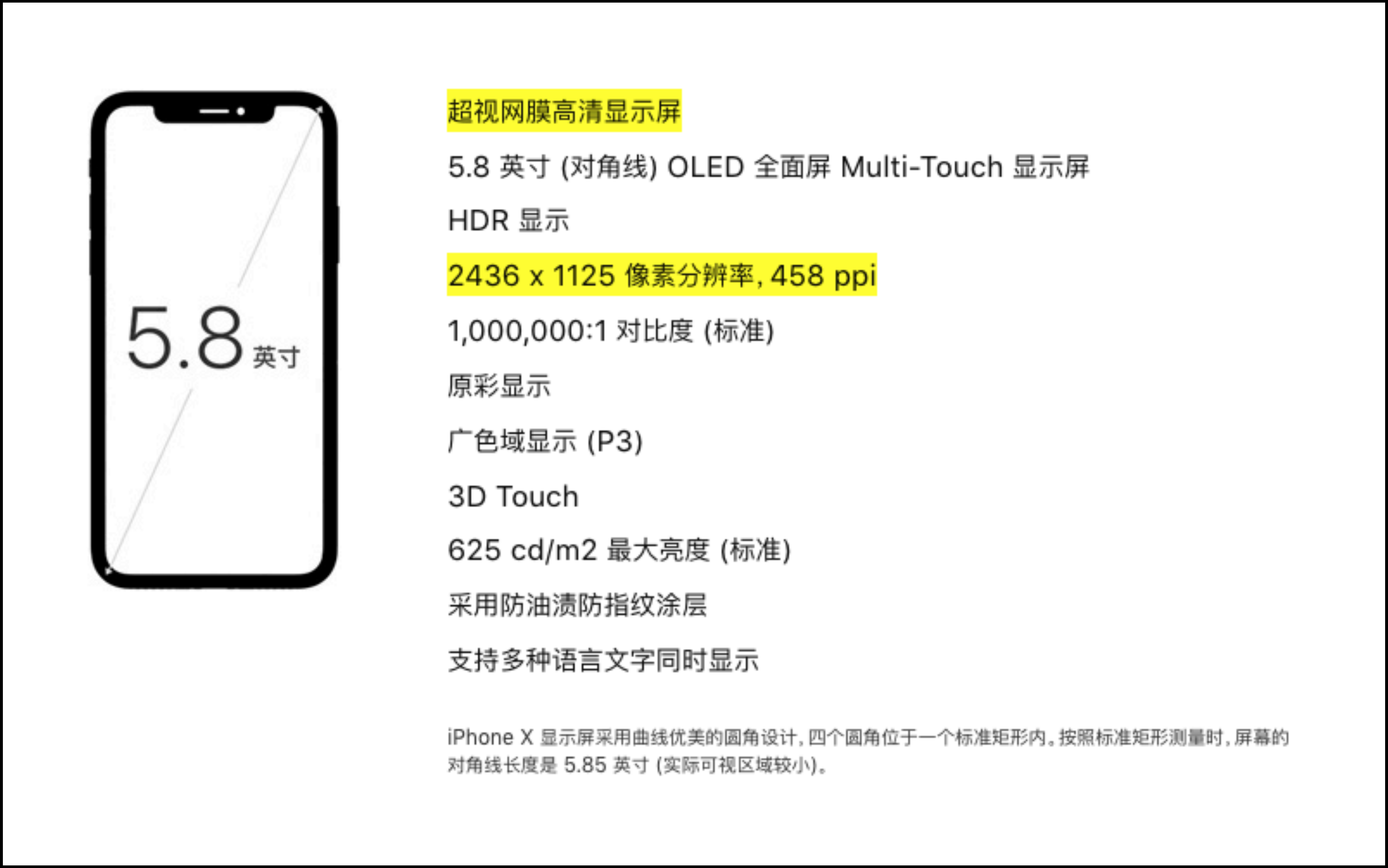
iPhone X 适配

2017-09 明林清 百家云

iPhone Screen
& Autolayout

- iPhone 屏幕
- UI 适配原则
- Autolayout 基础
- Masonry 使用

iPhone X



超视网膜高清显示屏

5.8 英寸 (对角线) OLED 全面屏 Multi-Touch 显示屏

HDR 显示

2436 x 1125 像素分辨率, 458 ppi

1,000,000:1 对比度 (标准)

原彩显示

广色域显示 (P3)

3D Touch

625 cd/m2 最大亮度 (标准)

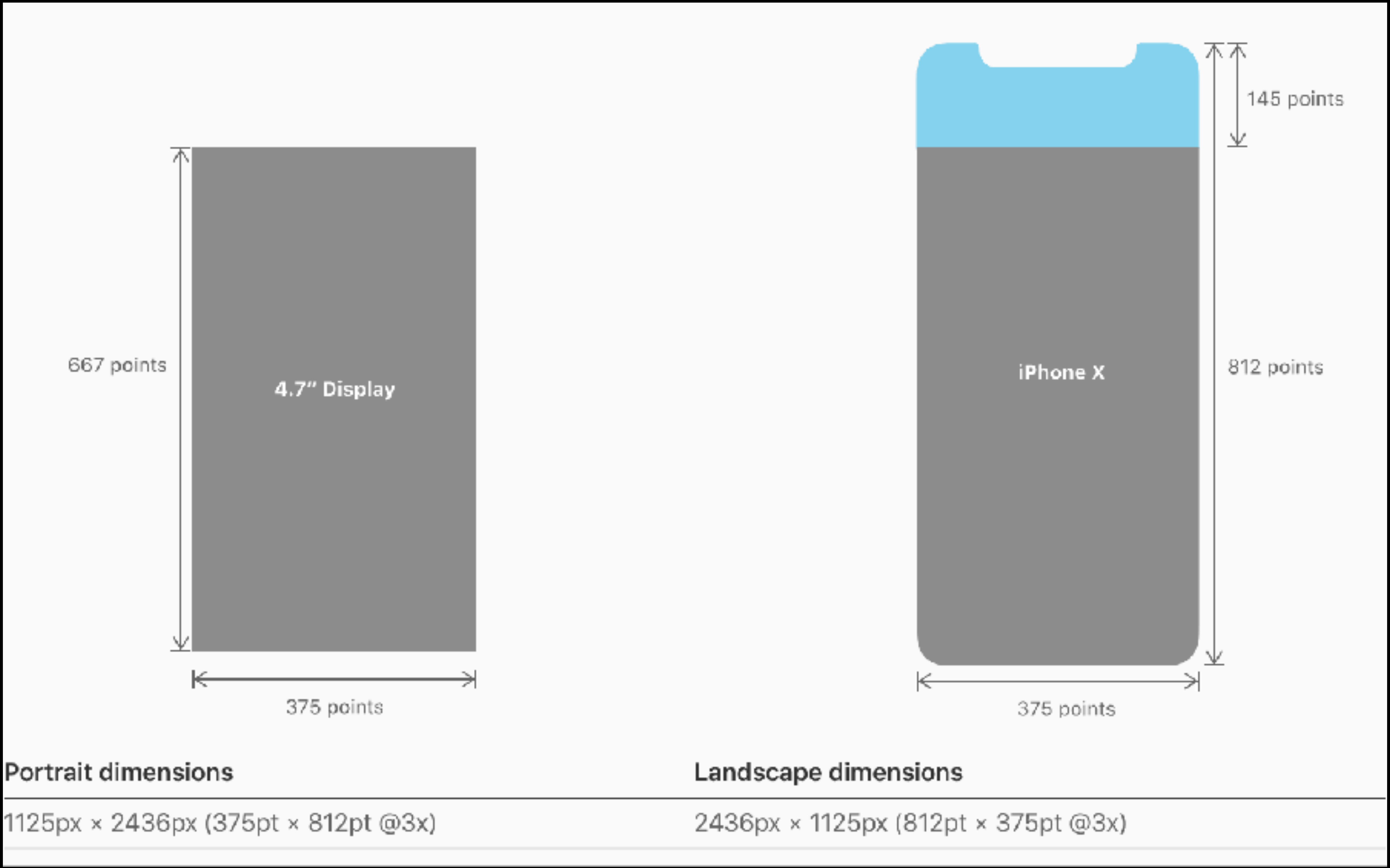
采用防油渍防指纹涂层

支持多种语言文字同时显示

iPhone X 显示屏采用曲线优美的圆角设计，四个圆角位于一个标准矩形内。按照标准矩形测量时，屏幕的对角线长度是 5.85 英寸 (实际可视区域较小)。

Resolution

```
  2436 x 1125 (Pixels)
÷   3x
=  812 x  375 (Points)
```



Portrait dimensions	Landscape dimensions
1125px × 2436px (375pt × 812pt @3x)	2436px × 1125px (812pt × 375pt @3x)

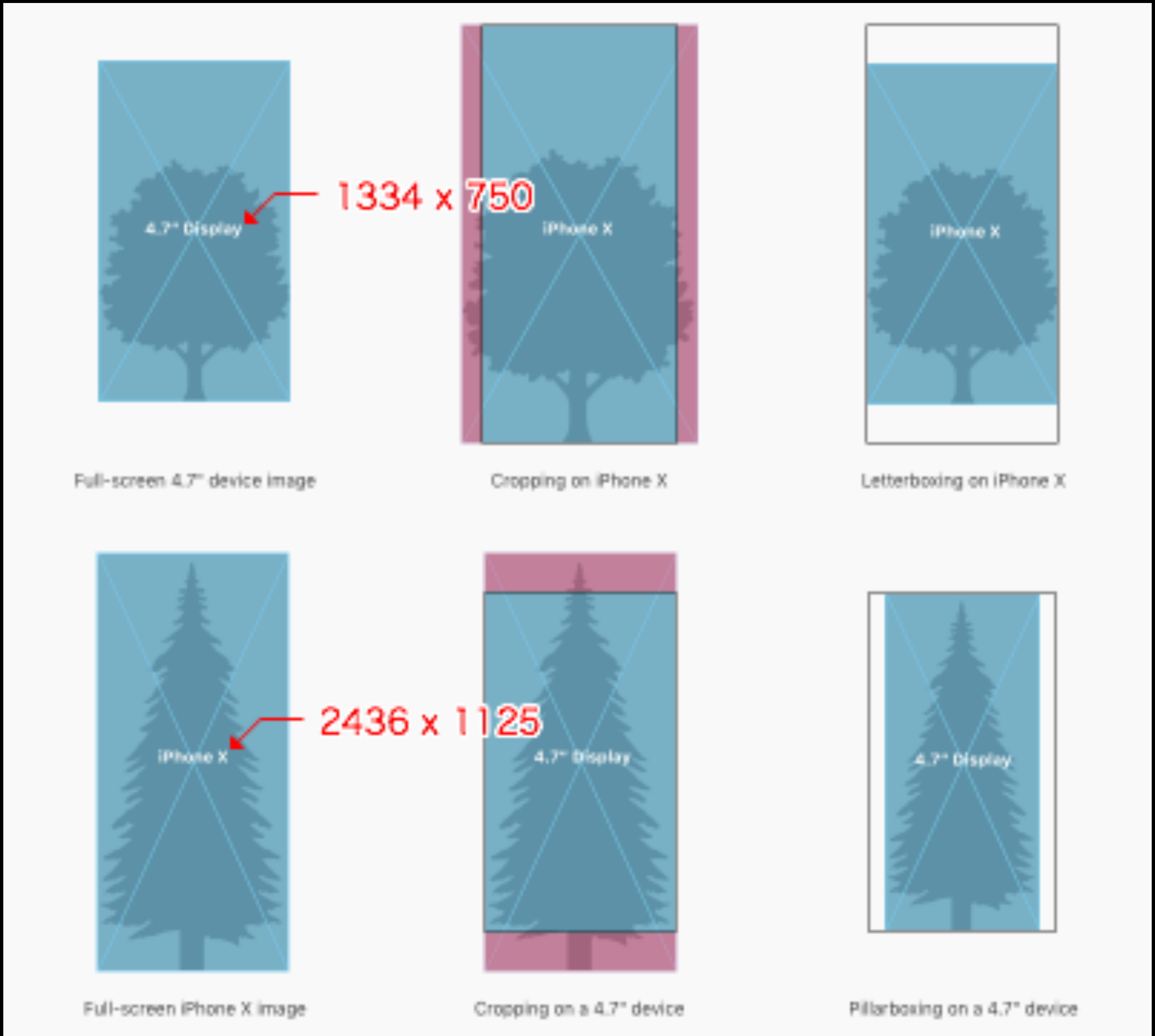
2 : 1

16 ÷ 9 = 1.77777778

iPhone 667 ÷ 375 = 1.77866667

iPhone X 812 ÷ 375 = 2.16533333

812 ÷ 375 = 1.99466667
– 32 // 齐刘海
– 32 // 对称



1334 x 750

2436 x 1125

Full-screen 4.7" device image

Cropping on iPhone X

Letterboxing on iPhone X

Full-screen iPhone X image

Cropping on a 4.7" device

Pillarboxing on a 4.7" device

PPI

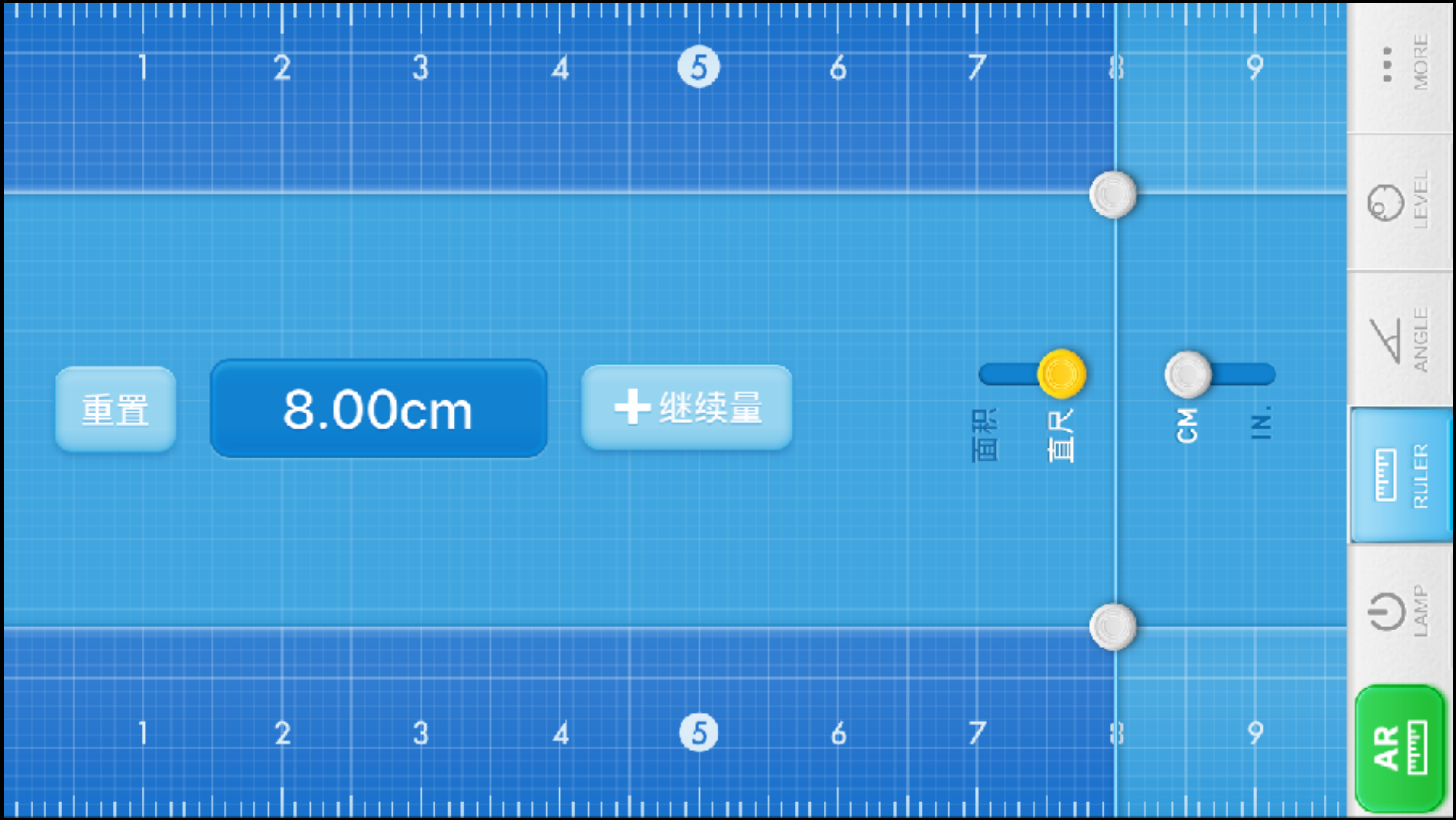
iPhone	2~3	4~8	6P~8P	X
PixelsPerInch	163	326	401	458
	1	*2*	*2.46*	*2.81*

+ 4 mm

iPhone	375 x 2 ÷ 326 = 2.30in = 58.4mm
iPhone X	375 x 3 ÷ 458 = 2.46in = 62.4mm

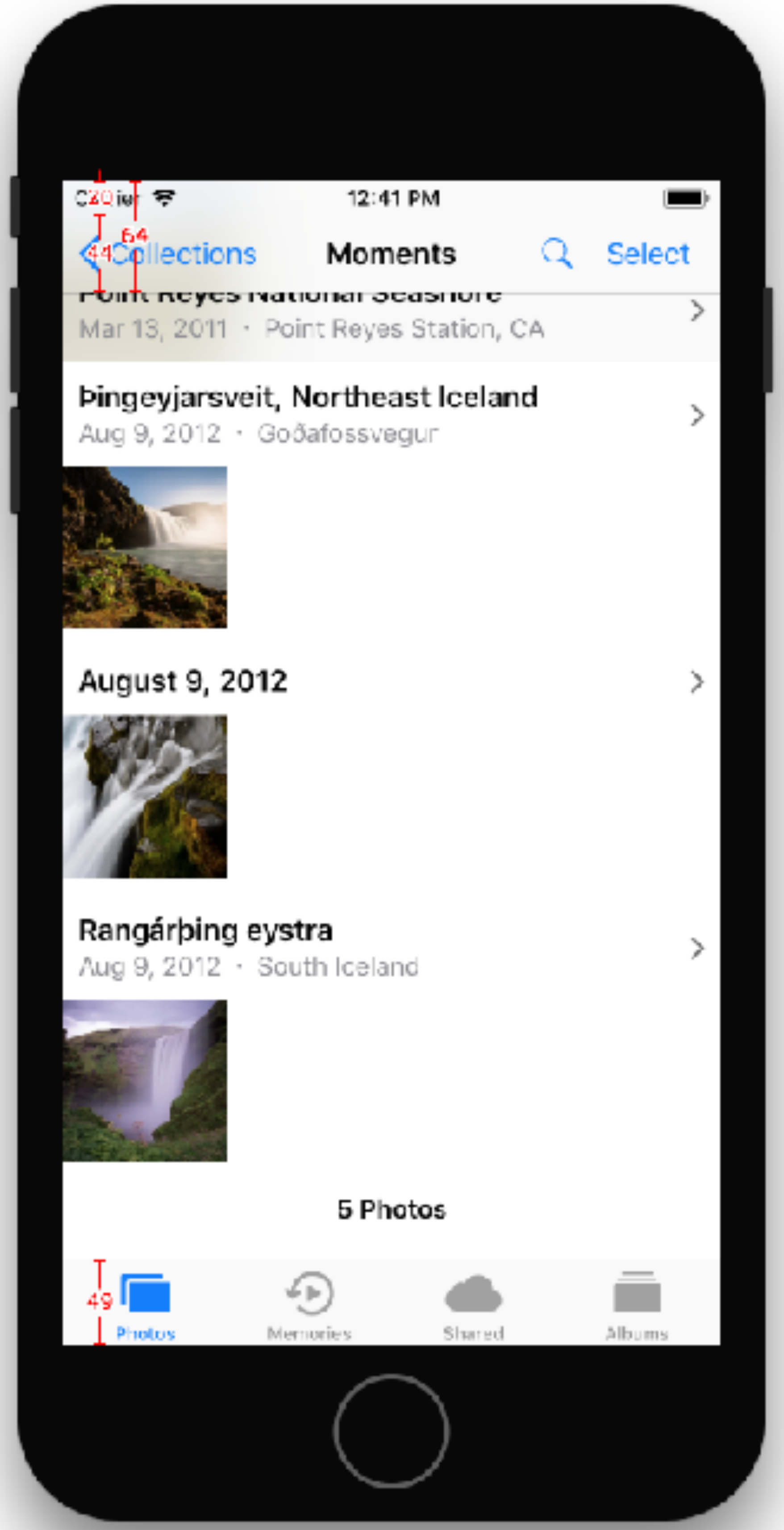
+ 4 mm

```
iPhone      375 x 2 ÷ 326 = 2.30in = 58.4mm

iPhone X    375 x 3 ÷ 458 = 2.46in = 62.4mm

iPhone P    375 x 3 ÷ 401 = 2.44in = 62.0mm
                ÷ 1.15 // downsampling
```

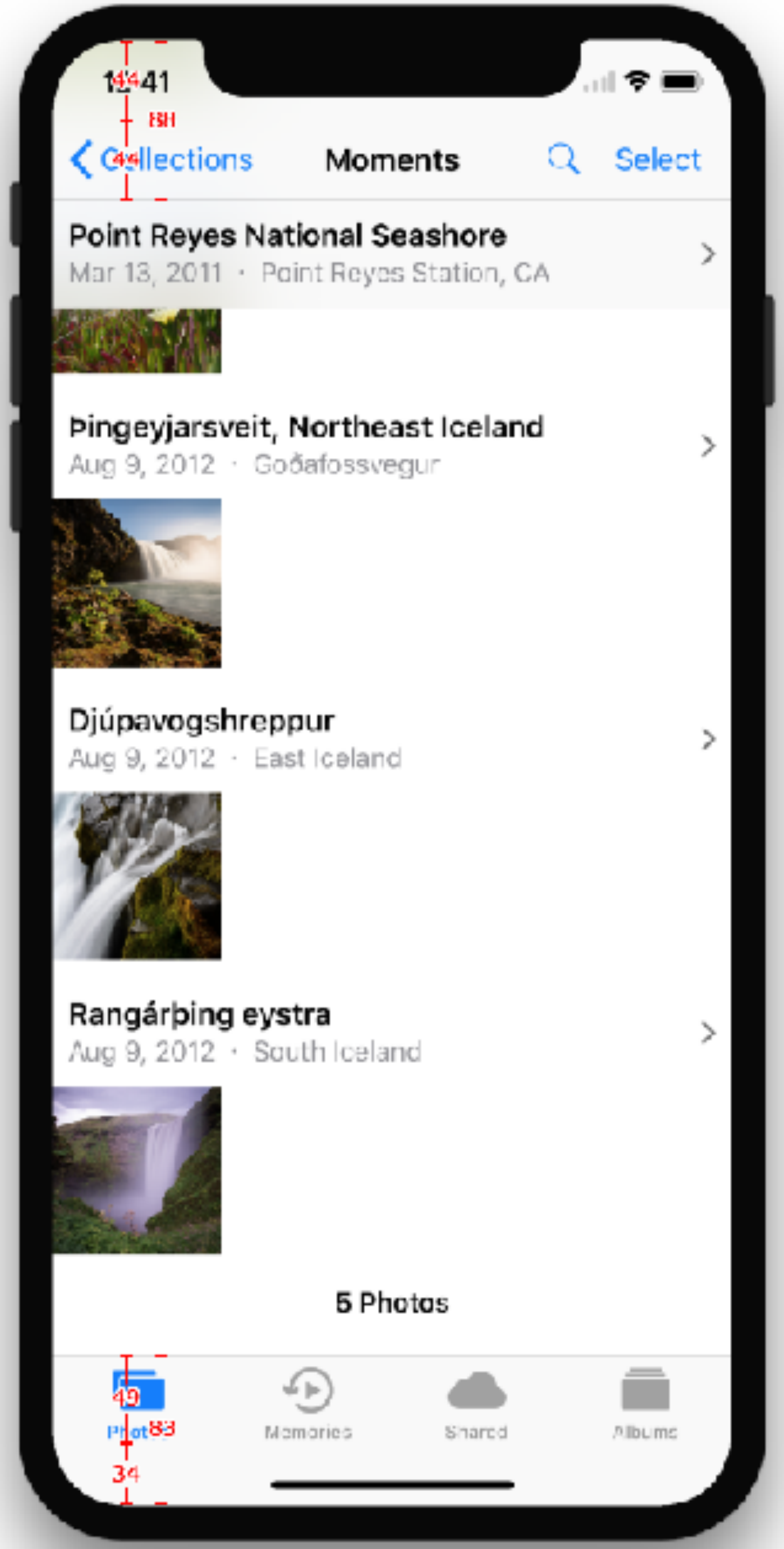


8.00cm

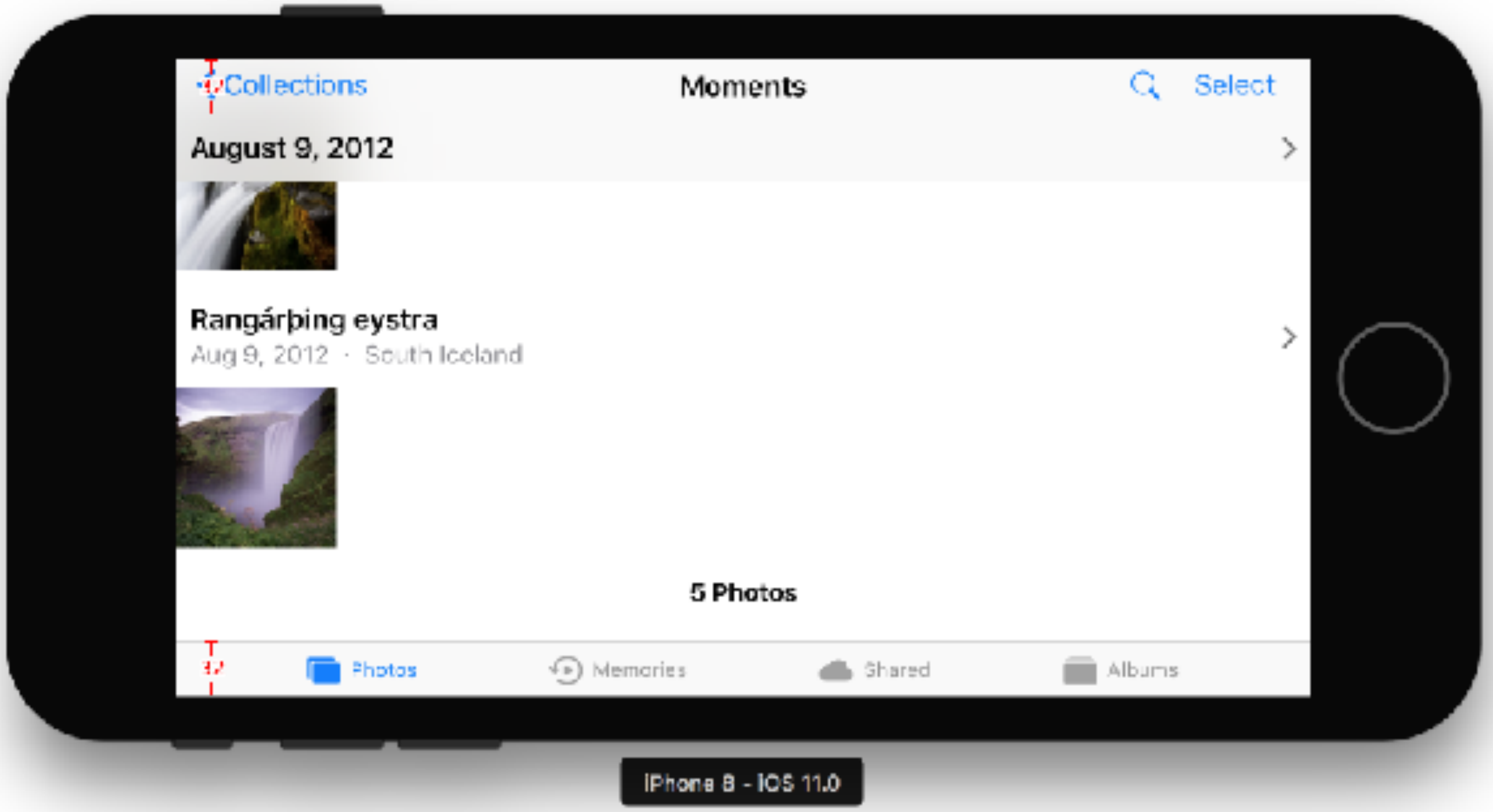
App


20
44
64
12:41 PM
Collections
Moments
Select
Point Reyes National Seashore
Mar 13, 2011 · Point Reyes Station, CA
Þingeyjarsveit, Northeast Iceland
Aug 9, 2012 · Goðafossvegur
August 9, 2012
Rangárþing eystra
Aug 9, 2012 · South Iceland
5 Photos
49
Photos
Memories
Shared
Albums

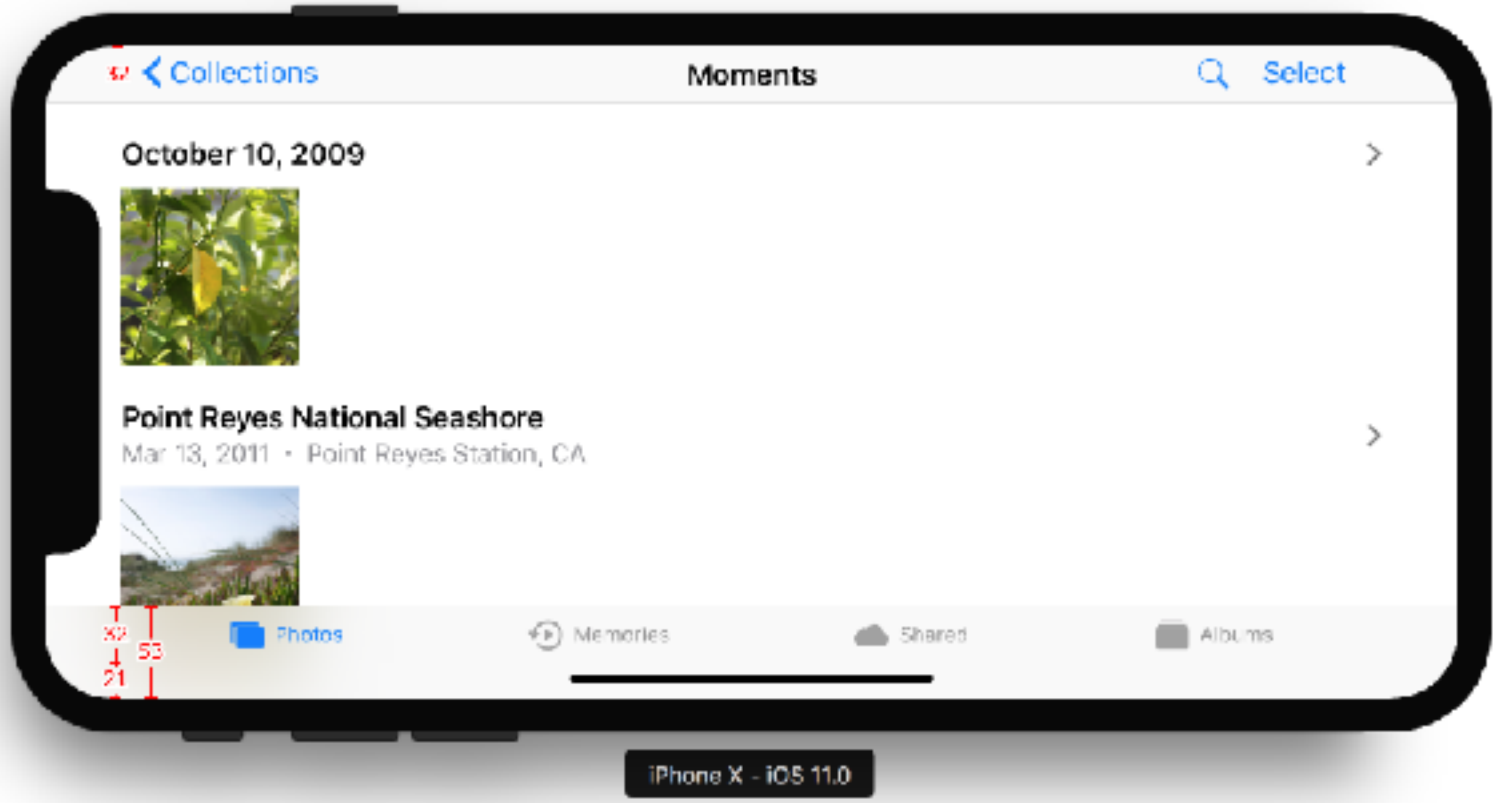
iPhone 8 - iOS 11.0


12:41
44
88
44
Collections
Moments
Select
Point Reyes National Seashore
Mar 13, 2011 · Point Reyes Station, CA
Þingeyjarsveit, Northeast Iceland
Aug 9, 2012 · Goðafossvegur
Djúpavogshreppur
Aug 9, 2012 · East Iceland
Rangárþing eystra
Aug 9, 2012 · South Iceland
5 Photos
49
83
34
Photos
Memories
Shared
Albums

iPhone X - iOS 11.0



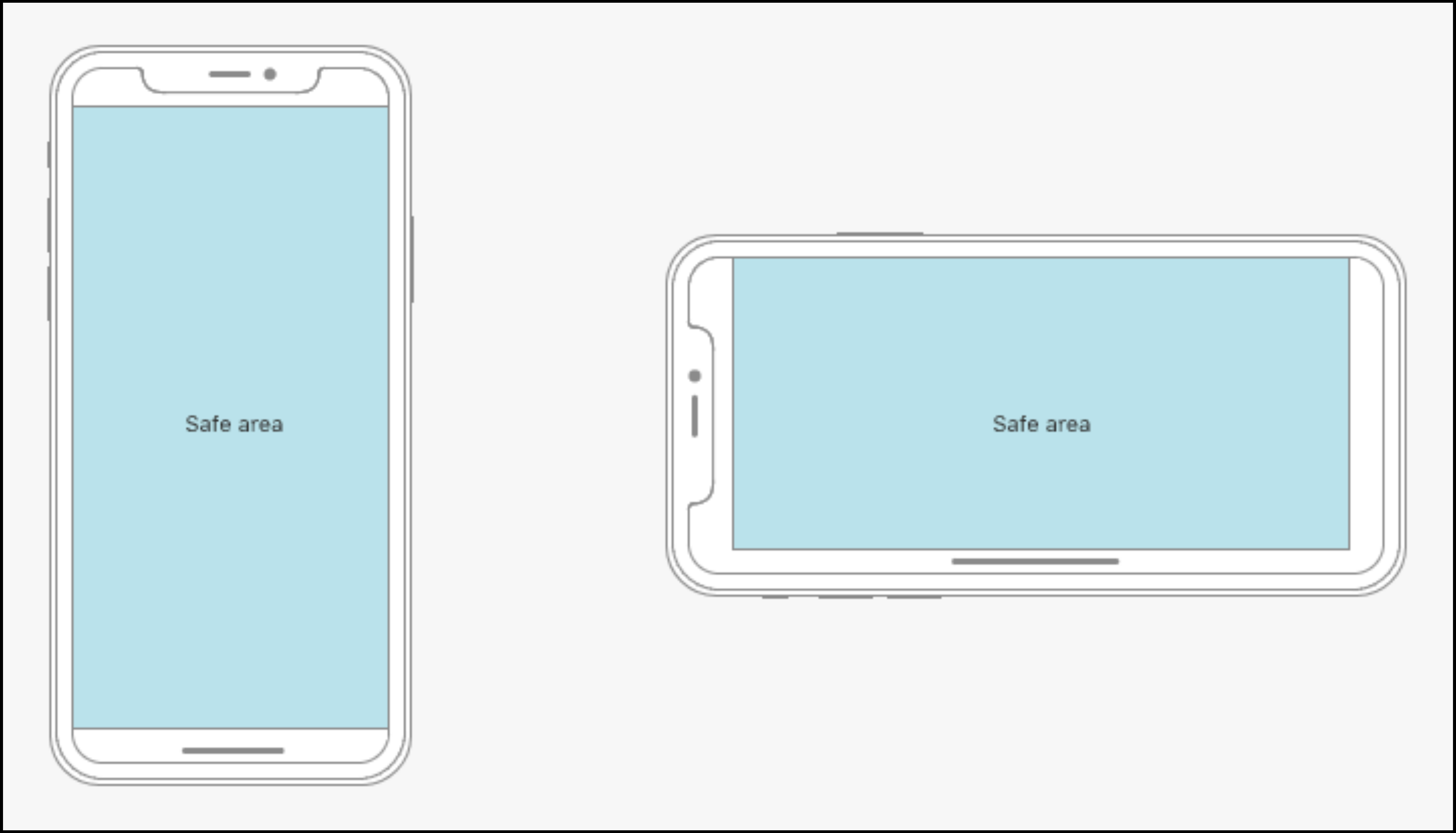
iPhone 8 - iOS 11.0

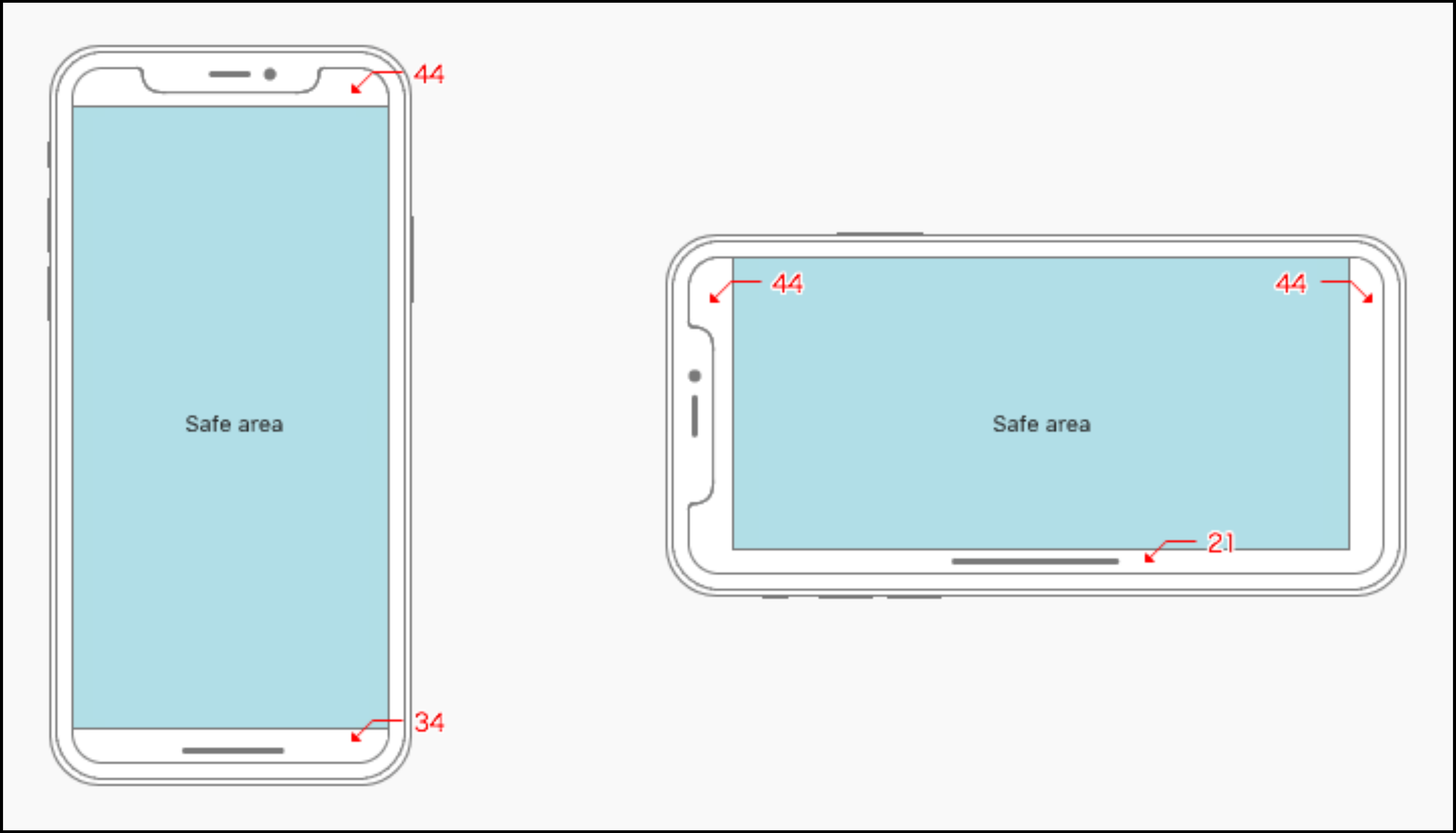


iPhone X - iOS 11.0

9:41
9:41

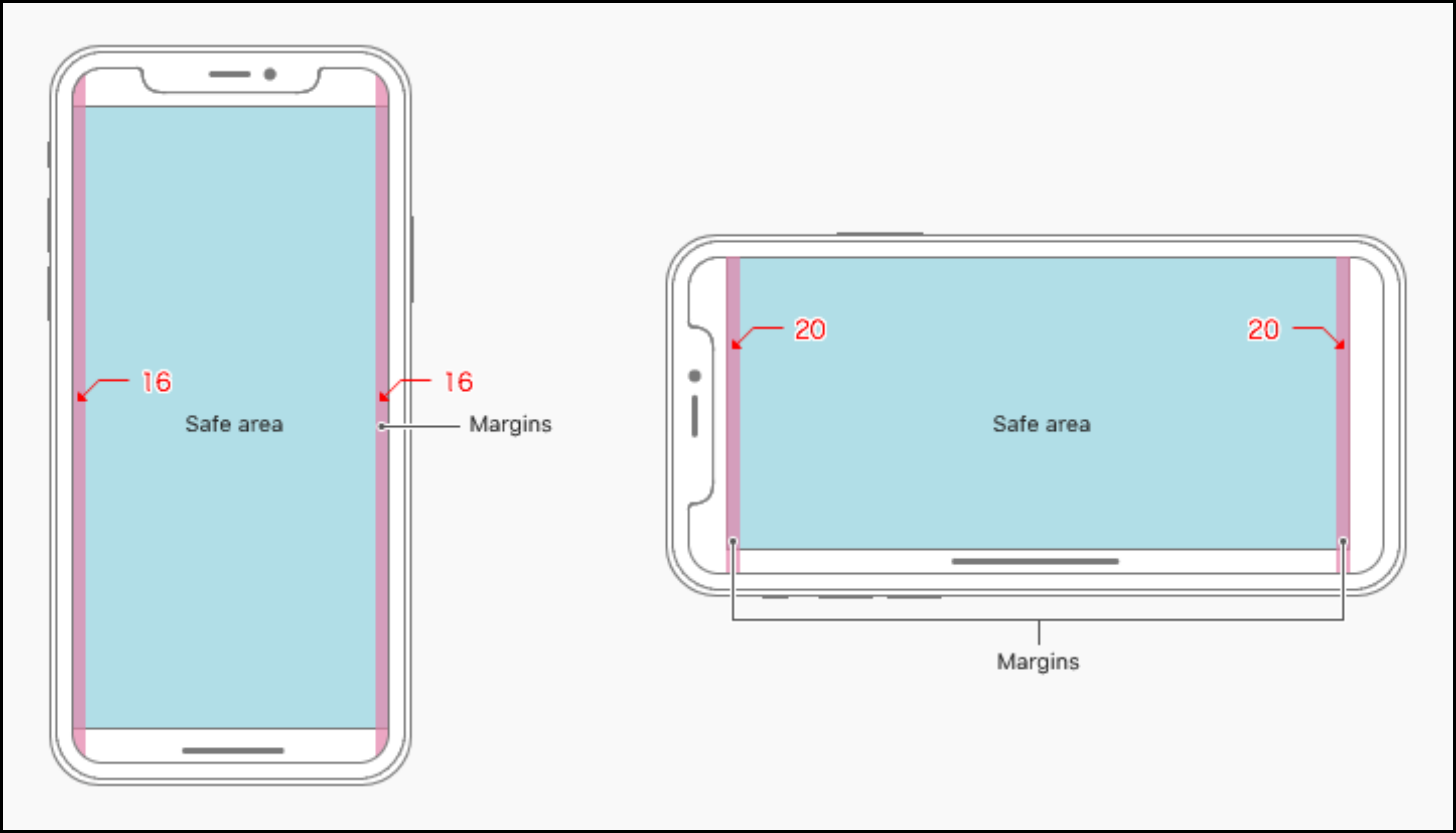
Don’t mask or call special attention to key display features.


Safe area
Safe area


44
Safe area
34
44
44
Safe area
21

UIView

```
// ver: (top = 44, left =  0, bottom = 34, right =  0)
// hor: (top =  0, left = 44, bottom = 21, right = 44)
@property (readonly) UIEdgeInsets safeAreaInsets
    API_AVAILABLE(ios(11.0), tvos(11.0));

- (void)safeAreaInsetsDidChange
    API_AVAILABLE(ios(11.0), tvos(11.0));
```


16
16
Safe area
Margins
20
20
Safe area
Margins

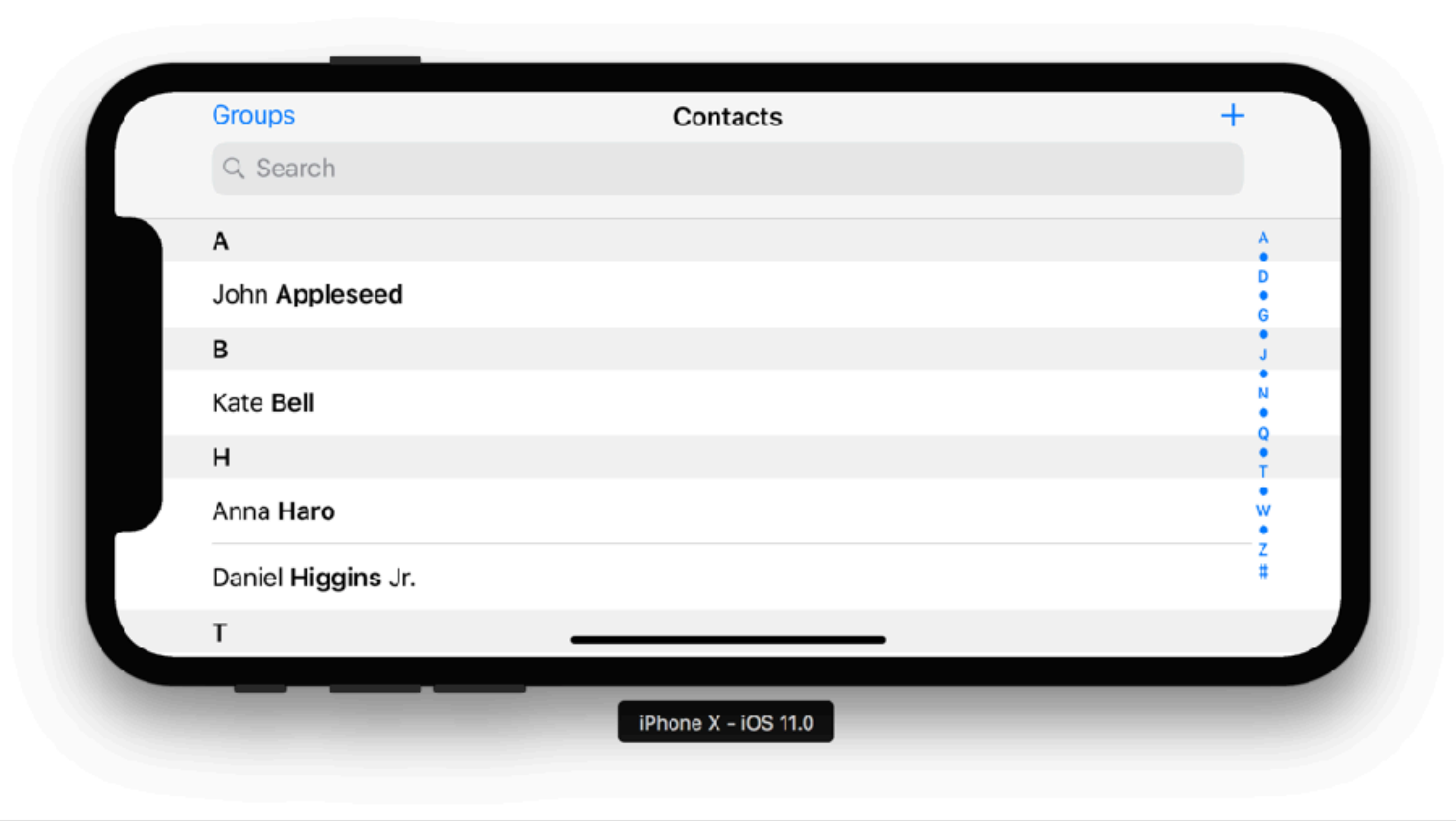
UIView

```
// ver: (top = 44, leading = 16, bottom = 34, trailing = 16)
// hor: (top =  0, leading = 64, bottom = 21, trailing = 64)
@property (nonatomic) NSDirectionalEdgeInsets directionalLayoutMargins
    API_AVAILABLE(ios(11.0), tvos(11.0));
```

规则

- 背景要铺满
- 可连续滚动内容要铺满
- 控件必须在 SafaArea 以内
- 不介意边缘被刘海和圆角遮挡的全屏内容可以铺满

10:57
云端课堂
iPhone X - iOS 11.0



Groups

Contacts

+

Search

A

John **Appleseed**

B

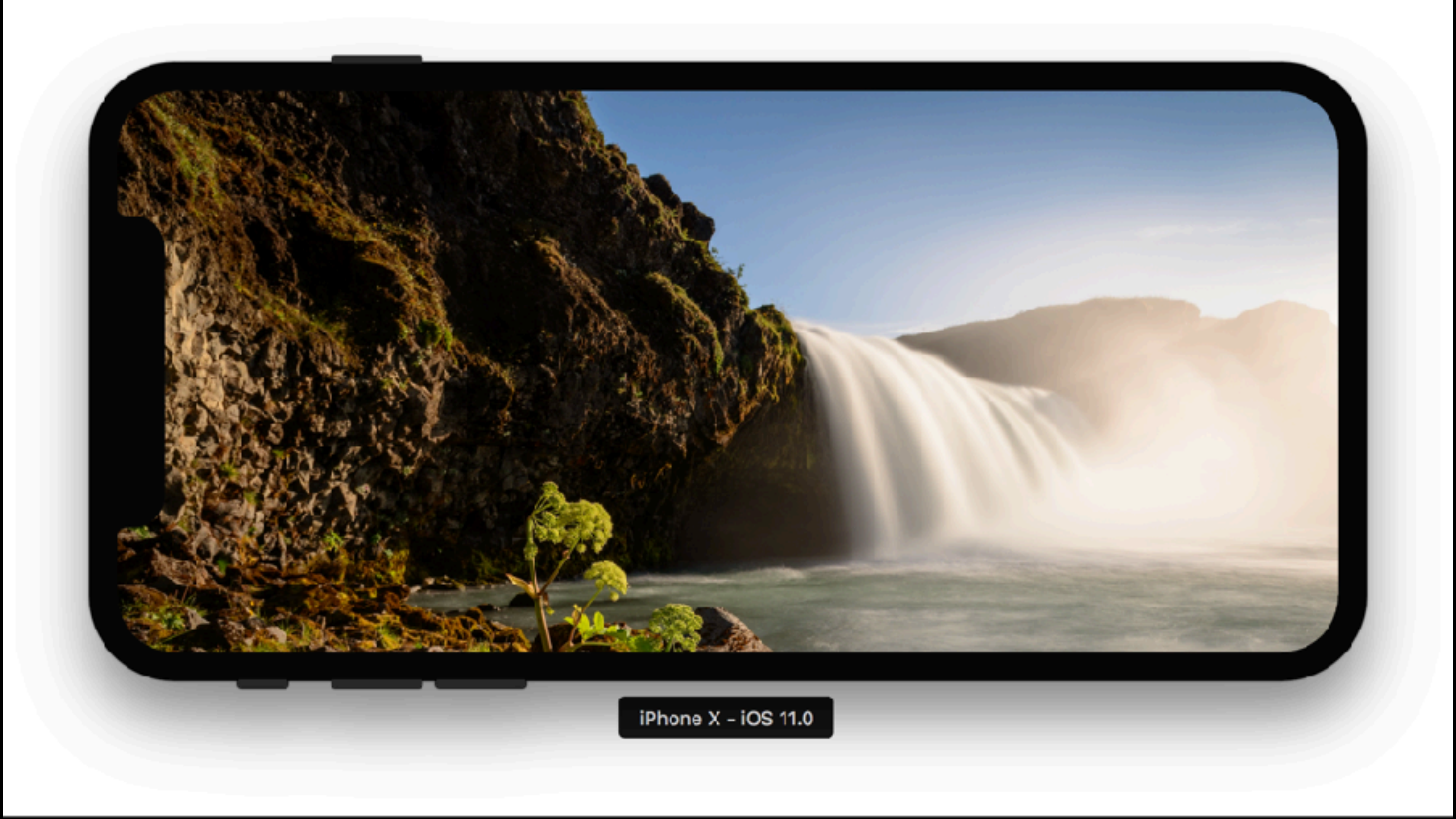
Kate **Bell**

H

Anna **Haro**

Daniel **Higgins** Jr.

T



iPhone X - iOS 11.0

Code

UIView

```
// frame
@property (readonly) UIEdgeInsets safeAreaInsets
    API_AVAILABLE(ios(11.0), tvos(11.0));

// autolayout
@property (readonly) UILayoutGuide *safeAreaLayoutGuide
    API_AVAILABLE(ios(11.0), tvos(11.0));
```

UILayoutGuide

```
NS_CLASS_AVAILABLE_IOS(9_0)
@interface UILayoutGuide : NSObject <NSCoding>

@property (readonly) NSLayoutXAxisAnchor *leftAnchor;
@property (readonly) NSLayoutXAxisAnchor *rightAnchor;
@property (readonly) NSLayoutYAxisAnchor *topAnchor;
@property (readonly) NSLayoutYAxisAnchor *bottomAnchor;

@property (readonly) NSLayoutXAxisAnchor *centerXAnchor;
@property (readonly) NSLayoutYAxisAnchor *centerYAnchor;

@property (readonly) NSLayoutDimension *widthAnchor;
@property (readonly) NSLayoutDimension *heightAnchor;

@end
```

UIView

```
// NS_AVAILABLE_IOS(9_0)
@interface UIView (UIViewLayoutConstraintCreation)

@property (readonly) NSLayoutXAxisAnchor *leftAnchor;
@property (readonly) NSLayoutXAxisAnchor *rightAnchor;
@property (readonly) NSLayoutYAxisAnchor *topAnchor;
@property (readonly) NSLayoutYAxisAnchor *bottomAnchor;

@property (readonly) NSLayoutXAxisAnchor *centerXAnchor;
@property (readonly) NSLayoutYAxisAnchor *centerYAnchor;

@property (readonly) NSLayoutDimension *widthAnchor;
@property (readonly) NSLayoutDimension *heightAnchor;

@end
```

UIViewController

```
@property (readonly) id<UILayoutSupport> topLayoutGuide
    API_DEPRECATED("-[UIView safeAreaLayoutGuide]");
@property (readonly) id<UILayoutSupport> bottomLayoutGuide
    API_DEPRECATED("-[UIView safeAreaLayoutGuide]");
```

Relation

```
item1.attr1  ==  item2.attr2  ×  multiplier  +  constant
```

Relation

```
item1.attr1   == [item2.attr2] × [multiplier] + [constant]
                  nil   N/A       1.0              0.0

view1 left    ==  view2
      right   <=
      top     >=
      bottom
      centerX
      centerY
      width
      height
```

NSLayoutAnchor

```
view.translatesAutoresizingMaskIntoConstraints = NO;

NSLayoutConstraint *width =
[view.widthAnchor constraintEqualToAnchor:self.widthAnchor
                               multiplier:1.0
                                 constant:0.0];

width.priority = UILayoutPriorityRequired;

width.active = YES;
```

iOS 9+

```
view.translatesAutoresizingMaskIntoConstraints = NO;

[view.leftAnchor constraintEqualToAnchor:self.leftAnchor].active = YES;
[view.rightAnchor constraintEqualToAnchor:self.rightAnchor].active = YES;
[view.topAnchor constraintEqualToAnchor:self.topAnchor].active = YES;
[view.bottomAnchor constraintEqualToAnchor:self.bottomAnchor].active = YES;
```

iOS 8–

```
view.translatesAutoresizingMaskIntoConstraints = NO;

[self addConstraints:@[[NSLayoutConstraint constraintWithItem:view
                                                    attribute:NSLayoutAttributeLeft
                                                    relatedBy:NSLayoutRelationEqual
                                                       toItem:self
                                                    attribute:NSLayoutAttributeLeft
                                                   multiplier:1.0
                                                     constant:0.0],
                       [NSLayoutConstraint constraintWithItem:view
                                                    attribute:NSLayoutAttributeRight
                                                    relatedBy:NSLayoutRelationEqual
                                                       toItem:self
                                                    attribute:NSLayoutAttributeRight
                                                   multiplier:1.0
                                                     constant:0.0],
                       [NSLayoutConstraint constraintWithItem:view
                                                    attribute:NSLayoutAttributeTop
                                                    relatedBy:NSLayoutRelationEqual
                                                       toItem:self
                                                    attribute:NSLayoutAttributeTop
                                                   multiplier:1.0
                                                     constant:0.0],
                       [NSLayoutConstraint constraintWithItem:view
                                                    attribute:NSLayoutAttributeBottom
                                                    relatedBy:NSLayoutRelationEqual
                                                       toItem:self
                                                    attribute:NSLayoutAttributeBottom
                                                   multiplier:1.0
                                                     constant:0.0]]];
```

Masonry

```
[view mas_makeConstraints:^(MASConstraintMaker *make) {
    make.edges.equalTo(self);
}];
```

兼容

- iOS 11+: SafeArea
- iOS 9+: NSLayoutAnchor/Masonry + SafeArea
- iOS 6+: Masonry + SafeArea

TODO: SDK with NSLayoutAnchor & SafeArea

@available

```
if (@available(iOS 11.0, *)) {
  view.translatesAutoresizingMaskIntoConstraints = NO;
  [view.leftAnchor constraintEqualToAnchor:self.safeAreaLayoutGuide.leftAnchor].active = YES;
  [view.rightAnchor constraintEqualToAnchor:self.safeAreaLayoutGuide.rightAnchor].active = YES;
  [view.topAnchor constraintEqualToAnchor:self.safeAreaLayoutGuide.topAnchor].active = YES;
  [view.bottomAnchor constraintEqualToAnchor:self.safeAreaLayoutGuide.bottomAnchor].active = YES;
}
else {
    [view mas_makeConstraints:^(MASConstraintMaker *make) {
        make.edges.equalTo(self);
    }];
}
```

Talk is cheap.

git

http://git.baijiahulian.com/iOS/training

凡义

技巧

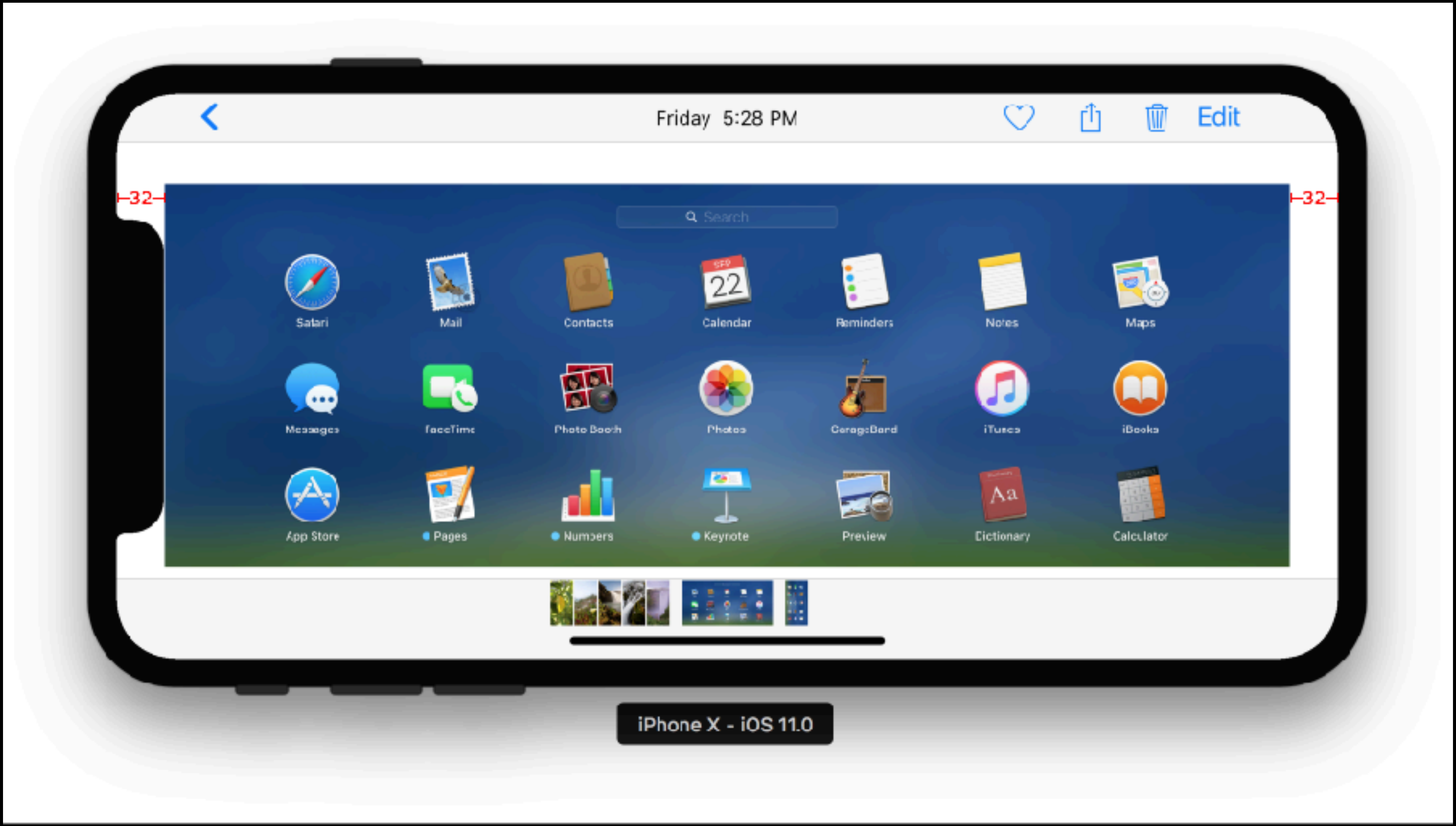
- 给所有 subviews 外加个容器，或者 subviews 之间采用相对布局
- 不推荐 Masonry+safeAreaInsets
- 别忘了非 iPhone X 的 iOS 11 设备

Human Interface Guidelines

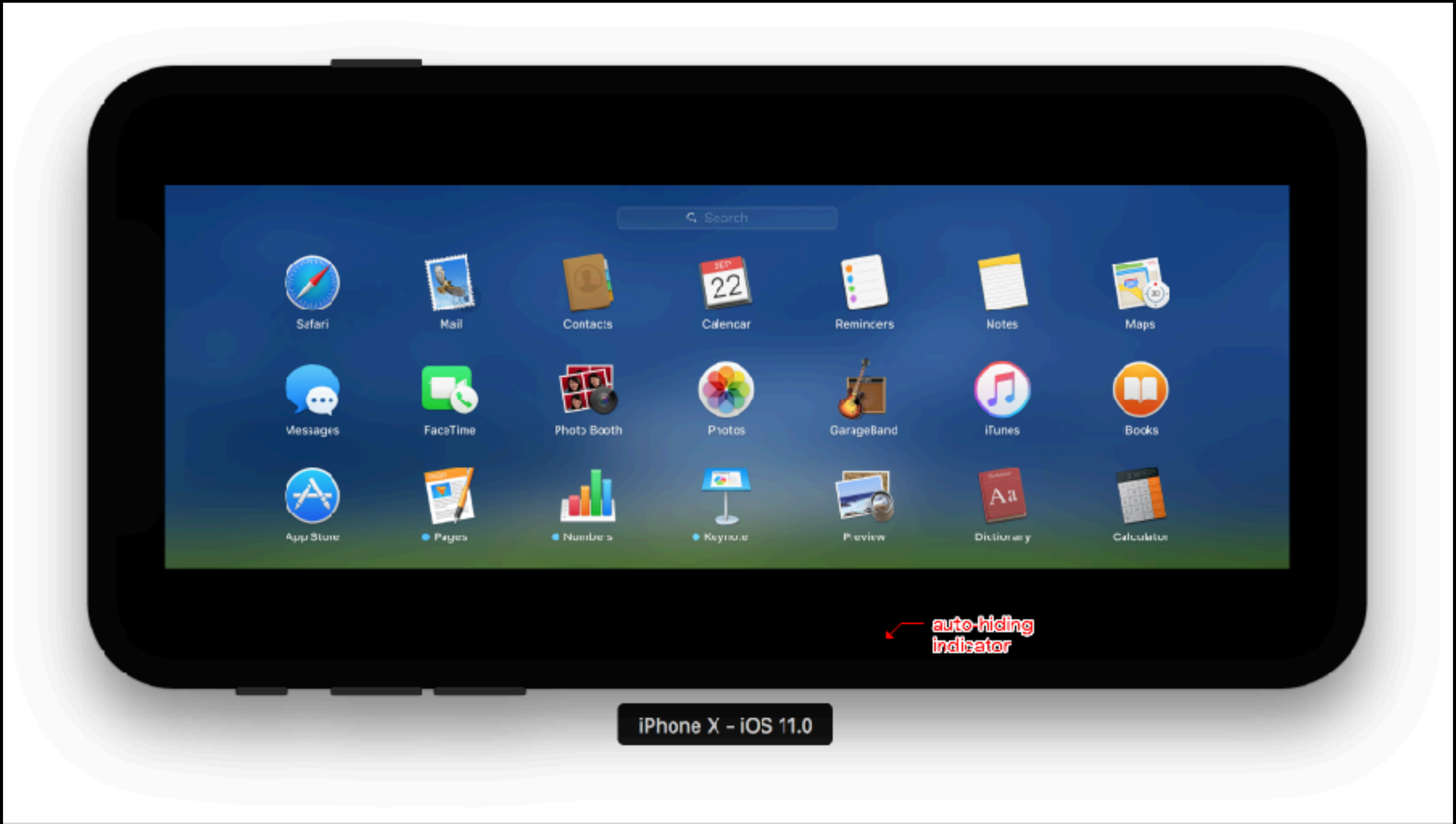
Who's the daddy

https://developer.apple.com/ios/human-interface-guidelines/overview/iphone-x/

Photos


Friday 5:28 PM
Edit
32
32
Search
Safari
Mail
Contacts
22
Calendar
Reminders
Notes
Maps
Messages
FaceTime
Photo Booth
Photos
GarageBand
iTunes
iBooks
App Store
Pages
Numbers
Keynote
Preview
Aa
Dictionary
Calculator
iPhone X - iOS 11.0

Photos


Search
Safari
Mail
Contacts
Calendar
Reminders
Notes
Maps
Messages
FaceTime
Photo Booth
Photos
GarageBand
iTunes
Books
App Store
Pages
Numbers
Keynote
Preview
Dictionary
Calculator
auto-hiding indicator
iPhone X - iOS 11.0

Auto Hidden

```
@interface UIViewController (UIHomeIndicatorAutoHidden)

- (UIViewController *)childViewControllerForHomeIndicatorAutoHidden
    API_AVAILABLE(ios(11.0)) API_UNAVAILABLE(watchos, tvos);

- (BOOL)prefersHomeIndicatorAutoHidden
    API_AVAILABLE(ios(11.0)) API_UNAVAILABLE(watchos, tvos);

- (void)setNeedsUpdateOfHomeIndicatorAutoHidden
    API_AVAILABLE(ios(11.0)) API_UNAVAILABLE(watchos, tvos);

@end
```

the end