

# RWD Grundprinzipen

# Übersicht

- Geräte und Viewport
- Breakpoints
- Mediaqueries
- Einfache RWD Patterns

o2 - de+ 3G      13:18      \* 78 %

lms-ticket.de

 BESTELLUNG

**Ihre Bestellung**

Ihre Bestellung mit der Bestellnummer  
"52626015" war erfolgreich.

Sollten Sie noch weitergehende Fragen zu Ihrer  
Bestellung haben, so wenden Sie sich bitte an die im  
linken Rand genannte Servicerufnummer.

HILFE U. SERVICE

 Kontakt Hotline

 Buchungsanleitung

 Newsletter

 Mitglied werden

<    >    ⌂    ⌓    ⌔



Startseite

Videos &amp; Audios

Inland

Ausland

Wirtschaft

Wahlen

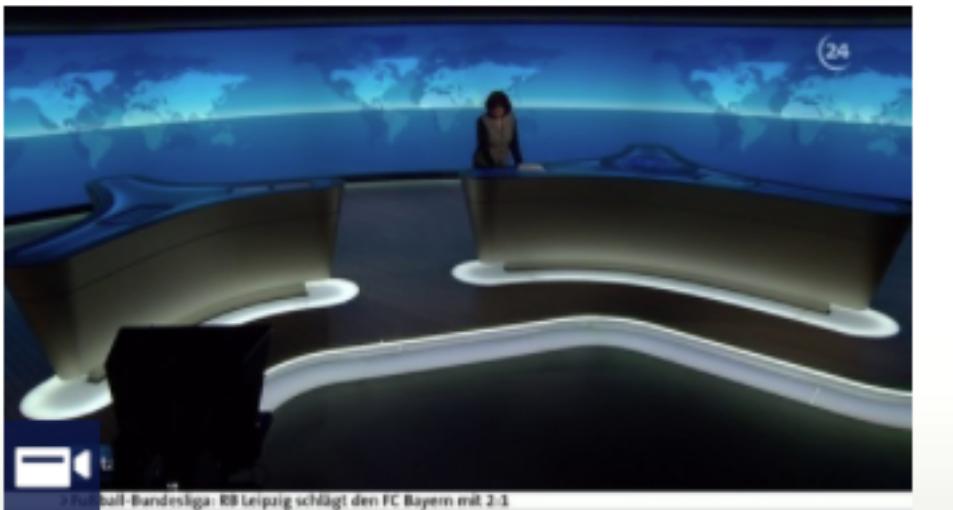
Wetter

Ihre Meinung

Mehr

## Video

ALLE VIDEOS



Live: tagesschau



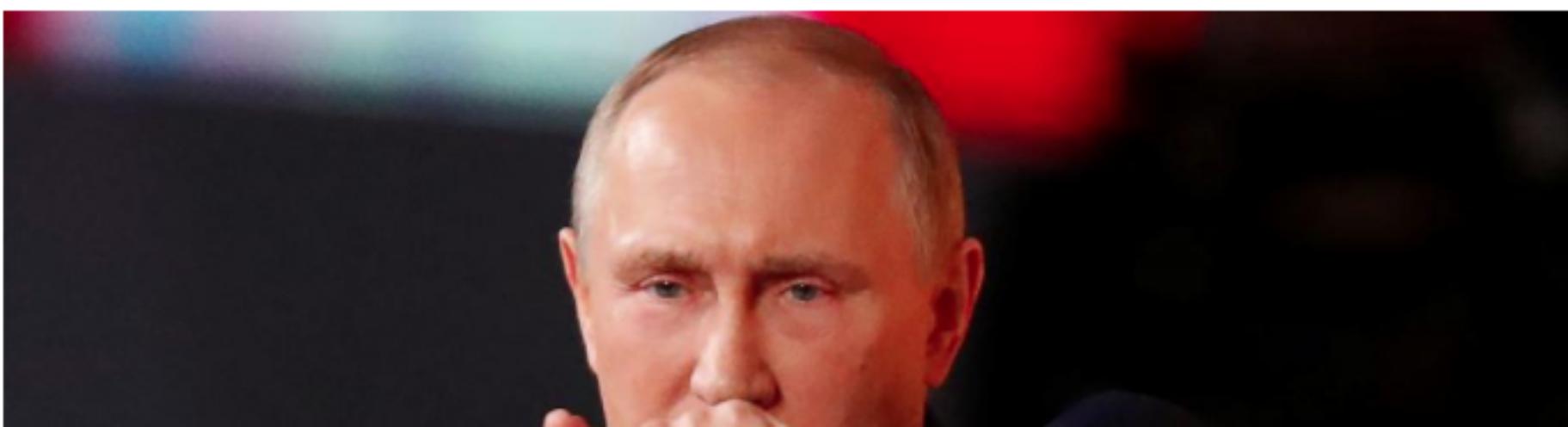
100 Sekunden



tagesschau 20 Uhr



tagesthemen



Wahl in Russland

## Triumph des neuen alten Präsidenten

Wie erwartet ist Russlands Präsident Putin bei der Präsidentschaftswahl im Amt bestätigt worden. Nach Auszählung fast aller Stimmen kam er auf 76,7 Prozent - das beste Ergebnis seiner Geschichte. Von Sabine Stöhr. | mehr

Beobachter melden Unregelmäßigkeiten bei Wahl in Russland

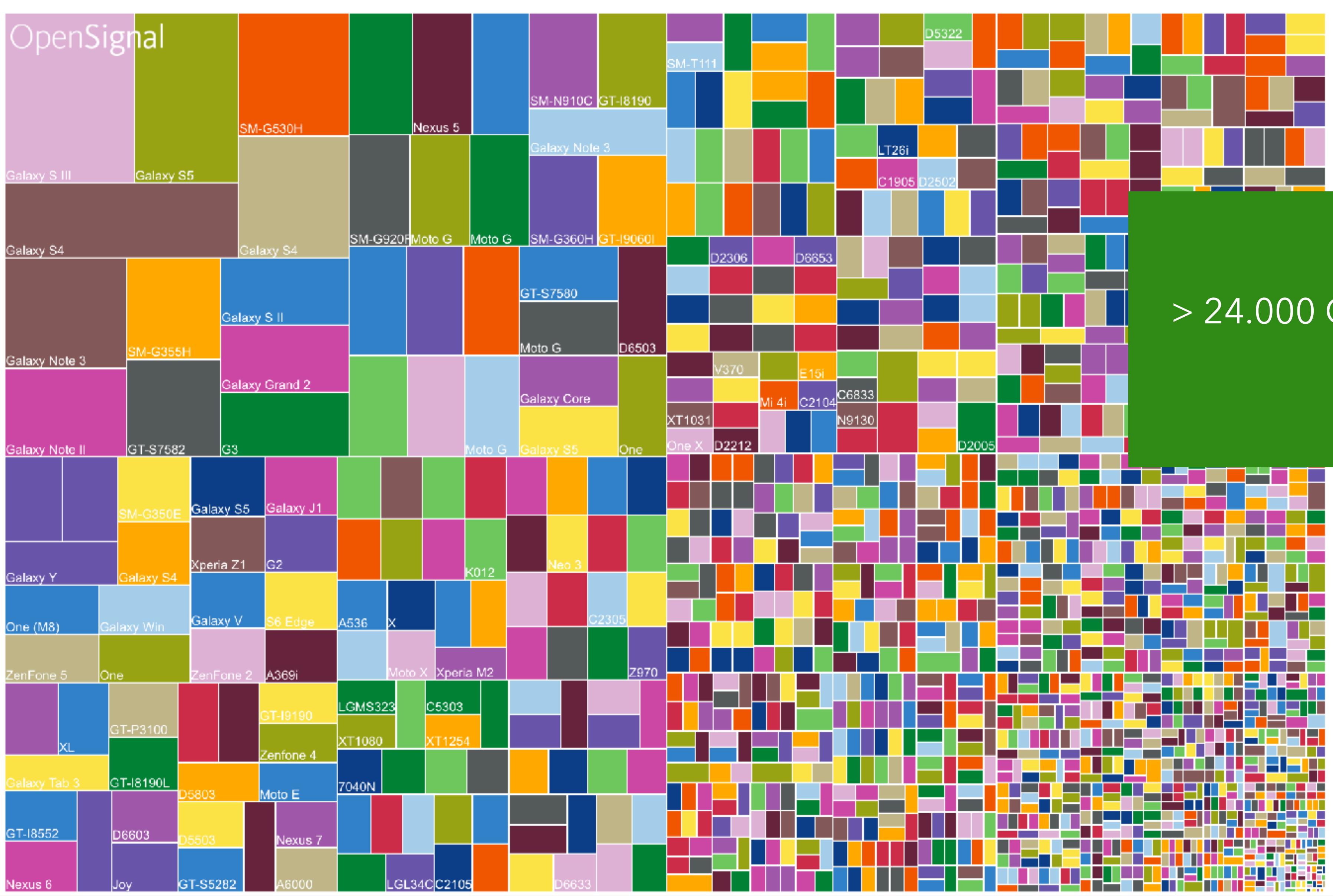
Nach der Wahl - 77 Prozent für Putin, S. Stöhr, ARD Moskau | audio

Zukunft Russlands

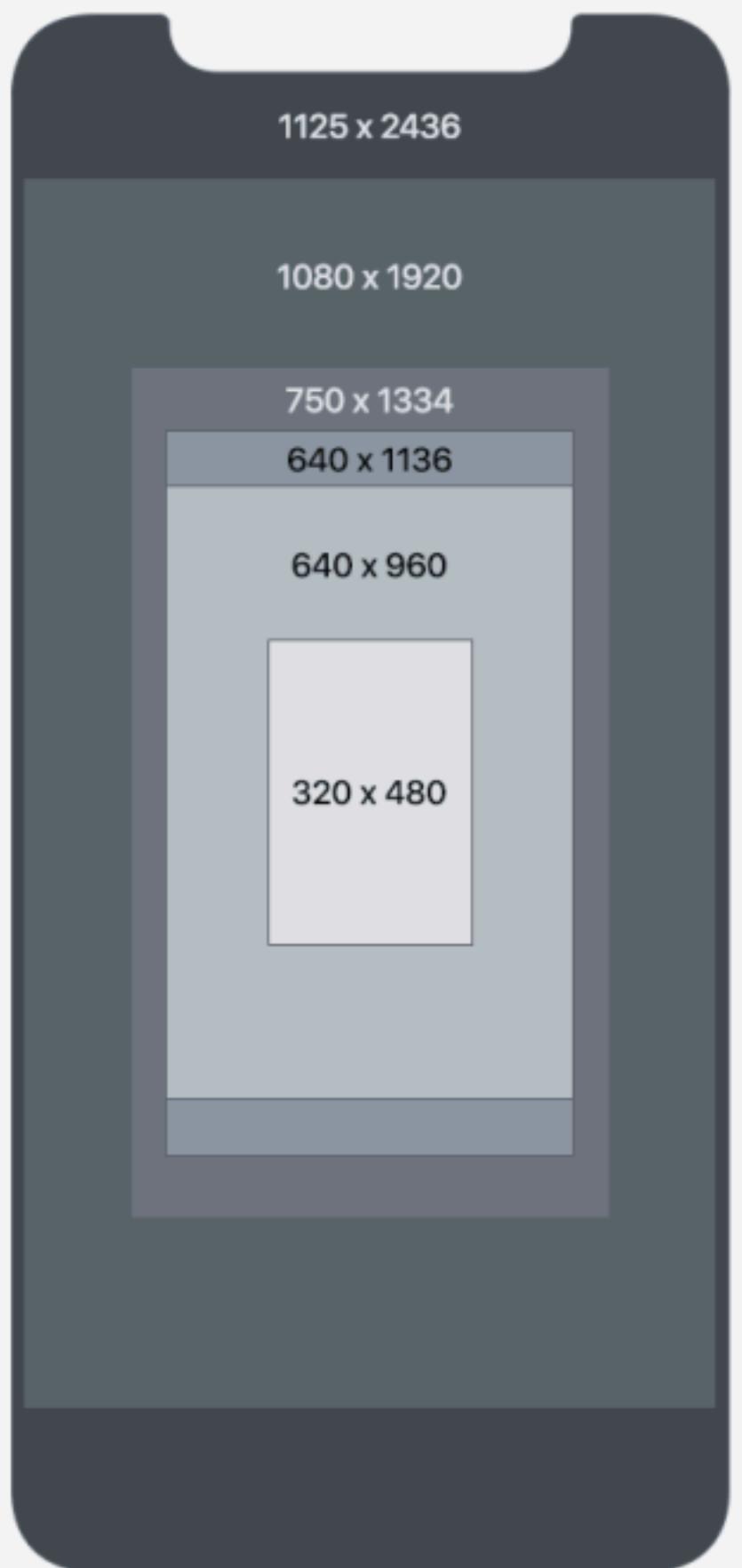
## Reformen mit Putin 4.0?

Nach dem Wahlsieg könnte sich Putin an Reformen machen. Doch dann bekäme er Ärger mit denen, die ihn stützen, kommentiert Udo Lielischkies in den tagesthemen. Und nur Abgrenzung schweiße zusammen. | mehr

# Geräte und Viewport



Aktuell (2019)  
 > 24.000 Google Certified Devices  
 nur Android  
 Quelle: PlayStore



iPhone X

iPhone 8, 7, 6s, 6 Plus

iPhone 8, 7, 6s, 6

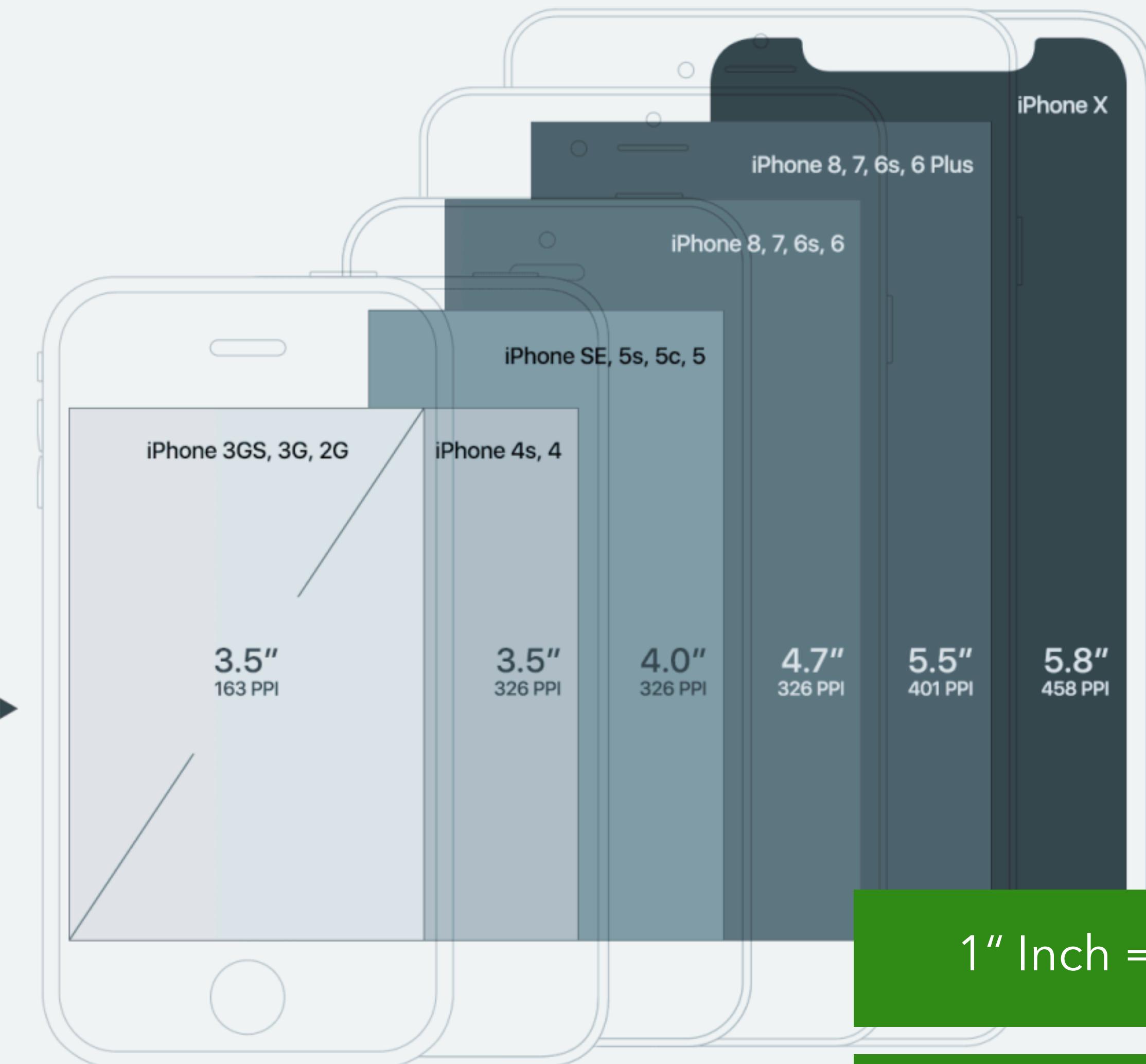
iPhone SE, 5s, 5c, 5

iPhone 4s, 4

iPhone 3GS, 3G, 2G

# iPhone

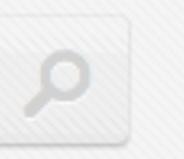
◀ Screen Resolution | Size ▶  
Through the Years



1" Inch = 2,54 cm



## SCREEN SIZES



screensiz.es

DEVICE	OPERATING SYSTEM	PHYS SIZE "	PHYS SIZE CM	W PX	H PX	DEVICE WIDTH	PX PER INCH	PX DENSITY	POPULARITY
Apple iPhone 7	iOS	4.7	11.5	750	1334	750	326	100% MDPI	100
Apple iPhone 7+	iOS	5.5	14.0	1080	1920	1080	401	100% MDPI	100
Apple iPhone 6	iOS	4.7	11.9	750	1334	750	326	100% MDPI	67
Apple iPhone 6+	iOS	5.5	14.0	1080	1920	1080	401	100% MDPI	54
Apple iPhone 6s	iOS	4.7	11.9	750	1334	750	326	100% MDPI	36
Apple iPhone 5 (5c, 5s)	iOS	4.0	10.0	640	1136	320	326	200% XHDPI	16
Samsung Galaxy S6	Android	5.1	13.0	1440	2560	1440	577	100% MDPI	13
Samsung Galaxy S8+	Android	6.2	15.7	2960	1440	2960	529	100% MDPI	13
Google Pixel	Android	5.0	12.7	1080	1920	1080	441	100% MDPI	11

# Display Auflösungen

dpi entspricht ppi

Low Density

ldpi

120 dpi

Medium Density

mdpi

160 dpi

High Density

hdpi

240 dpi

Extra High Density

xhdpi

320 dpi

Extra Extra High Density

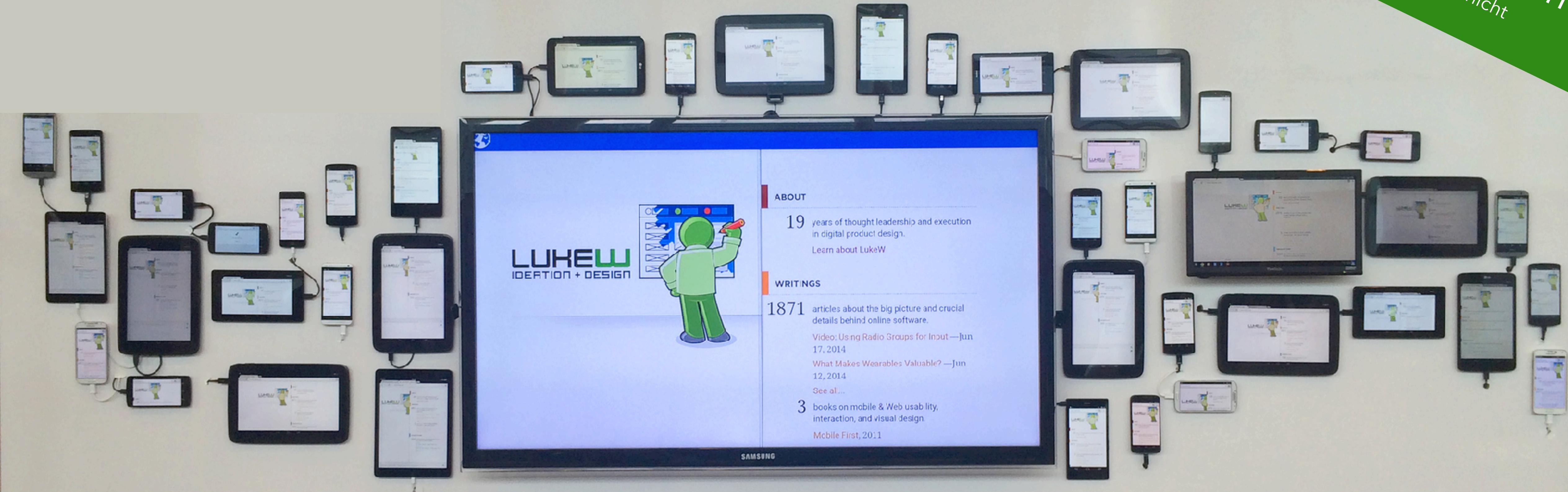
xxhdpi

480 dpi

# Geräte Parameter

Nur displaygestützte Systeme!

- Auflösung
- Format: Hoch oder Quer
- Seitenverhältnis
- Eingabe: Touch / Mouse / Remote Control / ...



# Versuch einer Annäherung: Geräte-Klassifikation

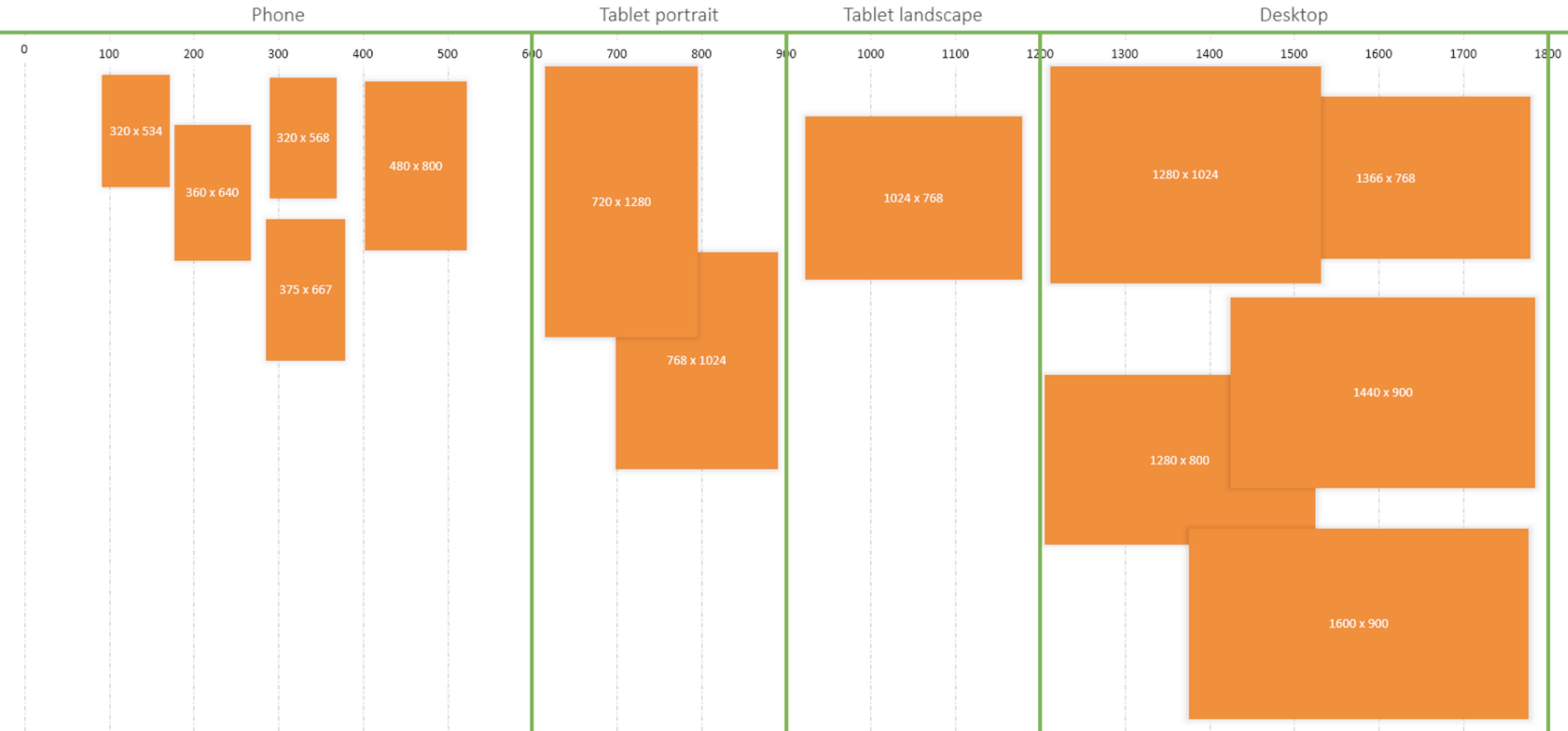


# Viewport

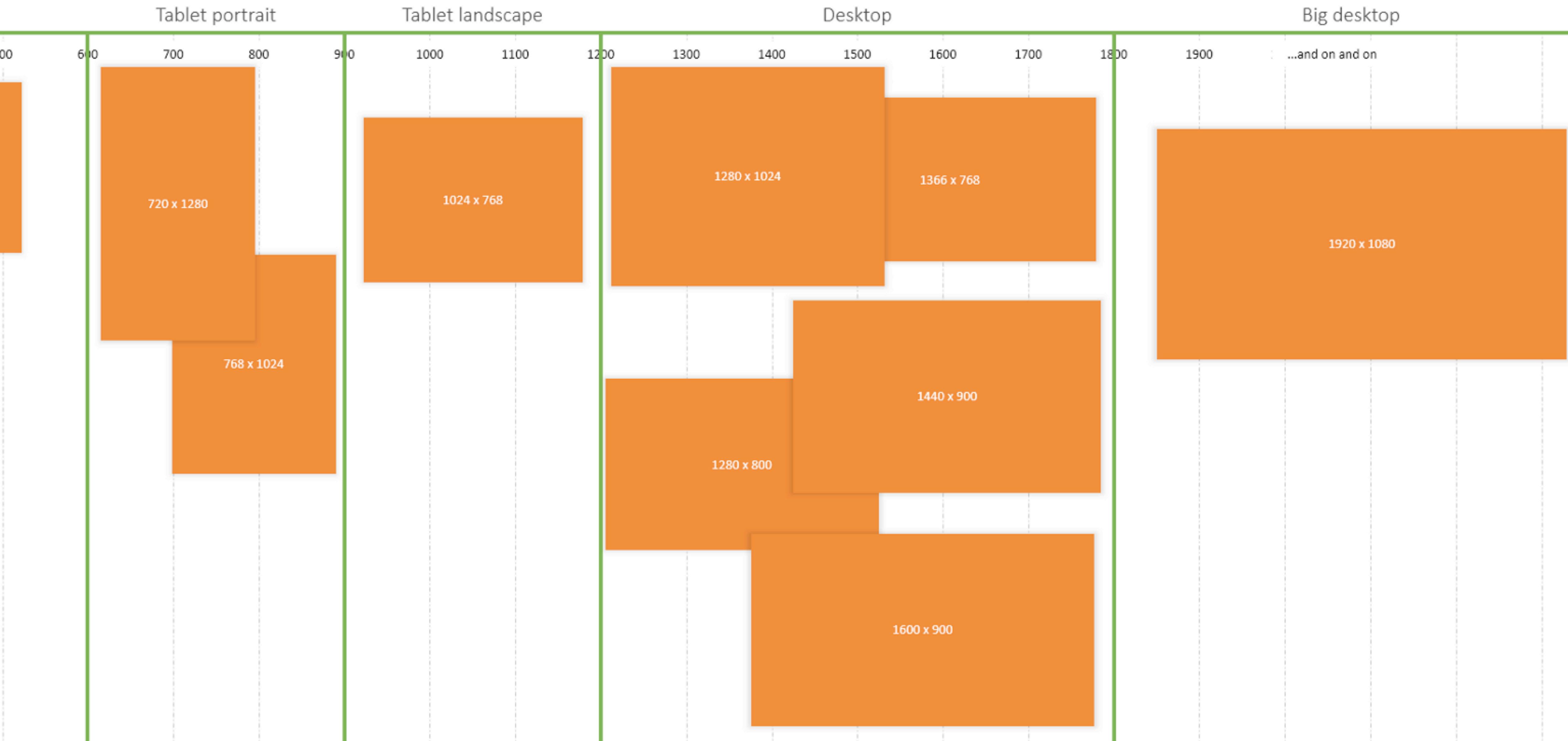
# Viewport

- Als **Viewport** wird der Bereich des Browserfensters bezeichnet, der für die Darstellung der Inhalte zur Verfügung steht.
- Als **Standardbreite** für die Darstellung wurde ursprünglich eine **Device-Breite von 1024px** angenommen.
- Abzgl. Browser-Elemente blieben damit für den **Viewport 980px**
- Daher werden ohne weitere Angaben alle Inhalte entsprechend auf diese Darstellungsgröße optimiert dargestellt / skaliert.
- Sinnvoll: Anpassung an die Breite des Geräts  
`<meta name="viewport" content="width=device-width,initial-scale=1.0">`

# Breakpoints



Quelle: <https://medium.freecodecamp.org/the-100-correct-way-to-do-css-breakpoints-88d6a5ba1862>



Quelle: <https://medium.freecodecamp.org/the-100-correct-way-to-do-css-breakpoints-88d6a5ba1862>

## Common breakpoints



**0-480**

*Smaller  
smartphones*



**481-768**

*Tablets & larger  
smartphones*



**769-1279**

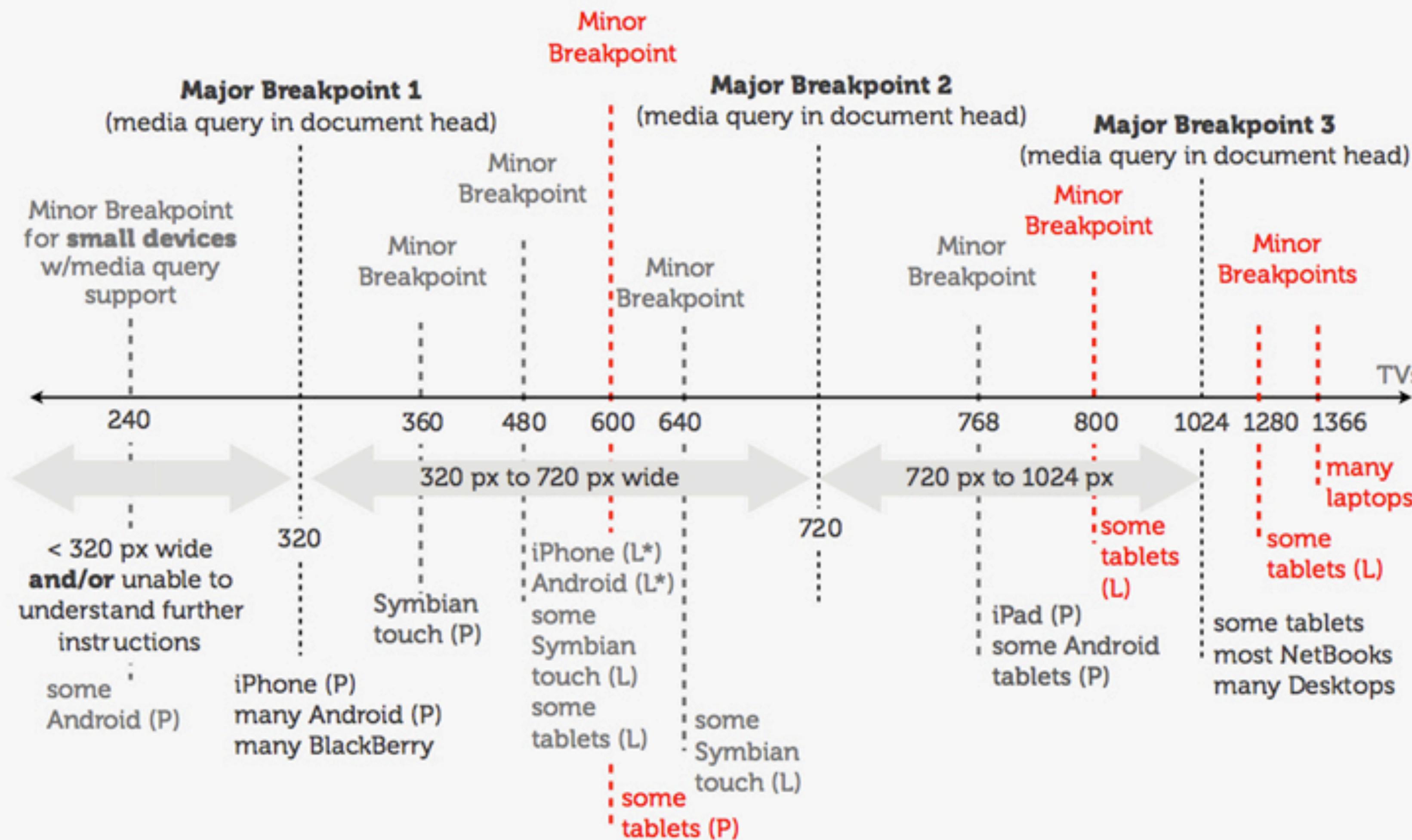
*Laptops, larger tablets  
in landscape, and small  
desktops*



**1280+**

*Larger desktops  
and monitors*

# Breakpoints for Responsive Design



# Strategie für Breakpoints

- Sinnvolle Abstufungen (Major-Breakpoints) setzen in Abhängigkeit zur Gerätekasse
- Weitere Feinabstufungen (Minor-Breakpoints) in Abhängigkeit zum Content festlegen
- Nicht zu viele Abstufungen
- Mobile first
- Viewport nicht vergessen!

# Mediaqueries

# Media Queries

z.B.

- Width / Height des Viewports
- Width / Height des Devices
- Orientation (Landscape oder Portrait)
- Resolution (Auflösung)
- Aspect Ratio (Seitenverhältnis)

# Mobile First - Beispiel

[https://www.w3schools.com/css/  
css\\_rwd\\_mediaqueries.asp](https://www.w3schools.com/css/css_rwd_mediaqueries.asp)

```
/* Allgemeine Anweisungen = Smartphone Darstellung
header {
    ..
}

/* Besondere Anweisungen für größere Auflösungen */
@media screen and (min-width: XX px) {
    header {
        ..
    }
}
..

/* Besondere Anweisungen für andere Medien */
@media print {
    header {
        ..
    }
}
```

# Responsive CSS

## Festlegung Viewport

```
<meta name="viewport" content="width=device-width,  
initial-scale=1.0">
```

## Mediaquery Screen

```
@media screen and (min-width: 768px) {...}
```

## Mediaquery Print

```
@media print {...}
```

## Alternative Einbindung

```
<link rel="stylesheet" media="screen and (min-width:  
768px)" href="tablet-portrait.css">
```

## Mobile first!

Zuerst mobile CSS-Definition, dann Tablet, Desktop,...

# RWD Strategien

Welche grundsätzlichen Möglichkeiten zum  
Umgang mit Inhalt und UI gibt es?

Produkte für Zuhause · [Jetzt online kaufen](#)

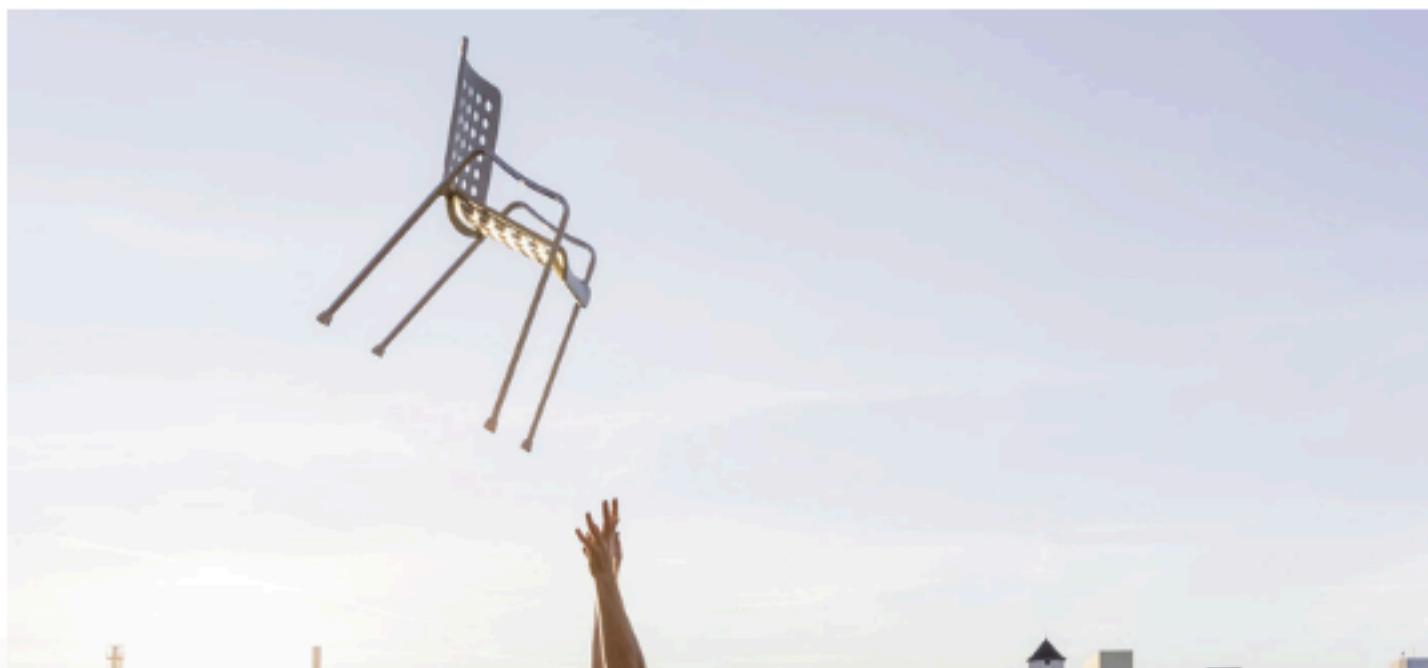
## Ceramic Clocks

Der Film gibt einen Einblick in die vielen verschiedenen handwerklichen Schritte der Produktion der Ceramic Clocks von George Nelson.

FILM ABSPIELEN

Design George Nelson

**vitra.**



# RWD Strategien für Inhalte und UI

Gemeinsame Sammlung...

# User Interface Patterns

<https://developers.google.com/web/fundamentals/design-and-ux/responsive/patterns>

# Tiny Tweaks





# FUTURE ★ FRIENDLY

---

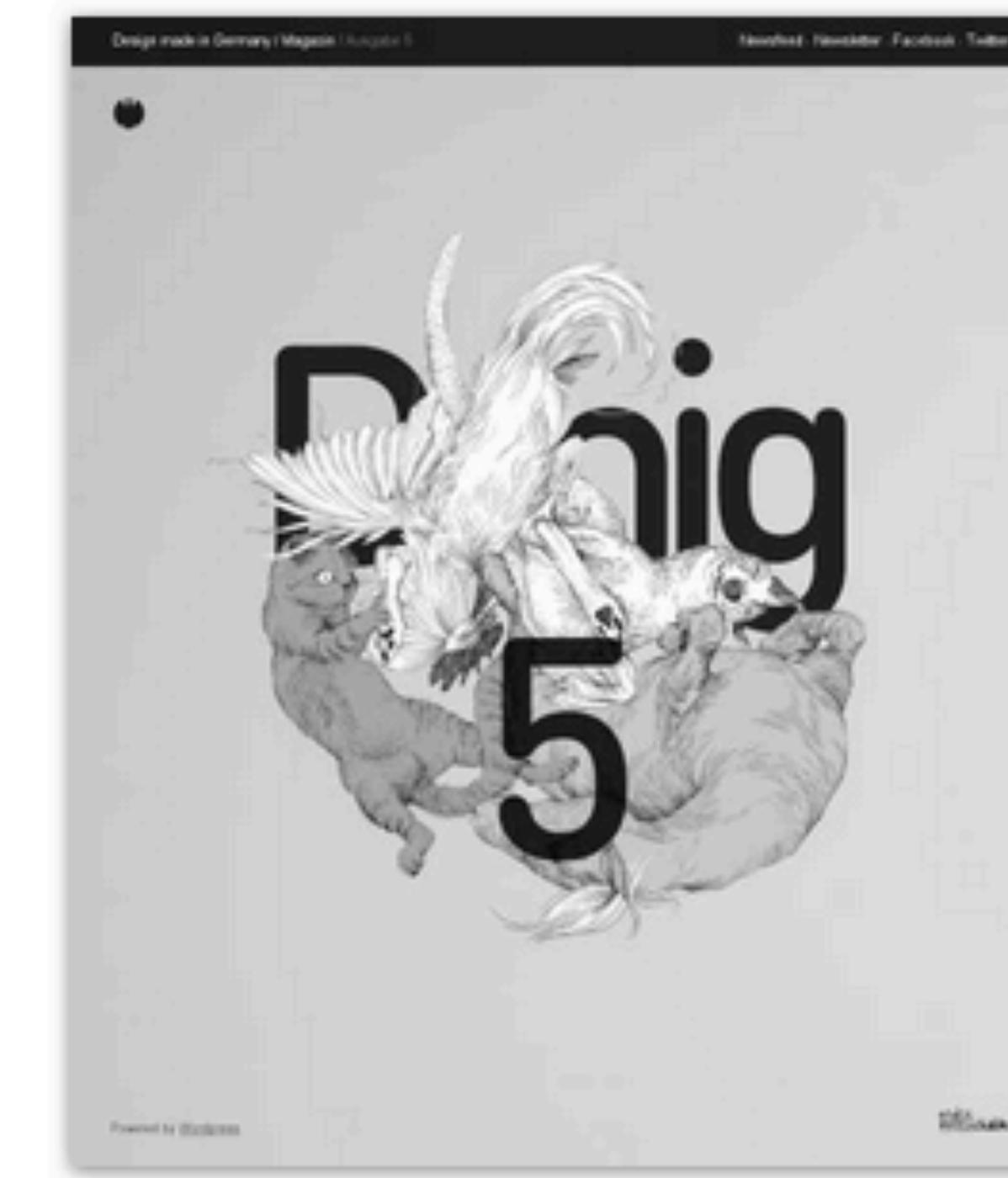
---



**In today's incredibly exciting yet overwhelming world  
of connected digital devices, these are the truths we  
hold to be self-evident:**

---

**D**isruption will only accelerate. The quantity and diversity of connected devices—many of which we haven't imagined yet—will explode, as will the quantity and diversity of the people around the world who use them. **Our existing standards, workflows, and infrastructure won't hold up.** Today's onslaught of devices is already pushing them to the breaking point. They can't withstand what's ahead. **Proprietary solutions will dominate at first.** Innovation necessarily precedes standardization. Technologists will scramble to these solutions before realizing (yet again) that a standardized platform is needed to maintain sanity. **The standards process will be painfully slow.** We will struggle with (and eventually agree upon) appropriate standards. During this period, the web will fall even further behind proprietary solutions.



**iPhone XR from \$18.99/mo. or \$449.\***

Two great ways to buy. Just trade in your current  
iPhone online or at an Apple Store.\*

[Buy >](#) [Learn more >](#)

## iPhone X®

All-screen design. Longest battery life ever in an iPhone.  
Fastest performance. Studio-quality photos.

[Learn more >](#) [Buy >](#)



# Tiny Tweaks

Kleine Anpassungen am Layout  
z.B. Font-Size, Bildgrößen,  
Umgang mit Inhalt



# Mostly Fluid



**e**  
STAZIONE SCIENCE NEWS MULTIMEDIA



Princess Elisabeth Antarctica  
**THE FIRST "ZERO EMISSION" POLAR RESEARCH STATION**

For decades, Antarctica has been the home of science and an example for preservation governance. In the middle of this pristine environment, the International Polar Foundation signed the return of Belgium on the continent with the first ever "zero emission" station: the Princess Elisabeth Antarctica.

LATEST NEWS



January 10, 2012  
**Home Sweet Home**  
After 5 months days spent at the coast, with the International Polar Foundation's arrival and the surge of the Mvya Antartica, we're back at the station! More news on [Mvya Antartica](#).



January 10, 2012  
**Johan Beire: the Work of the PEA Technical Team**  
Project Manager Johan Beire offers insight into the Princess Elisabeth Antarctica's current activities and how they relate to the station's mission.



January 09, 2012  
**A Speedy Offloading**  
The goods of the Antarctic are finally arriving upon the PEA. The Mvya Antartica was able to load at Ocean Bay via the IPF foundation's crane and the surge of the Mvya Antartica were back at the station. On Monday, January 09.

**e**  
STATION SCIENCE NEWS MULTIMEDIA



Princess Elisabeth Antarctica  
**THE FIRST "ZERO EMISSION" POLAR RESEARCH STATION**

For decades, Antarctica has been the home of science and an example for preservation governance. In the middle of this pristine environment, the International Polar Foundation signed the return of Belgium on the continent with the first ever "zero emission" station: the Princess Elisabeth Antarctica.

LATEST NEWS



January 10, 2012  
**Home Sweet Home**  
After 5 months days spent at the coast, with the International Polar Foundation's arrival and the surge of the Mvya Antartica, we're back at the station! More news on [Mvya Antartica](#).



January 10, 2012  
**Johan Beire: the Work of the PEA Technical Team**  
Project Manager Johan Beire offers insight into the Princess Elisabeth Antarctica's current activities and how they relate to the station's mission.



January 09, 2012  
**A Speedy Offloading**  
The goods of the Antarctic are finally arriving upon the PEA. The Mvya Antartica was able to load at Ocean Bay via the IPF foundation's crane and the surge of the Mvya Antartica were back at the station. On Monday, January 09.

**e**  
STATION SCIENCE NEWS MULTIMEDIA



Princess Elisabeth Antarctica  
**THE FIRST "ZERO EMISSION" POLAR RESEARCH STATION**

For decades, Antarctica has been the home of science and an example for preservation governance. In the middle of this pristine environment, the International Polar Foundation signed the return of Belgium on the continent with the first ever "zero emission" station: the Princess Elisabeth Antarctica.

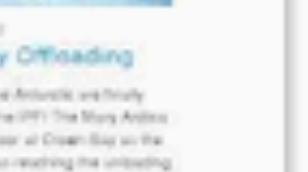
LATEST NEWS



January 10, 2012  
**Home Sweet Home**  
After 5 months days spent at the coast, with the International Polar Foundation's arrival and the surge of the Mvya Antartica, we're back at the station! More news on [Mvya Antartica](#).



January 10, 2012  
**Johan Beire: the Work of the PEA Technical Team**  
Project Manager Johan Beire offers insight into the Princess Elisabeth Antarctica's current activities and how they relate to the station's mission.



January 09, 2012  
**A Speedy Offloading**  
The goods of the Antarctic are finally arriving upon the PEA. The Mvya Antartica was able to load at Ocean Bay via the IPF foundation's crane and the surge of the Mvya Antartica were back at the station. On Monday, January 09.

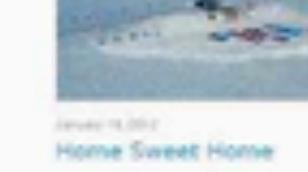
**e**  
STATION SCIENCE NEWS MULTIMEDIA



Princess Elisabeth Antarctica  
**THE FIRST "ZERO EMISSION" POLAR RESEARCH STATION**

For decades, Antarctica has been the home of science and an example for preservation governance. In the middle of this pristine environment, the International Polar Foundation signed the return of Belgium on the continent with the first ever "zero emission" station: the Princess Elisabeth Antarctica.

LATEST NEWS



January 10, 2012  
**Home Sweet Home**  
After 5 months days spent at the coast, with the International Polar Foundation's arrival and the surge of the Mvya Antartica, we're back at the station! More news on [Mvya Antartica](#).



January 10, 2012  
**Johan Beire: the Work of the PEA Technical Team**  
Project Manager Johan Beire offers insight into the Princess Elisabeth Antarctica's current activities and how they relate to the station's mission.



January 09, 2012  
**A Speedy Offloading**  
The goods of the Antarctic are finally arriving upon the PEA. The Mvya Antartica was able to load at Ocean Bay via the IPF foundation's crane and the surge of the Mvya Antartica were back at the station. On Monday, January 09.

# BMW 7ER

Jetzt konfigurieren

Mehr erfahren



Die jungen gebrauchten von BMW

• • • • •

Modelle    Bauformen

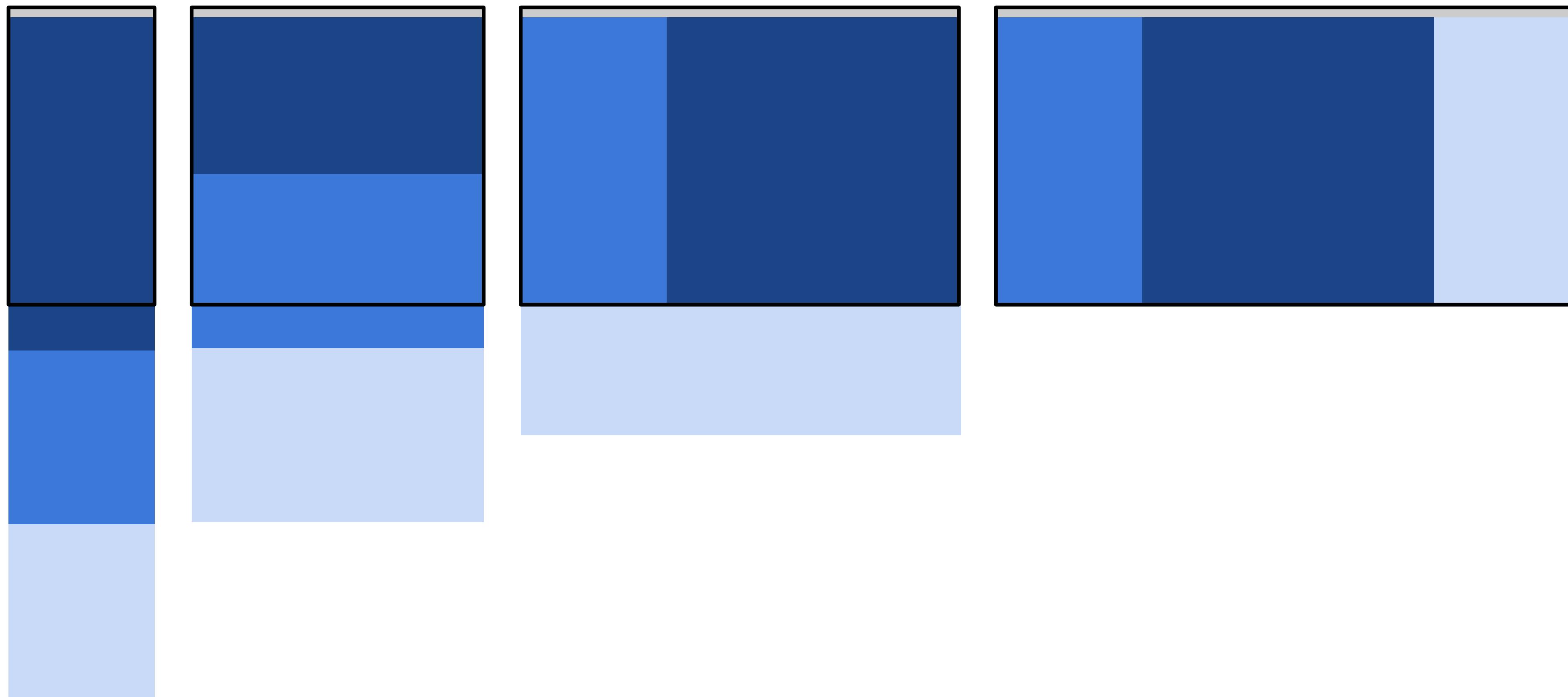
Alle

1er    2er    3er    4er    5er    6er    7er    8er    X    Z    i    M    Plug-in-Hybrid

# Mostly Fluid



# Column Drop



# Respond to your user's browser features.

Modernizr tells you what HTML, CSS and JavaScript features the user's browser has to offer.

[Add your detects](#)[Development build](#)

## What is Modernizr?

It's a collection of superfast tests – or “detects” as we like to call them – which run as your web page loads, then you can use the results to tailor the experience to the user.

## Why do I need it?

All web developers come up against differences between browsers and devices. That's largely due to different feature sets: the latest versions of

## Getting Started

[Modernizr explained](#)[What is feature detection?](#)[Using Modernizr with JavaScript](#)[Using Modernizr with CSS](#)

## Latest News

[Modernizr 3.5.0](#)[Modernizr 3.4.0](#)[Modernizr 3.3.1](#)[Modernizr 3.3.0](#)

**Alle Jacken & Westen**

Hardshell-Jacken

Softshell-Jacken

Daunenjacken

Isolationsjacken

Windstopper

Regenjacken

Westen

Winterjacken

Ski- &amp; Snowboardjacken

## VERFÜGBARKEIT

 Available

FARRFN

GRÖSSE

PREIS

TECHNOLOGIEN (BEKLEIDUNG)

GEGIONET FÜR

HERREN - BEKLEIDUNG - JACKEN &amp; WESTEN

**226** Jacken & Westen für Herren

Sortieren ▾

SALE

SALE

SALE



Stoney

Hardshell-Jacke für Herren

470,00 € 280,00 €

SALE

Stoney

Hardshell-Jacke für Herren

470,00 € 280,00 €

SALE

Stoney

Hardshell-Jacke für Herren

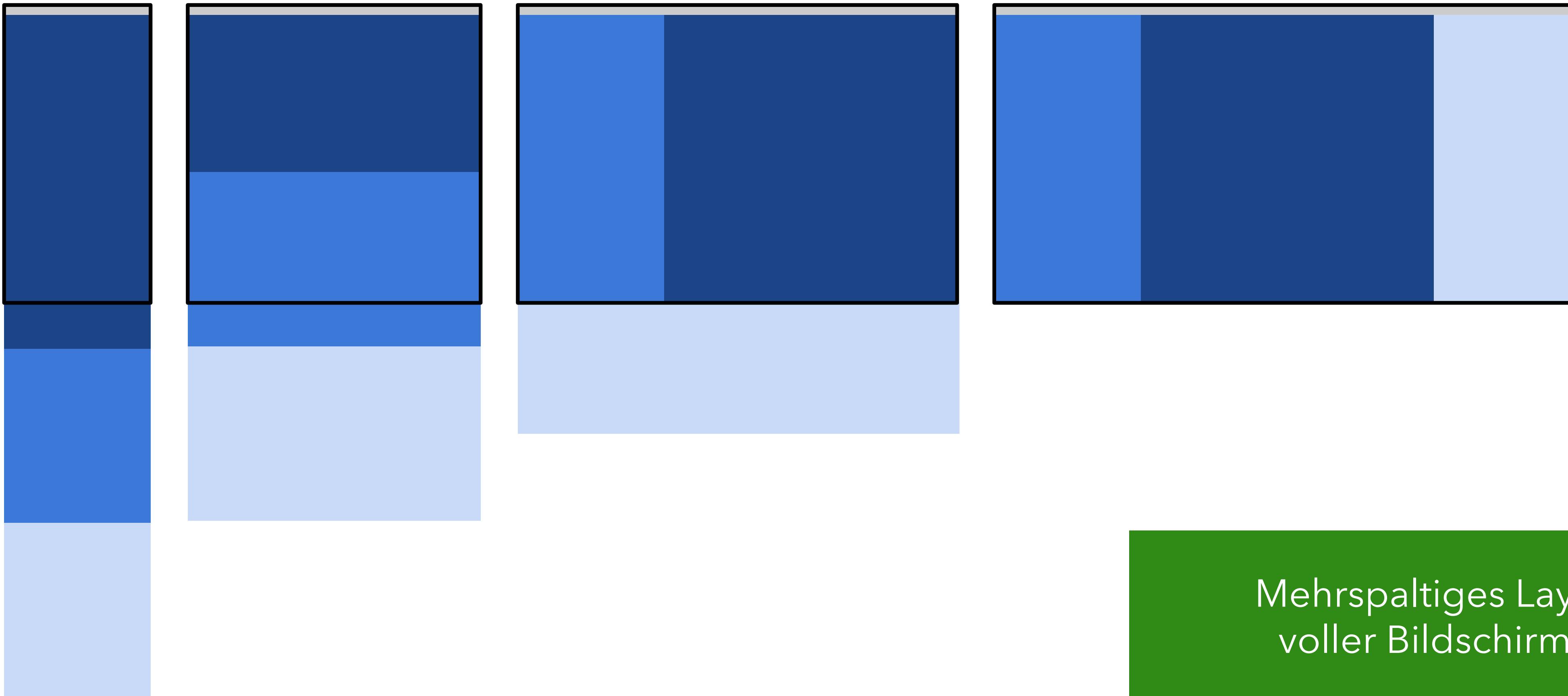
470,00 € 280,00 €

MAMMUT  
INSPIRED BY  
EIGER

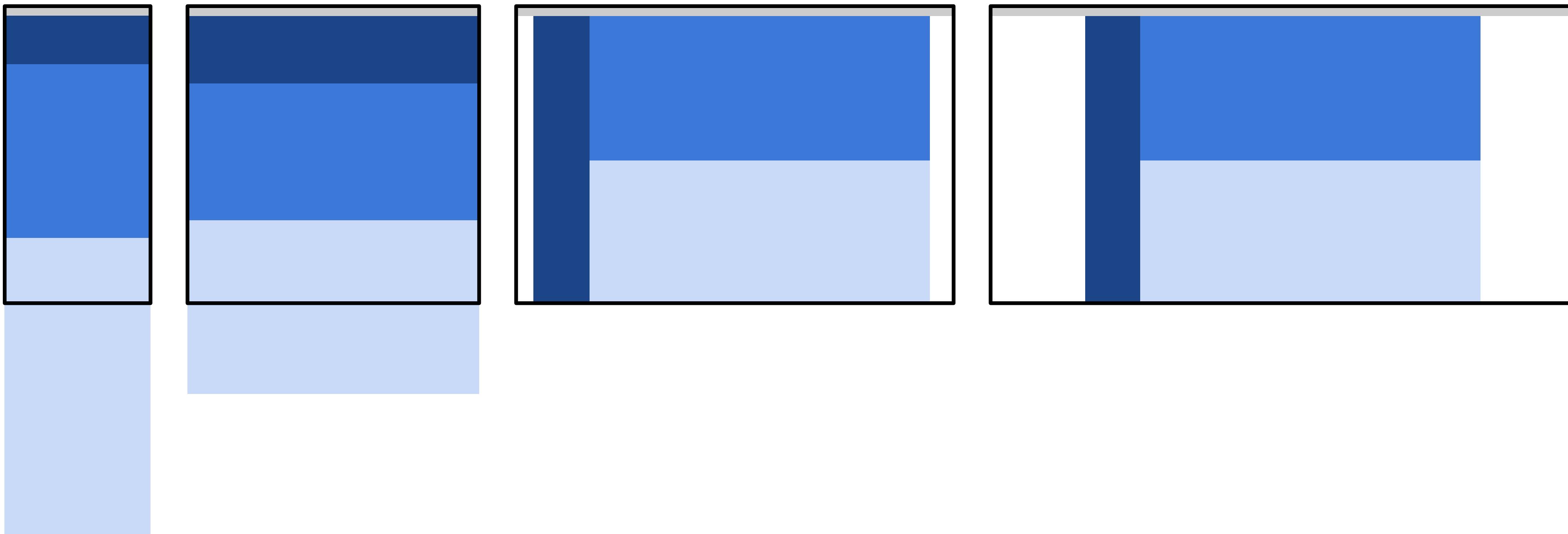
Feedback



# Column Drop



# Layout Shifter





**Tastemakers**

**Blog**

**The A-List**

**Contribute**

**About**

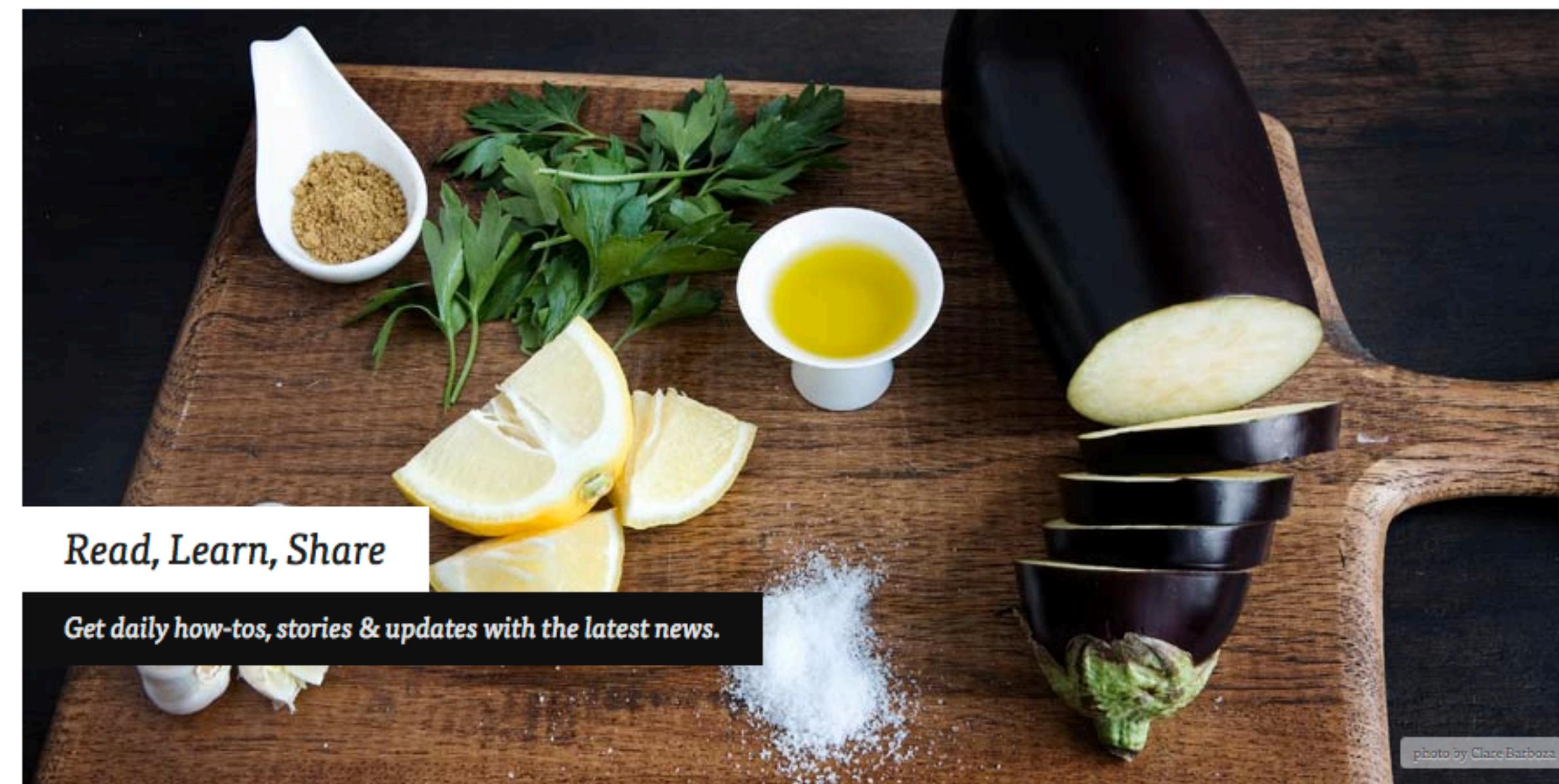
LATEST TWEET

[Join the Conversation](#)

LET'S BE FRIENDS!

For weekly finds, community recommendations, and more, like us on Facebook.

[Join the Community](#)



**Tastemakers**

Feast your eyes & get recipes!

**Blog**

News, how-tos, stories, and more

**The A-List**

Handpicked, absolute favorites

**Contribute**

We want to hear from you!



Sign up for our newsletter to receive a handpicked selection of the best stories, recipes, and news, delivered weekly to your inbox.

Email

Subscribe



**2012's Best Summer Cookbooks**

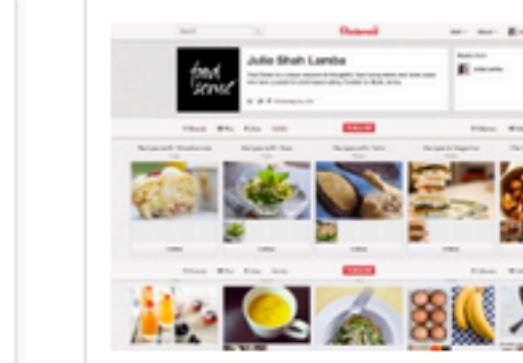
With the best of the season coming from "orchards, farms and gardens," NPR has put together an impressive collection of 10 summer cookbooks.

May 23, 2012 / [Read »](#)



**How to Make Vegetable Chips**

About a month ago, I ate almost an entire box of kale chips. My brother and I were visiting our cousin in Brooklyn, and before a very thoughtfully prepared vegan...



**Join us on Pinterest!**

If I could curate a cookbook for you, this would be it.

May 16, 2012 / [Read »](#)



**Recipes from a Sunday Supper**

I could not figure out what to do with the delectable slices of Pear Cake that I brought home from this wonderful Sunday supper - eat them slowly, a little bit at...

May 15, 2012 / [Read »](#)

ANDERSSON·WISE

STUDIO  
PROJECTS  
PRESS  
MONOGRAPH  
CONTACT



TEMPLE RANCH  
DUVAL COUNTY, TX

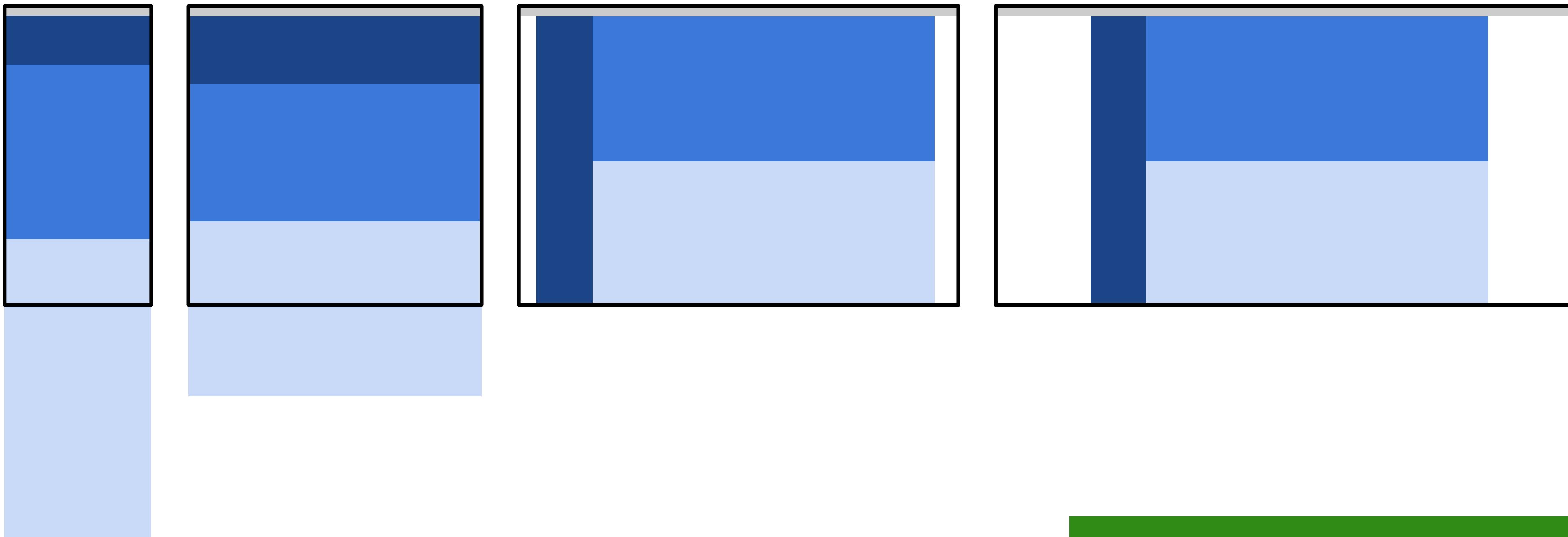
FEATURED PRESS

## ON THE BOARDS - WESTVIEW

A·W

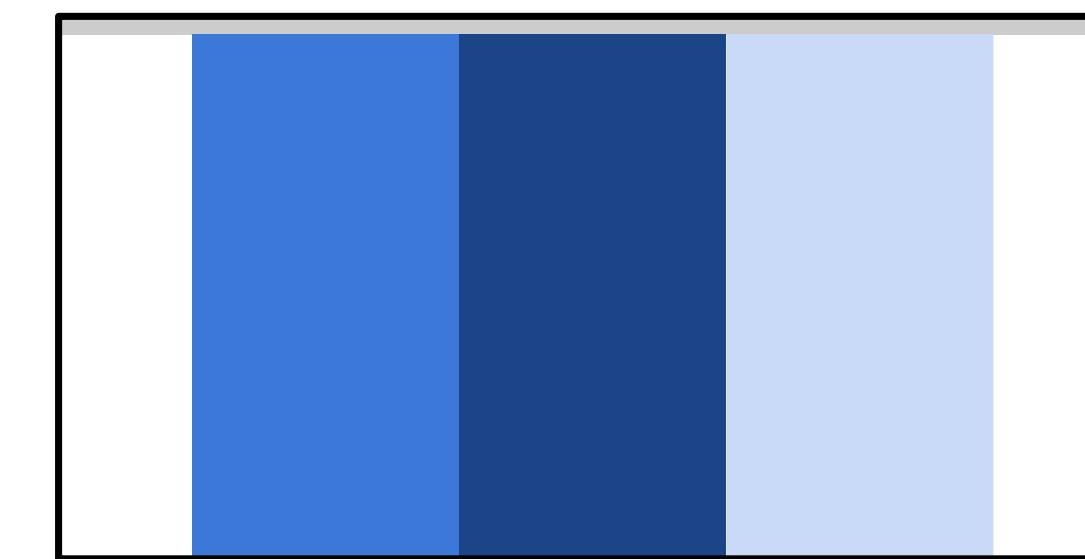
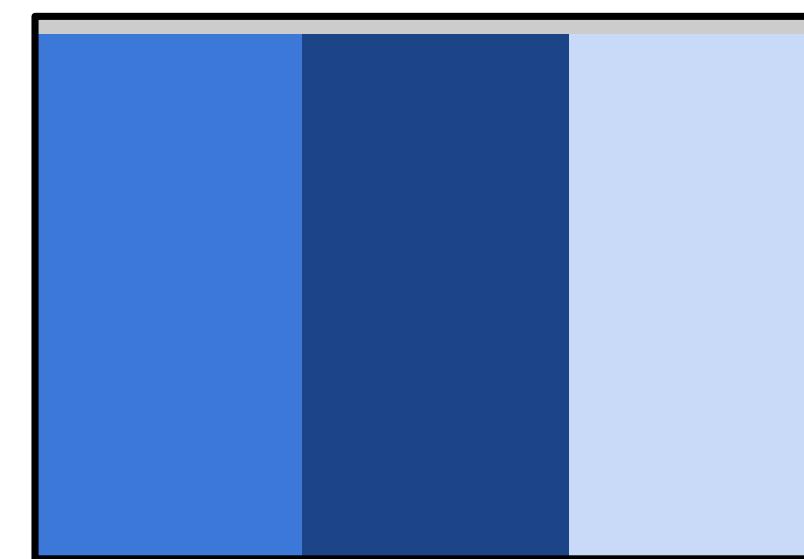
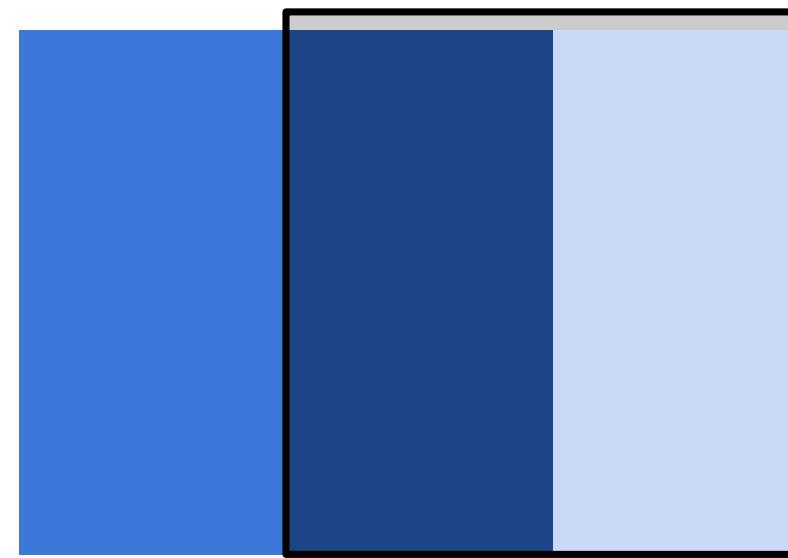
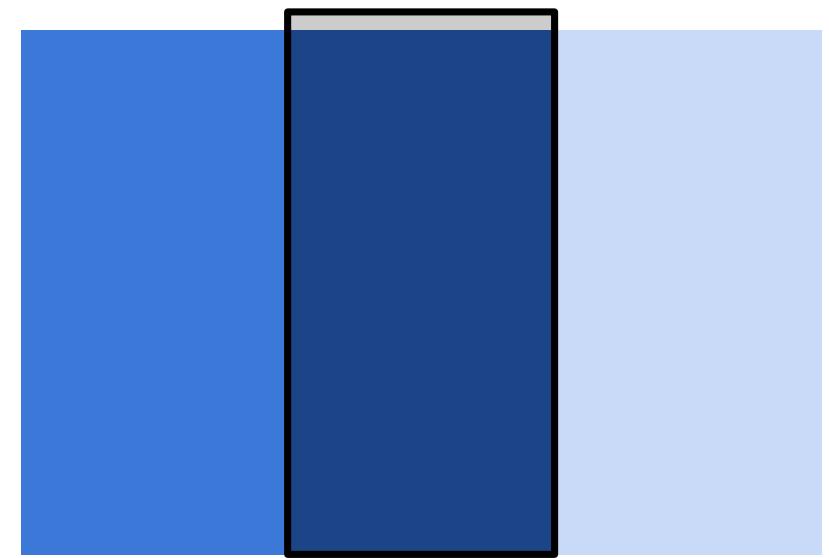
Andersson-Wise is an architecture & design studio based in Austin, Texas. Our collaborative approach to residential, institutional, and hospitality architecture results in precise solutions carefully attuned to their purpose.

# Layout Shifter



Umfangreiche Layoutanpassung  
für unterschiedliche Bildschirmbreiten

# Off Canvas





TWO IS COMPANY



SCROLL DOWN

ATHENS RESIDENCE II

# WANDERLUST

For as long as we can remember, we have been travelling the world and sharing our most memorable experiences. We thought it was about time to collect our favourite stories and put them into one selection. Enjoy!

[Discover our favorites](#)

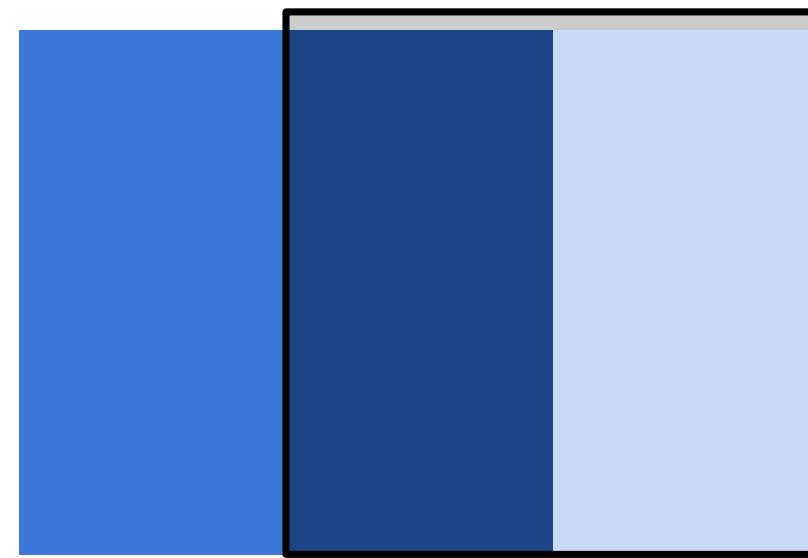
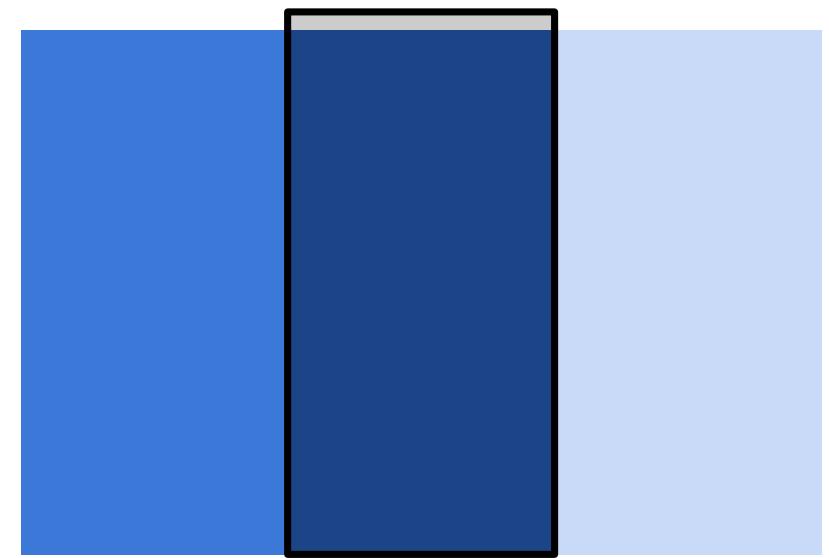


*There is so much to discover* —

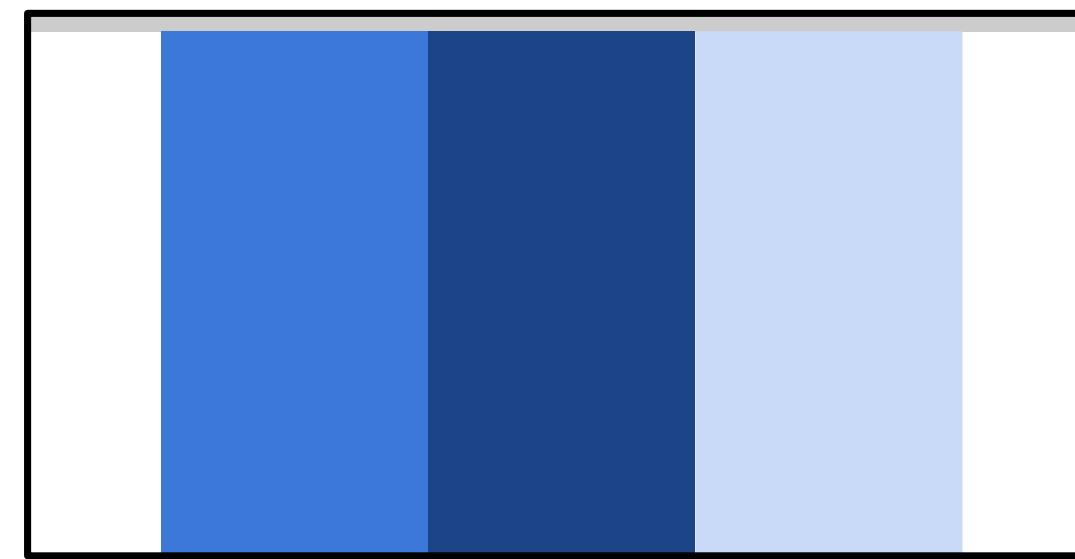
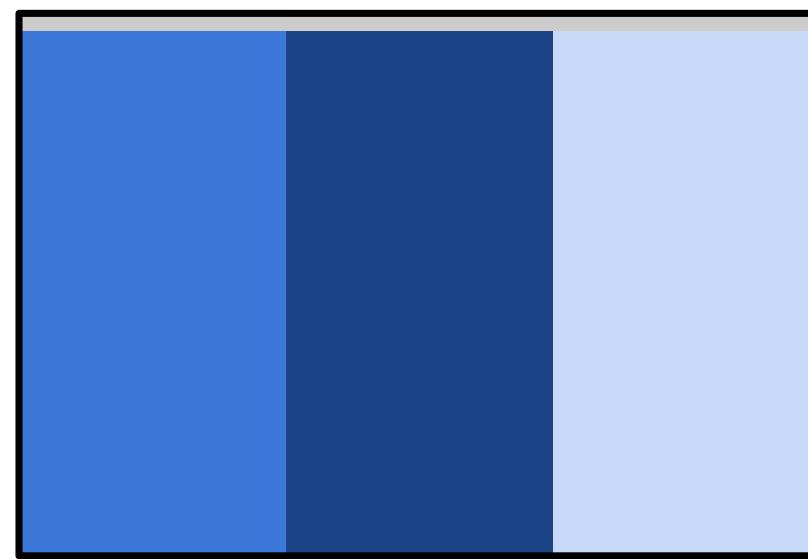
The sporty side of Cape Town



# Off Canvas



Weniger häufig benötigter Inhalt  
im nicht sichtbaren Bereich,  
z.B. Navigation



# Besondere Problemstellungen

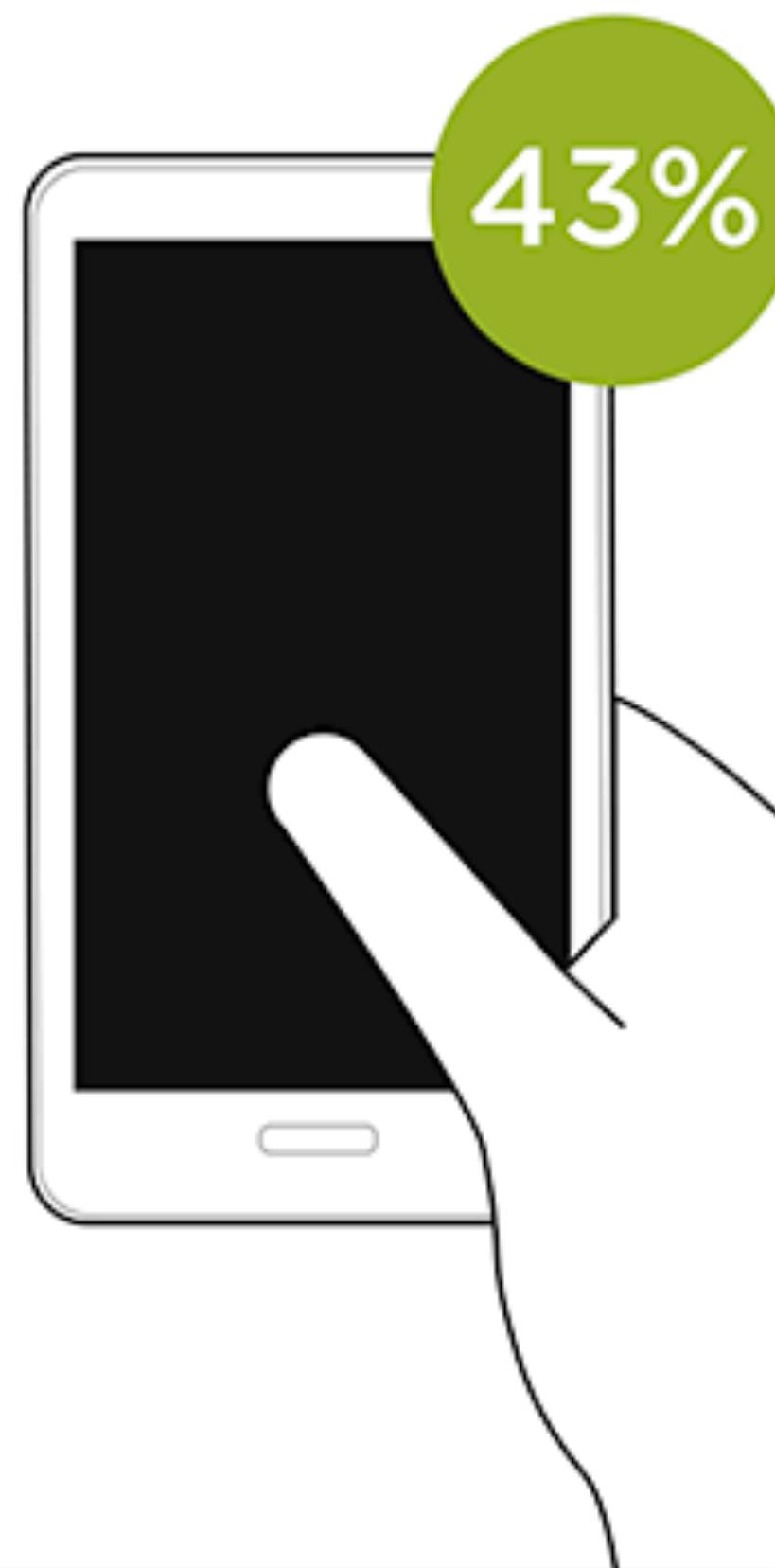
## Wachsende Displaygrößen Smartphones

2014



OF ACTIVE  
SMARTPHONES HAVE  
5.5"-6" SCREENS

2017

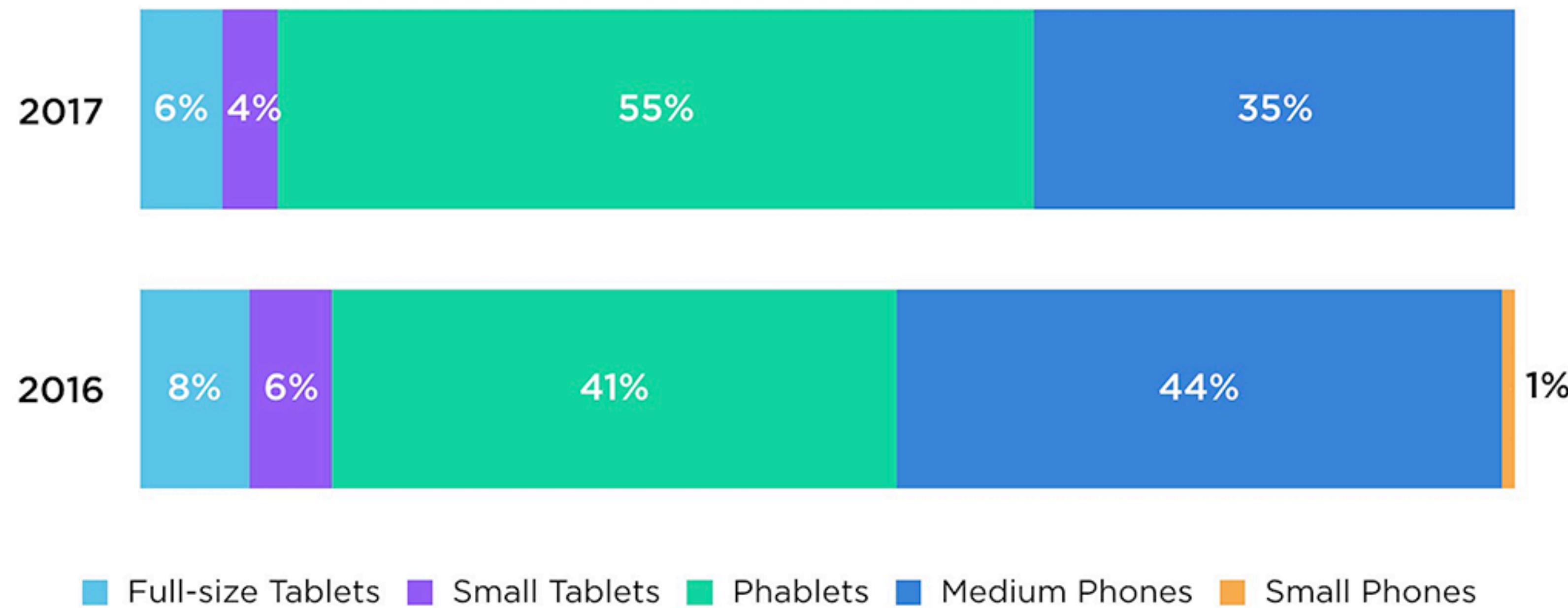


OF ACTIVE  
SMARTPHONES HAVE  
5.5"-6" SCREENS

VS

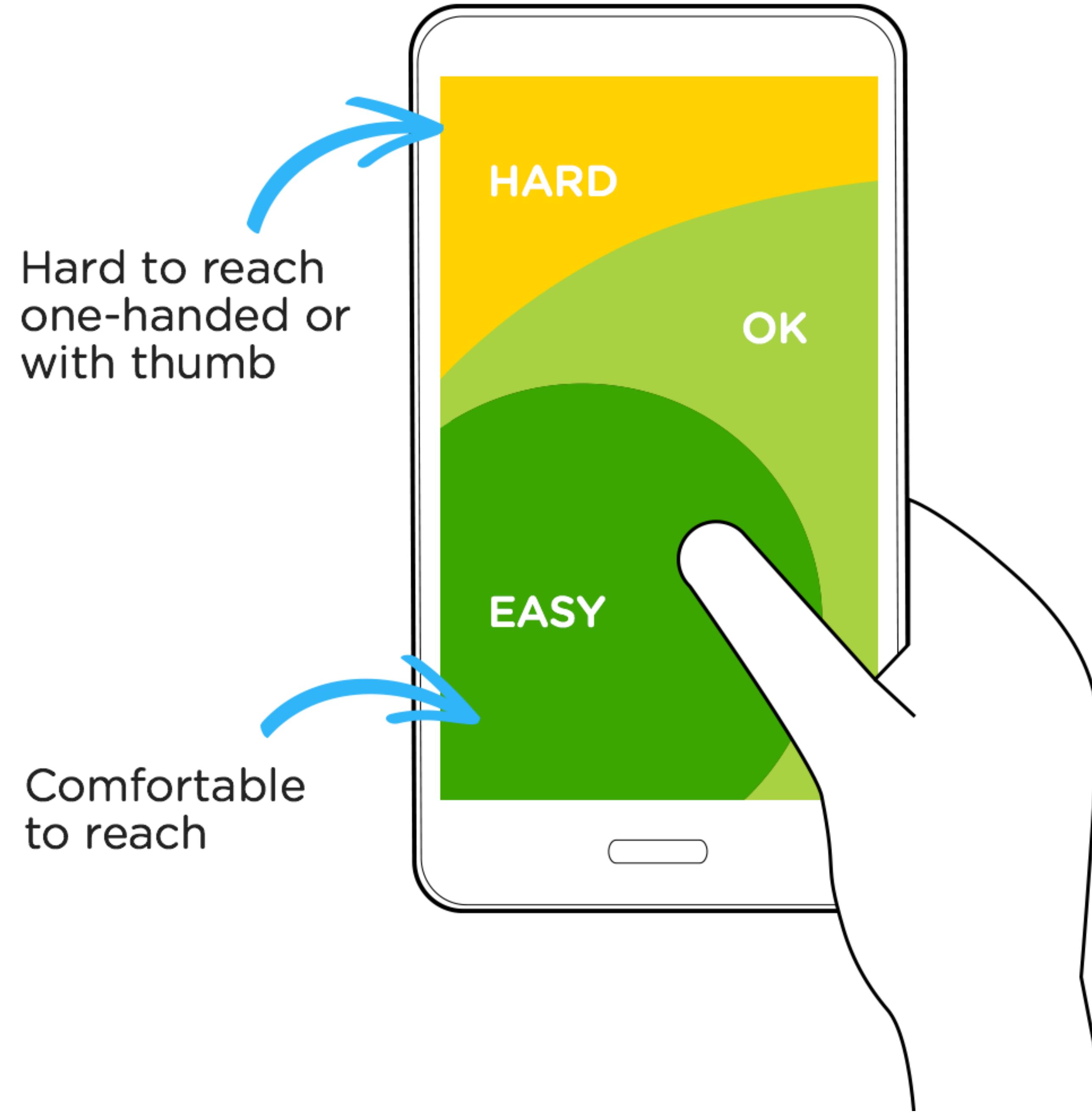
# Form Factor Distribution

## End of Year Device Distribution



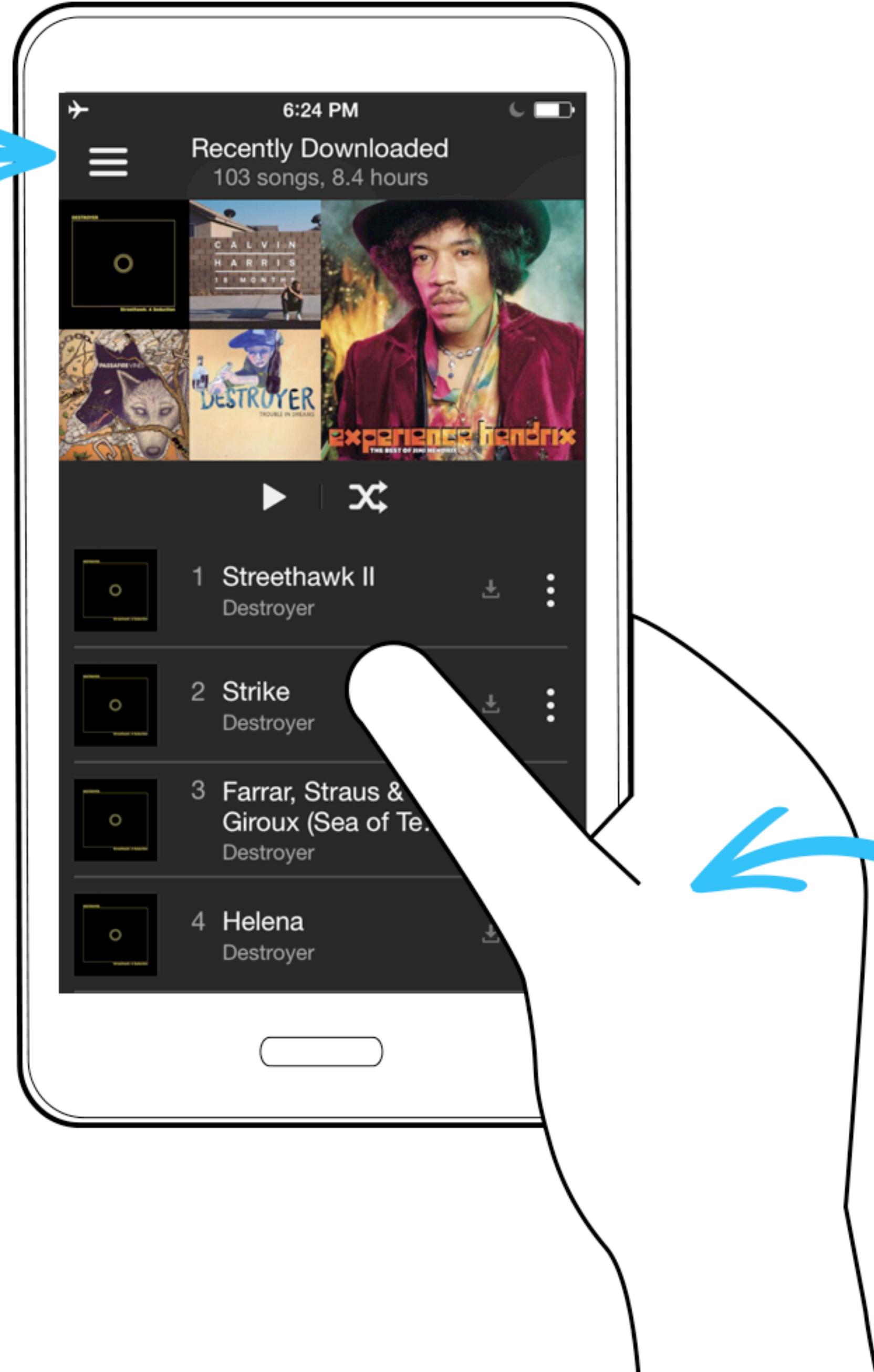
Source: Flurry Analytics, 2016-2017

Quelle: <https://www.lukew.com/ff/entry.asp?1986>

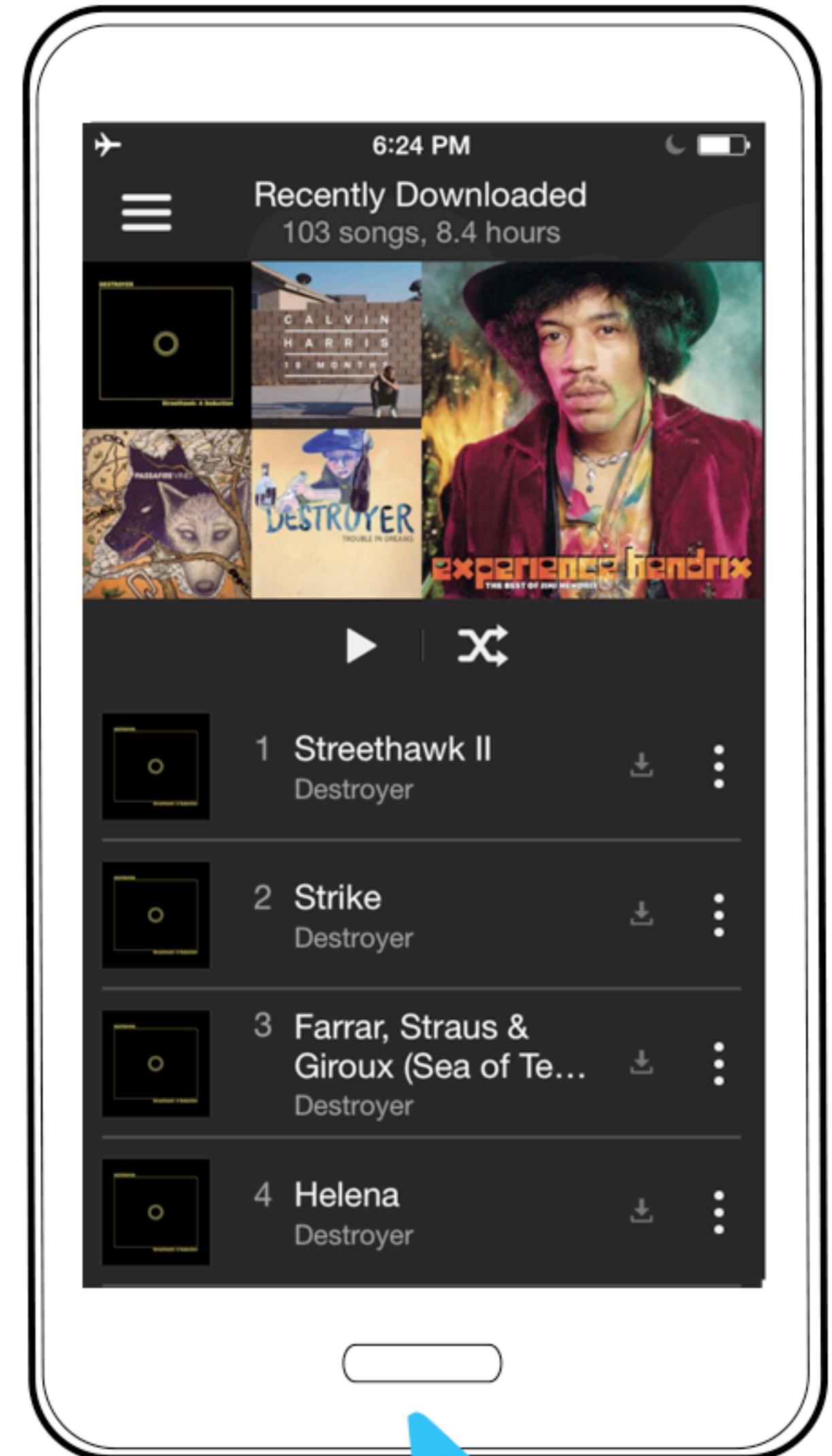


Quelle: <https://www.lukew.com/ff/entry.asp?1986>

Hard to reach  
primary control

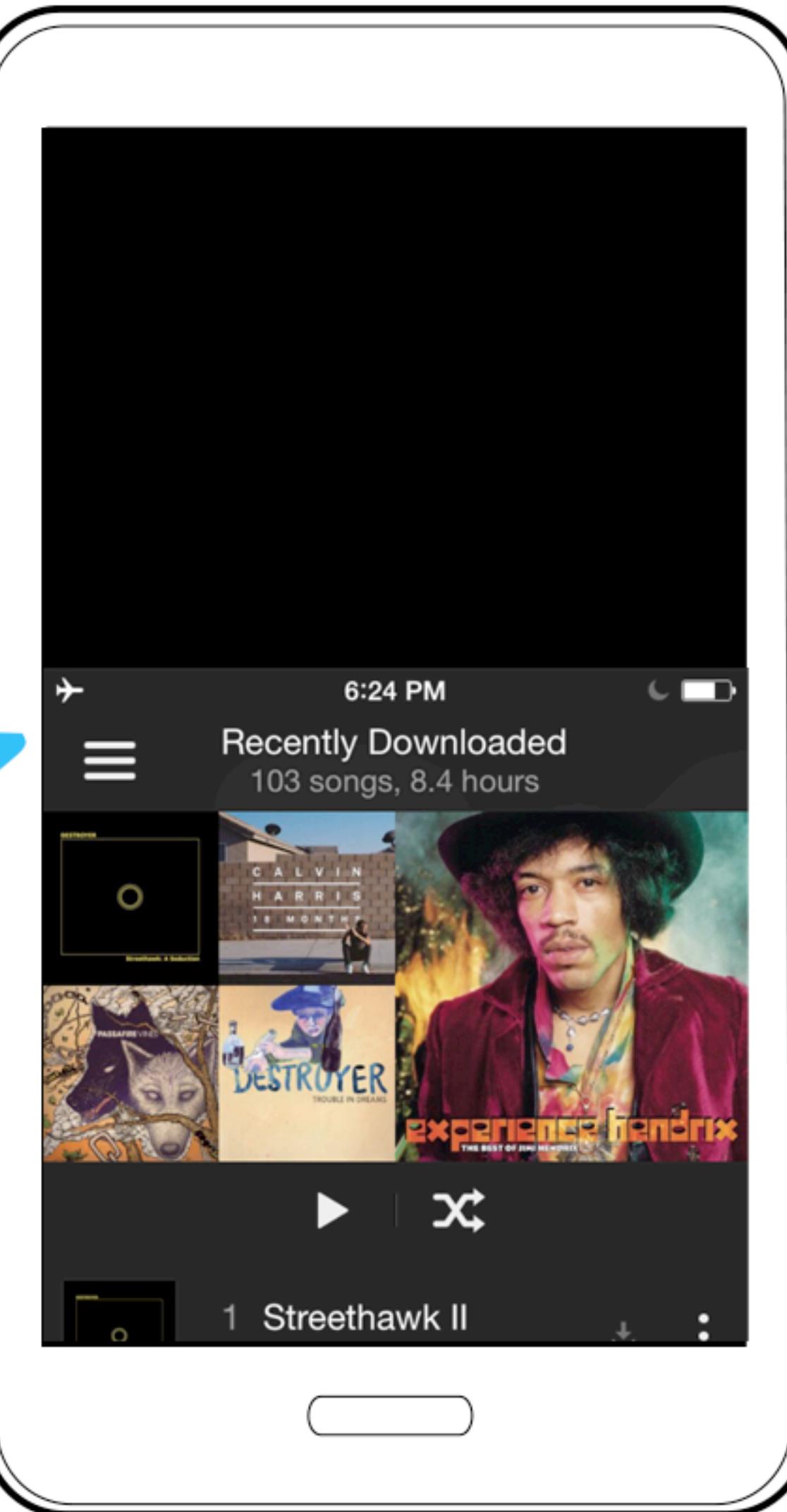
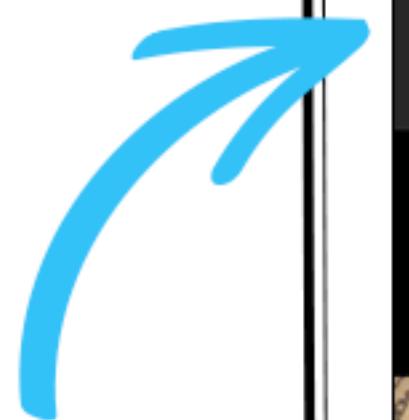


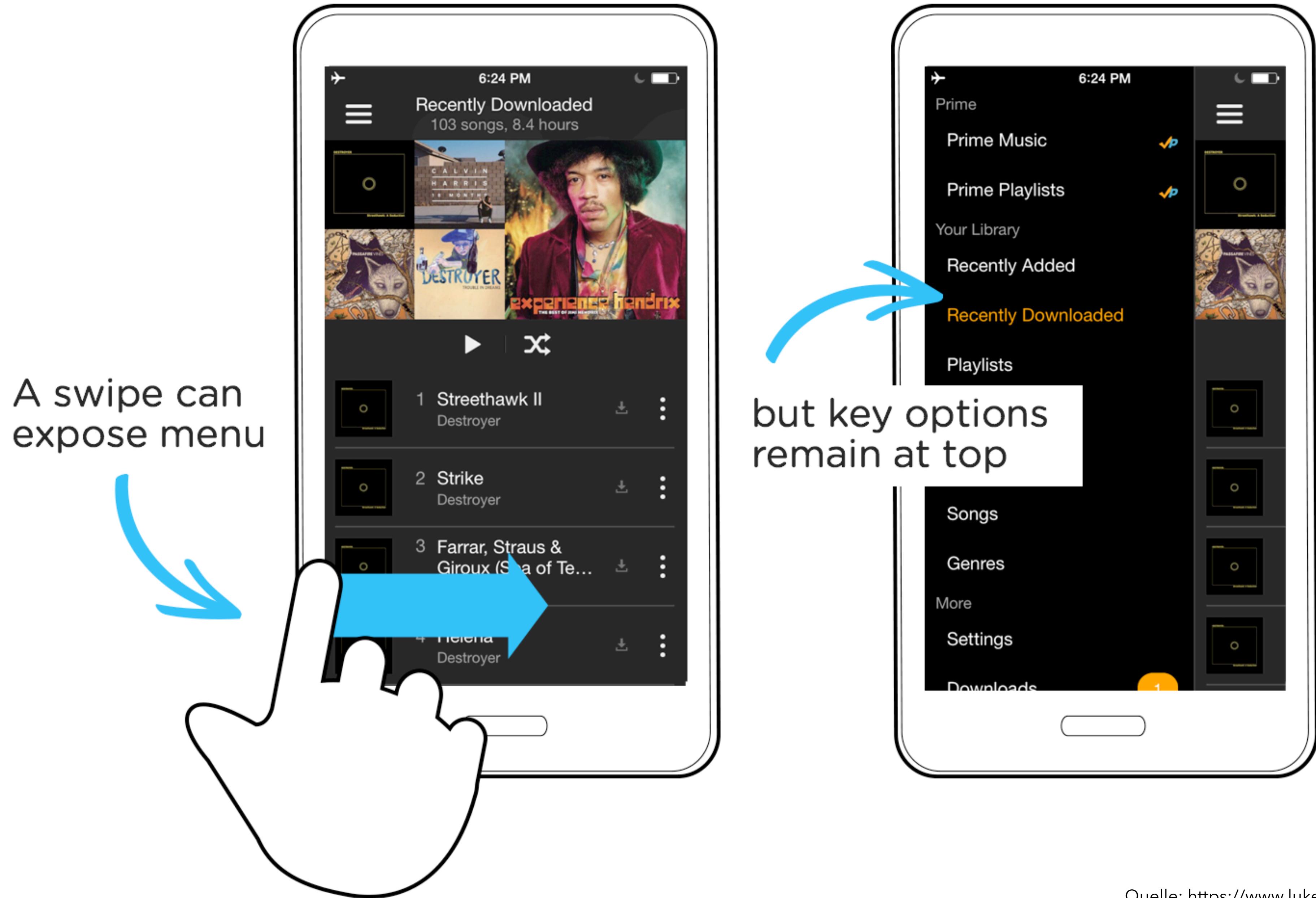
Comfortable  
one-handed grip



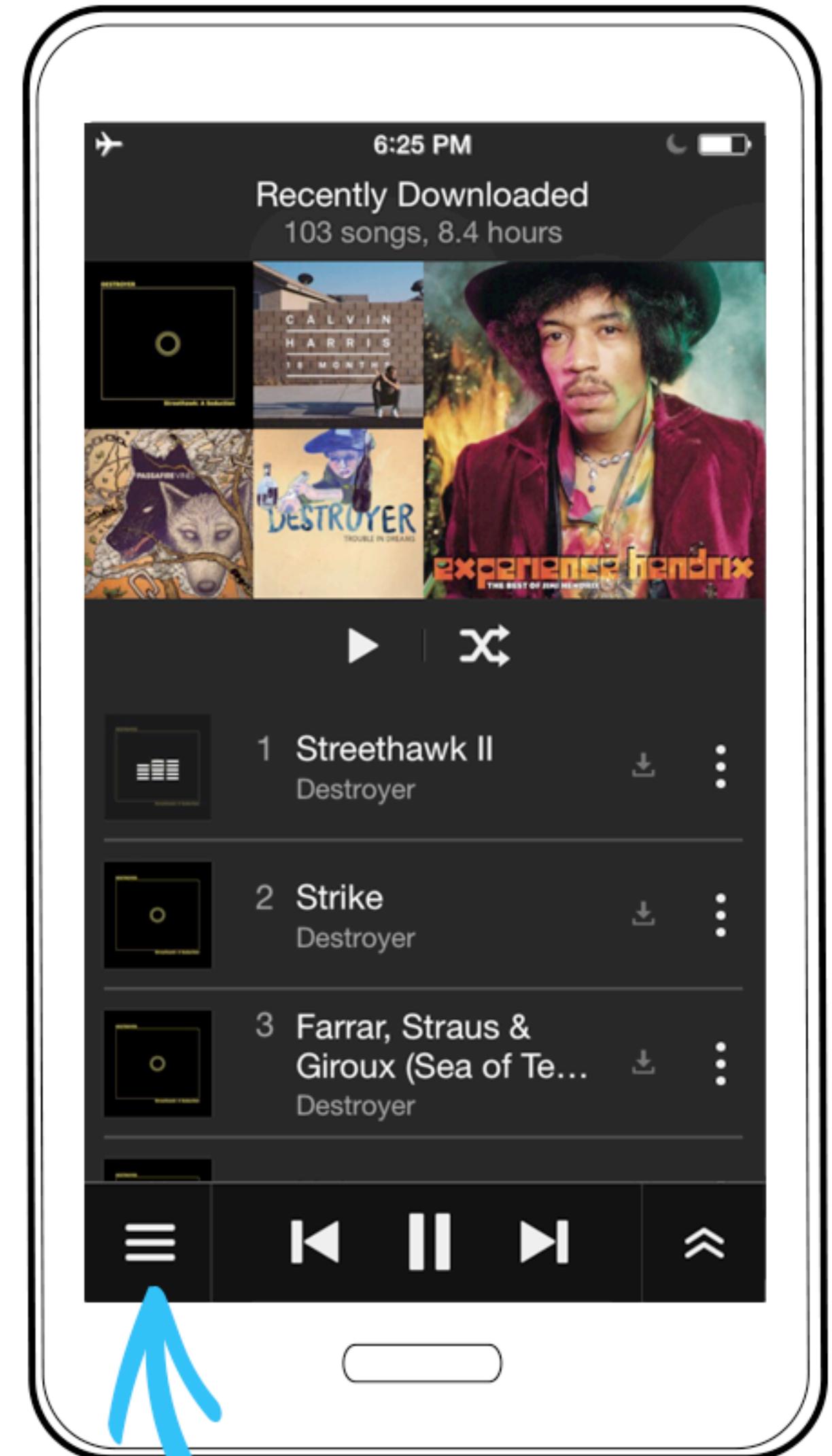
A double tap on  
the button...

...makes the  
control easier  
to reach

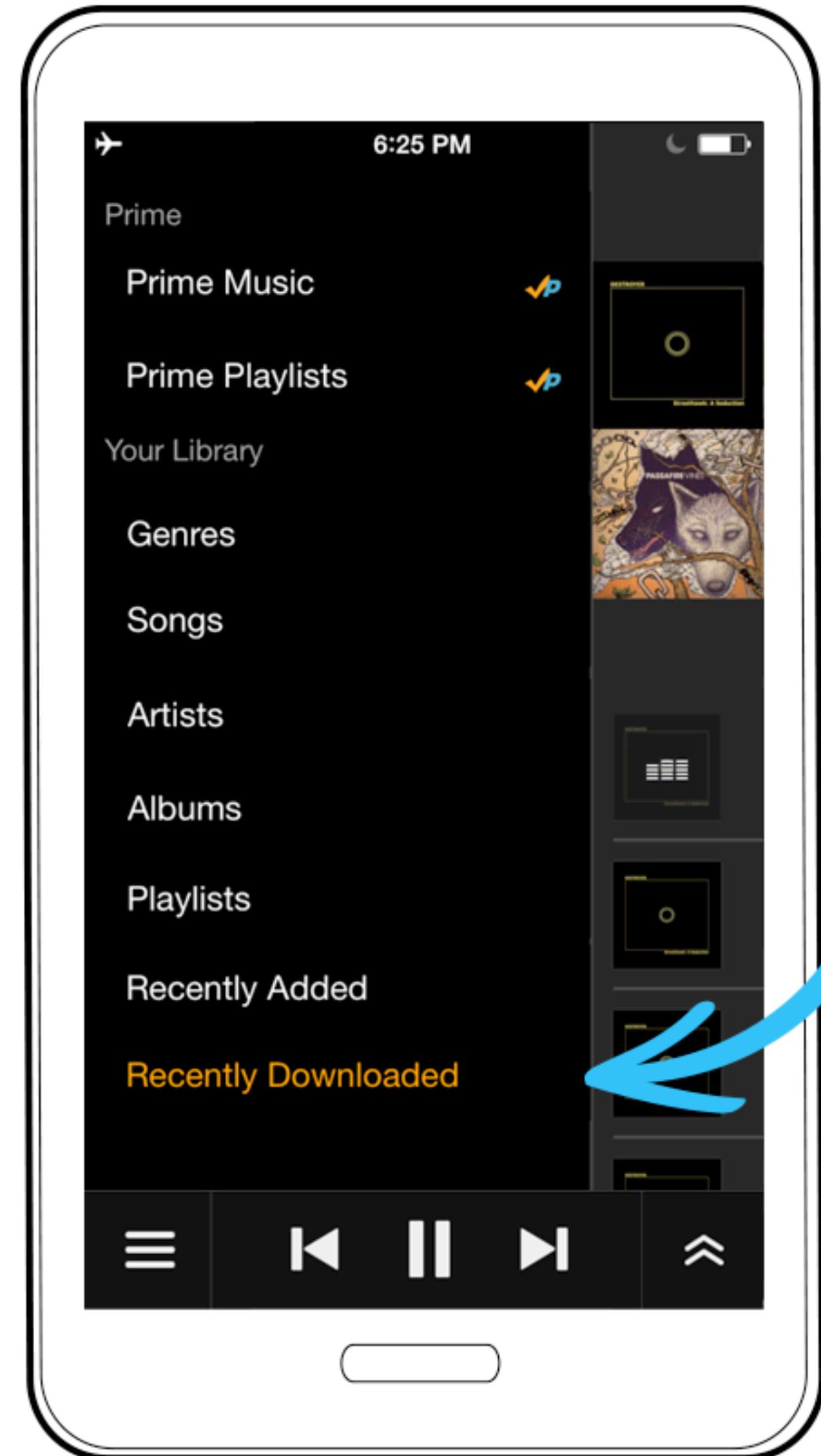




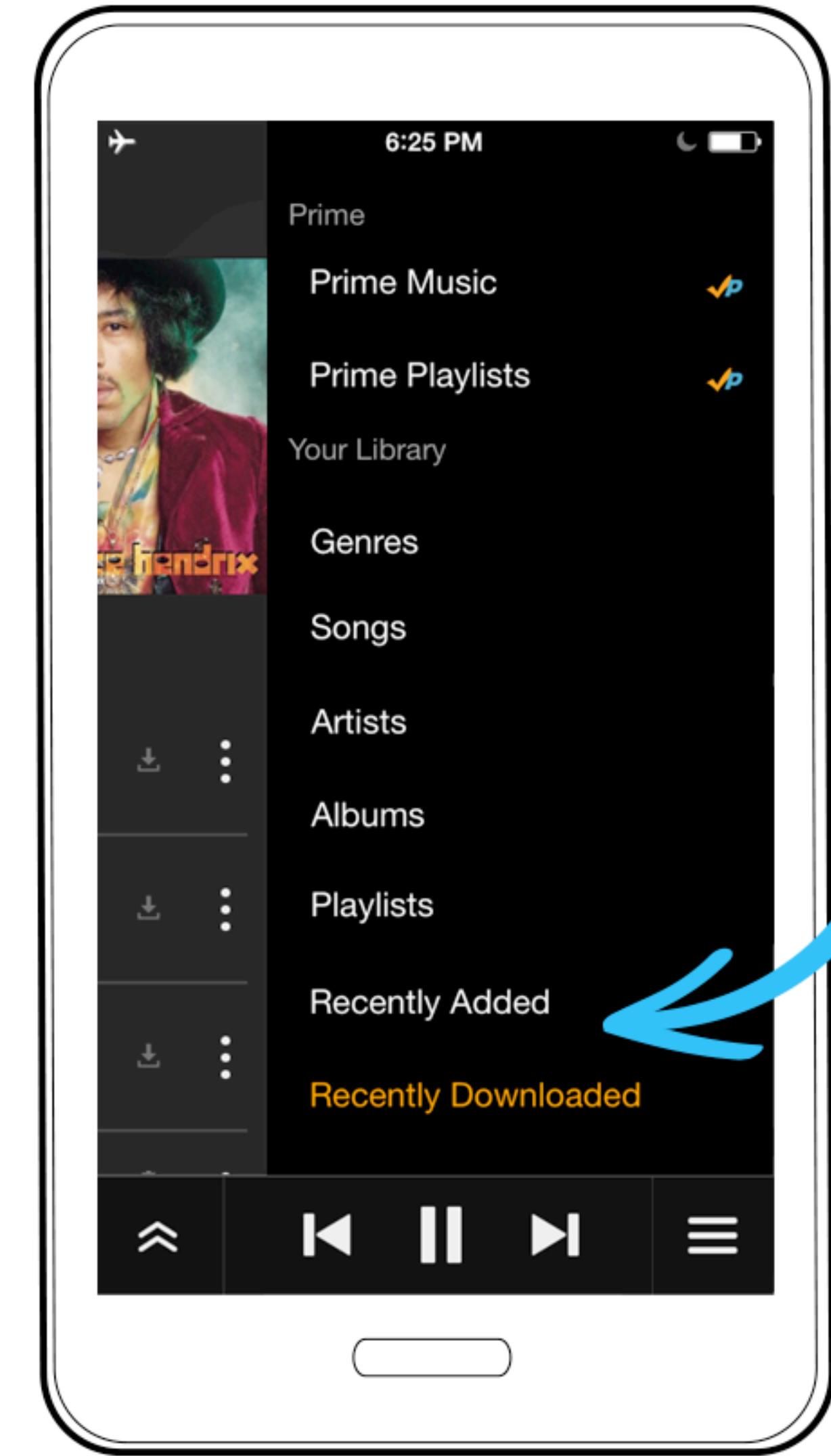
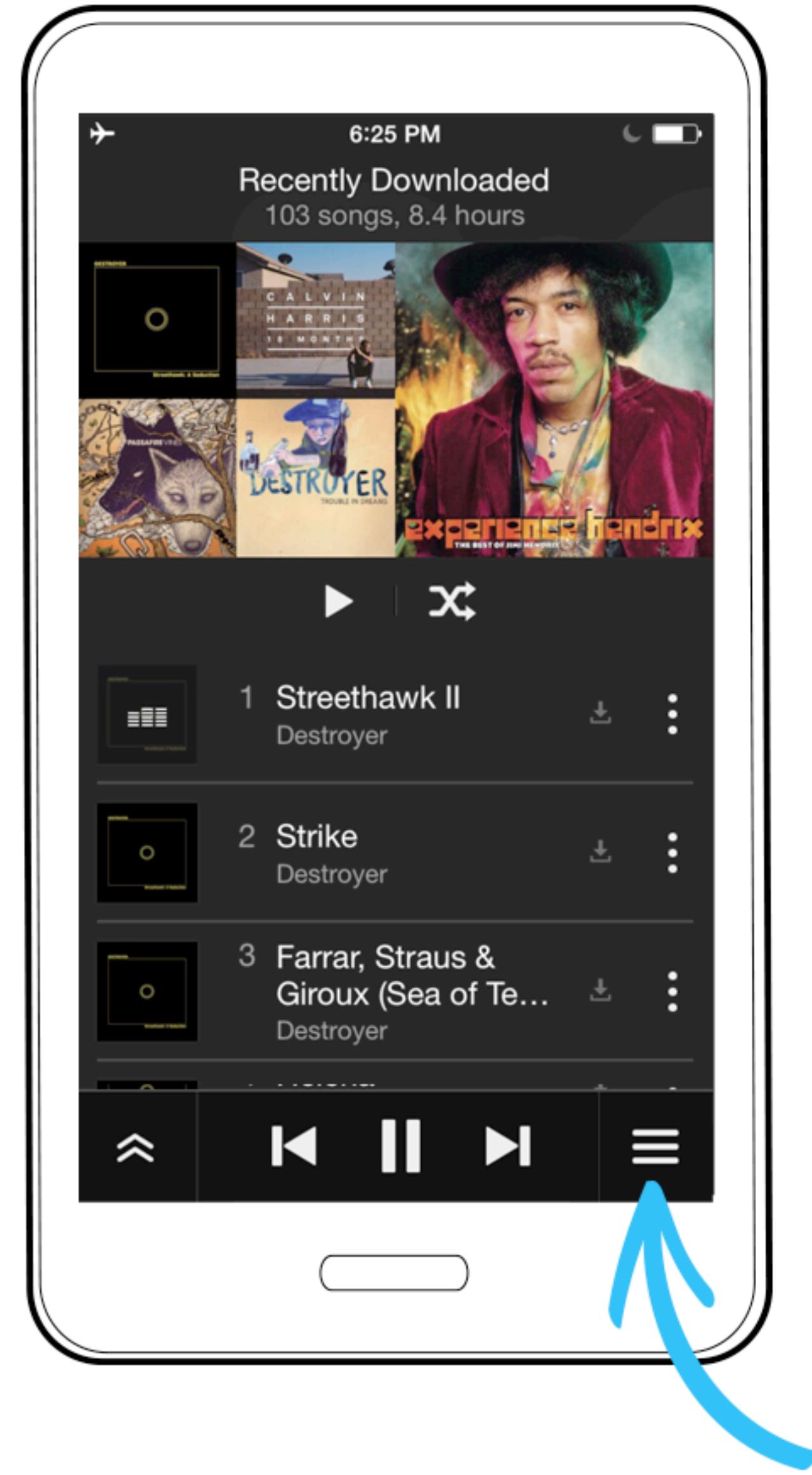
Quelle: <https://www.lukew.com/ff/entry.asp?1986>



Menu control in easy  
to reach position

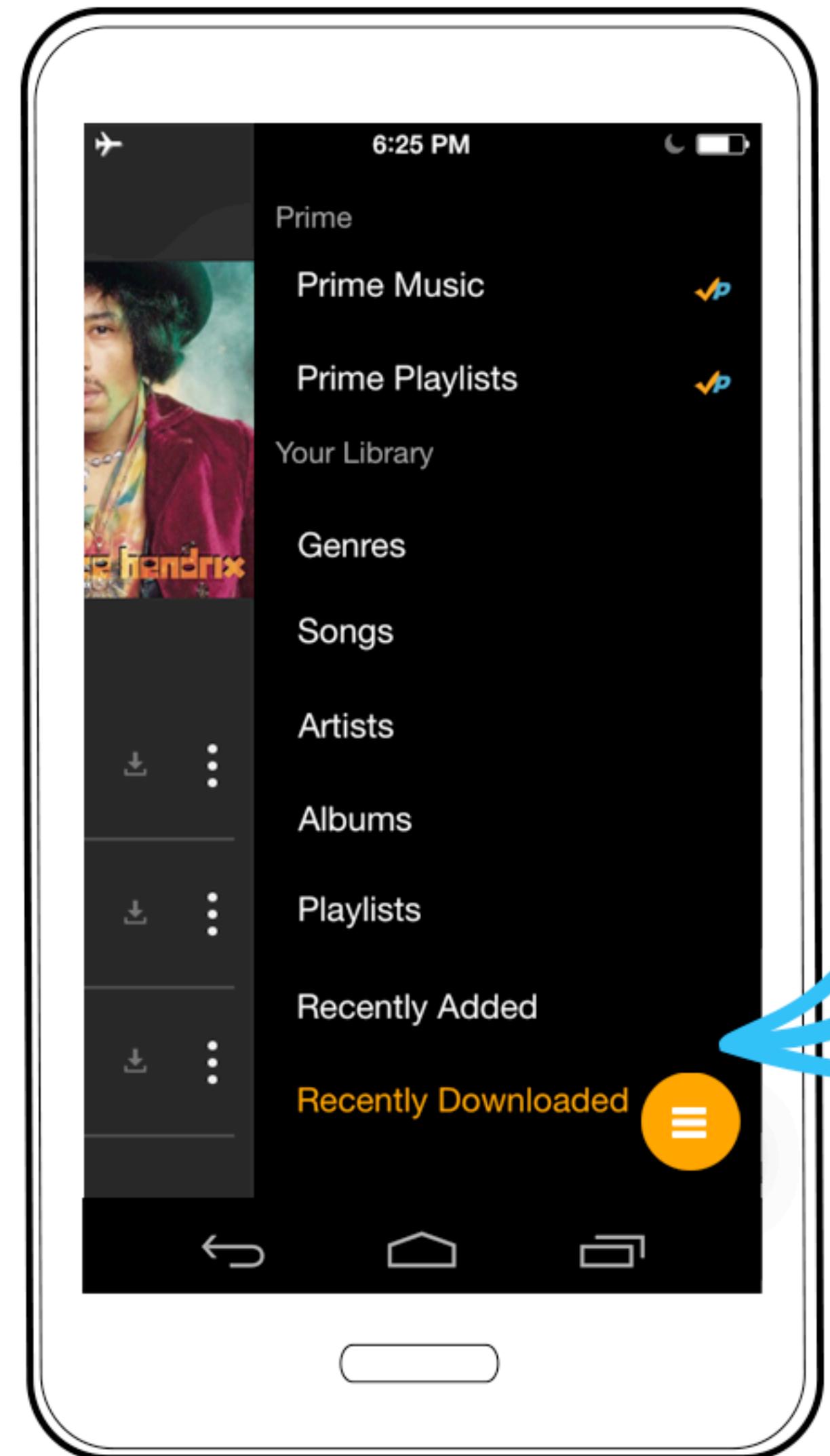
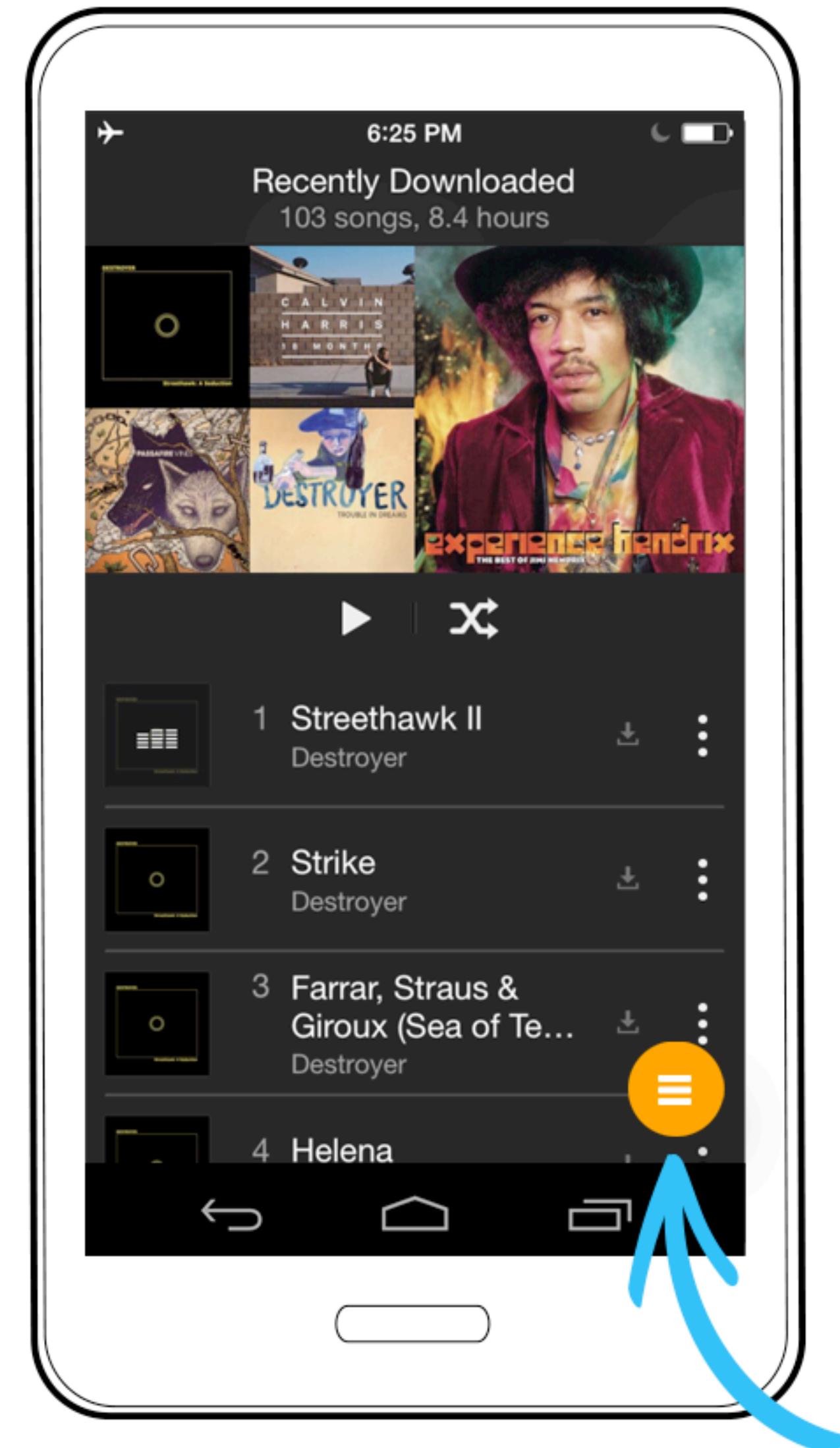


most common  
options at  
bottom



Menu control in easy  
to reach position

most common  
options at  
bottom



Floating menu  
control

When tapped  
expands menu