

# GatorIT iPad Deployment Process



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Jennifer Czyzewski  
Gateway School District

July 7th, 2022



This Presentation and any Scripts mentioned will be available on GitHub:

[https://github.com/JCSmillie/PSUMacAdmins2022\\_iPadDeploymentsInGSD](https://github.com/JCSmillie/PSUMacAdmins2022_iPadDeploymentsInGSD)



# About Gateway

- ❖ Located in Monroeville, Pennsylvania (just outside Pittsburgh)
- ❖ 3,200 across 4 elementary schools, 1 middle school, and 1 high school
- ❖ 600 Staff (over half issued Laptops)
- ❖ MacBook Air (2020) for all teachers: Mac OS (100%)
- ❖ iPad 7th gen or better for Teachers who want them



# About Us

## Jesse

*Mac & Linux Operations Engineer*

- With GSD since 1999
- ACMT since 2005
- Solo Apple Tech until Sept 2021
- Presenter at PSU MacAdmins 2019
- “Ask Apple: Mosyle Spotlight” Presenter April 2021
- Co-Presenter for March 22’ Apple IT Roundtable @ GSD
- Co-Presenter for April 22’ Apple Virtual Tech Event “Onboarding iPads to MDM Using Apple Configurator”



*Drinker of the Apple Kool Aide and future Mosyle Cult member*

## Jennifer

*Child Accounting Technology Support*

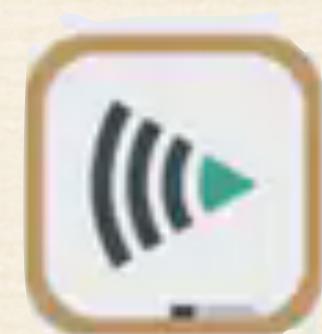
- With GSD since 2021
- Previous Apple employee until 2021
- Skyward Child Accounting Coordinator
- Create/Present to Elementary Students on iPad Care
- Create/Present to Middle School Students on iPad Care and Internet Safety
- Summer Student Help Desk
- Co-Presenter for March 22’ Apple IT Roundtable @ GSD

*Apple Technician and Skyward Child Accounting Coordinator*



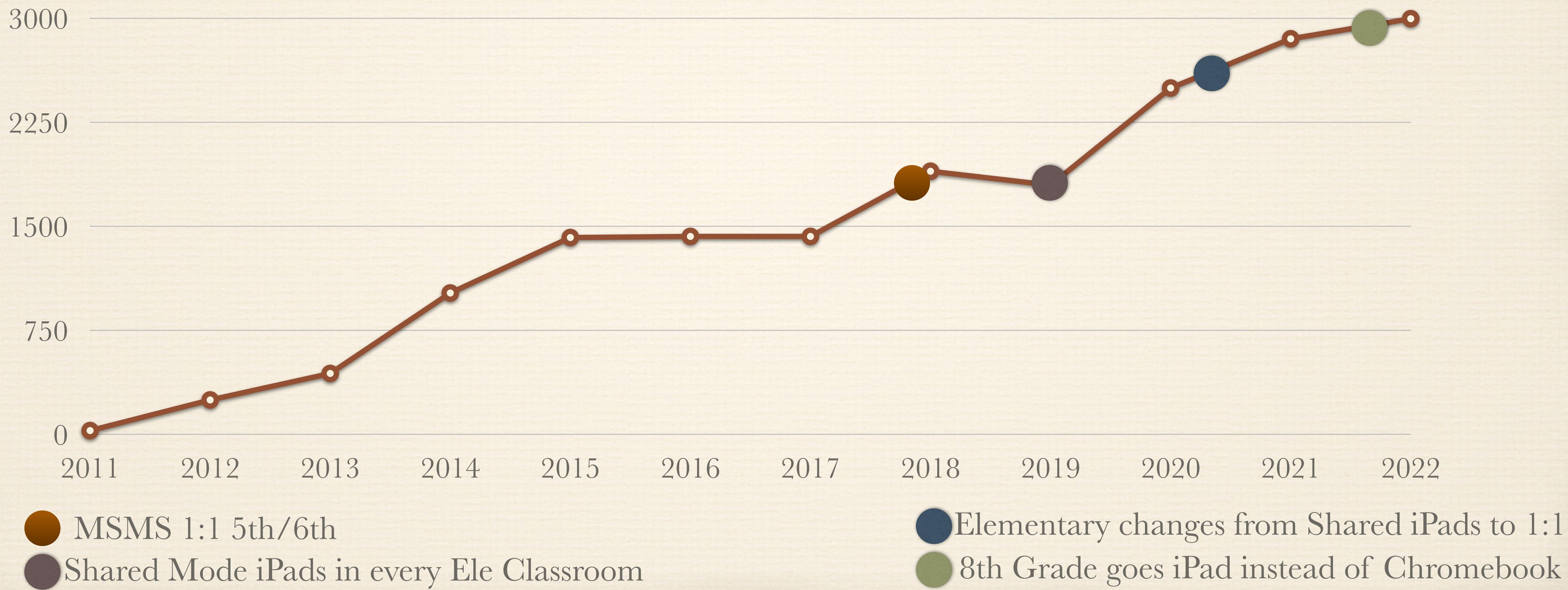
# Technology Deployed at a Glance

- ❖ 4 Technicians and 1 Director
- ❖ Elementary (K-4) 1,260 iPads 1:1
- ❖ Moss Side Middle (5-8) 1,024 iPads 1:1
- ❖ Gateway High School: About 1,200 1:1 Chromebooks and a cart of Shared Mode iPads (30)
- ❖ District Wide Staff 250 iPads in hand
- ❖ All Apple hardware enrolled in JAMF Pro April 2012 to January 2020.  
Mosyle Manager April 2020 to current.



MOSYLE  
**manager**

# iPad Growth in the District



# iPads 1:1 K-8 Life Cycle

- K & 1st get oldest iPads (hand me downs from 5th & 9th.)
- 2nd grade NEW iPads, will keep through 4th grade
- 5th grade NEW iPads, will keep through 8th grade
- 9th grade trade in for Chromebooks.



On an iPads 5th year it is retired from GSD

New iPads get 4yrs AGiRepair Protection Plans



# Reinforcing iPad Care

# WHY? iPad Care Presentations



- ❖ Damage to devices
- ❖ Gross iPads covered in food
- ❖ Uncharged iPads in class
- ❖ Kids forgetting their school iPads
- ❖ Screen Protector being removed
- ❖ Presentations for the grades getting new hardware (2nd & 5th)



## School iPad Rules



1. I will only use the iPad when my hands are clean.
2. I will use the handle when carrying my iPad.
3. I will never leave the iPad sitting on the floor or on the edge of a desk.
4. I will make sure there is no food or drink near the iPad.
5. I will charge my iPad at home in the evening.
6. I will make sure I bring my iPad to school.
7. I will use my iPad in a responsible manner at home for school work and appropriate things.
8. I will not put stickers or tape things on my iPad.
9. I will keep my iPad in the case it came in.
10. I will not take the screen protector off.
11. I will tell my teacher if I spill something on or break my iPad.

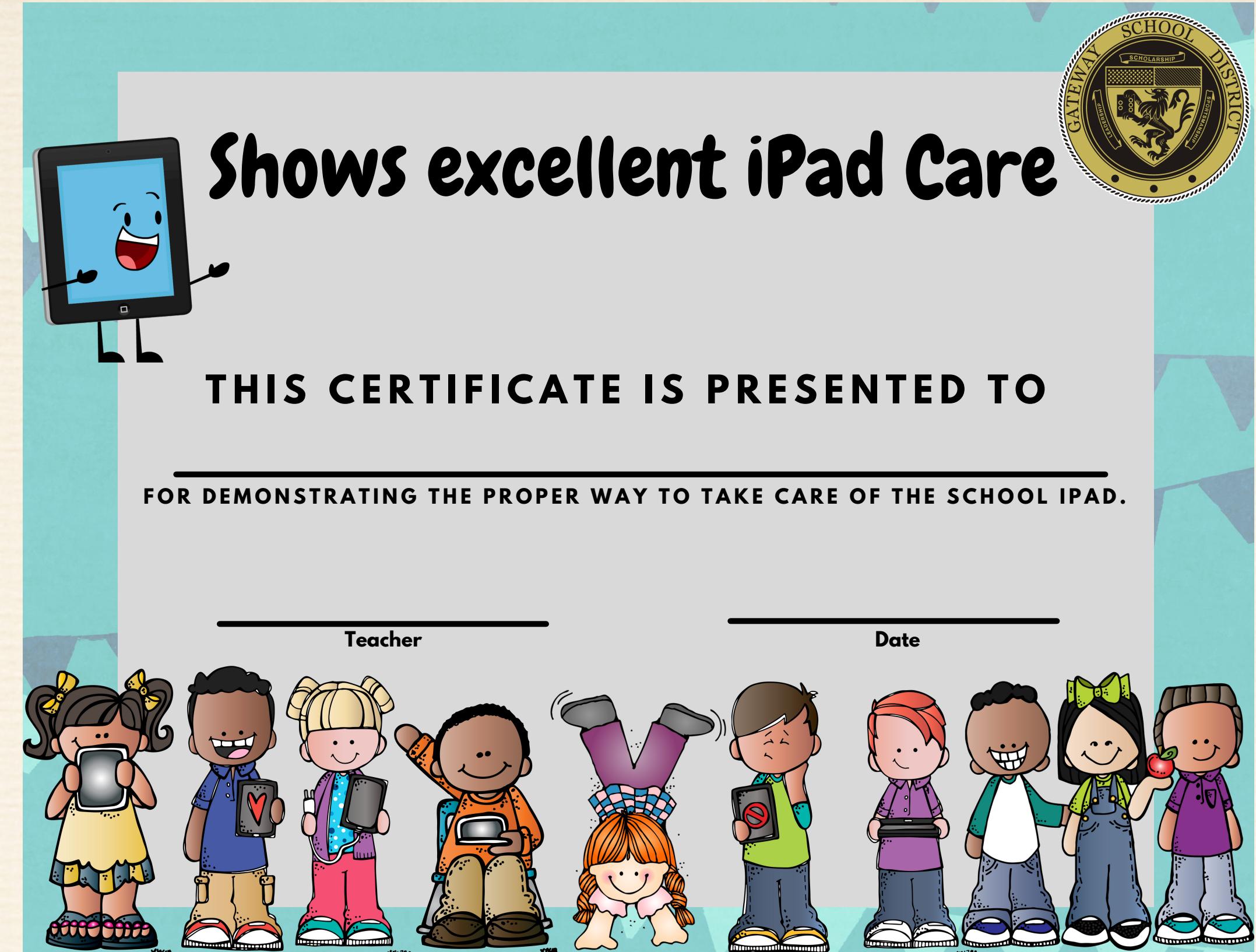


# IPAD CARE

## School iPad Rules

## 2nd Grade iPad Care

- ❖ Visit classrooms and discuss iPad care and expectations



2nd Grade  
Incentives and Certificates

## SCHOOL IPAD RULES

- \* Bring the iPad to school everyday
- \* Charge the iPad at home everyday
- \* Keep the iPad in the case
- \* Leave the screen protector on
- \* Do NOT throw or step on your bookbag with your iPad in it

- \* Do NOT put stickers on the iPad or case
- \* Use the iPad in a responsible manner for school work and appropriate things

- \* Do NOT put in your binder near metal rings.
- \* Tell the teacher/secretary immediately if you break or spill something on the iPad or case



# INTERNET SAFETY FOR MIDDLE SCHOOL

Gateway School District

5th Grade  
iPad Care  
Internet Safety

# iPad Care and Internet Safety

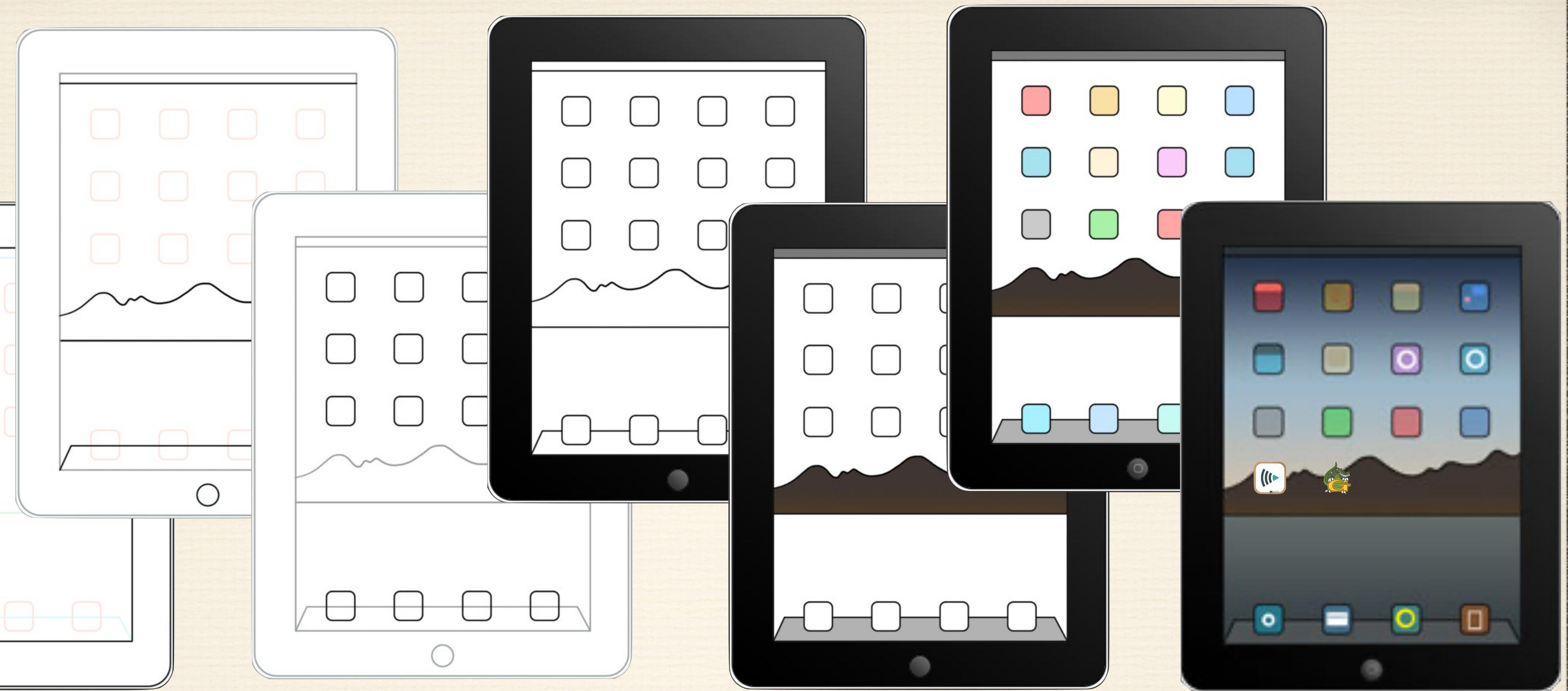


- ❖ Refresher on iPad care for students in 5th grade
- ❖ Internet safety introduced
- ❖ Quiz on both
- ❖ *Future: Set a passcode on the device and change student email password*



# Barcodes are KEY for us

- ❖ Barcodes are used for Asset tags and Student ID
- ❖ Both bar codes are used for inventory, check in, and check out to users. (Will show more of this later)
- ❖ With bar codes we can easily scan 100s of devices to assign to students.



# Deploying iPads with Mosyle

*And liking it!*

# 4 States of iPads in Mosyle



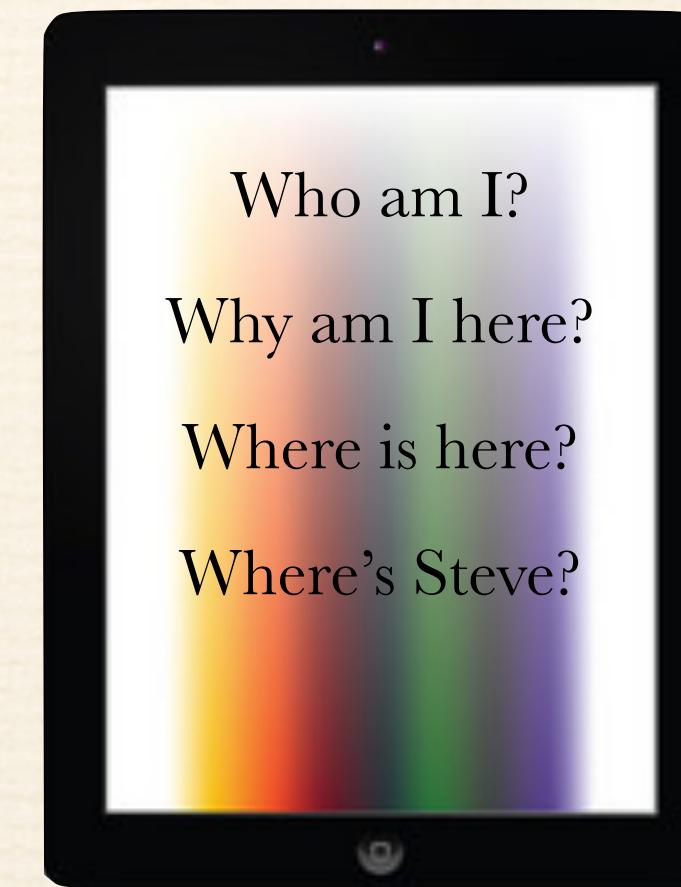
1:1 Teacher/Staff



1:1 Student



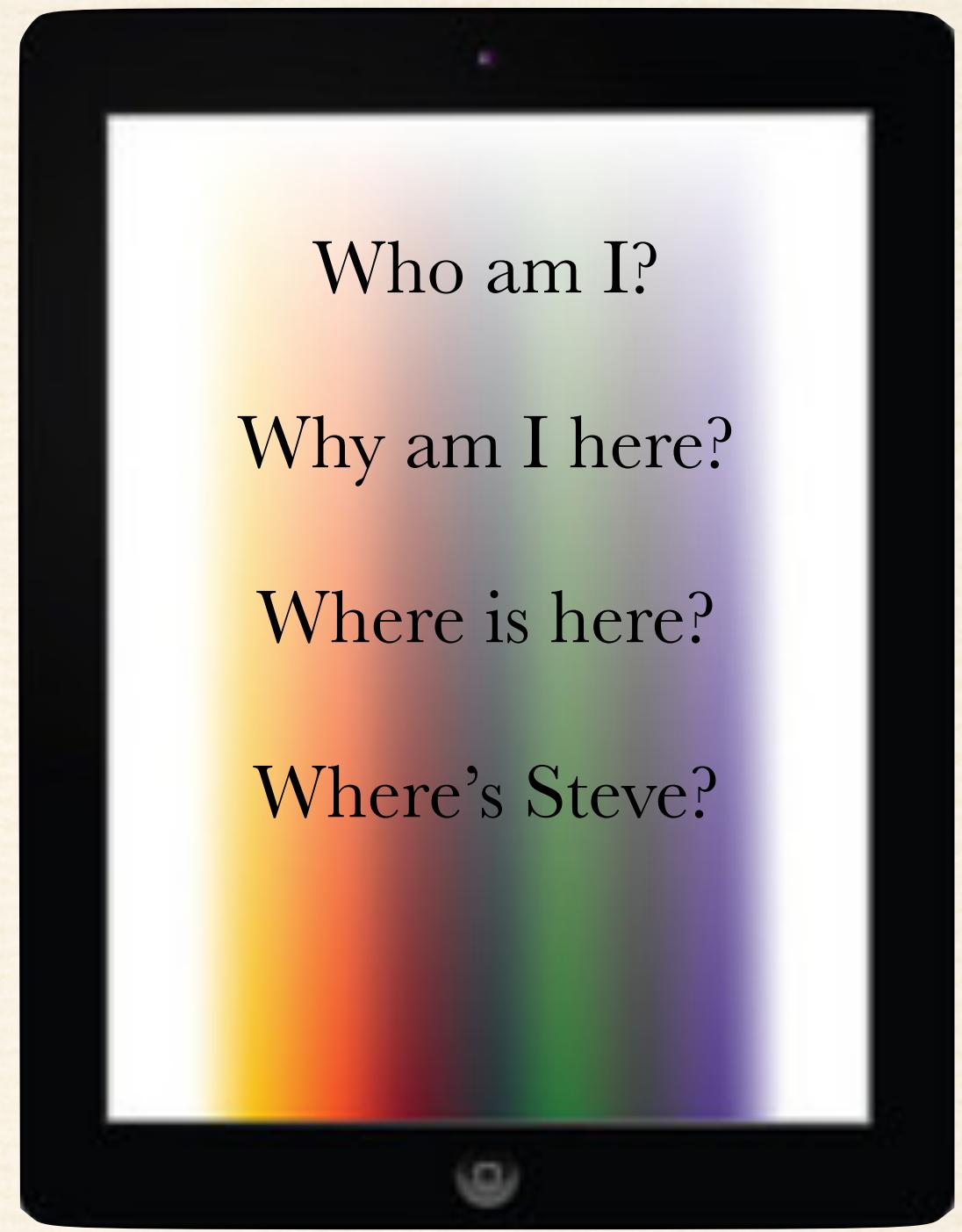
Shared Mode



Limbo

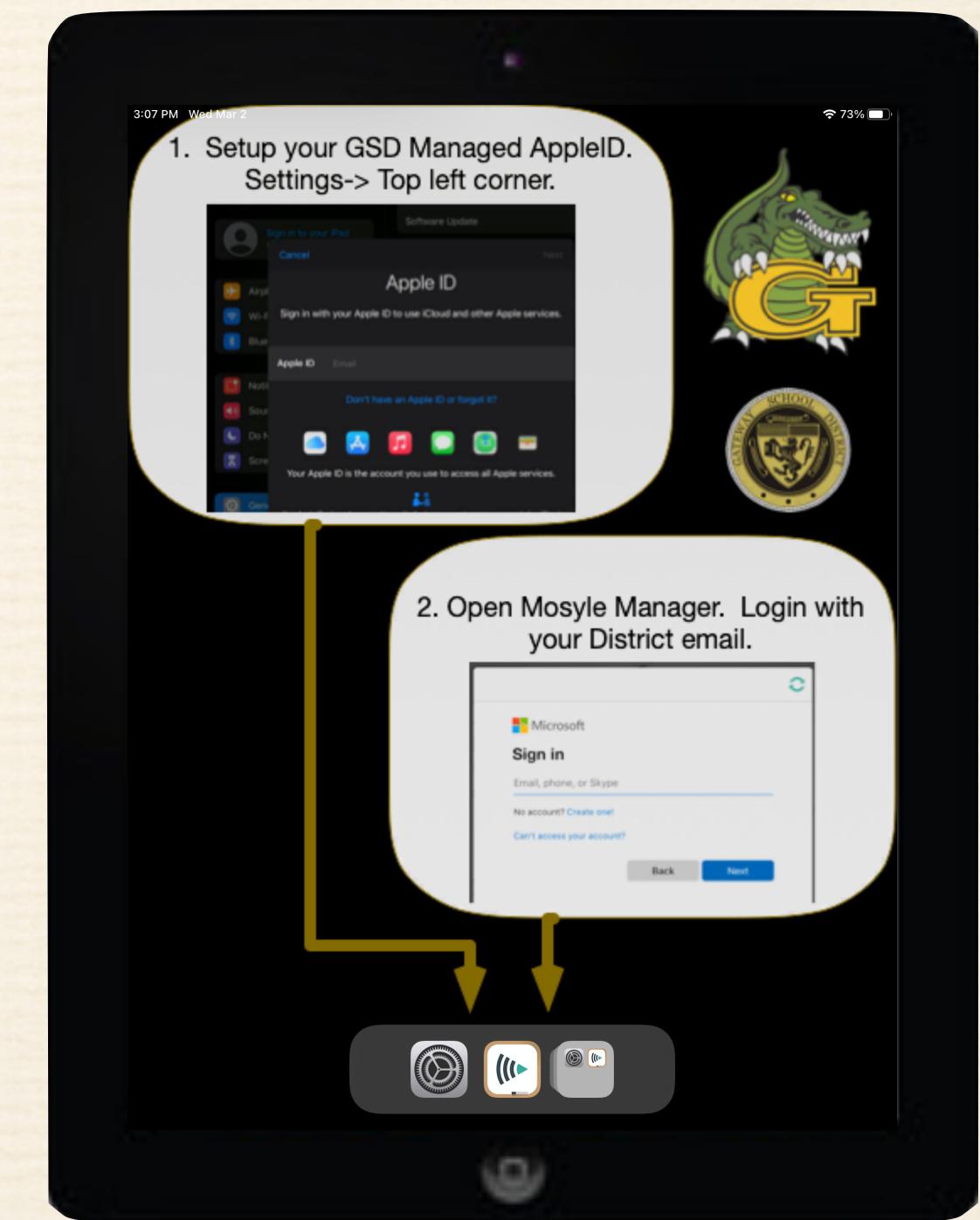
# In GSD All 1:1 Roads start with Limbo

- ❖ After Hello screens iPad goes right to Limbo.
- ❖ Apps deemed as must have for all are tied to Limbo. This way those apps are there from the beginning.
- ❖ Limbo iPads are only “Allowed” Manager and Settings. This forces setup. Login to Manager and iPad is now usable. Apps for all appear. Additional apps by grade install.
- ❖ Custom Wallpaper tells you to login.



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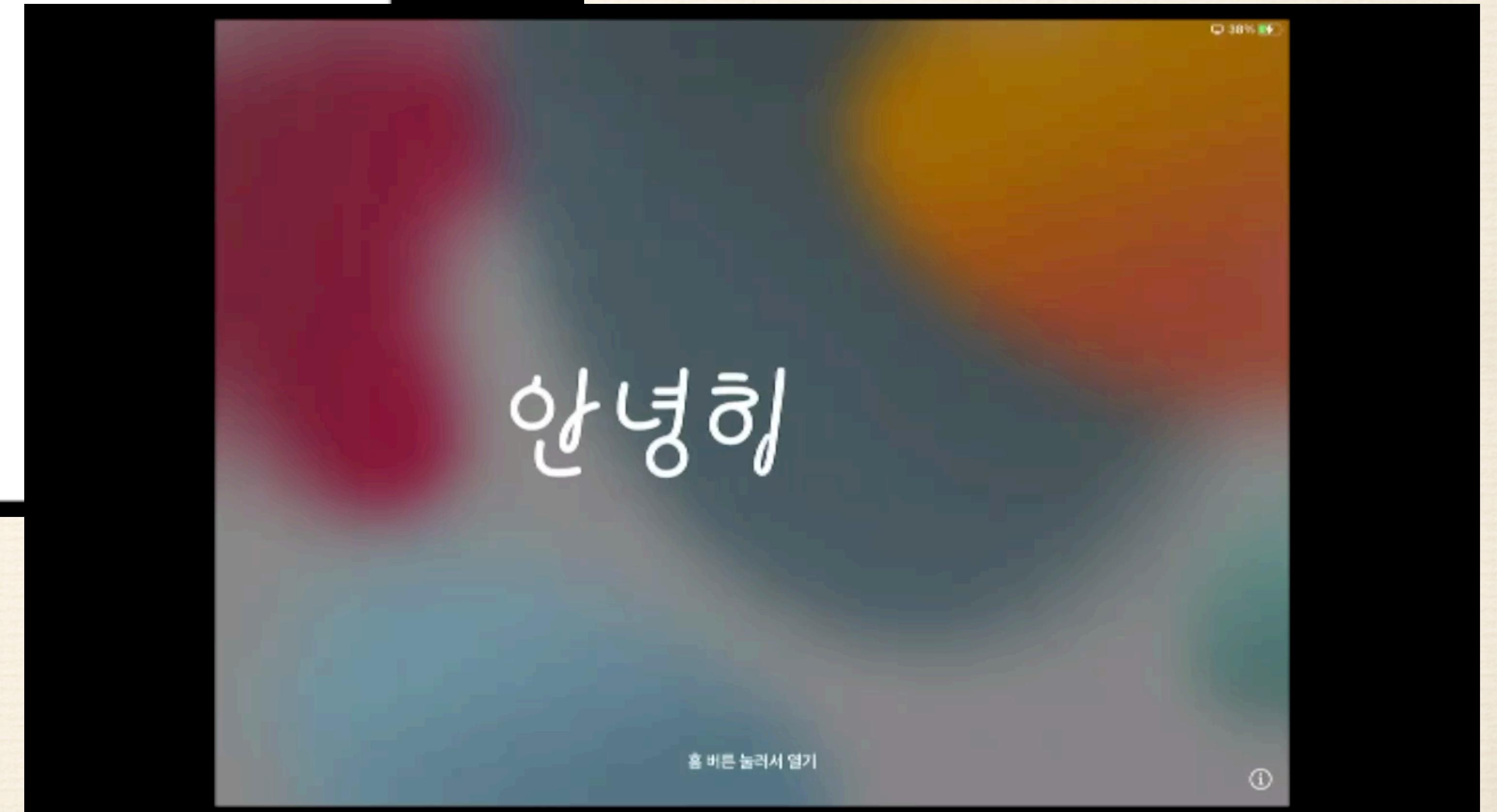
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# *The Old Way*



# *The Old Way*



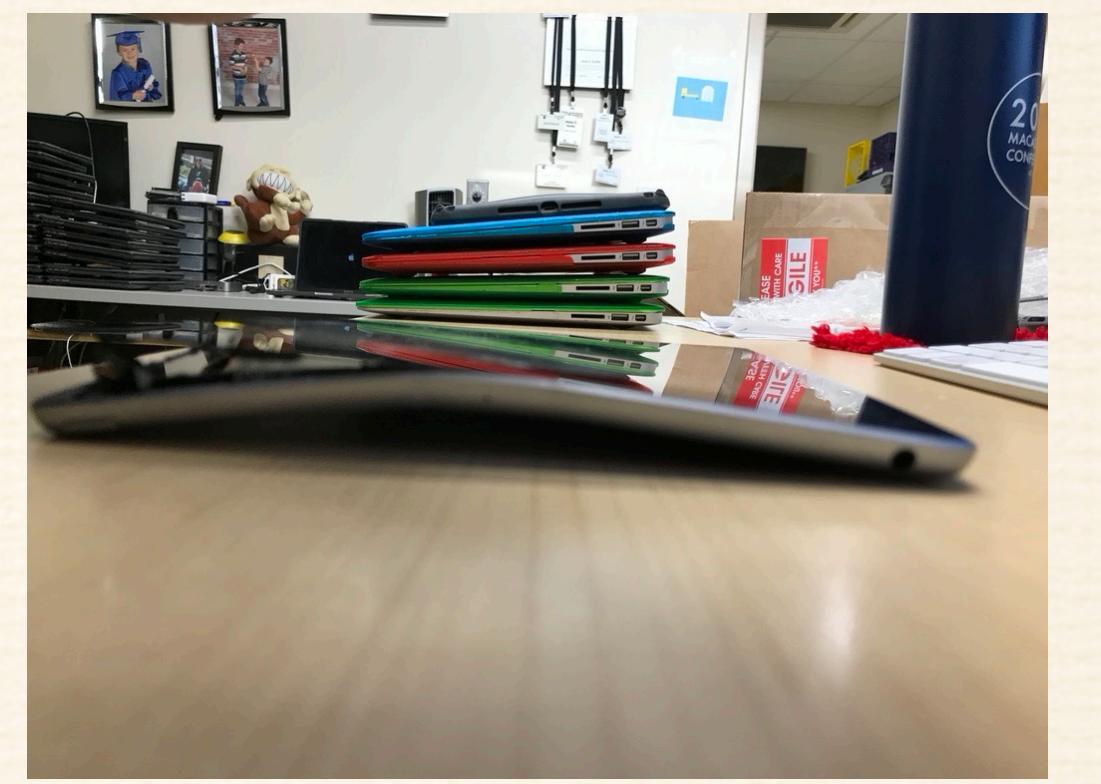
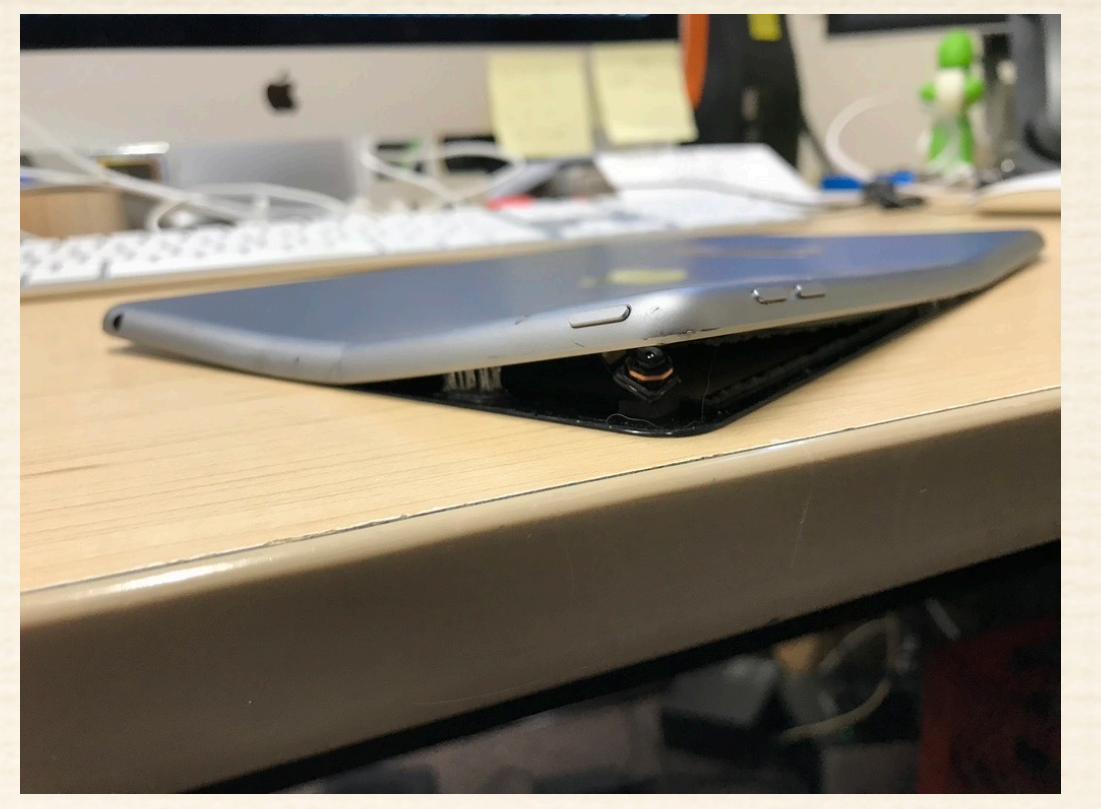
# *The Limbo Way*

# Why do it this way?

- ❖ Speeds up iPad deployment (from my hands to their hands)
- ❖ Limbo iPads are inventoried, on charge, and automatically updated. Always ready to be handed out. In charging/storage carts until then.
- ❖ Avoids big wifi draw during hand outs. Post login by student/staff they are ready to use. Apps are there.
- ❖ Bad certificates, bad time on iPad, MDM server “hiccups” play less of a role as they don’t happen when the student/staff is standing here waiting to pickup.

# iPad Storage Carts





# When iPads go Crack



# Your dirt in. Your dirt out.

Unless its destroyed, you always get the SAME iPad back.

- ❖ Loaners are issued. These are Shared Mode older iPads
- ❖ iPad is shipped to GHS in a padded case
- ❖ iPad goes out to AGiRepair
- ❖ iPad goes back to Building and original holder.



Students may be charged for repair in situations where iPad's case has been modified or extreme damage has occurred.

# So how can we make this better?

API Magic

MDM Device Groups

CLI Scripting

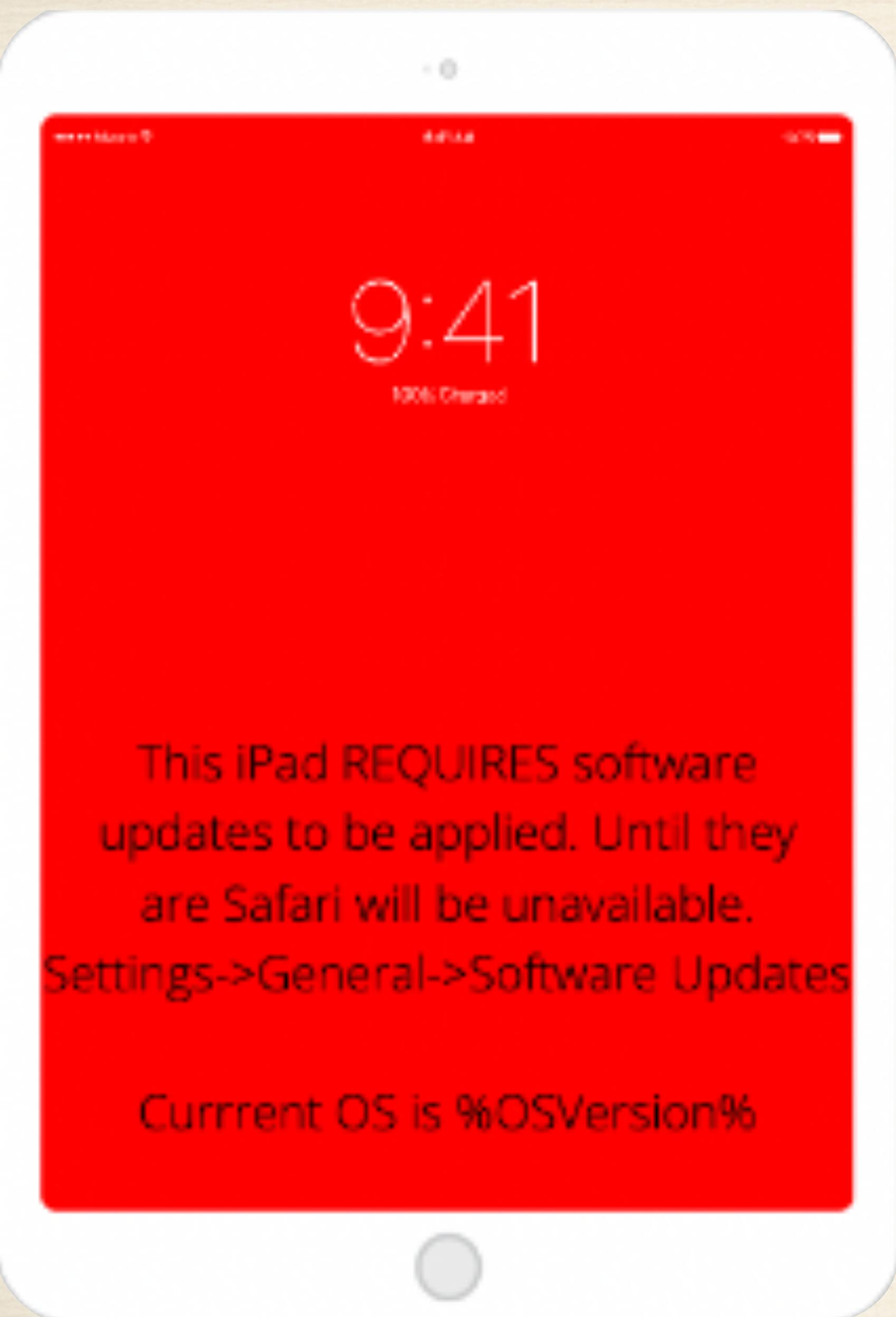


So how can we make this better?

Automation

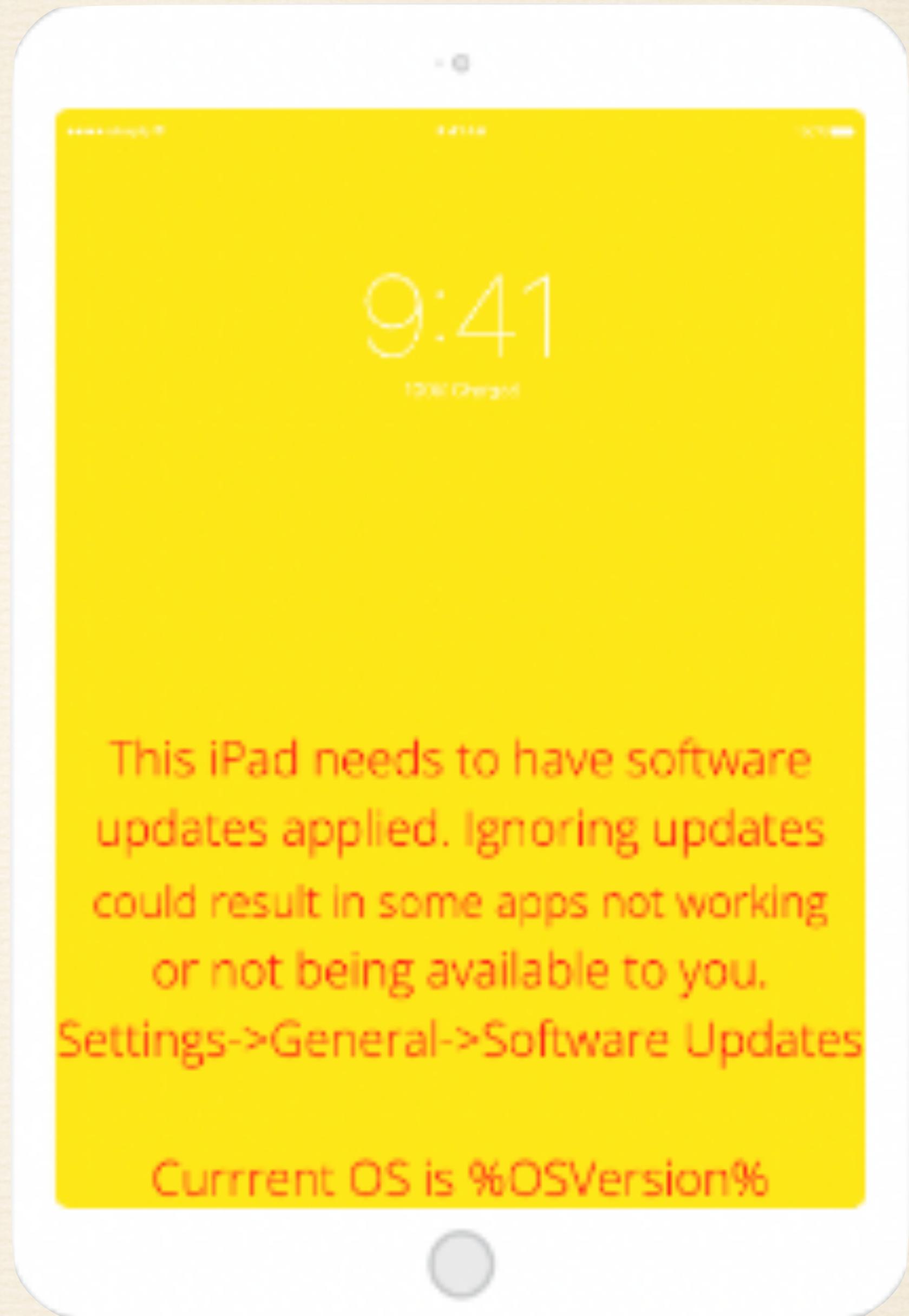
# Know we have a Problem before you do...

- ❖ API Scripts find out who's device isn't checking in for inventory. Initially just email student, parent, & homeroom teacher.
  - ❖ 14 Days use IncidentIQ API to make a ticket for IT to seek them out
- ❖ Device Groups built to locate iPads not doing Updates or other issues. Wallpaper changed to indicate.
- ❖ API scripts to disable iPads of withdrawn students nightly.
- ❖ API scripts to query inventory of hardware (IIQ) and make sure asset tags are filled in.
- ❖ API scripts to add “Tags” to devices based on outside placements, Cyber, GATE, etc



## <-REQUIRES Updates

Needs updates->  
Updates



# Other things we Automate this way...

- ❖ Ensure AppleTVs have asset tags and correct name.
- ❖ Automatically make tickets for device recovery when students withdraw from district. Also put that device in Lost mode.
- ❖ Confirm proper device assignment (IIQ and Mosyle Manager records Match)
- ❖ “Retire” unassigned devices in Munki Reports

*Not trying to Automate myself out of a Job.. but 1:1 is here to stay  
so automating the repeat stuff gives me more time for the other.*

# Command line quick Tasks - MOSBasic

<https://github.com/JCSmillie/MOSBasic>

- ❖ Homebrew solution not necessarily for a problem but to do more faster.
- ❖ Simple ZSH script with separate command line arguments to do fast tasks on MDM controlled iPads through the MDM.
- ❖ Supports “modules” to gather more data from ticket systems, SIS, other further expansion. IncidentIQ support today.
- ❖ Requires API access

# Things MOSBasic can do

- ❖ Lostmodeon by asset tag
- ❖ Lostmodeoff by asset tag
- ❖ Whoislost (outputs mass list)
- ❖ Annoy by asset tag (must be lost first)
- ❖ iOSwipe
- ❖ Iosdump, Userdump, Macdump (Dump date from Mosyle DB)
- ❖ Info by asset tag or user (iPad & Mac)
- ❖ Iosassign
- ❖ Listgroups (get ID numbers for other API functions)
- ❖ Serialcheck <-Compare list of serials to make sure they are NOT in Mosyle (think retired hardware)

Most of this can be done through the web page but that gets tedious for multiple



# CFGUTIL

*Think Apple Configurator2 but from the Command Line*

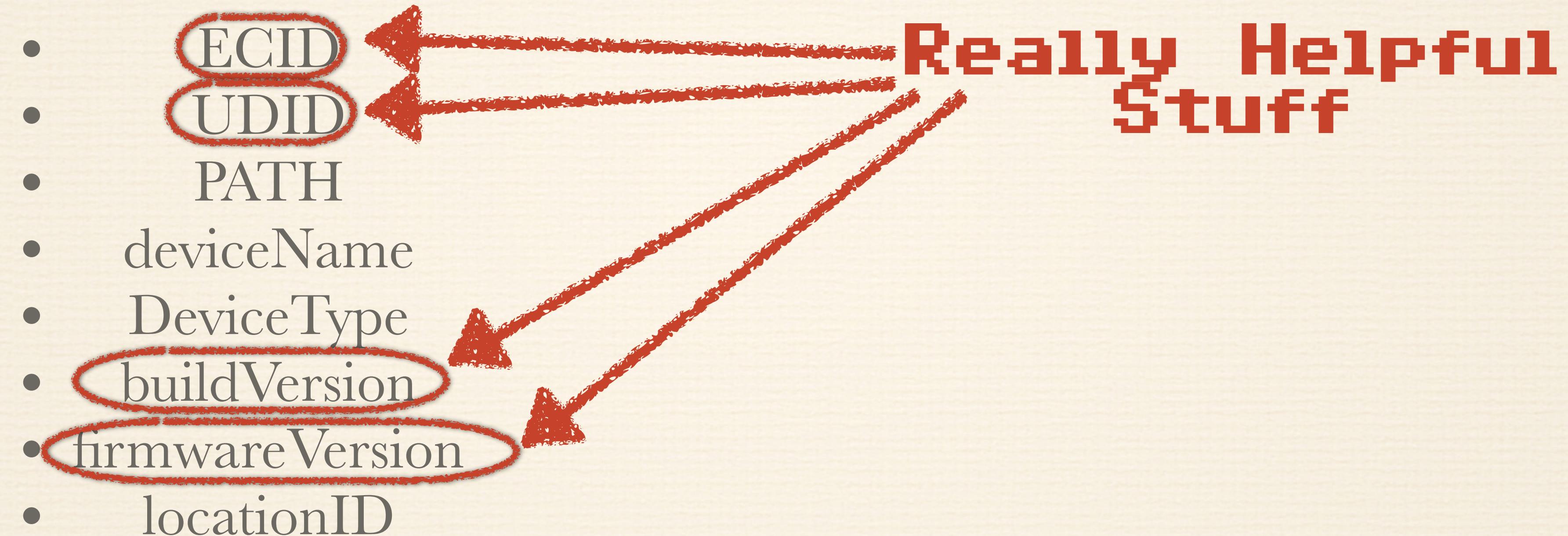
# CFGUTIL

<https://support.apple.com/guide/apple-configurator-2/use-the-command-line-tool-cad856a8ea58/mac>

- ❖ Installable from Apple Configurator 2 (Automation Tools)
- ❖ /usr/local/bin/cfgutil
- ❖ Can work on devices which has TRUST between the Mac and iPad
- ❖ Scriptable /usr/local/bin/cfgutil exec -a <YourScriptHere>

# /usr/local/bin/cfgutil exec -a <my script>

- ❖ Executing this command will run your script every time an iPad is connected.
- ❖ Variables given to the script executed:



My Sweet Terminal>\_ My Personal Cell Phone

My Sweet Terminal >\_ My Personal Cell Phone

cfgutil list

Type: iPhone13,2 ECID: 0x11XXXXXA81001E UDID: 00008101-00114849XXXXXXE  
Location: 0x1100000 Name: DaDarkCarnival

My Sweet Terminal >\_ My Personal Cell Phone

cfgutil list

Type: iPhone13,2 ECID: 0x11XXXXXA81001E UDID: 00008101-00114849XXXXXXE  
Location: 0x1100000 Name: DaDarkCarnival

cfgutil --ecid 0x11XXXXXA81001E get buildVersion

19F77

iOS 15.5 Build Version

My Sweet Terminal >\_ My Personal Cell Phone

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19F77

iOS 15.5 Build Version

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15.5

**NOTE: PAIRING AND/OR TRUST ARE NOT REQUIRED TO  
GET THIS INFO**

So what can we do with this?

My Sweet Terminal > \_Some random iPad in My Office

My Sweet Terminal > \_Some random iPad in My Office

cfgutil --ecid MyECID restore

*Installs latest compatible iPadOS*

MYECID REPRESENTS  
THE ECID OF THE IPAD

**NOTE: PAIRING + TRUST ARE REQUIRED HERE UNLESS IN DFU MODE**

My Sweet Terminal > \_Some random iPad in My Office

cfgutil --ecid MyECID restore

*Installs latest compatible iPadOS*

cfgutil --ecid MyECID install-profile /Users/Shared/MyWifiProfile.mobileconfig

*Installs a wifi profile with SSID, Username, & Password.  
Should be a dedicated setup network. I use ‘Apple Store’*

MYECID REPRESENTS  
THE ECID OF THE IPAD

**NOTE: PAIRING + TRUST ARE REQUIRED HERE UNLESS IN DFU MODE**

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*Installs a wifi profile with SSID, Username, & Password.  
Should be a dedicated setup network. I use ‘Apple Store’*

cfgutil --ecid MyECID prepare --dep --skip-language --skip-region

*Tell the iPad to do DEP process, skip-language & Region.  
Other “Hello” prompts will be skipped too per your enrollment config in your MDM*

**NOTE: PAIRING + TRUST ARE REQUIRED HERE UNLESS IN DFU MODE**

# Biggest Pitfall of Configurator/CFGUTIL

Is Supervision Identity Trust

- ❖ If iPad and your configurator Mac have trust for same Supervision Identity you can easily do all sorts of things to an iPad like erase, update, etc.
- ❖ Without Supervision Identity you can't pair and can't do anything to the iPad (restore, update, etc.)
- ❖ Apple Configurator **MUST BE OPEN** for CFGUTIL to access KeyChain stores!!!!

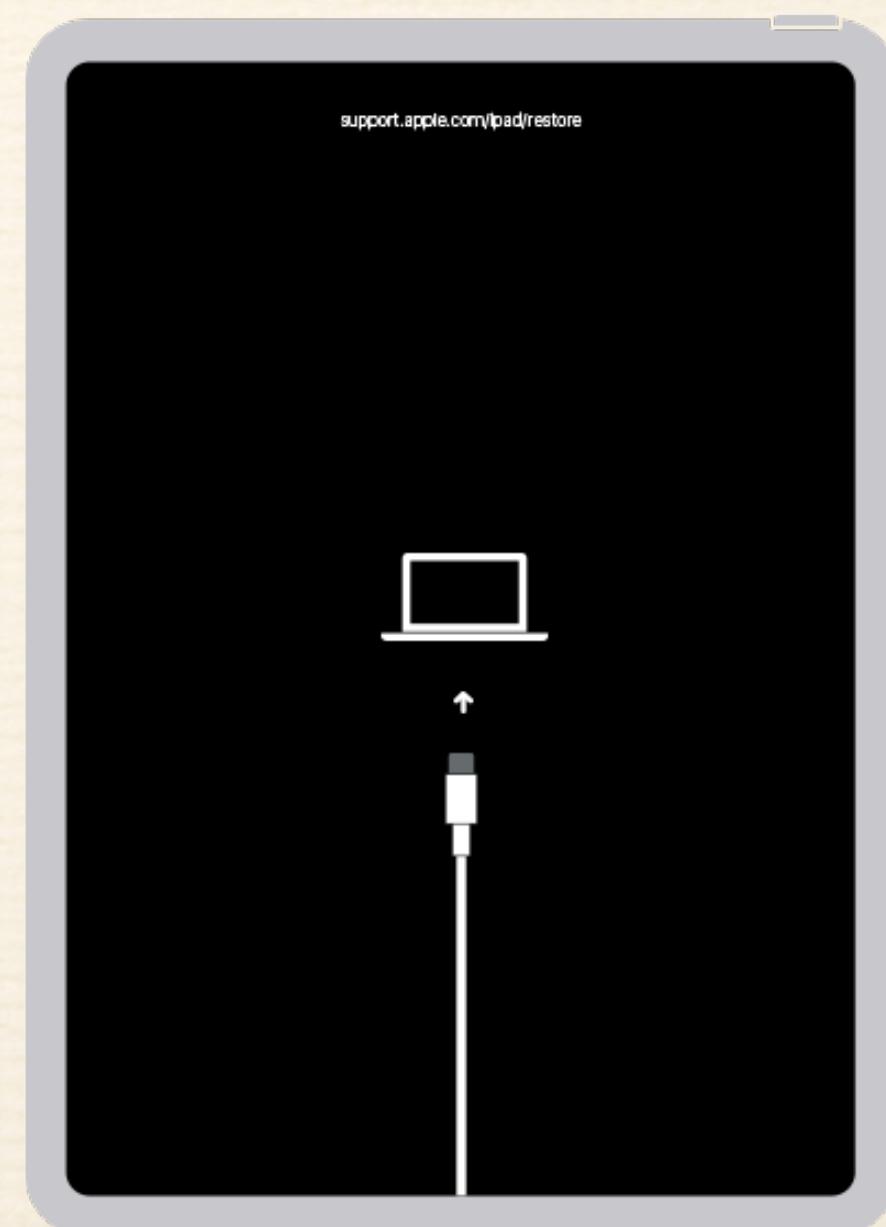
# Ways around Trust Issues...

- ❖ Leverage MDM by using the ERASE command.

If iPad has checked in to MDM today  
and its on wifi now easy way to go!

- ❖ Boot iPad to DFU mode. DFU mode  
doesn't care about Trust.

Tedious on the thumbs but  
maybe your last option.



# Impressed?



*Are you not entertained?*

# ShakeNBake.sh

- ❖ Combine MOSBasic Libraries with CFGUTIL to automate iPad cycle
- ❖ Automated Wipe, Update, Provision, and then let DEP bat clean up.
- ❖ Work around Trust issues by leveraging MDM wipe ability.
- ❖ Clear back logged commands in MDM before setting up device.
- ❖ Disable Lost mode on the iPad we are working on.

# Shake N Bake.....

The Live Demo

# What about us Other MDM people?

- ❖ ShakeNBake.sh utilizes functions from MOSBasic as well as cache'd data.
- ❖ If you can get this data out of your existing MDM or Ticket system you could easily adapt. Code is commented where necessary.

*Feel free to branch my Repo and adapt to your needs.*

<https://github.com/JCSmillie/MOSBasic>

# A warning about running CFGUTIL in a Loop

- ❖ Some chargers/Sync stations disconnect the iPad from USB connectivity momentarily to switch from charge mode to no charge mode. When this happens, if you are running CFGUTIL exec, it will detect that drop/connect as a new connection and wipe it again.
- ❖ Think infinity loop of iPad wiping...

## Known to work:

- ❖ Lock N' Charge U16SCB
- ❖ Lock N' Charge ELE7060
- ❖ Cambrionix Thundersync 3-16
- ❖ OWC ThunderBolt 3 Dock
- ❖ Intel Macs with lots of USB A ports

## Known not to Work

- ❖ Griffin Storage Docks (Black & Silver)
- ❖ USBC to multi USBA port adapters.. Very finicky.

As a former Apple SE on our account used to tell me all the time “Mileage May Vary”



# What about Automator?

- ❖ MacOS Catalina and down? Yup. You can do that.

<https://support.apple.com/guide/apple-configurator-2/automator-actions-cade0f4df56f/mac>

<https://configautomation.com>

- ❖ Big Sur and up? Nope. You can't install a wifi profile so you can't finish the device. Always failed.

\*As of October 2021

Applying all of this to our  
Loaner iPad pools

# Today's Loaner Gotcha's

- ❖ Shared mode iPads student has to know their passcode. Great if they use their student ID number, bad if they don't and forget.
- ❖ Shared mode iPads don't update iPadOS if someone is logged in.
- ❖ Shared mode iPads SHOULD cycle old logins off device to ensure there is always free space for the next person. Doesn't always work.
- ❖ ~~Shared Mode iPads and Securly don't play well together.~~
- ❖ Shared Mode iPads don't delete apps installed for individual users when they log out. It just stays behind even if no one ever uses that app again.

# Regular iPads as Loaners

- ❖ ShakeNBake connected to ChargeNSync
- ❖ iPads waiting to deploy are just like regular iPads, but flashier cases
- ❖ Take iPad, log kid in, let them use it. When it comes back throw it in the charger and ShakeNBake takes care of the rest.



This Summer and Future

# Launch of Jr. GatorIT Summer Camp

- ❖ 9 week program (most Thursdays)  
10am-2pm
- ❖ Students help prepare returning iPads for redeployment and buy back.
- ❖ Students learn hardware Safety
- ❖ Students learn Tier I response procedures so they can be first response to their fellow students for the 22-23 school year.
- ❖ Students are fed with the help of Donations from our Technology Partners and Local businesses.



# Jr. GatorIT Summer Camp Supporters



MOSYLE



Our Technology  
Success Partners

Our Local Supporters



# Jr GatorIT Help Desk Program Goals

- ❖ 22' - 23' School year Jr GatorIT helpers will respond to Tier I student issues.
- ❖ Summer 23' Year 2 of Jr GatorIT Summer Camp. 8th graders train 6th & 7th graders. 9th/10th graders train 8th graders.
- ❖ 23'-24' return to Gateway Middle School. Dedicated student Help Desk Space close to main office. New course Introduced for Jr GatorIT covering IT ethics, Management, Presentations, and of course IT Tier I Support.

# GHS Student Help Desk

- ❖ Started 21'-22' School Year and overseen by Sean McMahon, Technology Specialist
- ❖ Very grass roots right now, but students do repair Chromebook in house. Monthly visits from AGiRepair Staff for new training and exposure to the many possible career paths in IT.
- ❖ Long Term Goal-> Jr Help Desk gets students oriented and iPad Tier I support is their gateway to the program. When students come to GHS they learn Chromebook repair and assist with other day to day IT tasks.
- ❖ Starting 22'-23' school year partnership with AGiParts to supply repair parts for latest Chromebook purchase. The students will continue to repair.
- ❖ Help Desk participation qualifies for Act 158 credits.

# Random Small Changes

- ❖ Migration to MosyleDNS for all district iPads.
- ❖ Deploy new Loaner Model to all Loaner locations.
- ❖ ~~Sell soul for Magic Beans~~
- ❖ Restart the GSD Student Hardware Insurance Plan
- ❖ Put App Deployment in the Teachers hands.

# App Deployment in Teachers Hands

- ❖ Clear out our Optional Catalog for 22' - 23'

Profile Name \*

Save

Installation source  
Apps and Books (VPP) - Mosyle Manager VPP

Assignment method  
Device based - Assign licenses to device serial number

**ADD APPLICATION**

Grid View ▾

Application	Licenses Used / Total Licenses
ABCmouse.com	268/1000 licenses used
Bee-Bot	96/3000 licenses used
Blockly for Dash & Dot robots	73/3000 licenses used
Boom Cards	178/500 licenses used
Canvas Student	50/4500 licenses used
Chess - Play & Learn	448/1000 licenses used
Chess for Kids - Play & Learn	336/1000 licenses used
eBooks	82/3000 licenses used
Cork The Volcano - Puzzles	177/1000 licenses used
Cricut Design Space	67/1000 licenses used
Desmos Graphing	728/4087 licenses used
Duolingo - Language	534/2300 licenses used
EdClub	92/1000 licenses used
Edpuzzle	262/4500 licenses used
Expeditions	42/1500 licenses used
EZ Calculators	1193/3063 licenses used
Flip - Share, Discover, Be You	631/2481 licenses used
FreeFlight Mini	13/3000 licenses used
GarageBand	1464/6940 licenses used
Geo Touch: Learn Geography	123/1000 licenses used
GeoGebra 3D Calculator	120/3000 licenses used
GoNoodle - Kids Videos	442/899 licenses used
Google Calendar: Get Organized	1027/5000 licenses used
Google Docs: Sync. Edit. Share	1252/6112 licenses used
Google Earth	1339/4093 licenses used
Google Keep - Notes and lists	943/6091 licenses used
Google Maps	48/3000 licenses used
Google Meet	1071/3091 licenses used
Google Sheets	1051/6563 licenses used
Google Slides	1544/6561 licenses used
Google Tasks: Get Things Done	126/3000 licenses used
Google Translate	256/1720 licenses used
Imagine Learning Student	81/350 licenses used
iMovie	1465/3615 licenses used
iRobot Coding	267/1000 licenses used
Jamboard	480/2500 licenses used
Keynote	1369/3000 licenses used
Khan Academy Kids	123/2000 licenses used
Khan Academy	147/1500 licenses used
Kids A-Z	451/1500 licenses used
Kite Student Portal	40/1000 licenses used
Learn to Read - Duolingo ABC	122/3000 licenses used
LEGO® Boost	246/1500 licenses used
LEGO® BOOST Star Wars™	233/500 licenses used
Math Inventory	141/1925 licenses used
Merriam-Webster Dictionary	169/3000 licenses used
micro:bit	12/3000 licenses used
Microsoft Excel	68/1500 licenses used
Microsoft OneNote	302/3849 licenses used
Microsoft PowerPoint	204/1500 licenses used
Prodigy Math: Kids Game	663/2476 licenses used
Quizizz: Play to Learn	297/3498 licenses used
Quizlet: Learn with Flashcards	492/2825 licenses used
Read Live	79/1872 licenses used
Read&Write for iPad	44/3000 licenses used
Reality Composer	91/3000 licenses used
SAM Space	18/3000 licenses used
SayHi Translate	91/1000 licenses used
SchoolMessenger	15/4500 licenses used
Sight Reading Factorv	45/3000 licenses used
Sketchbook®	1467/4000 licenses used
Minecraft: Education Edition	1434/4000 licenses used
National Park Service Tours	86/1000 licenses used
Nearpod	1073/6772 licenses used
New SmartMusic	75/700 licenses used
Numbers	1368/6000 licenses used
OG Card Deck	38/3000 licenses used
Pages	1316/3000 licenses used
Sketchbook®	1467/4000 licenses used

# App Deployment in Teachers Hands

- ❖ Clear out our Optional Catalog for 22' - 23'
- ❖ Teachers use Mosyle Manager to setup Class Study Apps; force install apps when Class is started.

The screenshot shows the Mosyle Manager application interface. At the top, there's a header bar with the class name "Homeroom 1" and teacher name "Helen Burdette". Below the header, there are two tabs: "Manage iOS / iPadOS" and "Manage macOS".  
  
On the left, there's a sidebar with several options:

- "Class Feed"
- "Class" (with a switch)
- "Study Apps" (with a switch)
- "Heads Up!" (with a switch)
- "Safe Test"
- "App Lock"
- "Quick Poll"
- "Open Classroom App"

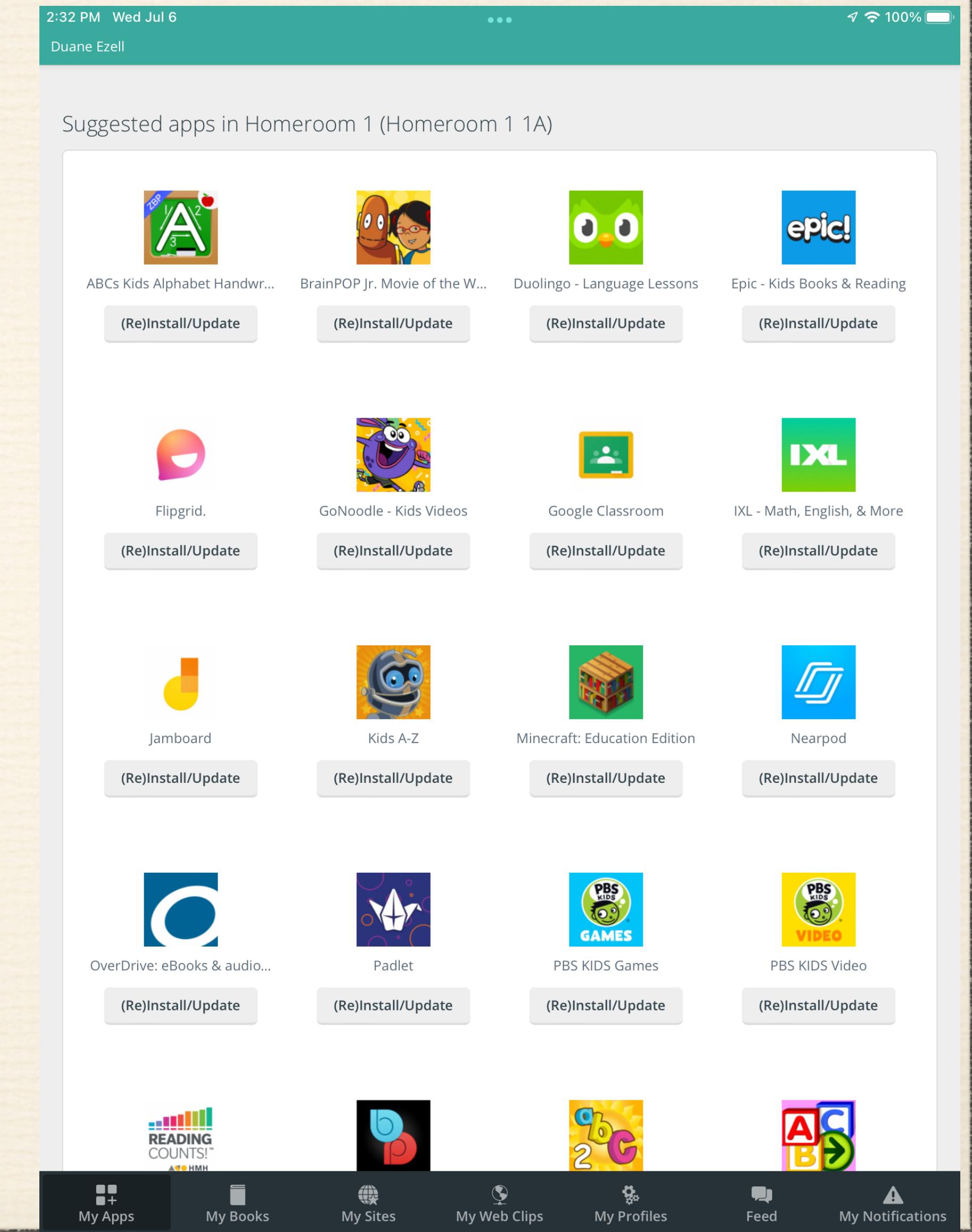
  
Below the sidebar, there's a "Settings" section with a button labeled "Open Training Center".  
  
The main content area is titled "Study Apps" and contains the following text: "Create a list of allowed apps for your class. All applications on the list will be installed on student devices. Any unlisted applications will be hidden." There's also a "Grid View" dropdown menu.  
  
The central part of the screen displays a grid of 25 application icons, each with its name below it:

25 APPLICATIONS				
ABCs Kids Alphabet Handwriting &	BrainPOP Jr. Movie of the Week	Duolingo - Language Lessons	Epic - Kids Books & Reading	Flipgrid.
Google Classroom	IXL - Math, English, & More	Jamboard	Kids A-Z	Minecraft: Education Edition
OverDrive: eBooks & audiobooks	Padlet	PBS KIDS Games	PBS KIDS Video	Reading Counts!
SPELLING MAGIC 2	Starfall ABCs	Starfall FREE	Stop Motion Studio	Superkids Online Fun
Whiteboard Easy and Smart				

  
At the bottom right of the main content area is a green button labeled "Add application(s) to the list".

# App Deployment in Teachers Hands

- ❖ Clear out our Optional Catalog for 22' - 23'
- ❖ Teachers use Mosyle Manager to setup Class Study Apps; force install apps when Class is started.
- ❖ Study Apps appear in students list of what they can install through the Manager Self Service App on their Own.



**Jesse**

*Mac & Linux Operations Engineer*

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jsmillie@gatewayk12.org

**Jennifer**

*Child Accounting Technology Support*  
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Questions?

GitHub Resources Noted:

[https://github.com/JCSmillie/PSUMacAdmins2022\\_iPadDeploymentsInGSD](https://github.com/JCSmillie/PSUMacAdmins2022_iPadDeploymentsInGSD)

