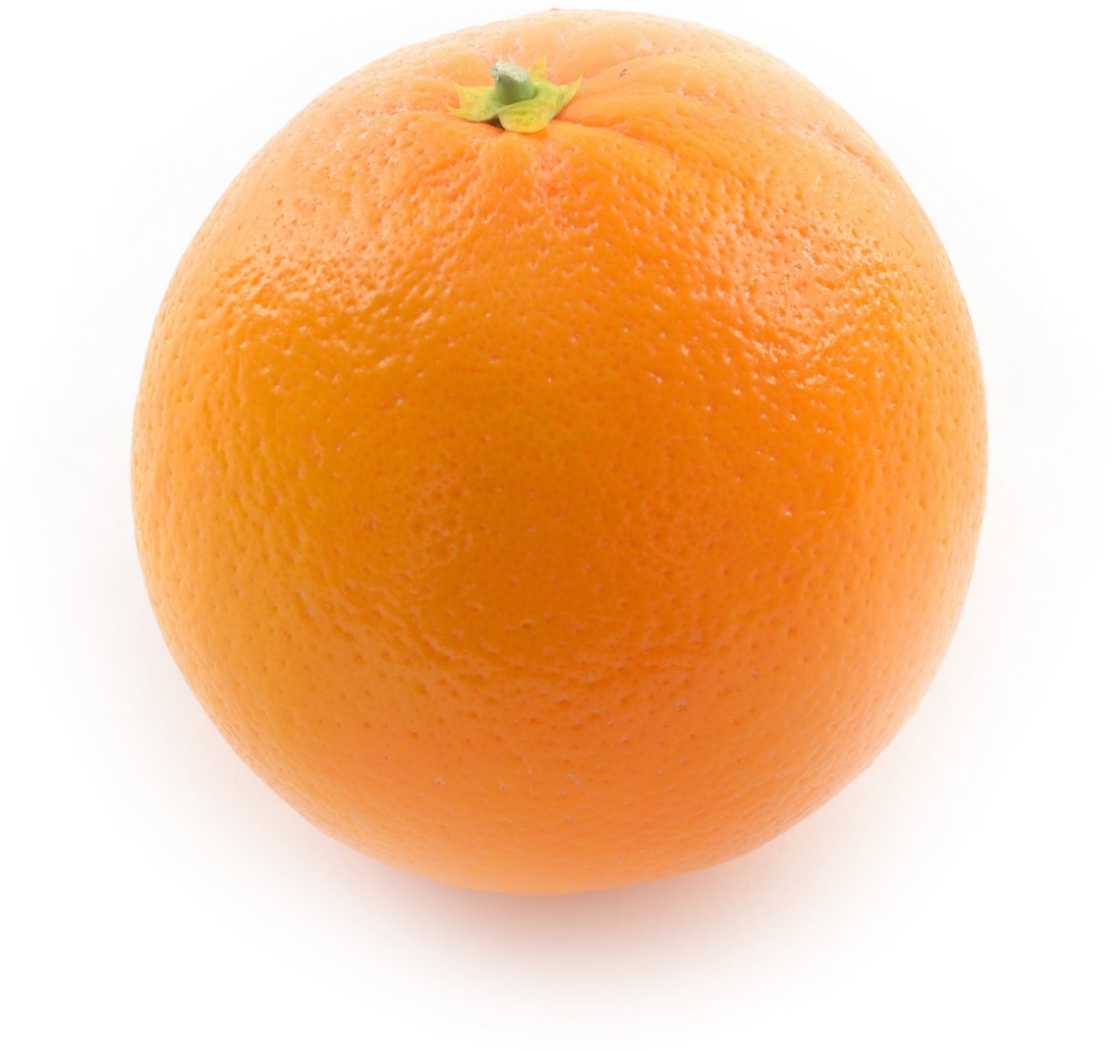
Orange Teardown

This Orange bit the bullet on April 1, 2013.

Written By: Jake Devincenzi



INTRODUCTION

We've been accused of favoring one fruit over all the rest. Some have even claimed that we love one juicy snack more than others.

No more. To show some appreciation towards other members of the fruit family, we decided to test out the accessibility, repairability, and end-of-life design of the Orange.

Tried the teardown at home with mild to moderate success? Celebrate with an **Orange Teardown t-shirt**! Or if you're having technical difficulties with your Orange, make sure you've identified your Orange correctly, and then visit our Orange Troubleshooting Guide to figure out what's going on. Perhaps you just need the right tool for the job.

Want to know more about how we juiced this Orange? Read the full behind-the-scenes account on the **iFixit blog**.

Check out all the latest fruits of our labor by following iFixit on Twitter or "Liking" us on Facebook.

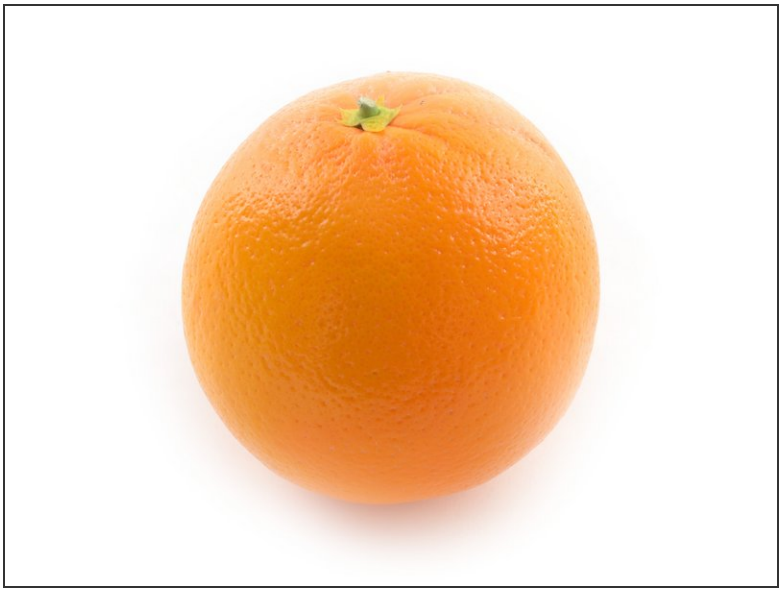
TOOLS:

- Heat Gun (1)
- iFixit 6 Inch Metal Ruler (1)
- iFixit Opening Picks set of 6 (1)
- iFixit Tech Knife (1)
- P2 Pentalobe Screwdriver iPhone (1)
- iSesamo Opening Tool (1)
- iFixit Opening Tools (1)
- Tweezers (1)

PARTS:

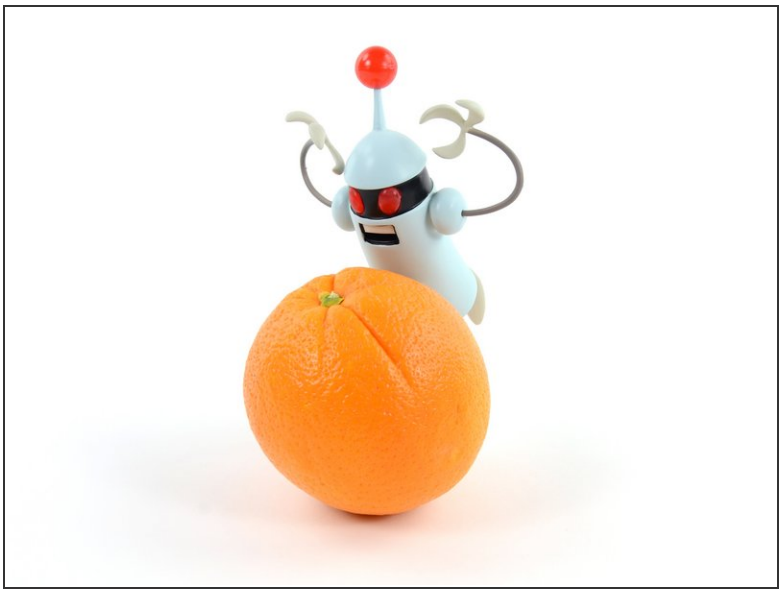
- oOpener (1)

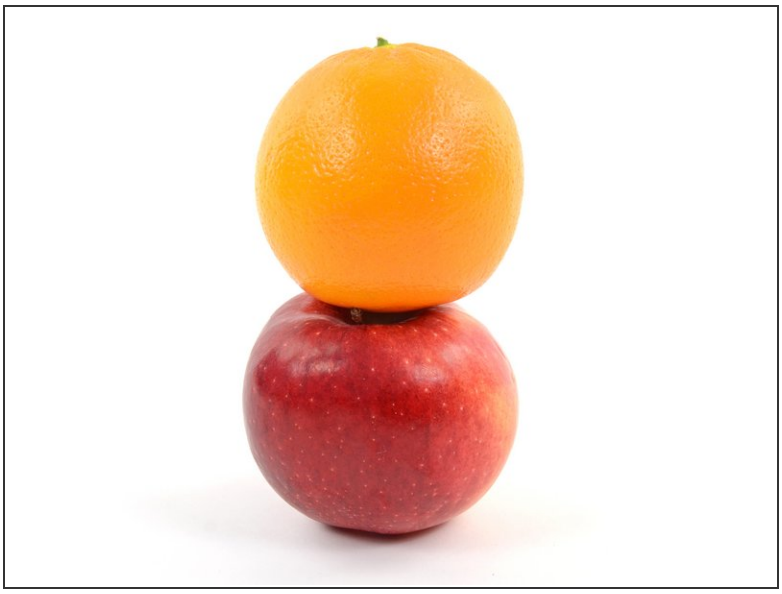
Step 1 — Orange Teardown



- The Orange. Nature's mysterious orange sphere. Believed to be the hybrid between a pomelo and a mandarin, the Orange is a staple food that has been cultivated since ancient times.
- So what components make up this juicy device? Here are the tech specs:
  - Orange peel
  - Orange seeds
  - Orange pith
  - Orange pulp
  - Orange juice
  - Orange color (corresponding to a 620 nm wavelength)

Step 2





- Before we could start penetrating the thick outer peel protecting the Orange's sweet innards, this small mechanoid appeared out of thin air. Cue Final Fantasy battle theme.
- After a protracted tussle, the Orange emerged victorious. The fate of the mechanoid is unknown—it vanished mysteriously into the arcane shadows from whence it came.
- Strike a pose; Juxtapose. We set up our customary comparison shot to contrast the Orange to an Apple.

Step 3

- What exactly adheres the outer layer to the Orange? We aren't really sure. We're familiar with how much adhesive devices these days employ and are prepared to act accordingly.
- In any case, the only sure-fire way to know is to heat the Orange up with our heat gun. This has never been done in the history of Orange disassembly. This truly is one small step for an Orange, one giant leap for fruitkind.

⚠ Do not attempt this procedure at home. We are Orange-certified repair technicians.

Step 4



- At this point, we are fairly confident that the heat gun sufficiently loosened any adhesive in the Orange. Time to get to the tearing down!
- To our surprise, our normal approach does not seem to apply to this strange device.

Step 5

- Oddly, we have no luck with a guitar pick, plastic opening tool, tech knife, ruler, pair of tweezers, or even an iSesamo!

Perhaps we've found some untapped functionality as a tool holder. This may warrant further investigation.

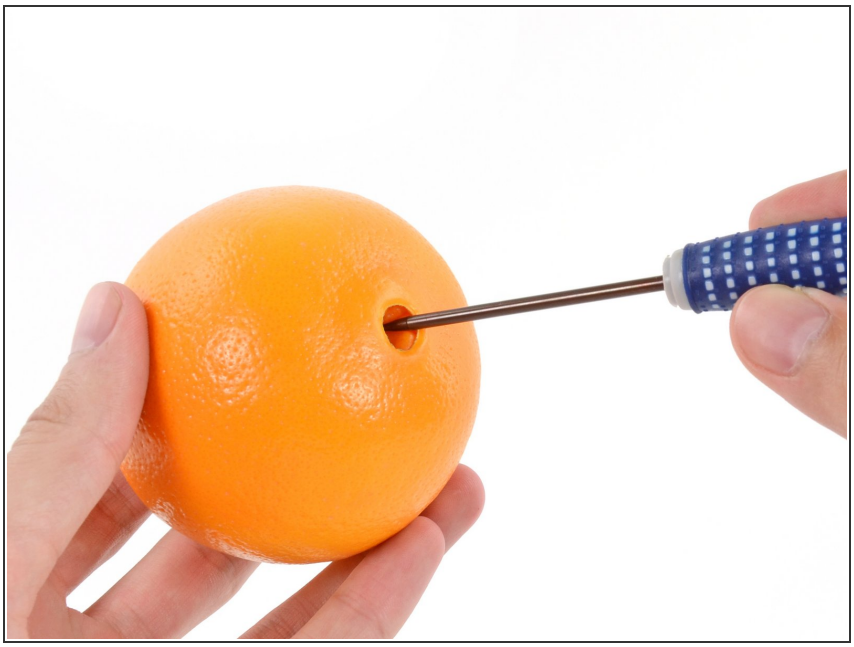
Step 6

- Having no luck with our vast array of poking, prodding, and prying tools, we figure a little more heat might be necessary.

⚠ Turns out keeping a heat gun on the same spot for too long will damage the outer layer of the peel beyond repair. If you're not extremely cautious, you will find yourself in need of a new outer peel.

ⓘ We stood in line at the local Orange Store for hours to get a whole heap of Oranges, so hopefully we'll have a fool-proof method to open them by the time we start writing repair guides.

Step 7



- With no other option in sight, we turn to our last resort for impossible-to-open devices: the Pentalobe screwdriver.
- Phooey! That didn't seem to work, either. We are running out of ideas…

Step 8

- Just when we think all hope is lost, a tool descends upon us from the repair heavens as Morgan Freeman's voice booms throughout our teardown room.
  - *Behold! The oOpener!*
- A tool rumored to open any orange in the universe, we had only heard about the oOpener in old repair myths shared around company campfires.
- While most disassembly tools, such as the iOpener, can be fabricated, the oOpener is said to only be available to those who are pure of heart, mind, and vision of a repair-friendly world.

Step 9



- We quickly get to work slicing through the Orange's thick peel with the oOpener, spiraling down like whirlybirds in the breeze.
- Having the right tool for the job is a truly heartwarming experience. We hold back the overflow of nostalgia as the oOpener brings back fond memories of early spudger escapades.

Step 10


- A plastic opening tool allows us to finish the job started with the armor-piercing strength of the oOpener.
- Prying things open with a plastic opening tool—finally a familiar tune for us.

Step 11

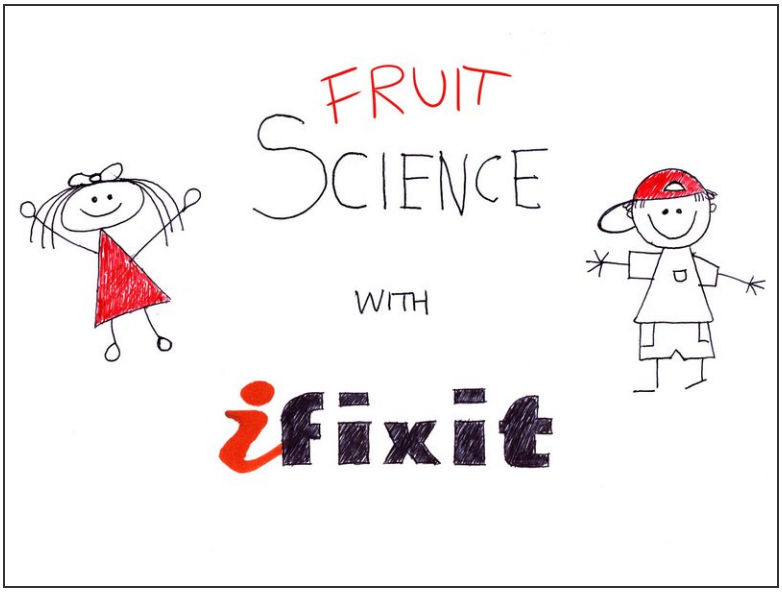


- It took us ten steps, but we finally managed to penetrate the impenetrable.
- As an added bonus, the Orange comes with a free accessory, the Orange Peel—an amusing, Slinky-like contraption, guaranteed to deliver hours of fun.

Step 12

- *Results may vary. Your Orange Peel may not actually look like a Slinky. Do not try to use Peel as a Slinky. Do not try to use Peel as any form of toy. Do not give Peel to children. Consult a doctor if you feel that your Orange Peel is not Slinky-y enough.*

Step 13

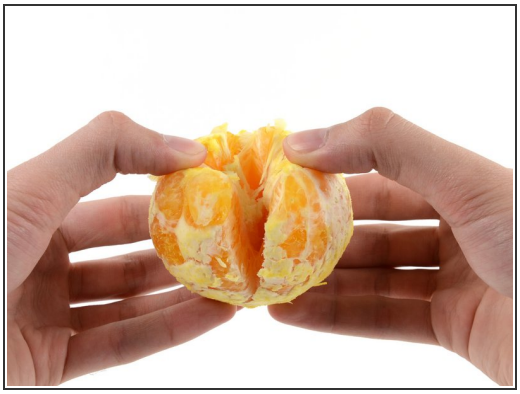


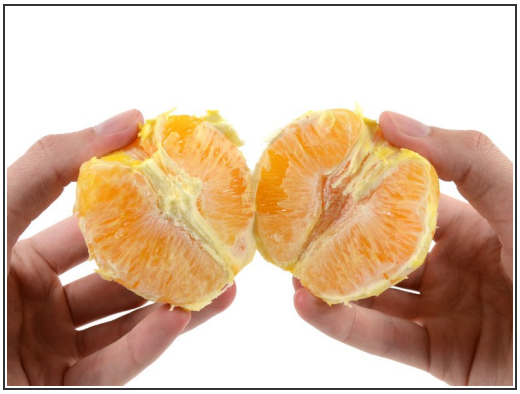
- Now that we've removed the rind, let's take a brief scientific look at the make-up of the Orange in the first ever segment of **Fruit Science with iFixit!**
- Oranges and other citrus fruits are of the order Hesperidium—a kind of berry with a tough, leathery rind.
- The three important layers of such fruits are the exocarp (rind), mesocarp (pith), and endocarp (the delicious edible part).

Step 14

- One final obstacle stands between us and sectioning the Orange into its component wedges.
- Gentle prying with a plastic opening tool separates the navel, freeing up the top of the Orange for separation.
- This appears to be yet another irreversible step; the Orange's repairability score will likely take another hit.

Step 15

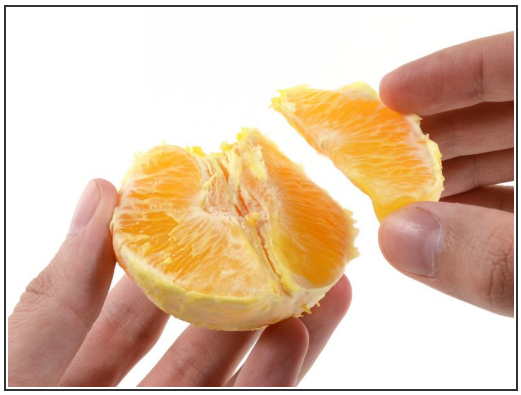




- We notice the resistance of some natural adhesive as we slowly pull the Orange apart.
- It appears that if you are not careful enough whilst pulling the Orange apart, you will tear the sectional membranes of the Orange.

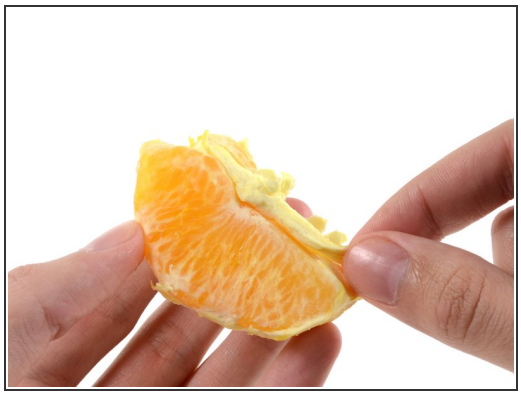
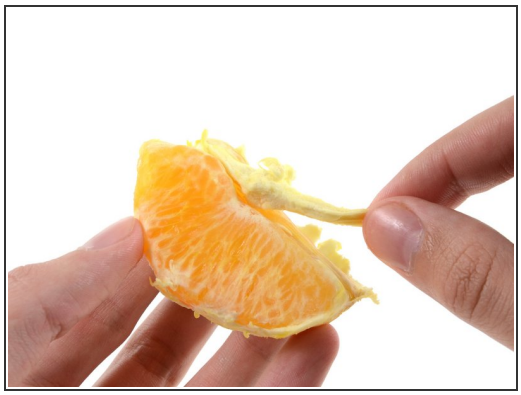
Step 16





- We love modular devices, and this one is as modular as they come. Having modular components makes replacing each component a lot ~~tastier~~ easier.
- All ten major internal components of this device are easily removable. However, we are worried that they might not go back together as easily as they come apart, a common problem in fruit repair.
- Though the Orange's repairability is highly questionable, we do admire its end-of-life design. It is completely recyclable, compostable, and delicious-able. We hope that devices like this will some day catch the attention of other device manufacturers and help keep electronics out of landfills… unless they are compostable, of course!

Step 17


- Sectioning the left half reveals another component: the central column of the Orange.

The central column is a structural build-up of pith, the mesocarp layer of the Orange's body.

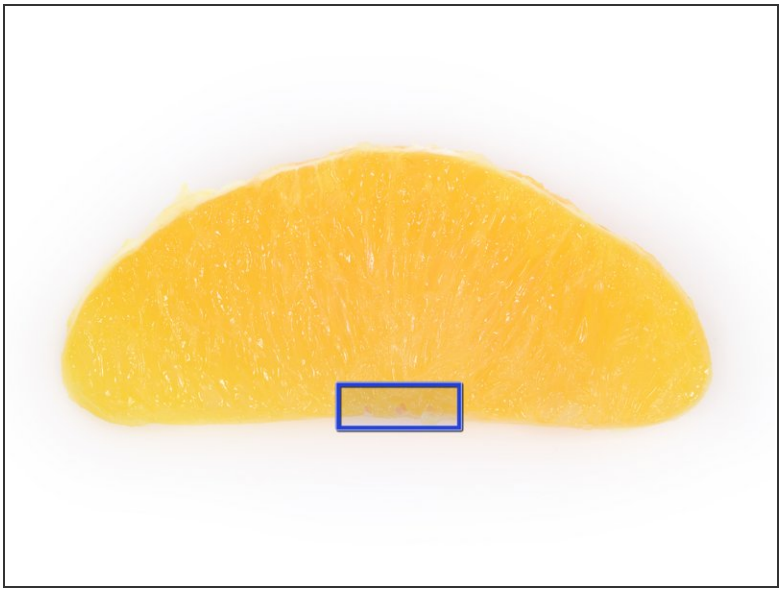
- Turning a wedge over reveals more of the pithy mesocarp. Its utility is currently unknown; we suspect possibly EMI shielding?

Step 18

- It's time to unlock the deeper mysteries of the Orange.
- Unlike some of our more complicated teardowns, a steady hand and a sharp blade are the only tools we need to get a view of a section's internal structure.

⚠ This may puncture the Orange's interior cells, causing acidic adhesive leakage. In the event of contact with this fluid, wash hands and eyes immediately…or just lick your fingers.

Step 19

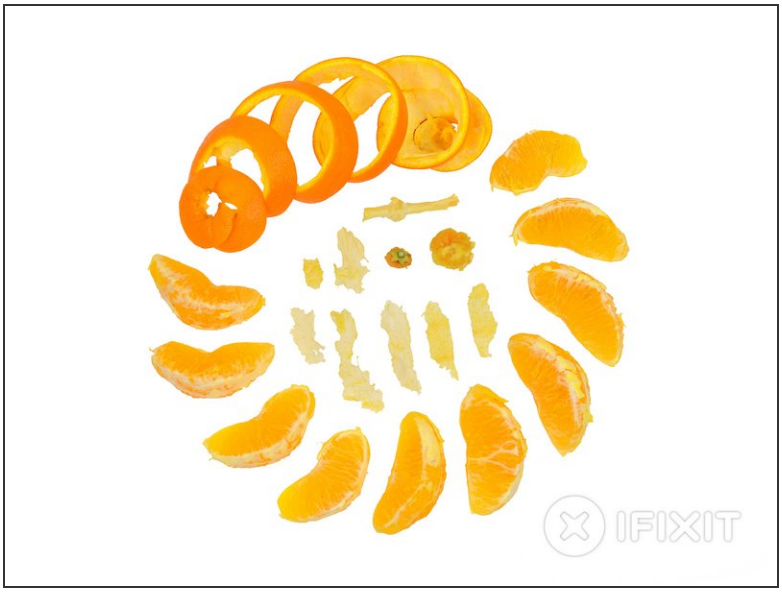


- With the wedge split, we get a serious look at the Orange's seriously small seeds.
- These extremely small components seem to be nested deep within the device. Repairability will definitely take a hit for this one.
- Navel Oranges, such as this, have small, sterile seeds that cannot be used to reproduce more Oranges—a cutting from an existing fruit-bearing tree must be grafted to another tree.

ⓘ This is the most advanced anti-piracy DRM measure we've seen, definitively ensuring that Orange owners won't be able to produce copies of their Orange to share with their friends.

- We assume the device is supported by Orange Mobile but it remains to be seen if it will be released to other carriers in the future.

Step 20



- Orange Repairability Score: **O out of 10** (10 is easiest to repair).
- Normal operation requires breaking the outer case.
- Partition membranes and linings are exceedingly fragile, and will break during casual use.
- Impossible to reassemble after opening.
- All components secured with some sort of natural adhesive.
- Internal components filled with acid.