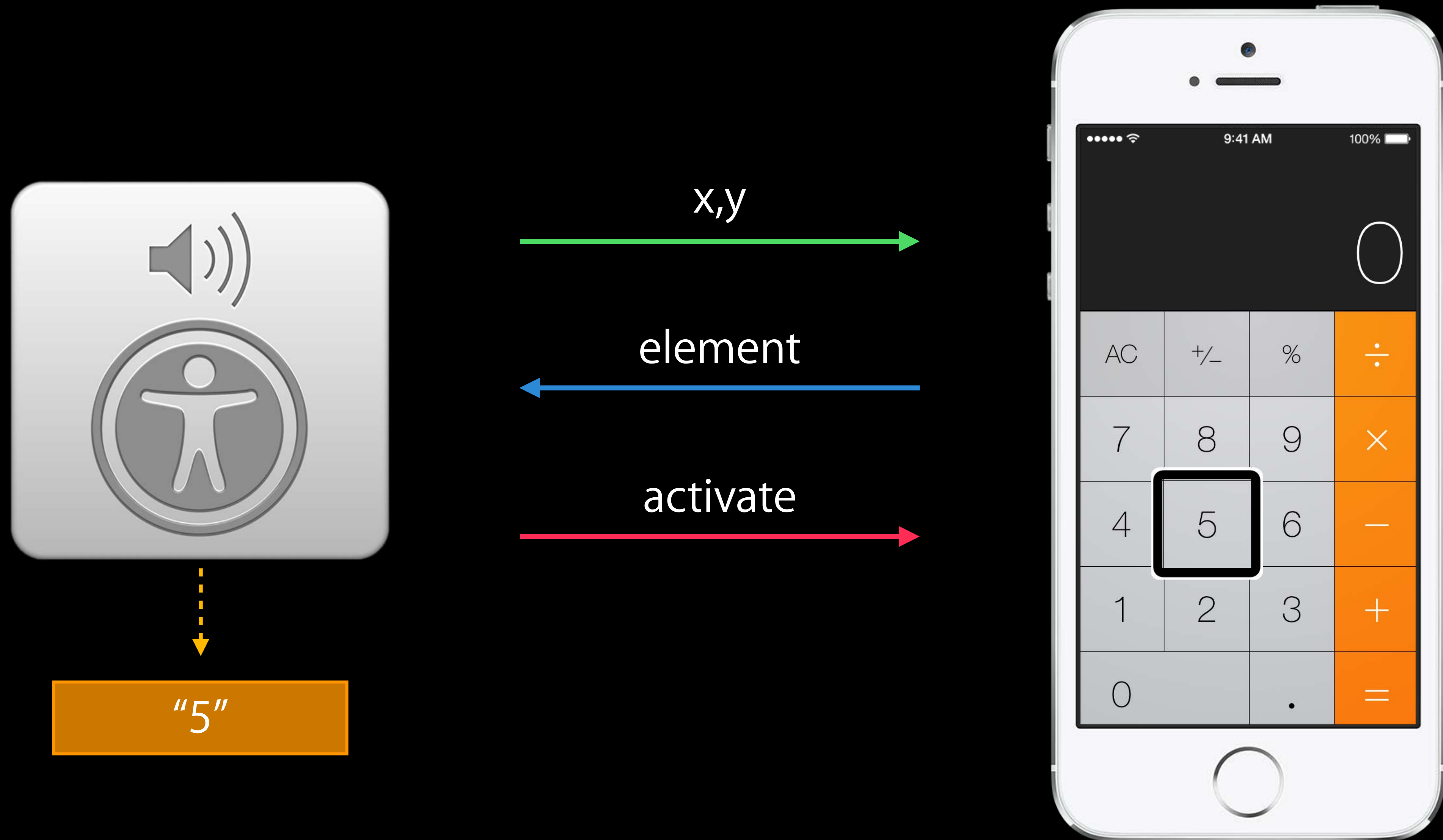
Semantic Accessibility

Example: VoiceOver



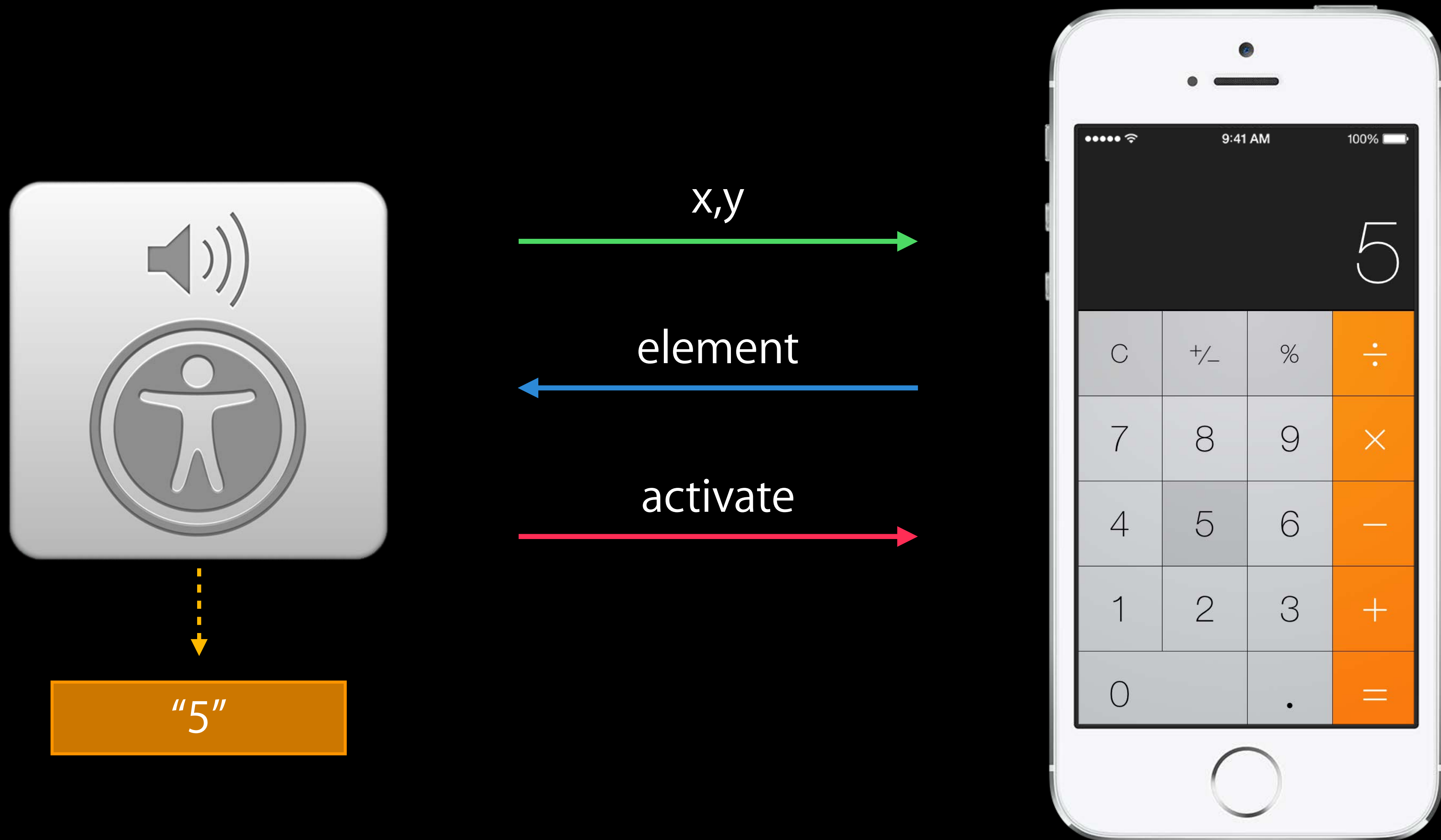
Semantic Accessibility

Example: VoiceOver



Semantic Accessibility

Example: VoiceOver



Semantic Accessibility Audit

Semantic Accessibility Audit

Most is built into iOS

Semantic Accessibility Audit

Most is built into iOS
Audit with VoiceOver

Semantic Accessibility Audit

Most is built into iOS

Audit with VoiceOver

- Can VoiceOver speak everything?

Semantic Accessibility Audit

Most is built into iOS

Audit with VoiceOver

- Can VoiceOver speak everything?
- Can VoiceOver do everything?

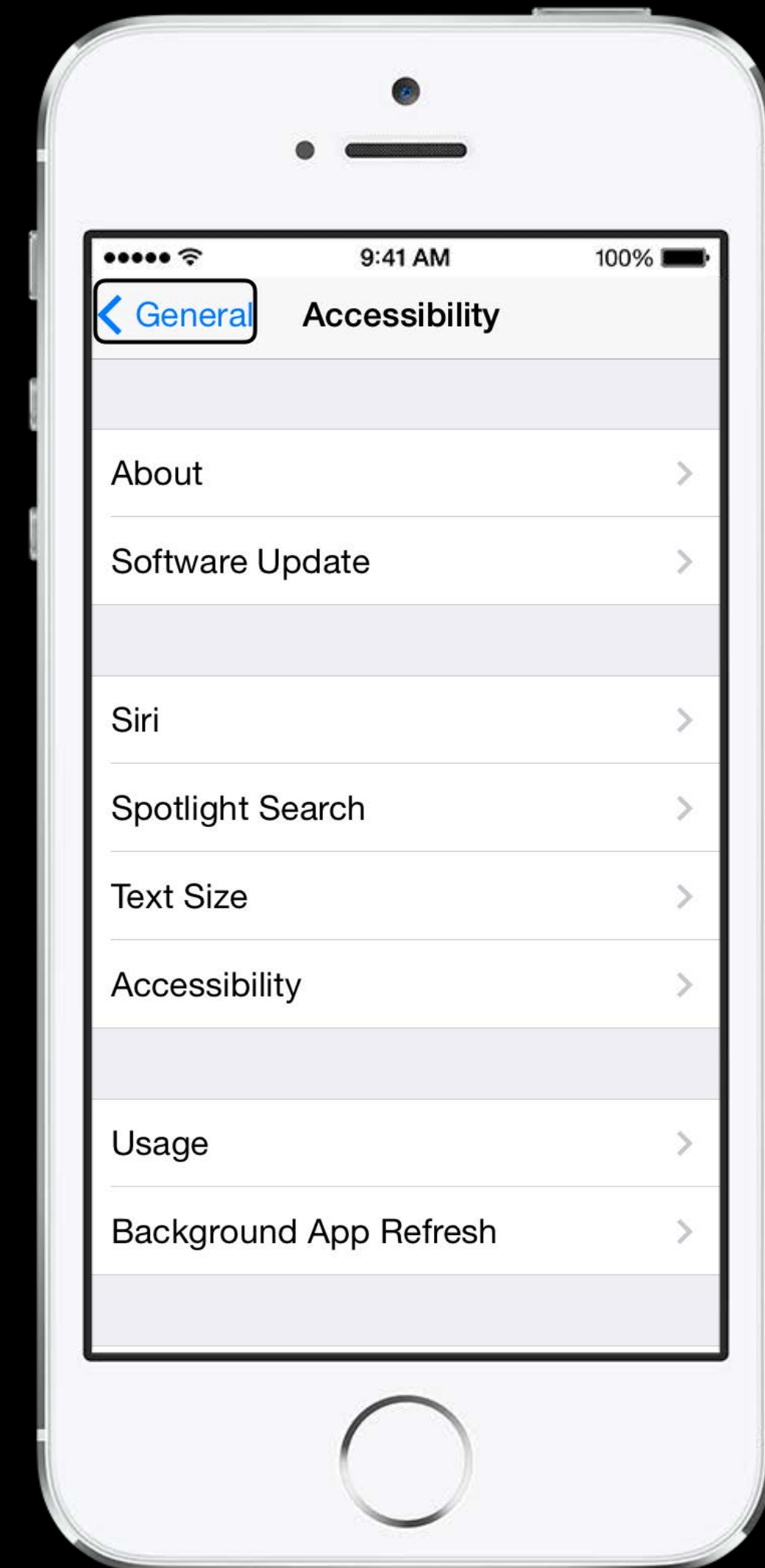
Semantic Accessibility Audit

Setup



Semantic Accessibility Audit

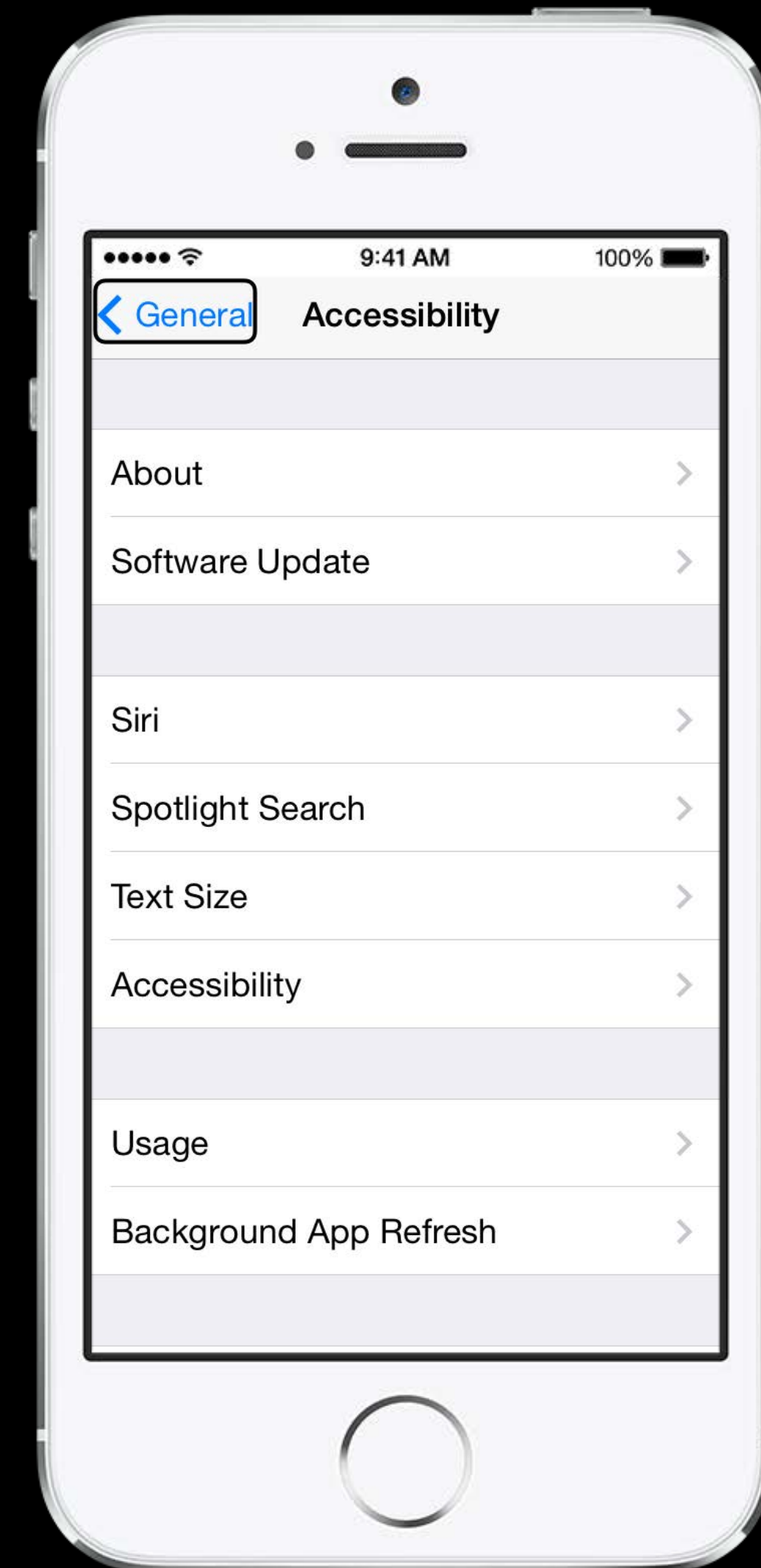
VoiceOver cheat sheet



Semantic Accessibility Audit

VoiceOver cheat sheet

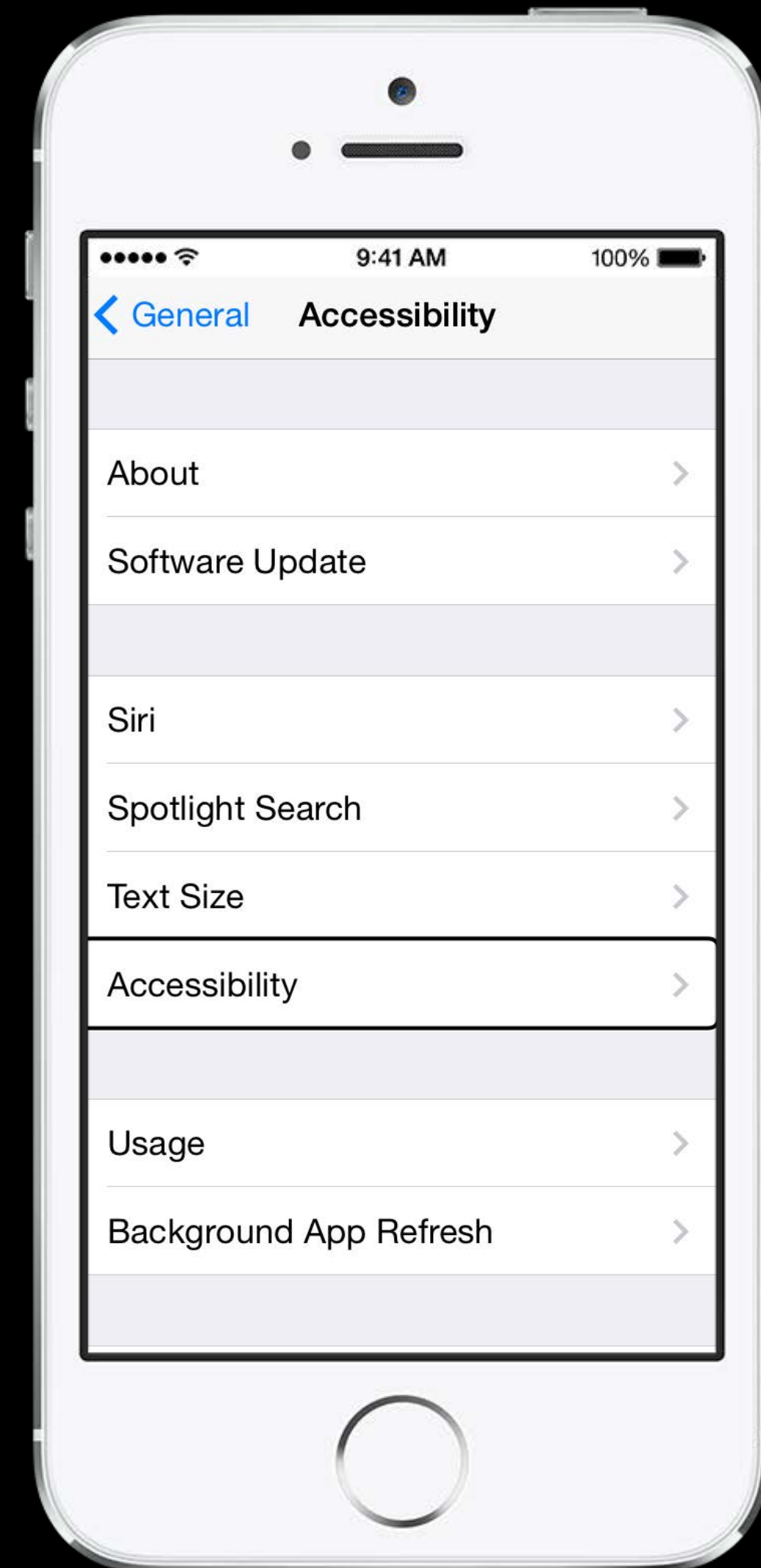
Tap: select and speak



Semantic Accessibility Audit

VoiceOver cheat sheet

Tap: select and speak

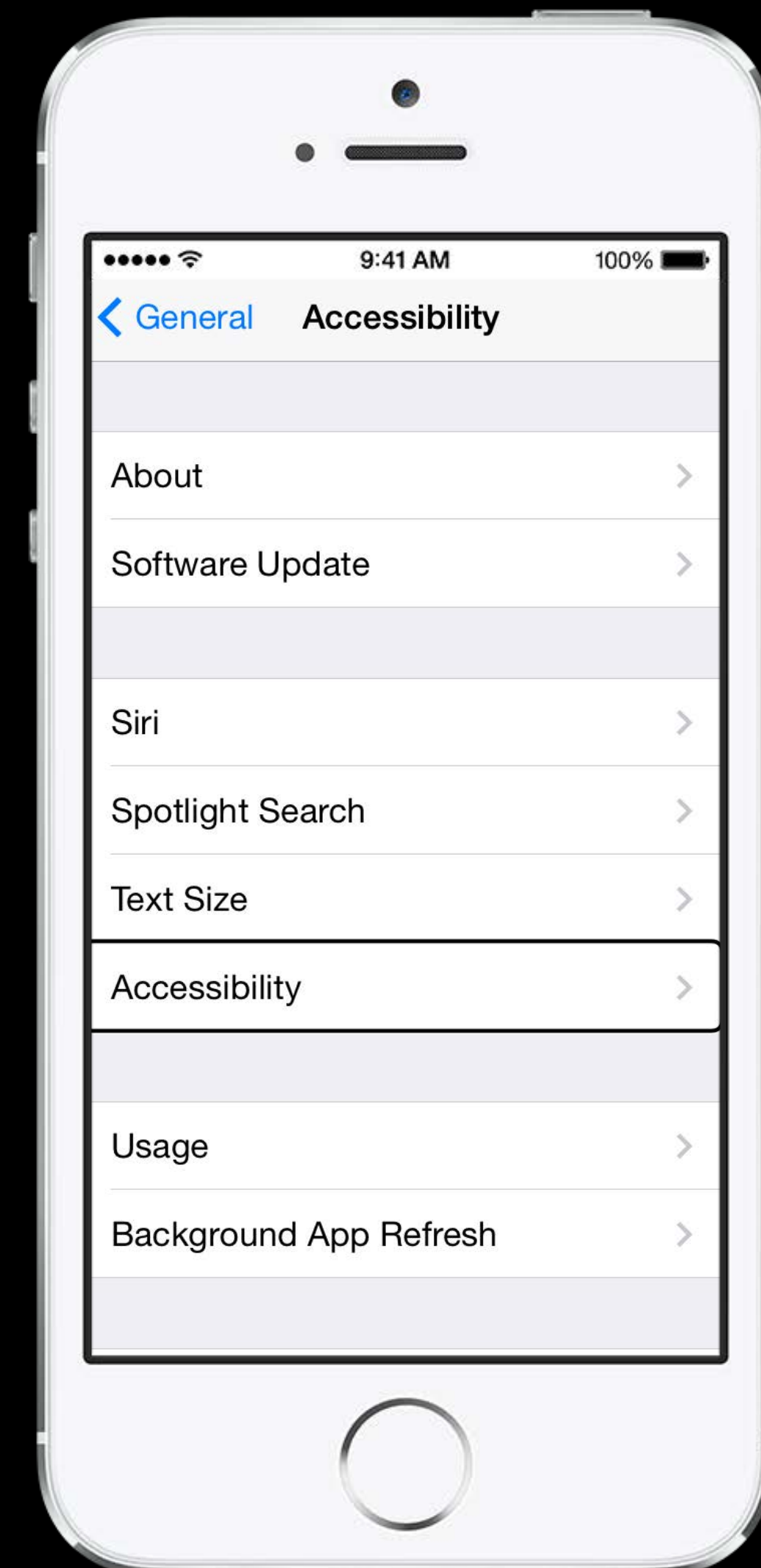


Semantic Accessibility Audit

VoiceOver cheat sheet

Tap: select and speak

Double tap: activate

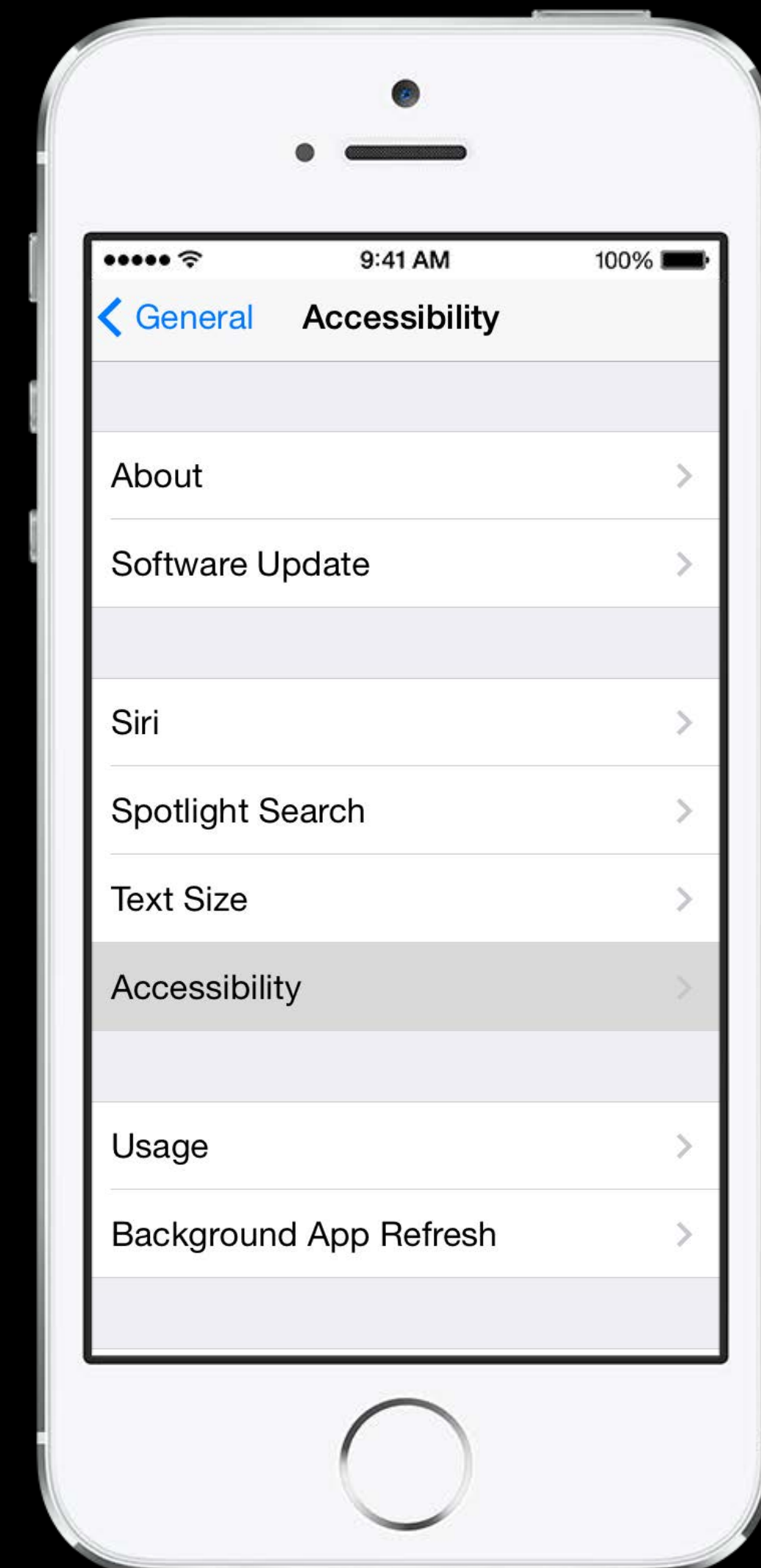


Semantic Accessibility Audit

VoiceOver cheat sheet

Tap: select and speak

Double tap: activate

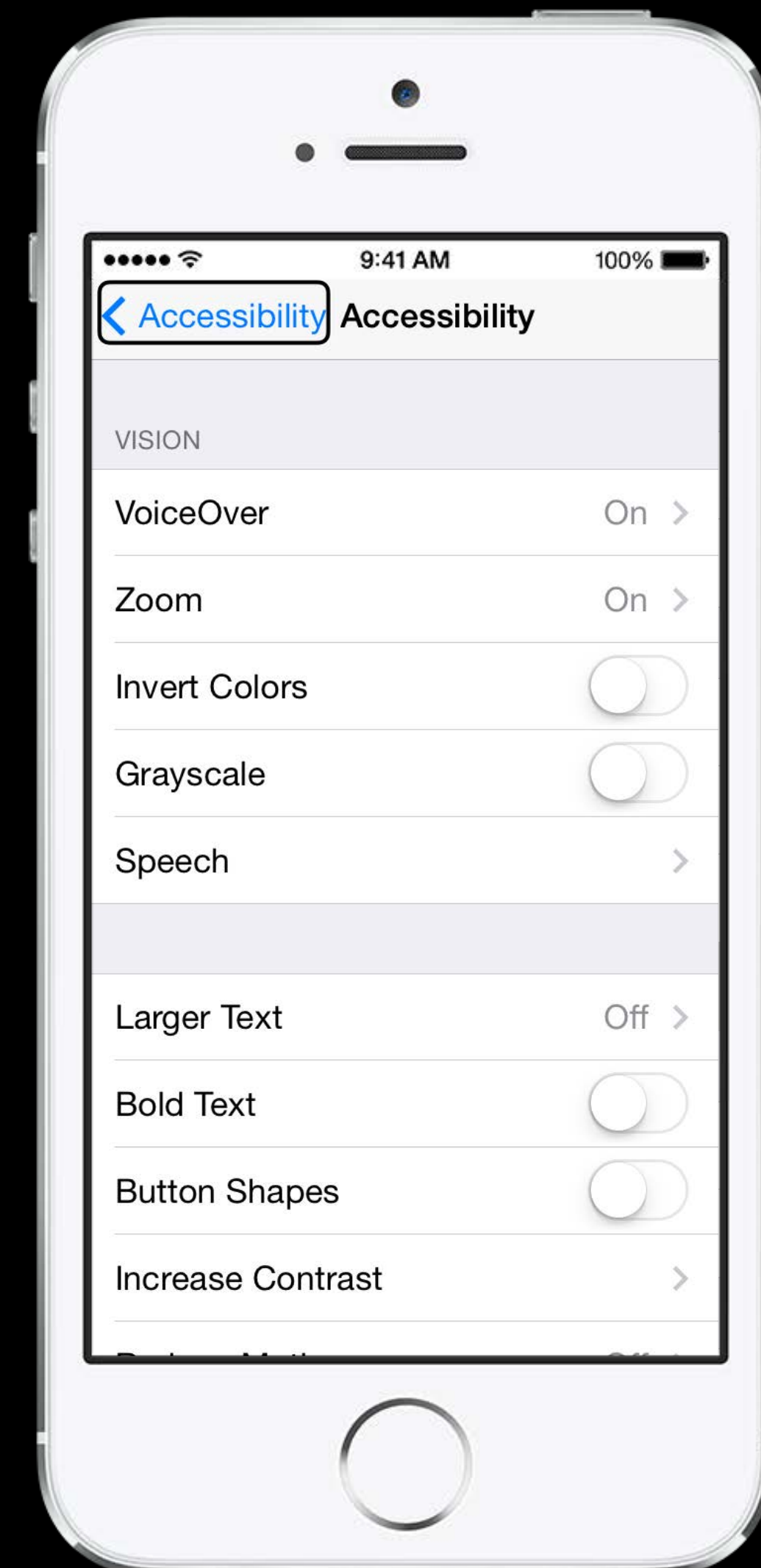


Semantic Accessibility Audit

VoiceOver cheat sheet

Tap: select and speak

Double tap: activate



Semantic Accessibility Audit

VoiceOver cheat sheet

Tap: select and speak

Double tap: activate

Swipe right: select and speak the next element



Semantic Accessibility Audit

VoiceOver cheat sheet

Tap: select and speak

Double tap: activate

Swipe right: select and speak the next element



Semantic Accessibility Audit

VoiceOver cheat sheet

Tap: select and speak

Double tap: activate

Swipe right: select and speak the next element

Three finger swipe: scroll



Semantic Accessibility Audit

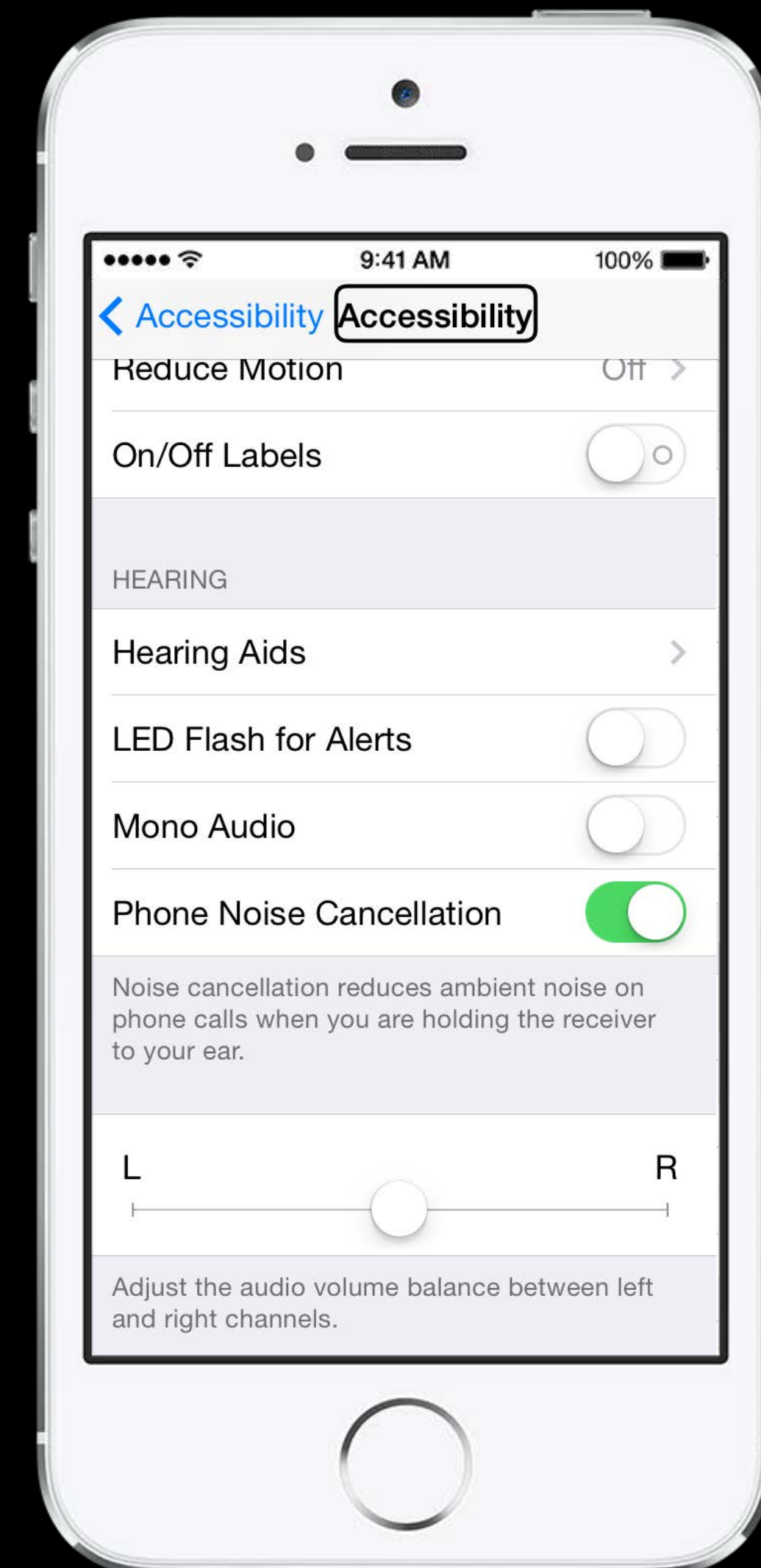
VoiceOver cheat sheet

Tap: select and speak

Double tap: activate

Swipe right: select and speak the next element

Three finger swipe: scroll



Demo

Semantic accessibility audit

Basic Accessibility API

Basic Accessibility API

```
@property(nonatomic) BOOL isAccessibilityElement;
```

Return YES to make a view visible to an assistive technology

Default is YES for controls and labels

Basic Accessibility API

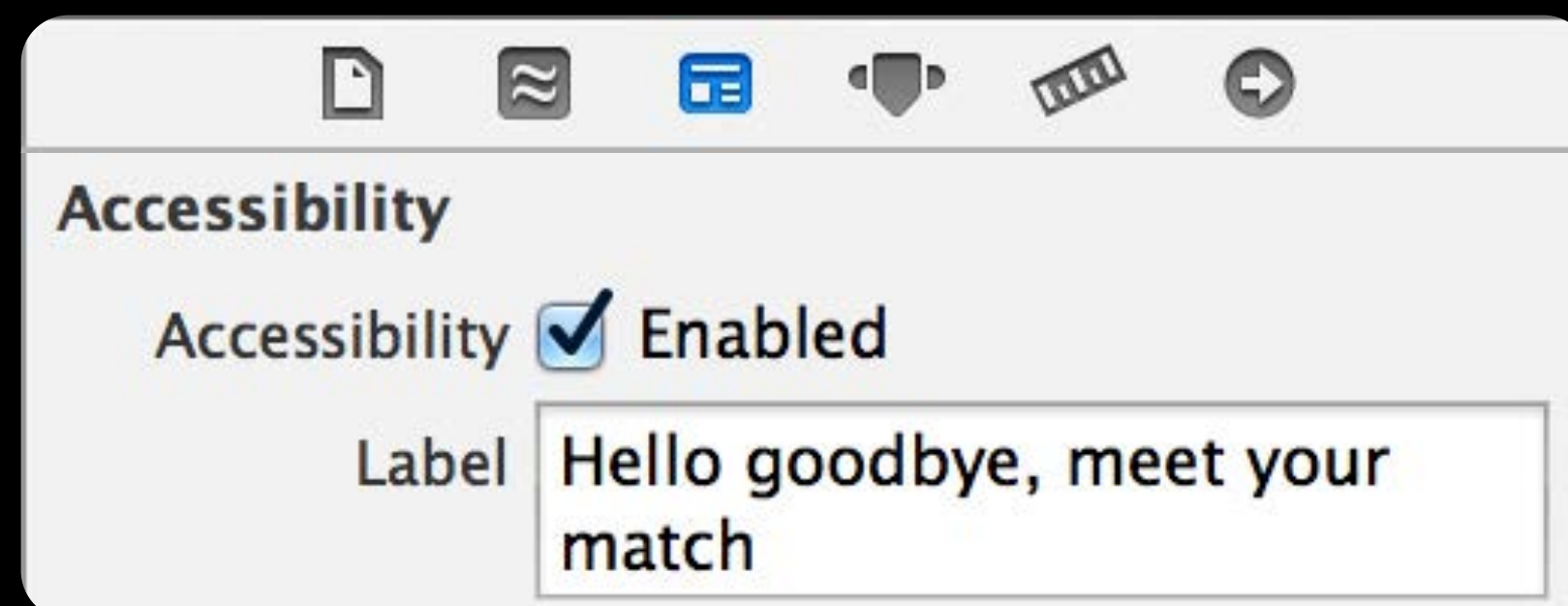
```
@property(nonatomic, copy) NSString *accessibilityLabel;
```

Return a description of the view

Spoken by VoiceOver

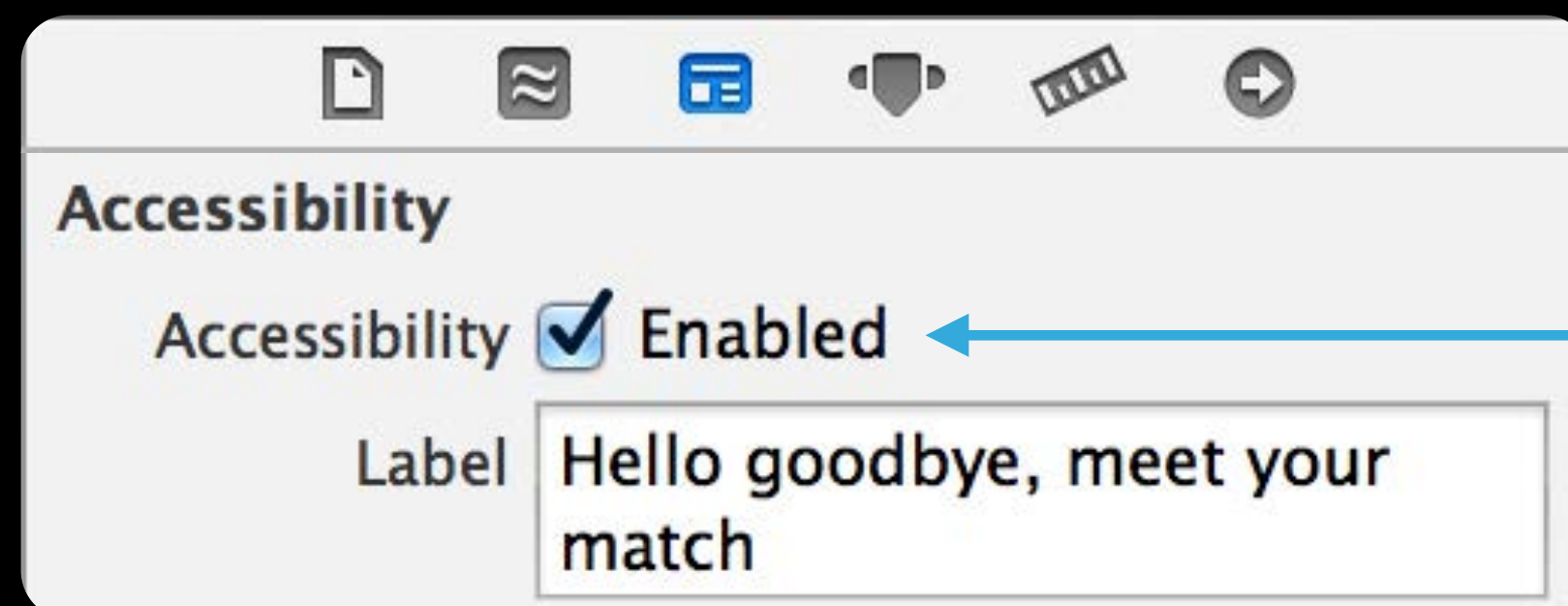
Basic Accessibility API

Interface Builder



Basic Accessibility API

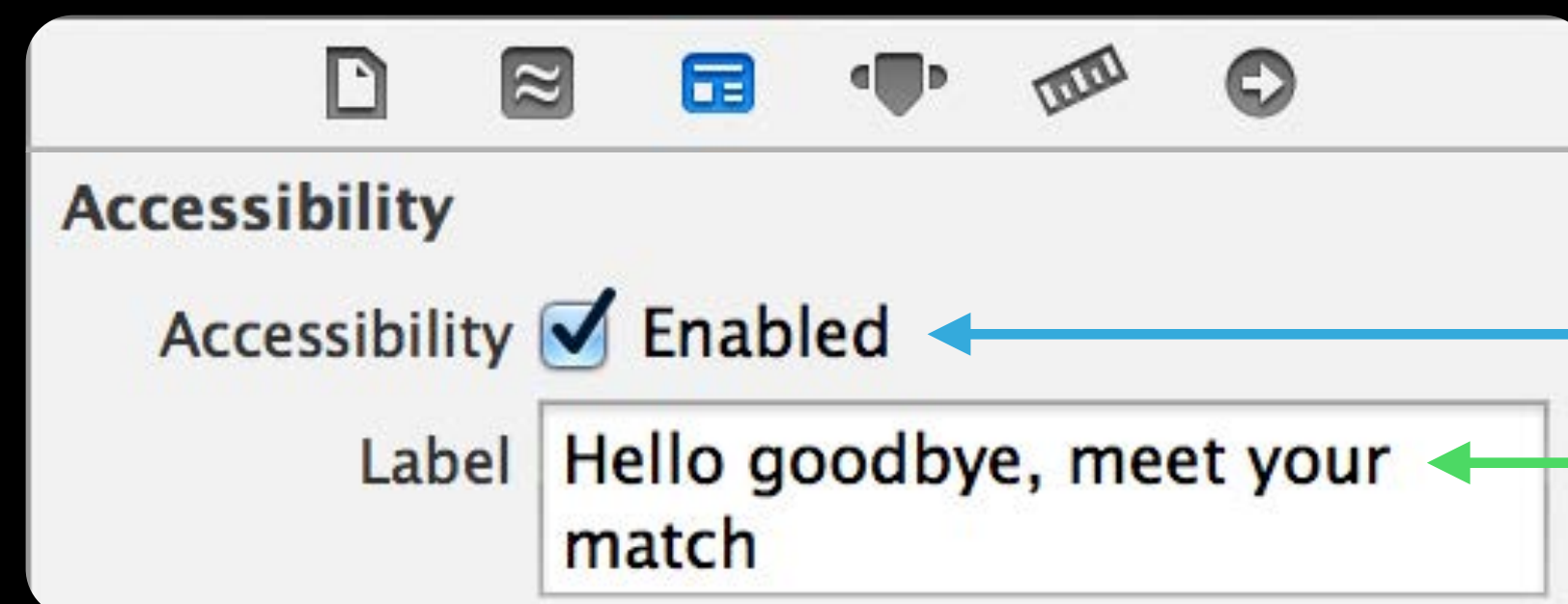
Interface Builder



isAccessibilityElement

Basic Accessibility API

Interface Builder



`isAccessibilityElement`

`accessibilityLabel`

Basic Accessibility API

Code

```
view.isAccessibilityElement = YES;  
view.accessibilityLabel = @"Profile photo";
```

Demo

Basic accessibility API

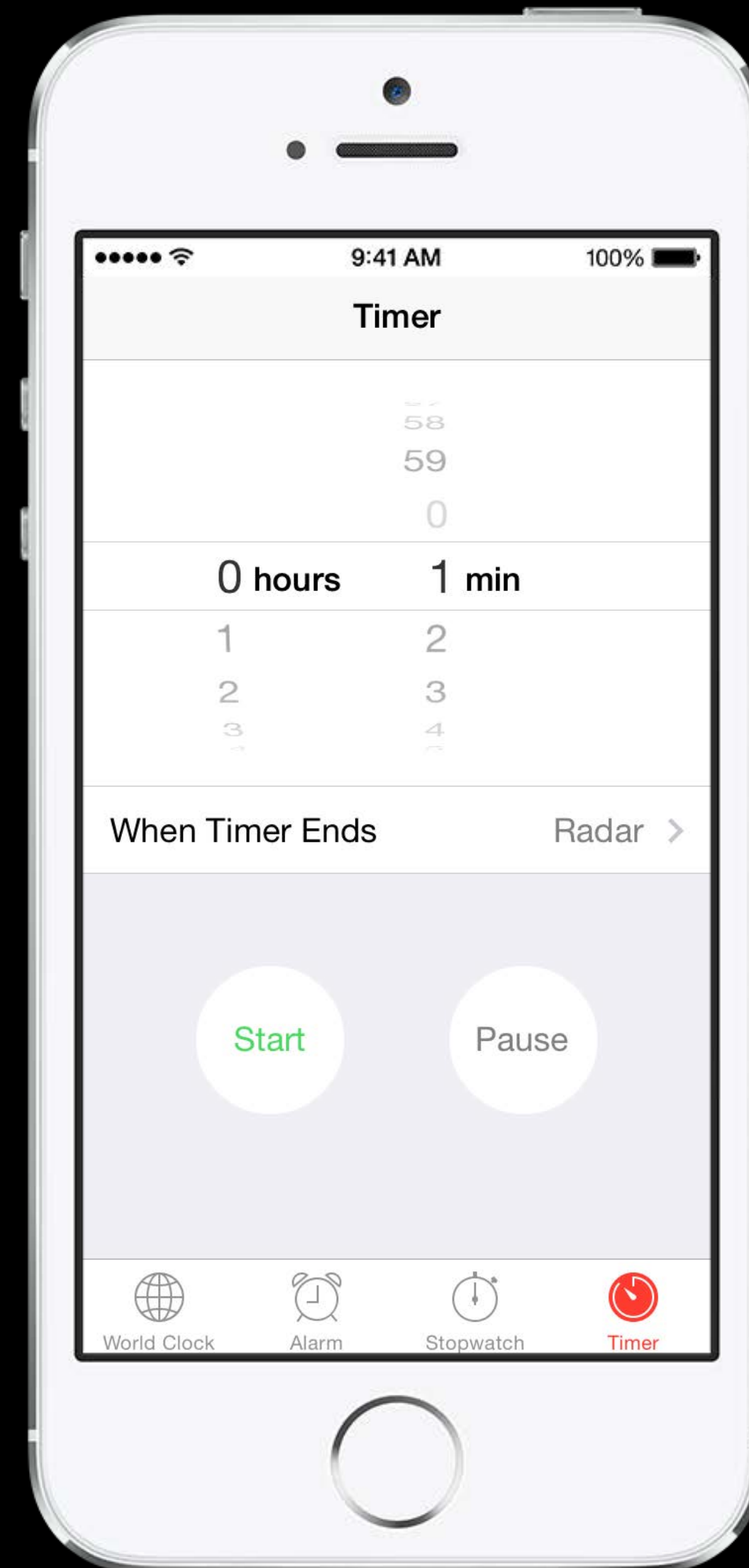
Accessibility API for Custom UI

Accessibility Traits

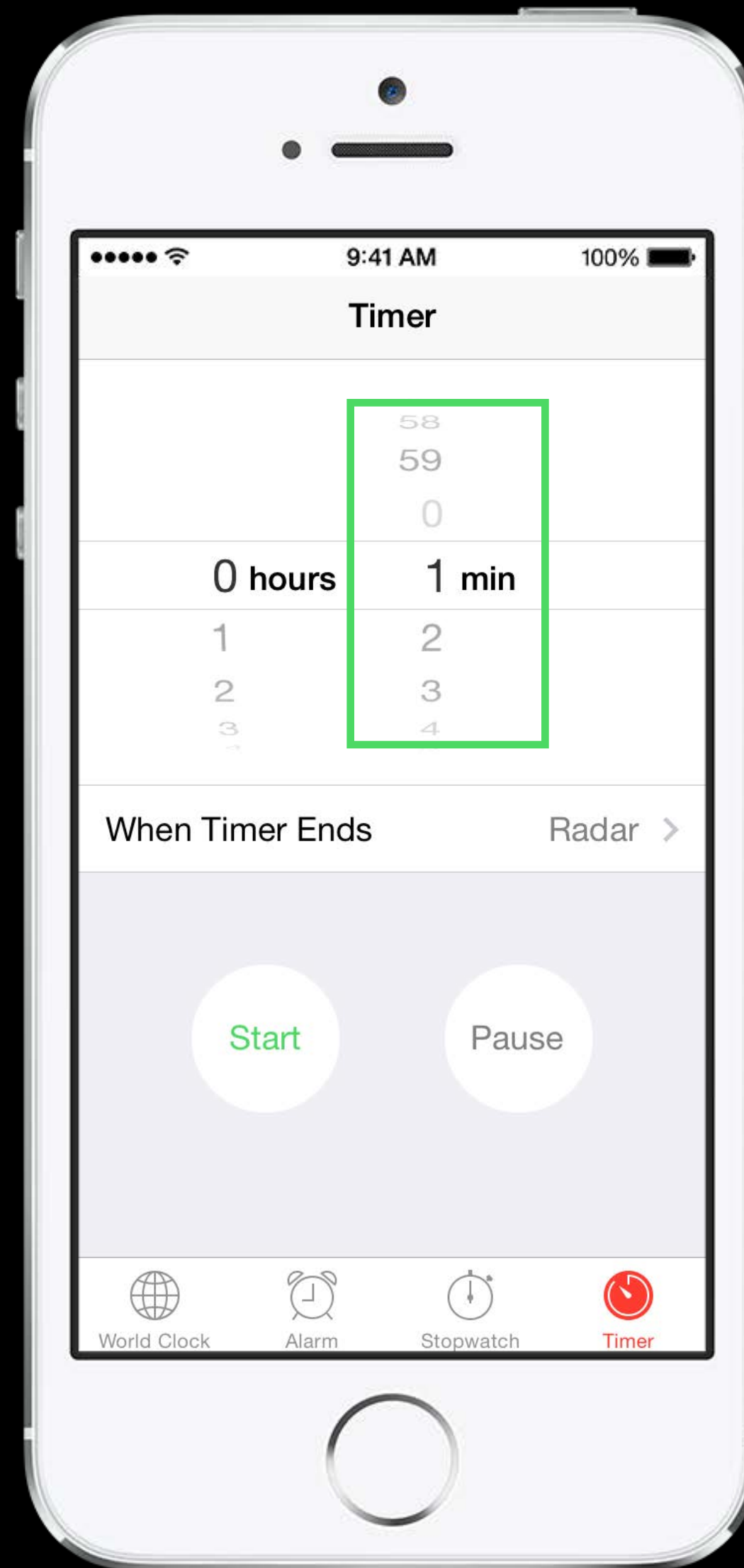
```
@property(nonatomic) UIAccessibilityTraits accessibilityTraits;
```

Describe the function of a view

Accessibility Traits

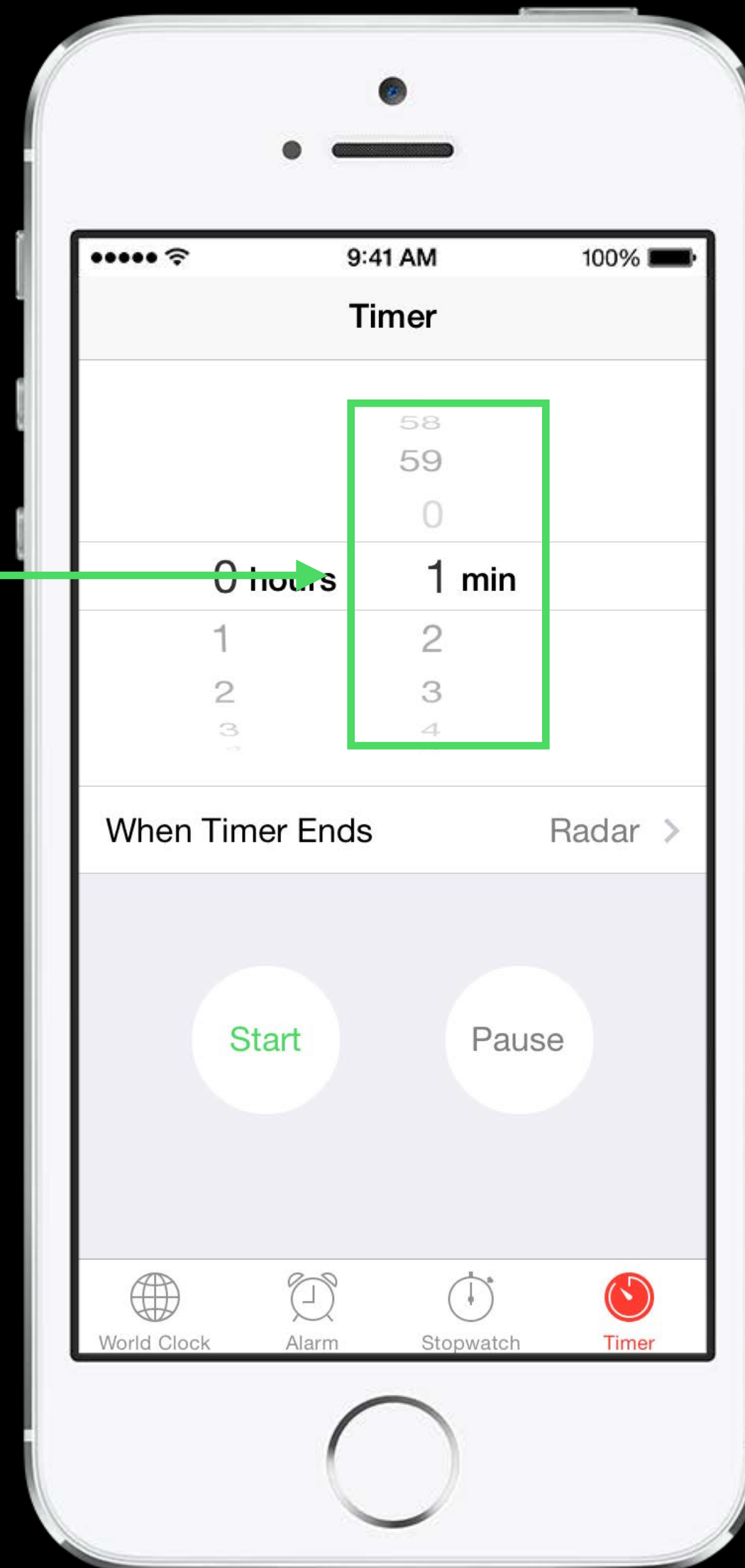


Accessibility Traits



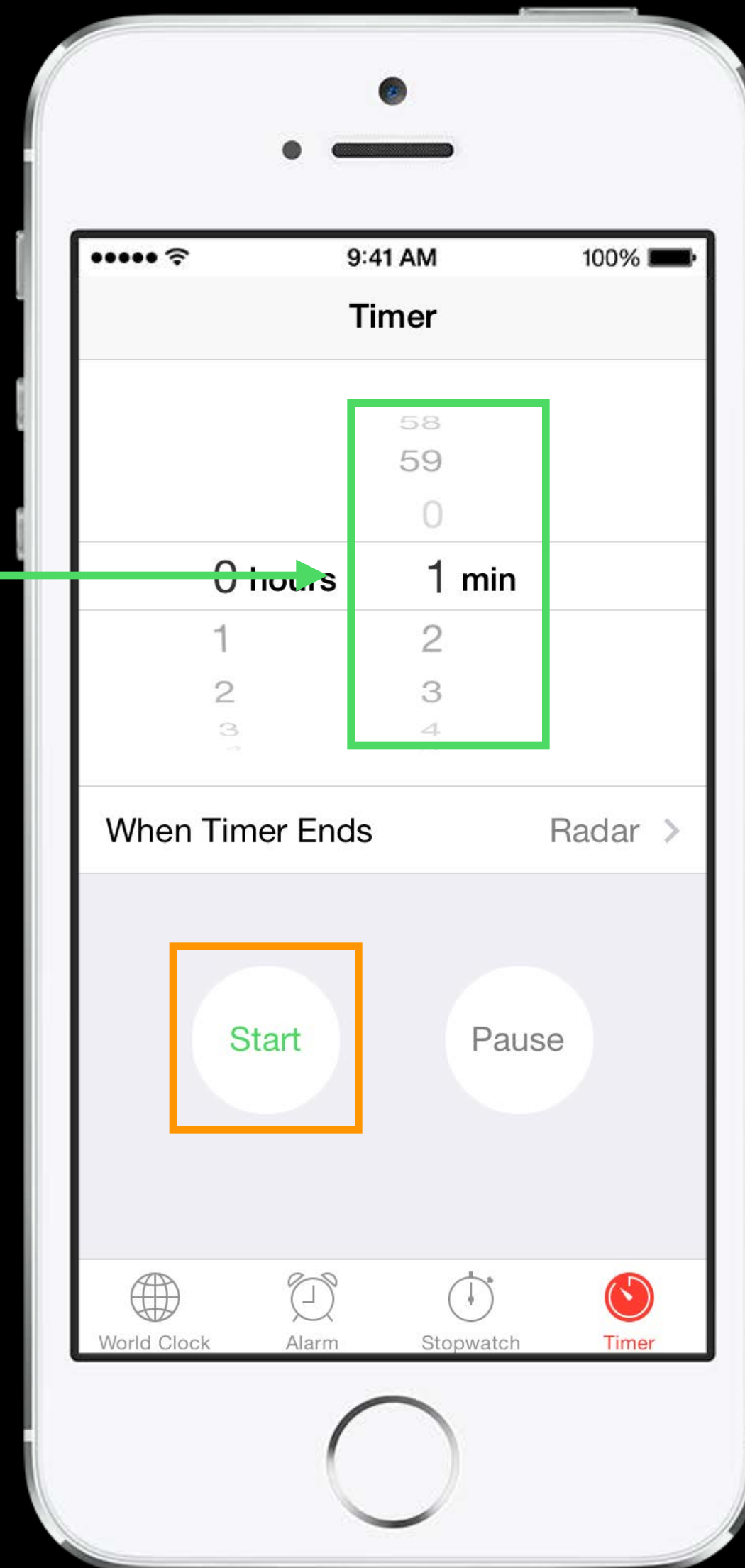
Accessibility Traits

`UIAccessibilityTraitAdjustable`



Accessibility Traits

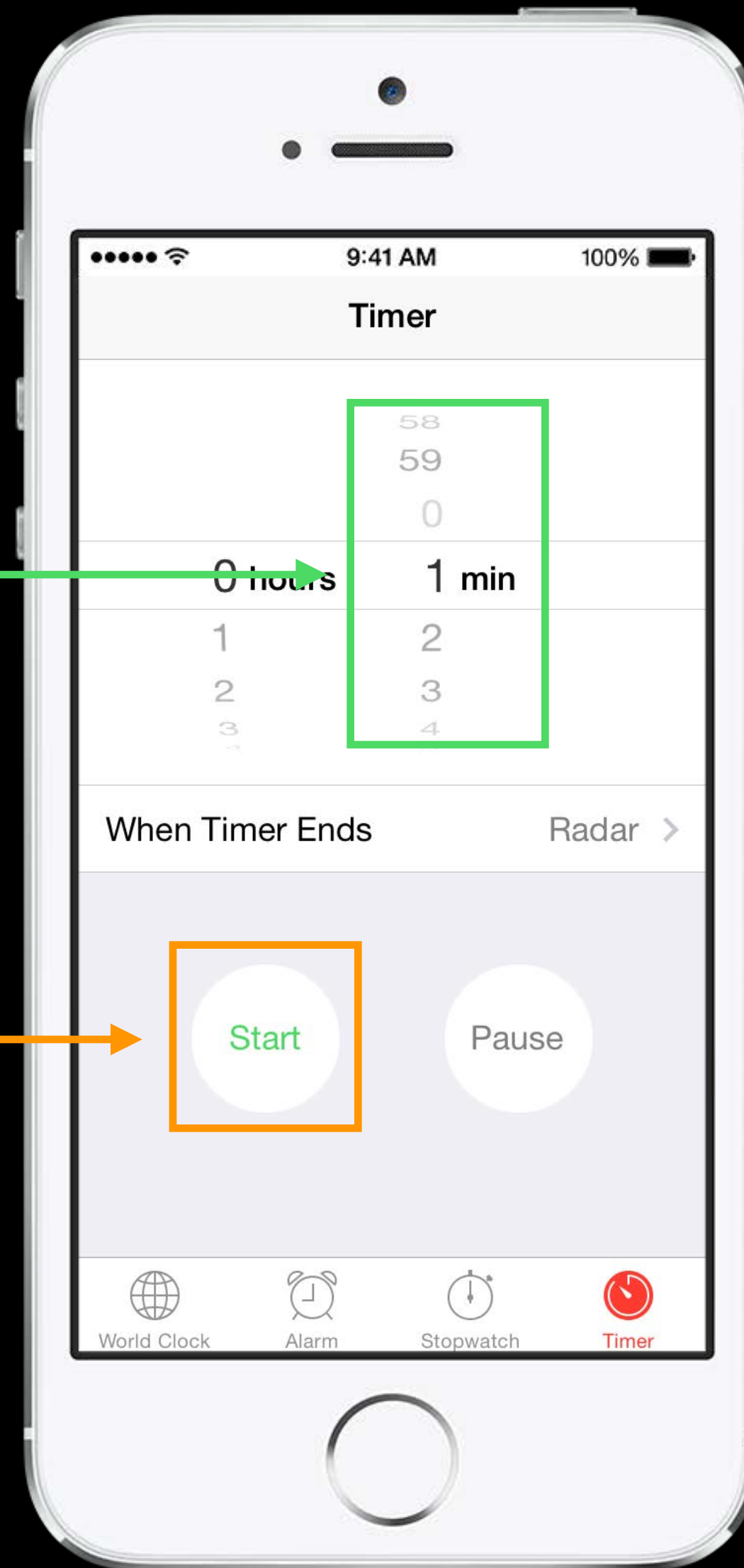
`UIAccessibilityTraitAdjustable`



Accessibility Traits

UIAccessibilityTraitAdjustable

UIAccessibilityTraitButton



Accessibility Traits

Interface Builder

- Traits
- Button
 - Image
 - Static Text
 - Search Field
 - Plays Sound
 - Keyboard Key
 - Summary Element
 - Updates Frequently
 - User Interaction Enabled
 - Link
 - Selected

Accessibility Traits

Code

```
view.accessibilityTraits = (view.accessibilityTraits |  
UIAccessibilityTraitButton);
```

Accessibility Value

Accessibility Value

```
@property(n nonatomic, copy) NSString *accessibilityValue;
```


Accessibility Value

```
@property(nonatomic, copy) NSString *accessibilityValue;
```

Use with UIAccessibilityTraitAdjustable

Accessibility Value

```
@property(nonatomic, copy) NSString *accessibilityValue;
```

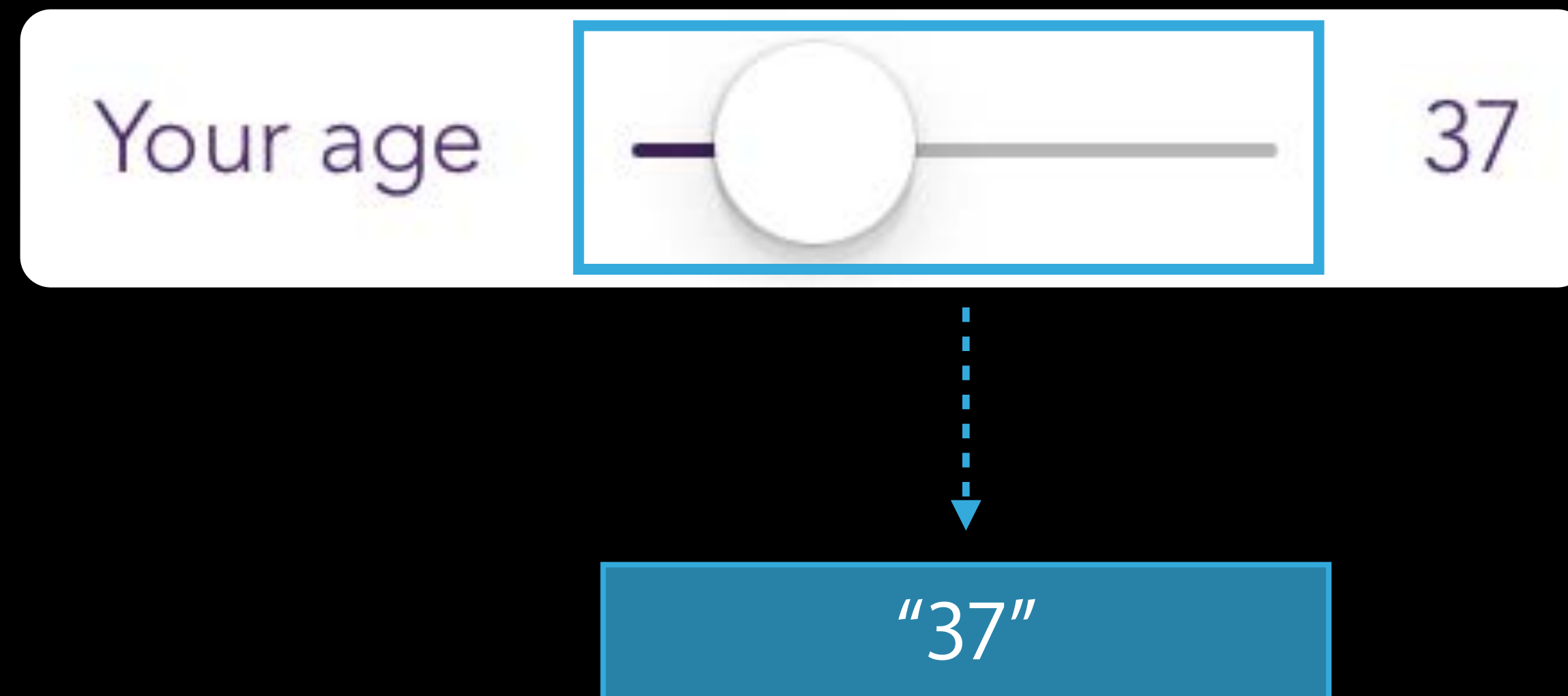
Use with UIAccessibilityTraitAdjustable



Accessibility Value

```
@property(nonatomic, copy) NSString *accessibilityValue;
```

Use with UIAccessibilityTraitAdjustable



Accessibility Actions

Accessibility Actions

- `(void)accessibilityIncrement;`

Accessibility Actions

- `(void)accessibilityIncrement;`
- `(void)accessibilityDecrement;`

Accessibility Actions

- (void)accessibilityIncrement;
- (void)accessibilityDecrement;

Use with UIAccessibilityTraitAdjustable

Accessibility Actions

- `(void)accessibilityIncrement;`
- `(void)accessibilityDecrement;`

Use with `UIAccessibilityTraitAdjustable`

Increase or decrease an element's value

Accessibility Actions

- `(void)accessibilityIncrement;`
- `(void)accessibilityDecrement;`

Use with `UIAccessibilityTraitAdjustable`

Increase or decrease an element's value

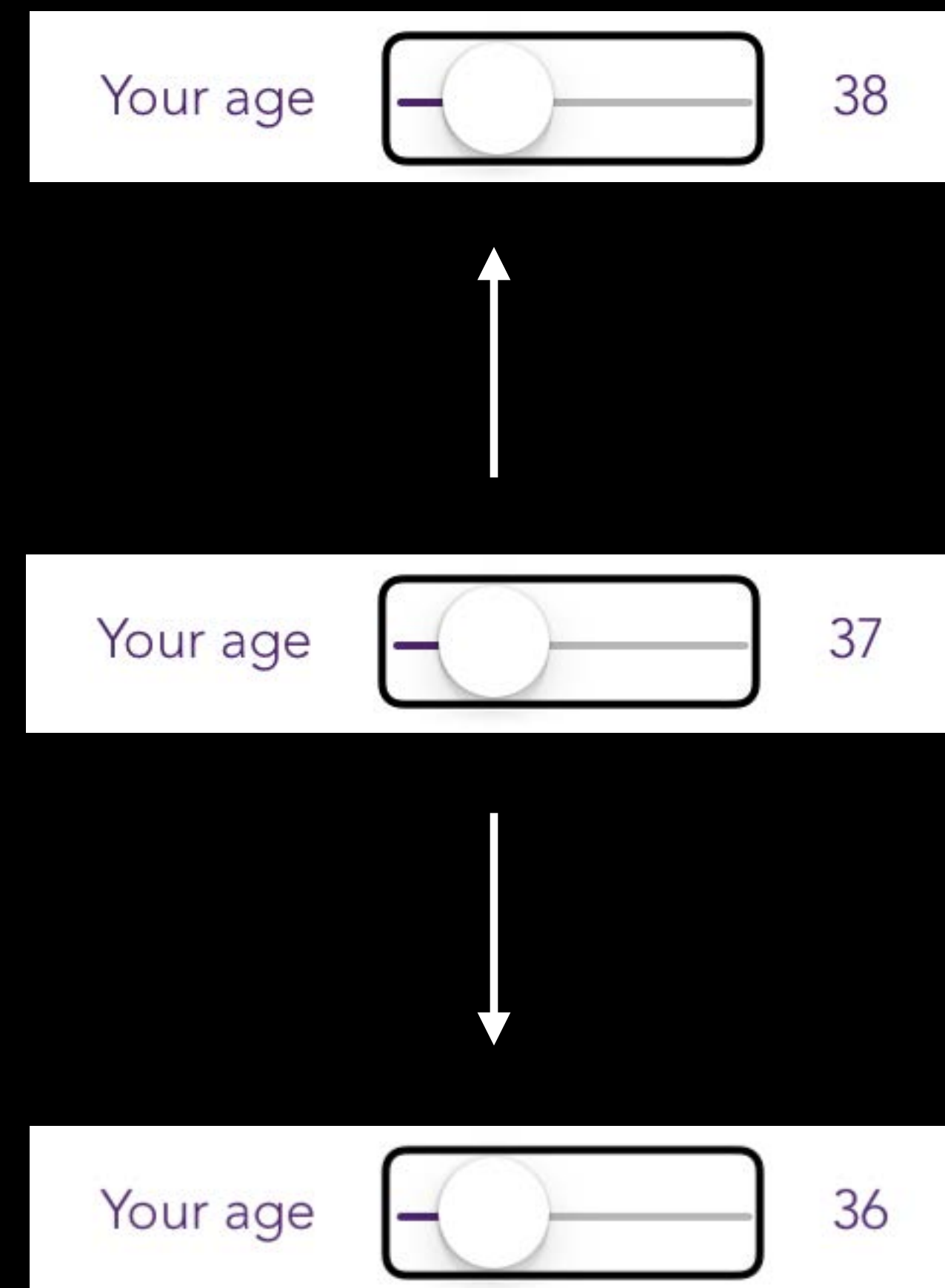


Accessibility Actions

- `(void)accessibilityIncrement;`
- `(void)accessibilityDecrement;`

Use with `UIAccessibilityTraitAdjustable`

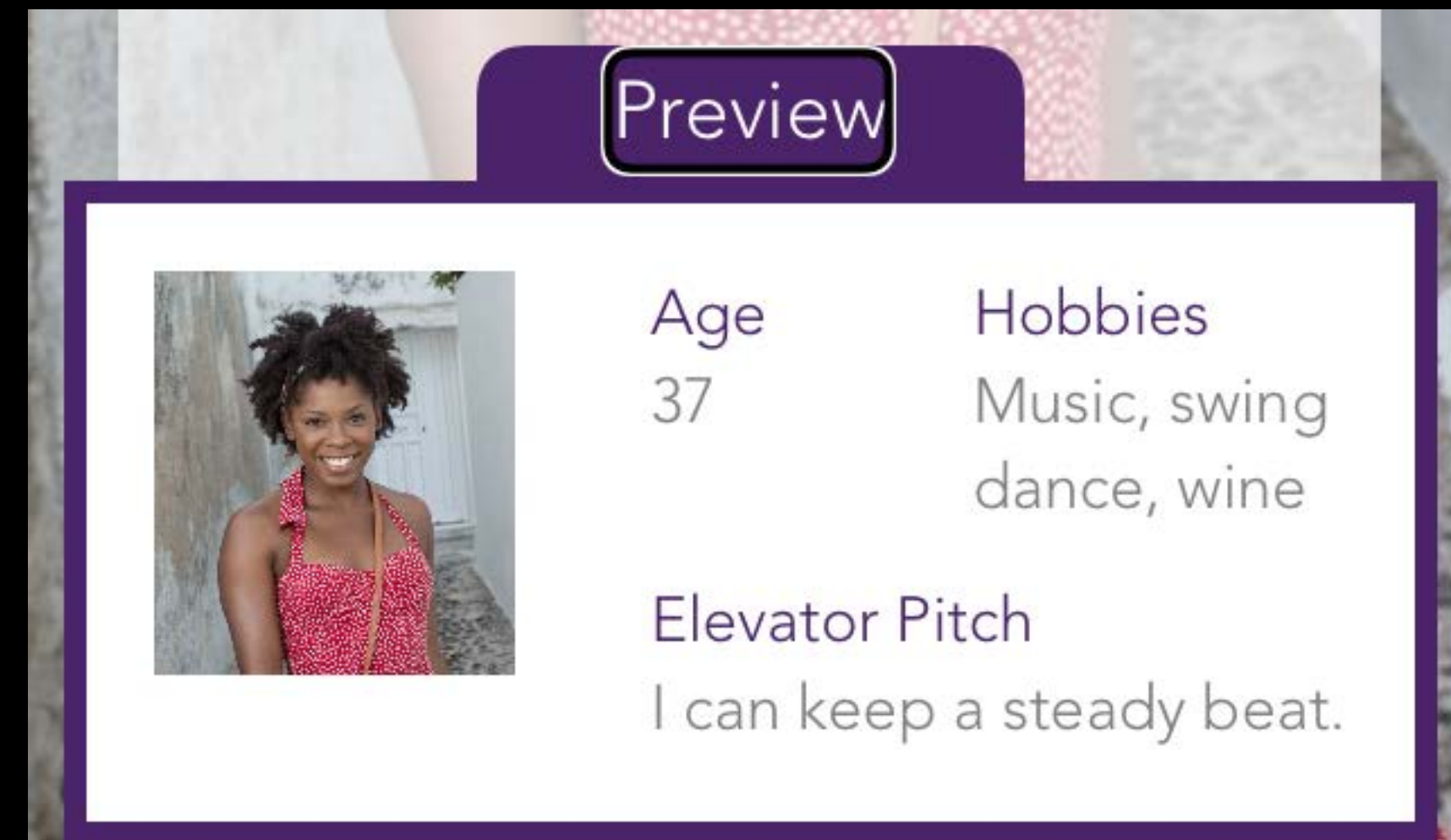
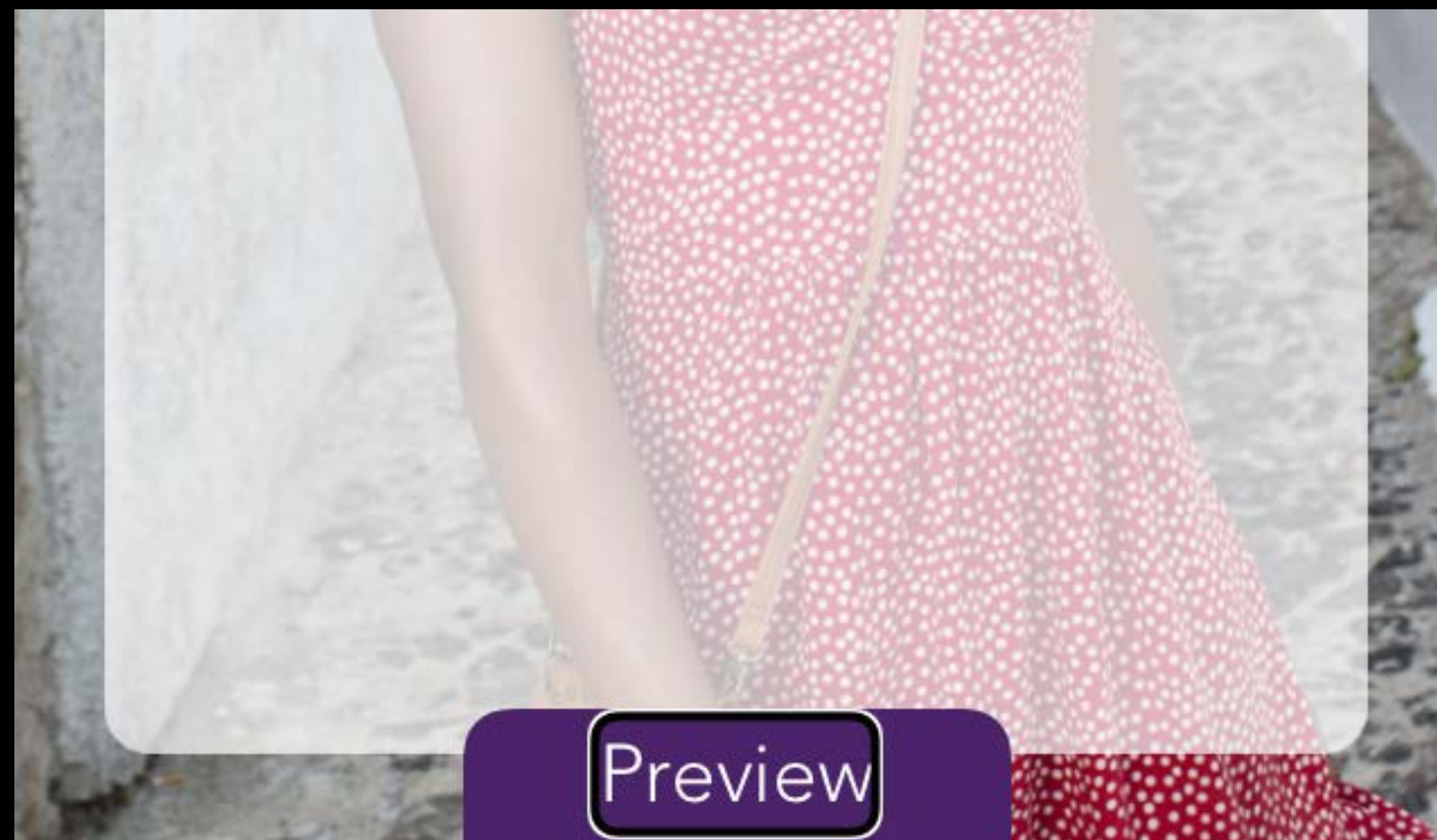
Increase or decrease an element's value



Accessibility Actions

– (BOOL)accessibilityActivate;

Provide a default action for views requiring a specific gesture



Accessibility Notifications

Accessibility Notifications

Notify assistive technology of a change

Accessibility Notifications

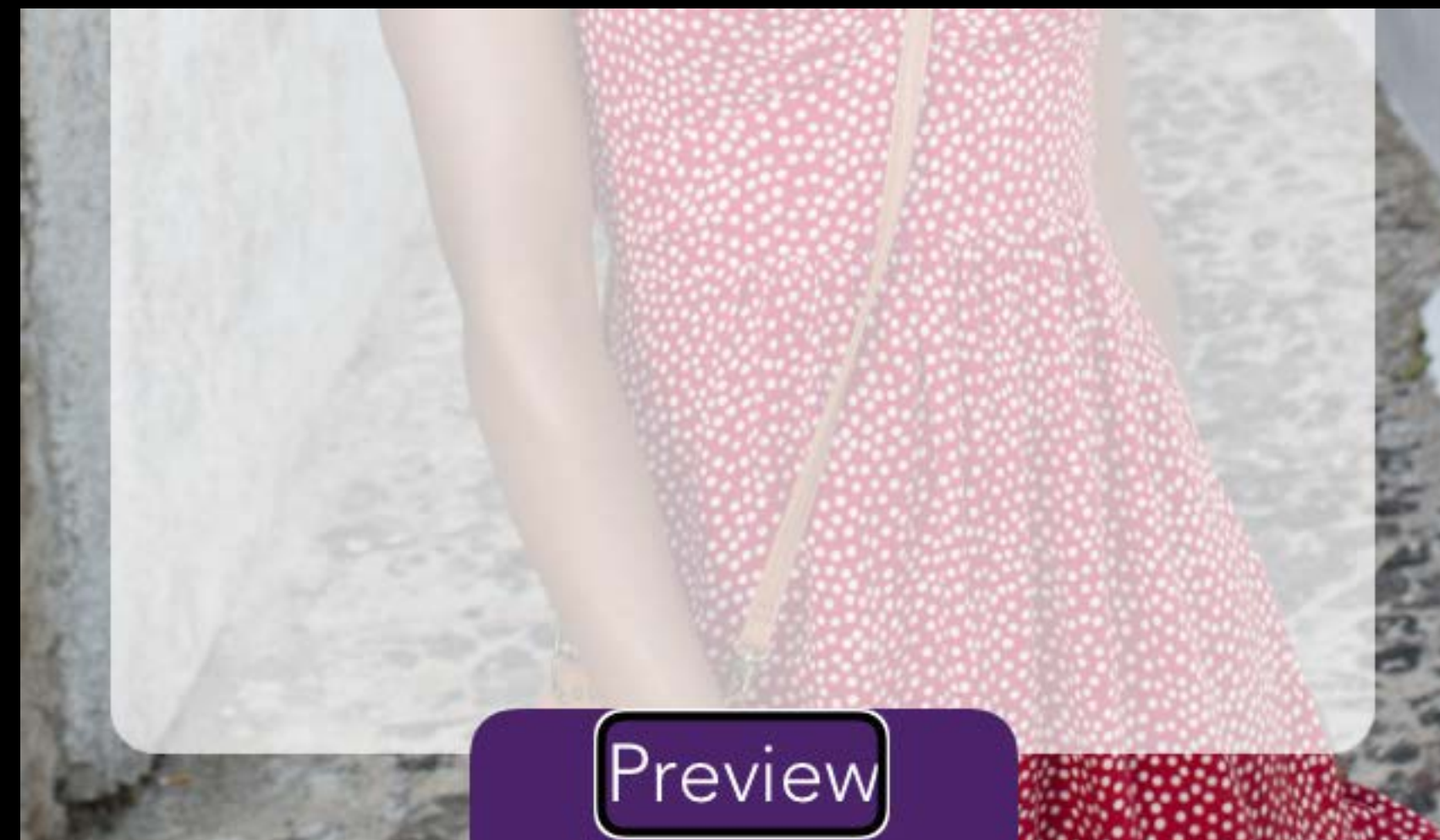
Notify assistive technology of a change

`UIAccessibilityLayoutChangedNotification`

Accessibility Notifications

Notify assistive technology of a change

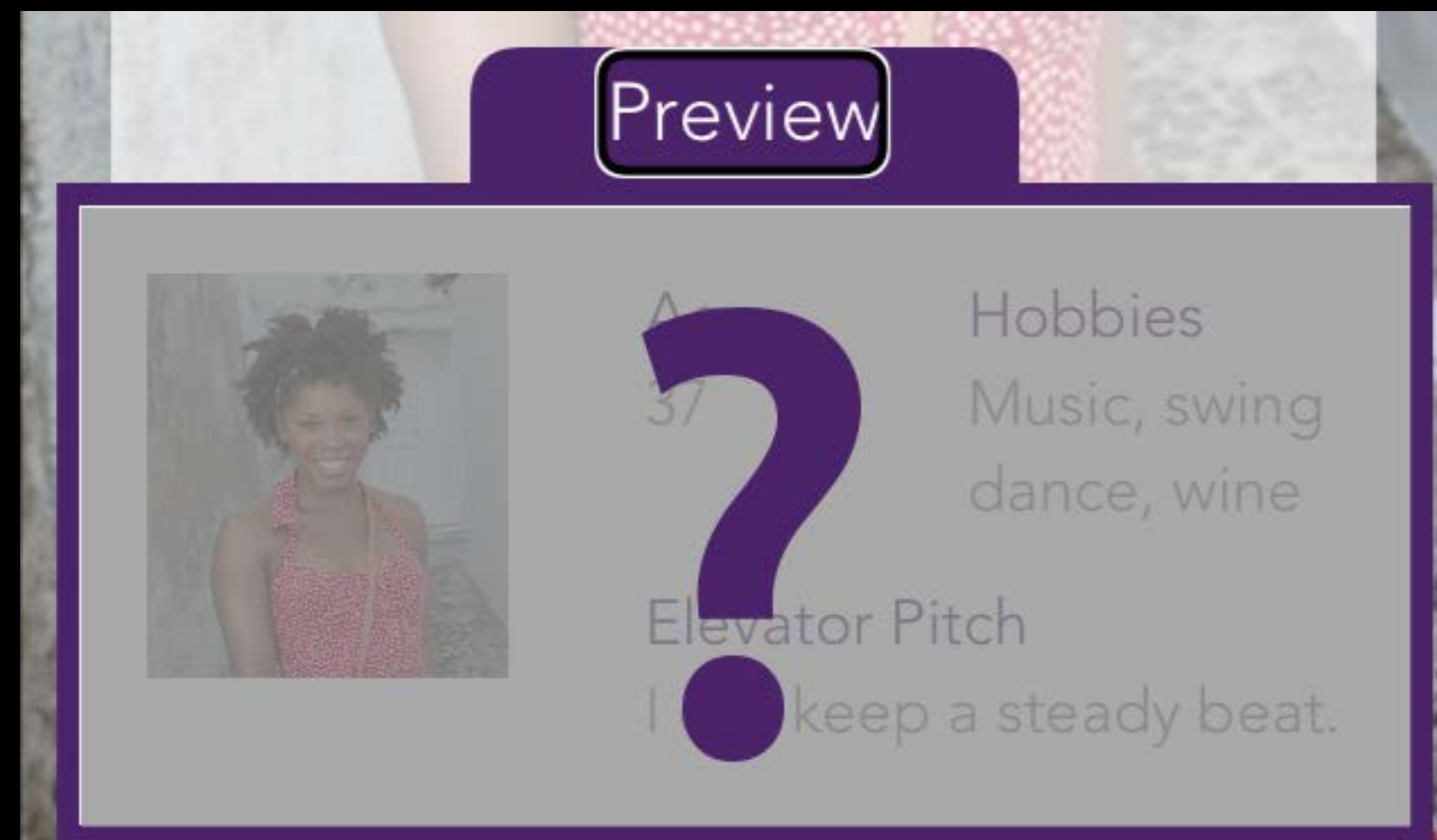
`UIAccessibilityLayoutChangedNotification`



Accessibility Notifications

Notify assistive technology of a change

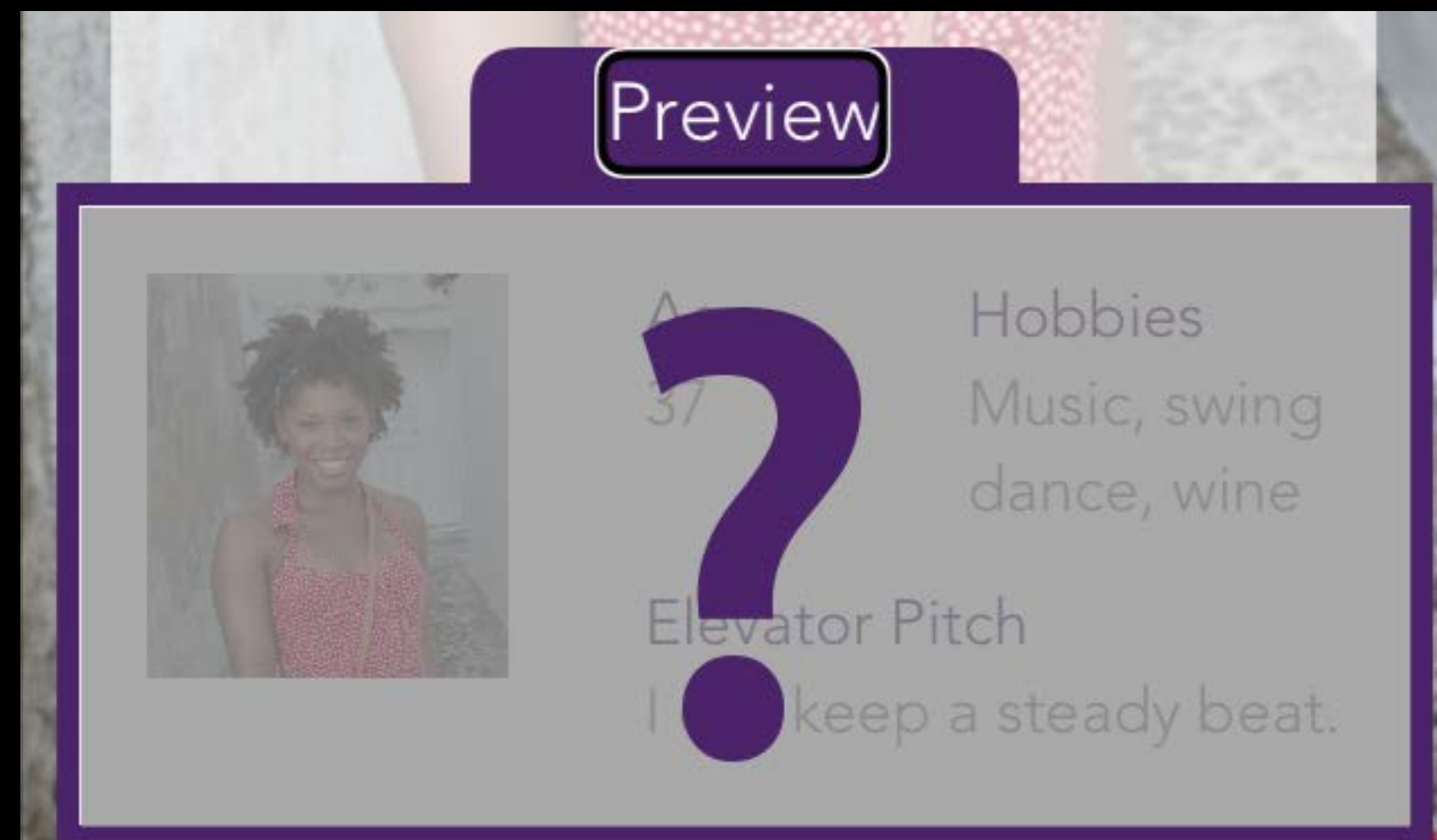
`UIAccessibilityLayoutChangedNotification`



Accessibility Notifications

Notify assistive technology of a change

`UIAccessibilityLayoutChangedNotification`

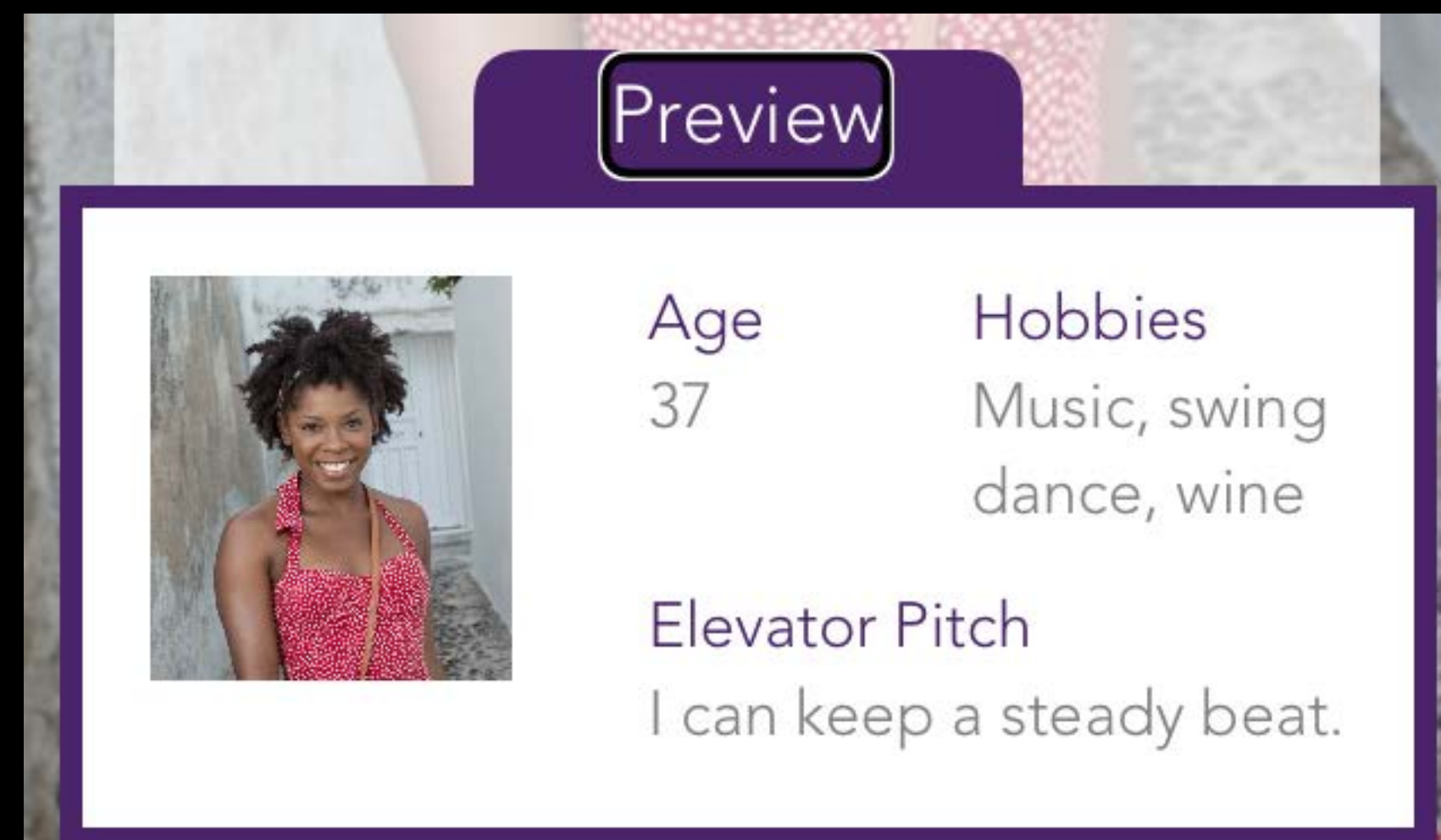


```
UIAccessibilityPostNotification(UIAccessibilityLayoutChangedNotification,  
nil);
```

Accessibility Notifications

Notify assistive technology of a change

`UIAccessibilityLayoutChangedNotification`



```
UIAccessibilityPostNotification(UIAccessibilityLayoutChangedNotification,  
nil);
```

Demo

Accessibility API for custom UI

New Accessibility API

UIAccessibilityContainer

UIAccessibilityContainer

Return a list of accessibility elements from a view

UIAccessibilityContainer

Return a list of accessibility elements from a view

Necessary for elements that don't correspond to views

UIAccessibilityContainer

Return a list of accessibility elements from a view

Necessary for elements that don't correspond to views



UIAccessibilityContainer

Return a list of accessibility elements from a view

Necessary for elements that don't correspond to views



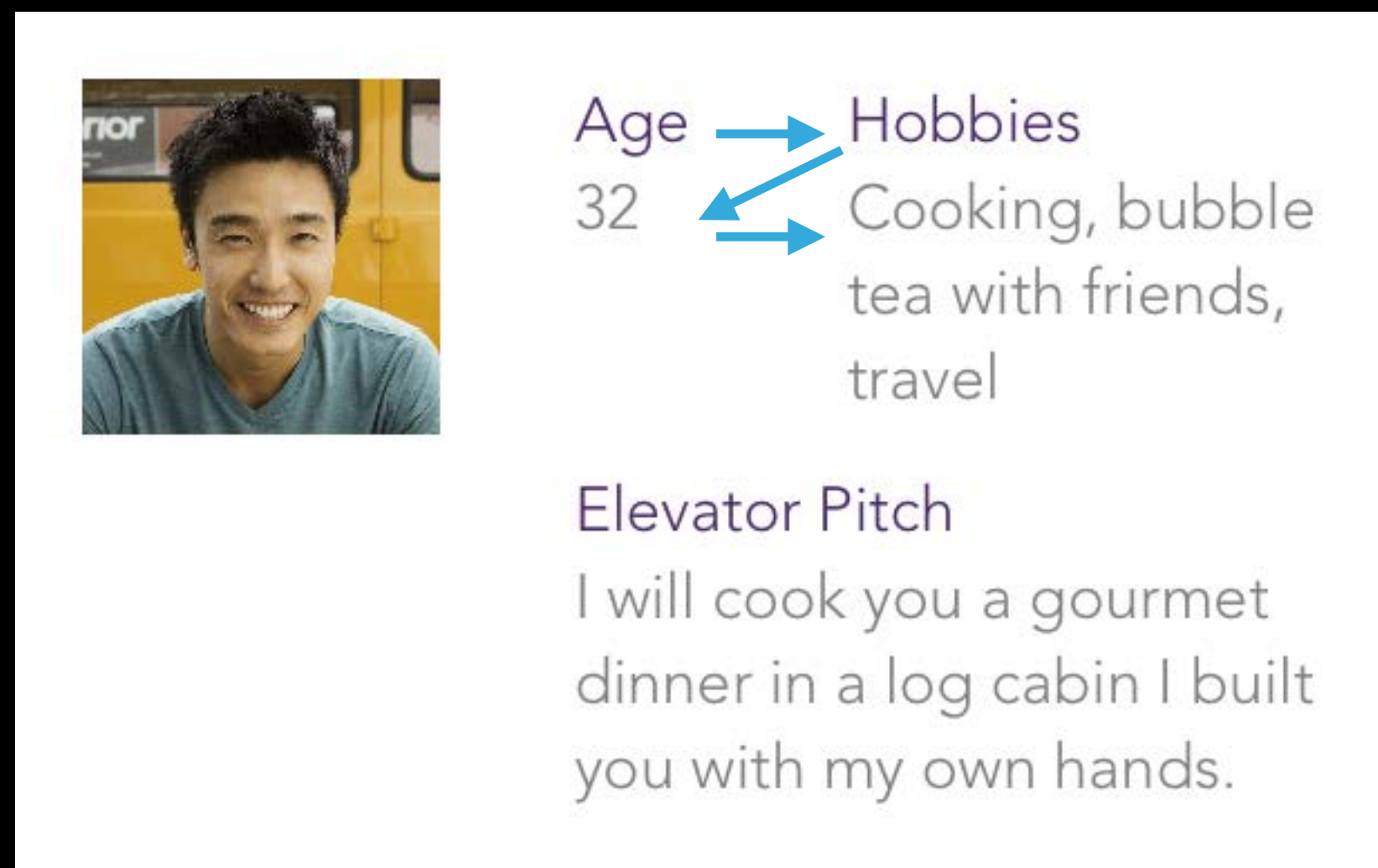
See last year's talk for example

UIAccessibilityContainer

Can be used to sort existing elements

UIAccessibilityContainer

Can be used to sort existing elements



The image shows a profile card for a person. On the left is a square photo of a smiling man with dark hair. To the right of the photo, the word "Age" is followed by the number "32". Further right, the word "Hobbies" is followed by the text "Cooking, bubble tea with friends, travel". Below this, the text "Elevator Pitch" is followed by the sentence "I will cook you a gourmet dinner in a log cabin I built you with my own hands." Blue arrows indicate a relationship between "Age" and "Hobbies", and between "Age" and "Cooking, bubble tea with friends, travel".

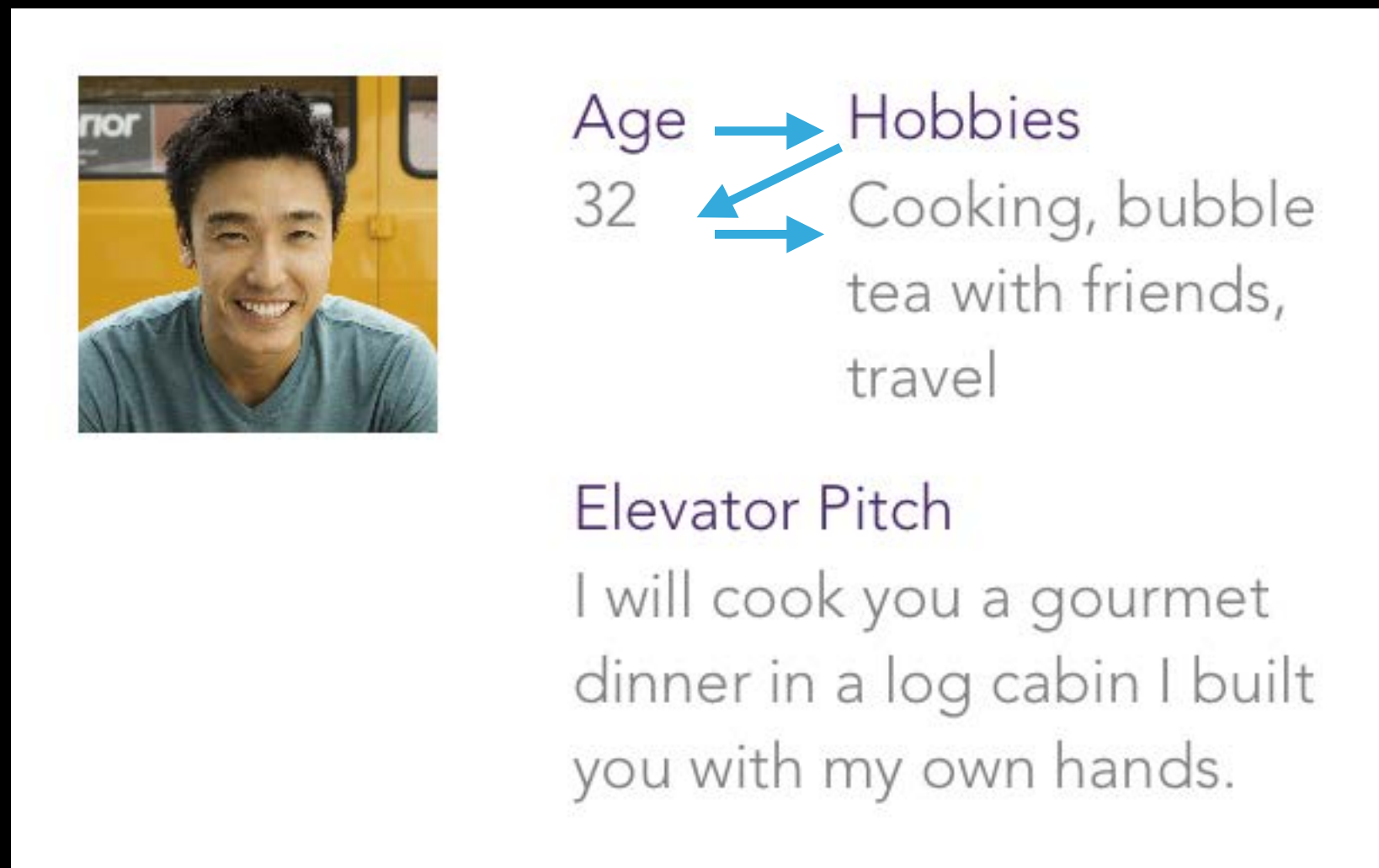
Age 32

Hobbies
Cooking, bubble tea with friends, travel

Elevator Pitch
I will cook you a gourmet dinner in a log cabin I built you with my own hands.

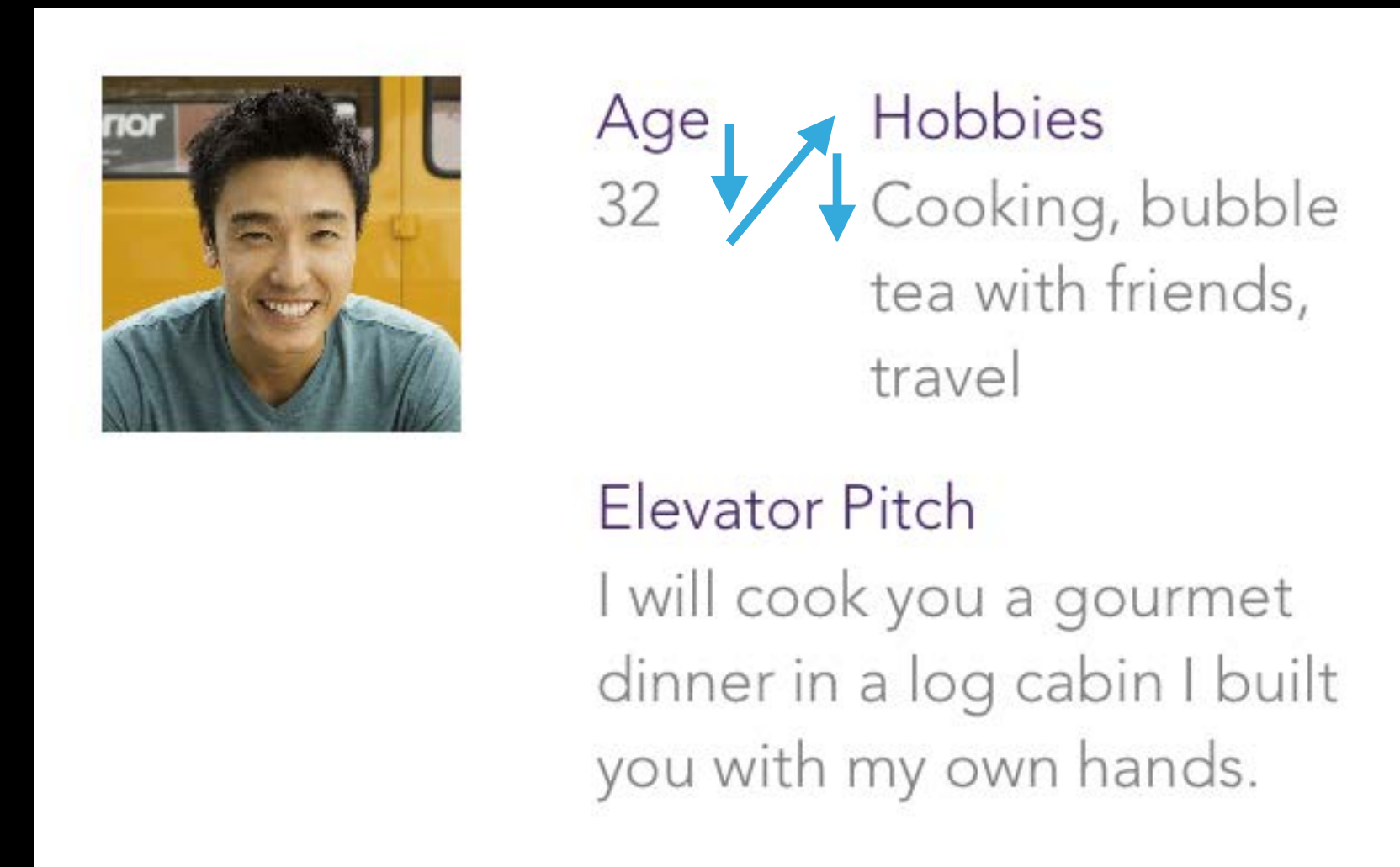
UIAccessibilityContainer

Can be used to sort existing elements



Age 32 Hobbies: Cooking, bubble tea with friends, travel

Elevator Pitch
I will cook you a gourmet dinner in a log cabin I built you with my own hands.



Age 32 Hobbies: Cooking, bubble tea with friends, travel

Elevator Pitch
I will cook you a gourmet dinner in a log cabin I built you with my own hands.

UIAccessibilityContainer



```
@interface NSObject (UIAccessibilityContainer)
```

- (NSInteger)accessibilityElementCount;
- (id)accessibilityElementAtIndex:(NSInteger)index;
- (NSInteger)indexOfAccessibilityElement:(id)element;

```
@end
```

UIAccessibilityContainer



```
@interface NSObject (UIAccessibilityContainer)
```

- (NSInteger)accessibilityElementCount;
- (id)accessibilityElementAtIndex:(NSInteger)index;
- (NSInteger)indexOfAccessibilityElement:(id)element;

```
@property (nonatomic, strong) NSArray *accessibilityElements;
```

```
@end
```

UIAccessibilityCustomAction



UIAccessibilityCustomAction



More than one action for an element

UIAccessibilityCustomAction

NEW

More than one action for an element
App switcher: launch or close app



UIAccessibilityCustomAction

NEW

More than one action for an element

App switcher: launch or close app

Say hello or goodbye to a match



UIAccessibilityCustomAction

A white rounded square containing the word "NEW" in a stylized, multi-colored font.

```
@interface UIAccessibilityCustomAction : NSObject

- (instancetype)initWithName:(NSString *)name target:(id)target selector:
(SEL)selector;

@property (nonatomic, copy) NSString *name;
@property (nonatomic, weak) id target;
@property (nonatomic, assign) SEL selector;

@end
```

UIAccessibilityCustomAction



```
@property (nonatomic, retain) NSArray *accessibilityCustomActions;
```

Demo

New accessibility API

Summary



Summary

iOS users are diverse



Summary

iOS users are diverse
Widen your user base



Summary

iOS users are diverse

Widen your user base

Low effort, high reward



More Information

Jake Behrens

App Frameworks Evangelist

behrens@apple.com

Documentation

Accessibility Programming Guide for iOS

<https://developer.apple.com/library/ios/documentation/UserExperience/Conceptual/iPhoneAccessibility>

Apple Developer Forums

<http://devforums.apple.com>

Related Sessions

-
- Accessibility on OS X Russian Hill Tuesday 2:00PM
 - Designing for the Sensitive Mind: The Digital Experience in the Autistic Spectrum Presidio Wednesday 12:45PM
 - Improving the Accessibility and Usability of Complex Web Applications Marina Friday 9:00AM
-

Labs

- Accessibility and Speech Lab

Frameworks Lab B Wednesday 10:15AM

 WWDC14