

EARLY YEARS MUSIC RESOURCE

OUR FUTURE CITY

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Why Digital Tools?

Digital tools for music making can offer

- A wide range of sounds and instruments
- Different ways to interact with, explore, create and manipulate sounds
- Record your own sounds
- Manipulate and combine sounds
- Opportunities to incorporate with singing and acoustic music making
- Multi sensory engagement

Digital tools for music making can be used in

- Composition
- Performance
- Musical learning – rhythm, pitch, timbre, dynamics
- Listening activities
- Cross arts creative activities
- Story making
- Drawing
- Physical Movement

Digital tools for music making can support and encourage

- Creativity
- Interaction
- Exploring together
- Playing as an ensemble
- Self expression and agency of children and adults together
- Confidence of adults to play and make music with children

Incorporating digital tools

“Computer pioneer Alan Kay likes to say that technology is anything that was invented after you were born. For kids growing up today, laptops and mobile phones aren’t high-tech tools – they’re everyday tools, just like crayons and watercolors.”

Mitchel Resnick, 2017. Author of Lifelong Kindergarten Cultivating Creativity through Projects, Passion, Peers, and Play

Digital tools are an addition to not a replacement of acoustic instruments “natural, sensory, embodied experience” (Young, 2006)

‘technology should be a means to an end and not an end in itself.’

(Pugh and Pugh, 1998)

Musical Development Matters in the Early Years By Nicola Burke

“Children’s use of mobile devices such as tablets and handheld computers is now commonplace. There is an enormous range of ways that devices can be used to support and enable music making. Effective use of devices can positively contribute to children’s music making and musical development. Devices, applications and interaction styles vary greatly, making it impossible to suggest how they are “typically” used and how they



DEVICE TIPS & RECOMMENDATIONS

ios TIPS

Side Switch (older models)	Settings – General – USE SIDE SWITCH TO LOCK ROTATION. Or on Control Centre for newer devices.
Auto Lock (turns device off)	Settings – General – Auto-Lock Can change to NEVER when in a session so iPad won't turn off.
Airplane Mode (SIM card)	Settings – Airplane Mode - turn on. Can then turn WiFi back on if you need. Will stop network access if you have SIM
<u>Guided Access</u>	Settings – General – Accessibility – Guided Access – turn on both GUIDED ACCESS + ACCESSIBILITY SHORTCUT Go to PASSCODE SETTINGS and enter a (VERY memorable) passcode ie 0000 or 1234. Triple click Home Button in the App you want to restrict. Draw round the specific areas you want to restrict. You can also define which physical buttons to restrict and put a time limit on. Enter Passcode. Press START (top RH corner). To exit - triple click Home button. Enter Passcode
If App not working properly	Settings – Privacy – Camera or Microphone – Turn on any Apps not working. Or at the bottom of SETTINGS is a list of all apps which you can individually go into to allow Microphone / Location services..
If you get annoying pop ups	Settings – Notifications – Turn off any in the INCLUDE section which you don't want
If Control Centre pops up	Settings – Control Centre – turn off ACCESS WITHIN APPS
Update Apps	App Store – Updates (bottom right) worth doing every so often for App improvements, freebies etc
Screenshots	At any time you can press and hold the HOME and the OFF button together. The screen will flash and the pic will go to Photos. Don't hold down after flash or iPad will reset BUT if iPad ever freezes this is good way of forcing a reboot!

General Tips

Speakers	Use external speakers if possible for more sonic power! Bluetooth speakers are convenient but nearly all have latency – ie you hear the sound (late) after you touch it. For some apps this does not matter but makes many music apps unplayable.
Using the built in microphone	Use headphones whenever you use the mic to avoid horrible feedback (when a mic gets pointed at its own speaker). The mics are at one end of the device so don't hold it with both hands covering the mic and try to record into the screen!
Lighting for camera use Safeguarding	Some apps are fussy about what the camera sees so experiment with lighting if app seems to be not working properly. To be sure all outside access is blocked put device on Airplane mode & check wifi is off.

ios Compatability

<u>iPad</u>	<u>iPhone</u>	<u>iPod Touch</u>	<u>ios Version</u>	<u>Type</u>	<u>Release date</u>
	1	1	3		Feb-10
	3G	2	4	32-bit	Nov-10
1		3	5		May-12
	3GS	4	6		Feb-14
	4		7		Jun-14
2, 3, Mini 1	4S	5	9	32 & 64-bit	Aug-16
4	5, 5C		10		Jul-17
			12	64-bit	Oct-18
			12.1		Nov-18

All newer devices from iPad Mini 2 / iPad Air (1) / & iPhone 5s, will work with ios 11 & 12 which are the last major updates (as at Mar 19)

Remember that not all apps will work on all devices - if you can't see the app in the device's own app store then you can't get it on that device

If you have an android device then search for the ios App you are interested in and add "android version" to see if there is a similar app for you.

Buying Recommendations

NEW	iPad(2018) 32gb for £309 (or larger memory 128gb for £409) with a 1yr warranty
OLD	iPad Mini2 £150 or iPad Air (1) £180. If you buy from ,e.g. CEX, then they give you a 2yr warranty!
CASE	Griffin Survivor Cases
HOLDER	From £20 for desk clamp e.g Bestek Gooseneck to £100 for wheelchair clamp e.g Buybits Tablet Holder Mount for Wheelchairs
USB Adaptor	Lets you connect USB devices (keyboards / triggers etc) to device (£29 Apple Store).
HDMI adaptor	Lets you put iPad/iPhone display and sound through TV / projector. Can also get VGA adaptor for older projectors (video only – sound would still come from device's speakers or headphone output). Apple TV can also be used to wirelessly display the iPad/iPhone if you have one.
Headphone splitter	These can be very useful as audio through headphones is always more magical and great to share. You can also get 5-way splitters cheaply.
DJ Accessory	Launchpad Mini £80. Grid of 64 rubber lit up pads providing tactile control of Launchpad App or most midi apps. Can also buy second-hand Launchpad S for £50 / £60 (must be " S " to work with iPads).
iPad Microphone	The cheapest option will be a mic (even a clip-on) that plugs into the headphone socket of the device – bear in mind newer iPhones don't have the headphone socket anymore! More expensive will be the mics or adapters that plug into the Lightning (charger) port. e.g. iK Multimedia iRig Pre (£25 for headphone socket or £75 for Lightning port - then you need to buy an XLR (3-pin) lead plus a microphone (cheap & replaceable depending on use!).
Keyboard	Many choices from around £25, 2 to 6 octaves some with weighted keys like piano, some with extra pads for drums etc.
Diffusion Speakers	Very useful for exploring musical vibrations on different surfaces and works as a standard speaker e.g Damson Cisor 10w (£30)
Mogee Pro Sensor	A vibration sensor that can be placed on any surface and turn it into an instrument through the iPad (around £100). A cheaper / more basic version of this is a mic sitting on a surface going through the app Impaktor!
Wooden Letter/Nos	Marbotic Deluxe Learning Kit £89.95 (works with some Android). Not musical but good physical interaction tool (but expensive!)

MOVEMENT APPS

AUMI by Deep Listening Institute

£free



Uses the camera as an input “to play sounds and musical phrases through movement and gestures” using small and large movement ranges. Can be played by individuals or groups depending on the setup. Different instrument sounds to choose from that can be played horizontally, vertically or set to zones. Change the key and the scale. Midi notes can also be sent. It is more useful for free improvisation than precise rhythmic playing.

TIPS

The app is sensitive to lighting so test different positions and lighting (try strong light but with the camera not directly pointed at the light source)

- Can be played with small or large movements. Change the size of the active instrument playing area by pinching and expanding with 2 fingers
- Can be used for general movement or choose a particular point to track by touching the screen on the point you want to track – experiment by trying different objects or points to follow. You will need to keep choosing the tracking point
- Check the angle and placement of the camera so the person or object you are tracking is in frame
- Moving the camera will trigger notes so keep the device still unless you are experimenting with playing like this
- Change the trigger area mode by tapping ‘Looks’ and changing ‘Layout’
- Change the key and scale in the ‘Instruments’ tab

IDEAS

- Grandmother’s footsteps
 - If the sound is triggered -
 - everyone claps a rhythm together
 - sings or chants a phrase
 - or everyone moves freely to play the instrument until stop signal
- Musical statues
- Red light / green light (stop and go). Try signalling start (moving) and stop (moving) with the voice or red and green objects like scarves or coloured card. Take in turns to conduct the group to stop and start
- Bounce balls, beanbags or teddies on parachute or lycra. Position the camera so when the toys bounce in the air the sounds are played
- Dance toys or puppets to play the instrument.
 - Play musical statues or Red light / Green light with the puppets
- Throw a ball to trigger the sounds.
 - Everyone keeps out of camera frame either side. Throw the ball across the app playing area
 - Set up the playing zone vertically and throw the ball up in the air to play the instrument
- Improvise with backing, for example Launchpad, Drumjam or The Improvise Approach
- Experiment with different movement, for example ‘put your hands in the air’, ‘pretend you are an elephant’
- Expressive movement with scarves or ribbons

Other apps to use for movement: AirHarp

MOVEMENT APPS

Color Band by Ting-Wei Liu £free



Draw with sound then play by touching screen or by movement using the camera. Choose instruments and draw on the screen. Play the different instruments by moving using the camera as an input to trigger the sounds, by touching the screen, or play your composition by scrolling across the screen or with the character. You can also record your own sound to use.

TIPS

- Change between play and draw mode on top left of screen
- When in play mode change between the camera, touch screen scrolling or character play options on top right of screen
- Record your own sound by choosing the microphone instrument and press and hold the microphone flower to the right of the screen.
- Recording a new sound will change the sound already on the canvas. Left on the screen plays lower pitch, right higher for each new mark on the canvas
- The other instruments go up the scale for each new mark on the canvas
- Add sounds to the canvas gradually – it can sound busy particularly when in camera play mode

IDEAS

- Draw pictures and experiment playing your pictures with the different play modes
- Try different combinations of instruments
- Take turns to write letters in the alphabet or numbers
- You could then perform the composition with the camera play mode by writing the letters or numbers in the air
- Incorporate movement activities in camera play mode. For example, grandmothers footsteps, Red light / Green light. See the AUMI app ideas
- Perform your piece in the camera play mode whilst drumming. Check the camera is pointed towards the drummer and experiment with different camera positions

Other apps that use drawing to compose with: Pitch Painter, Singing fingers

VOCALISING APPS

AUFX:Dub by Kymatica AB £4.99



Delay effect great for long delays to make live soundscapes. Lots of different effects including robot, flying saucer, as well as chorus, flanger.

NEED

Microphone, lead, Mic Adaptor, Speaker

TIPS

Watch out for feedback! - keep the microphone away from the speaker and keep near the speaker volume just in case
Make sure you have speaker and/or mic plugged in and you know where the volume is before turning on at the top left of the screen
If the effected sound is too quiet increase the Dry/Wet mix

IDEAS

Use the long delay preset to create a soundscape based on a theme, for example the jungle, the seaside, a walk in the park, a day in the city, the weather. Take turns to make a sound into the microphone using voice, sound making objects or instruments to make a soundscape based on your theme

Use instruments or sound making objects with the long delay to create a live performance

Explore the different presets – can be used to encourage vocalising

Use in story making. A science fiction based theme could use the 'Funny Robot', 'Dark Alien' 'Dark Space' and 'Flying Saucer' presets

Other apps to encourage vocalising and sound making:

Jam Synth - Tracks the pitch and amplitude of an incoming signal and uses this information to control digital oscillators

Vio - Transform your voice and change the sound with beautiful visual interface

Also Vocolo, Harmony Voice, AutoRap

IMPAKTOR by beepStreet £4.99



NEED

Ideally mic & speaker but otherwise must use headphones.

This is a very clever app that uses the volume detected through the microphone to trigger quality sounds, especially drum / percussion. It has many features such as a six track recorder and full adaptive synthesis of the sounds. Very simply any noise the microphone detects will trigger a selection of excellent sounds.

TIPS

The most important tweak is the Input Sensitivity in Settings (top left). This lets you adjust how the app reacts to each sound so it is not constantly on but just above certain levels.

If you don't wear headphones (or bring the sensitivity down) the app will probably constantly just trigger itself.

You can set your own tempo (bottom left), use a metronome and have a tweak of various effects.

IDEAS

You can put the mic (or iPad) on different surfaces such as a cereal packet or table.

You can put the mic in a prop so you can appear to be "playing" drums on a soft toy for example.

With a very high sensitivity setting even a YP who has very limited vocal output (even just breathing) can trigger exciting sounds.

For movement ideas you could again set the sensitivity high and see if children can walk past the mic or over some sheets of paper etc without triggering a sound.

MIXING SOUND APPS

Loopseque Kids

by Casual Underground

£free

Circular wheel based step sequencer and circular keyboard with colourful characters and playful sounds

TIPS

Change between the pads and the piano wheel on the main menu by pressing pause button in top right of screen

Add and remove sounds to the wheel. Rings on the wheel have different colours and sounds. Remove a sound added by touching it

Change between the 3 scenes and sound worlds with the central button

Play the characters and scenery around the circle



IDEAS

Take it in turns to add or remove a new sound

Build up the sound patterns gradually listening to how adding or removing sounds creates different rhythms and grooves

Pick a red or green object (could be building blocks, bean bags, shakers or other toys) from a bag or box (without looking). If you pick green add a sound, if you pick red remove a sound

Pick a yellow, red, green, blue object (could be building blocks, bean bags, shakers or other toys) from a bag or box (without looking) and place a new sound of that colour on the pad wheel

Explore the characters and scenery together

copy each other's rhythms played on the characters and scenery

Jam with the app using instruments, household objects, or body percussion

PUFFIN ROCK

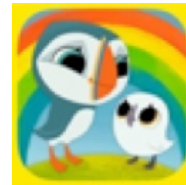
by penguin books

£1.99 (&Android)

TOCA BAND

by Toca Boca AB

£3.99



These are both fun and charming apps that let you make a start in mixing sounds and creating your own songs. They have cute characters that make different sounds at different volumes depending where you put them.

TIPS

Talk through the characters and notice the difference in their sounds when you position them

You could construct a narrative round the characters and tell the story as the music builds up / changes

Favourite toys could be used to add to this story

You could use the space you are in by making a mock up of the apps display (chairs as rocks / a stage at one end of the room)

Use percussion / DIY instruments to enhance the music – listening carefully to the rhythm and the change

Sound Forest

by Justin Alexander

£1.99

Compose using a collection of musical trees and creatures

TIPS

Free version goes through the tutorial before you can compose

Select a new or saved composition

Scroll the sounds along the bottom of the screen and tap to hear them

Choose a sound and place it on the screen

Tap a sound to remove it

Tap the play line at the top of the screen to start and stop

Tap the play line twice to change the speed between slow, medium and fast

Make the composition longer by scrolling right

IDEAS

Take turns to choose a sound / character to make a group composition

Choose a sound, roll a dice. If the dice rolls 4 add 4 of this sound to the composition. Choose another sound and roll the dice again.

Compose a piece of music along with a story using the various woodland characters and shapes

Act out the story for your composition or use toys to act it out

Make up a song based on the characters in your composition

Dance or jam along with your composition using voice, body percussion, sound making objects, instruments

Change the speed of your piece and practice listening, moving and playing instruments with the different tempos

JAMMING APPS

Thumbjam by Sonosaurus LLC £8.99



Good quality instruments, configurable playing area, amazing choice of scales, control parameters for expression, record and sample your own sounds

Tips

Change the key with the #b button in the top toolbar

Change the scale by tapping Sound – Change Scale

Change the size of the notes with Span + - on the toolbar at the top of the screen

Controls (volume, vibrato, pitch bend, tremolo) and Effects can be changed in Edit (bottom left hand corner)

The Improve Approach ibook has a handy Thumbjam set up guide for setting the key, scale, instrument

If using as an instrument you might want to use guided access to disable the toolbar and menus once instrument is set up

Ideas

Explore the different instruments

Explore the many different scales

Use in your musical making with other acoustic instruments

Try different ways to play the instrument – write your name, tickle it, hold your hand on it

Toe jamming – a great app to get the toes and feet playing music

Take it in turns to copy, mirror and respond to each other's phrases, rhythms, patterns and gestures

Create your own ensemble by choosing several instruments to play at once.

Tap the



icon on the top toolbar and #splits up to 4 different instruments on the screen

Jam with other instruments. Pitched instruments will sound good in C pentatonic scale (C, D, E, G, A, C)

Record loops. Red circle in top toolbar records, the Finish Record in top right hand corner. Pause, delete, simple mixer and loop options in the Loop tab in top right corner

Jam using Thumbjam and acoustic instruments with the music tracks on The Improve Approach. Tracks are in C pentatonic scale

Jam with Launchpad. Key can be set on Launchpad – match the key on Thumbjam

Record your own sound using voice, sound making objects or acoustic instruments. Have fun playing and listening to your sounds at different pitches

Sound – Create instrument – Record

LAUNCHPAD by Novation (& Android) £free



This is a quality sample app that lets anyone DJ really easily. It comes with some free packs (and of course you can buy many others). Ideally have the sound through speakers for a better sonic experience. Samples with circles are loops and will play forever. Samples with plain lines only play when held down (one-shot) and samples with a vertical line at the end will play the whole sample once when touched (retrigger). Only one sample per column will play at a time (so up to eight at once). Check out the FX (bottom right) which are great fun.

TIPS

The tuning fork at the top lets you put the samples into any key so if you play an instrument you can play along

The speed dial next to that lets you change tempo

There is a record button next to that so you can record a set and then email it etc (use as your ringtone?) but be careful of filling up device memory

If you are feeling very techy then there is a companion app Blocs Wave that lets you make your own sets of samples.

These could be used to learn vocabulary / make funny sounds / create sound FX for a school play etc

You could also make some DIY instruments or record percussion noises with found sounds from the local environment

This app can be used with the Launchpad controller which is very tactile and fun to use. It also means that two people can easily play at once.

You can create and save your own custom sets. For example a whole set of “one-shot” samples could be on hand for percussion / FX without entire loops.

Other Apps to use for jamming – GarageBand, DrumJam, Improve Approach, Music Memos

More Sensory Apps – Bloom, Cause & Effect Sensory Light Box

MUSIC LAB by Generategy llc £1.99



This app is fairly self explanatory as it is a whole learning process in basic pitch recognition. YP will enjoy earning trophies for getting the answers correct and it is a great start to differentiating hi and low notes.

ARTY APPS

TUNETRACE by QApps £Free



This is a simple but fun app that works on pre ios11 devices. When you touch the camera icon you can either take a new photo or choose a photo from the iPad's photo album. The app then analyses the picture and plays back music based on what it sees, mainly in terms of contrasting colours. This then is a great way to explore your surroundings together.

NEED

Paper & (thick black) pen.
Favourite toys / props
Photos already in device photo library

TIPS

Use good lighting and a thick pen as this app can be quite fussy in what it picks up

IDEAS

Take photos of favourite toys
See what sounds come out and try to sing along to them or tap a beat if there is one
Load picture from photo library - if picture of event / family day out then talk about the day and see what different sounds are created
If pictures of people then talk about them and again see what sounds they make
For physical activities take photo of standing on one leg or in funny position or spell out letters with body shapes
Take photo of a simple line drawing and add to it taking more pics as you go along
Construct a story from the drawing/s
Draw letters / numbers or words and practice mouthing / saying the sounds

SINGING FINGERS by Beginner's Mind (& Android) £ 0.99



This is a simple but clever app that acts as an instant sampler. You can move your finger whilst recording and then play it back

TIPS

Use the lock button at bottom of screen for playback only
Whilst recording you can draw the line anywhere you like so it could be used to say / draw letters or numbers
Record found sounds from around the room and then play them back to each other
Show how the louder the sound the thicker the line. This is particularly useful if you can see the pulse of a rhythm

Other Apps for drawing / sounds: Tonepad,

MUSYC

by Fingerlab (& Android)

£free (basic version)



This is another really good combination of music and art. Start a new song or look through the examples. Pick the line tool from the menu on the right and draw a couple of lines then pick a shape and watch / listen to them bounce around.

TIPS

If you pinch the screen with two fingers you can zoom in / out

If you touch the name of this set of sounds (top middle) you can change to different sounds

If in the app settings you tick the “Gravity With Accelerometer” box then you can angle the iPad to control the gravity of the shapes instead of them just falling down

There are more settings on the drop down menu for the full (paid) version and you can get quite complicated if you want to

Experiment with the FX (button next to settings at top)

This is a quiet app but you can turn master and individual volumes up in the mixer page (button next to FX at top)

IDEAS

Start with only a few elements and listen to each change as you slowly add more – maybe tap rhythm / sing notes if possible

With the “Static” button pushed (in bar at bottom which appears when a shape is selected) the shapes freeze and can be used to make pictures.

For more physical activity create a maze (don't forget to zoom out for more space) and turn on the “Gravity With Accelerometer” in settings. Try to get through the maze by tilting the device without making any sounds.

Explore the examples that come with the app. You can interact and change them however you like but as they are locked they will always go back to their original state.

SAMPLING APPS

Skoog Scratch by Skoogmusic £ free



Record up to 5 samples on coloured tiles.

Keezy Classic by Keezy Corp. £free



Record up to 8 sounds on coloured tiles and play.

TIPS

Record quiet sounds close to the mic and louder sounds further away
Be ready to make your sound before you tap the coloured square to record
It might help to have a count down and a thumbs up when recording signal

IDEAS

Match the animal pairs. Record an animal sound into each square for the animal on the visual aid, picture card, toy. Play back one of the sounds and identify which animal matches the sound.

Listen to animal sounds and try to recreate the sounds using voice, sound making objects or instruments.

Sound libraries

<https://www.freesoundeffects.com/free-sounds/animals-10013/>

<http://animal-sounds.org/animal-sounds-free-download.html>

Match the pairs with transport, instruments, cooking sounds, household objects, other themes.

Record body percussion and play rhythms with the percussion instruments you have created in the app

Explore the sounds of your environment and record in the app

Use these in story telling and story creation

Make a soundscape. This could be based on a theme, for example 'a visit to the moon', 'swimming with the penguins'

Make a composition

Play homemade sounds with the Duckie Deck Homemade Orchestra app and try making some of the homemade instruments to record into Skoog Scratch / Keezy to make your own homemade orchestra

Additional Equipment: Animal pictures or toys

APP LIST

App & developer	platform	Description	weblink	cost	App icon
Air Drums ! By: Skunk Brothers GmbH	IOS	Drum kit that can be played simply by shaking / moving the iPad	https://itunes.apple.com/us/app/air-drums/id549136796	free	
AirHarp – play in the air By: NR	IOS	Play the harp by moving	https://itunes.apple.com/gb/app/airharp-play-in-the-air/id431372563	£0.99	
AUMI By: Deep Listening Institute	IOS Mac OS Windows	Uses the camera as an input “to play sounds and musical phrases through movement and gestures”	http://deeplisting.org/site/content/aumipadhome	free	
AUFX:Dub By: Kymatica AB	IOS	Delay effect, great for voice changing effects, and very long delays for live soundscapes. Use with external mic and speaker or headphones. Be careful of feedback!	http://kymatica.com/apps/au_fx_dub	£4.99	
Beatonal By: drieriver	IOS Android	Create drum loops using pattern pads, sketch bass lines, chord progressions and melodies	http://beatonal.com	Free + in app purchase	
Bebot By: Normalware	IOS Android	Fun synthesized animated robot. Great fun for a robot chat. 4-finger multitouch polyphony, adjust synth settings and effects	http://normalware.com/	£1.99 £1.79	
Blob Chorus By: Lumpty Learning	IOS	Ear training with blobs	https://itunes.apple.com/gb/app/blob-chorus-ear-training/id484567131?mt=8	£0.99	
Blocswave By: Novation	IOS	An advanced add on to Launchpad so you can make your own samples / sample packs	https://ampifymusic.com/blocswave	free	
Bloom By: Opal Limited	IOS	Developed by Brian Eno. Melodic coloured circles repeat and layer from tapping phrases on the screen	https://itunes.apple.com/gb/app/bloom/id292792586?mt=8	£3.99	
Bloom: 10 Worlds By: Opal Limited	IOS Android	10 world of generative music. Developed by Brian Eno and Peter Chilvers	http://www.generativemusic.com/bloom10worlds.html	£7.99	
Color Band By: Ting-Wei Liu	IOS	Draw with sound then play by touching or movement from camera	https://itunes.apple.com/us/app/color-band/id642764991	free	
DM1 -The Drum Machine By: Fingerlab	IOS	Great old school step sequencer	http://fingerlab.net/portfolio/dm1	£4.99	
DrumJam By: Sonosaurus LLC	IOS	High quality percussion app. Great to jam with	https://itunes.apple.com/gb/app/drumjam/id530162824	£7.99	

Drum Pads 24 - Music Maker	IOS Android	drum pads sampler and beats music mixer	https://www.drumpads24.com	Free + in app purchase	
Duckie Deck homemade Orchestra	IOS Android	experimenting with different instruments, all of which can be crafted from household objects	http://duckiedeck.com/apps/homemade-orchestra	£2.99 £1.59	
EtherSurface By: Paul Batchelor	Android	Multi-touch synthesizer with 3 different timbres	https://play.google.com/store/apps/details?id=com.zebproj.etherpad	free	
First Notes By: SoundLINCS	IOS Android	"music resource app for use in Early Years (EY) settings or by parents and carers at home – especially those without any previous experience of music	https://play.google.com/store/apps/details?id=com.adigitalengagement.firstnotes	free	
GarageBand By: Apple	IOS	Some great touch instruments and up to 32 track digital audio workstation	https://itunes.apple.com/us/app/garageband/id408709785?mt=8	free	
iKaossilator By: KORG INC.	IOS Android	XY interface. Colourful, synths and beats	https://www.korg.com/us/products/software/ikaossilator/ https://www.korg.com/us/products/software/korg_kaossilator_for_android/	£9.99 £15.49	
Impaktor By: BeepStreet	IOS	Turns a surface into a percussion instrument	http://beepstreet.com/ios/imfaktor	£4.99	
The Improvise Approach	iBooks	10 backing tracks to use with C pentatonic scale + guide to setting up Thumbjam	https://www.improviseapproach.com	free	
Jam Synth By: Primitive Digital Software	IOS	Tracks the pitch and amplitude of an incoming signal and uses this information to control digital oscillators	https://itunes.apple.com/us/app/jam-synth/id732618765?mt=8	free +in app purchase	
Keezy Classic By: Keezy Corp.	IOS	8 coloured tiles. Record sounds and play	https://keezy.com	free	
Keezy Drummer By: Keezy Corp.	IOS	Simple step drum machine	https://keezy.com	free	
Launchpad By: Novation	IOS Android	Instant DJ production tool with great sounds / FX – v easy to use + can buy extra genres	https://ampifymusic.com/launchpad	free	
Lily - Playful Music Creation By: Pelican7	IOS Android	Using 6 lily flowers compose melodies build up harmonies, melodic patterns and change to number of petals to explore polyrhythms	https://www.pelican7.com	£1.99	

Loopseque Kids By: Casual Underground	IOS	Circular step sequencer with colourful characters and playful sounds	https://www.loopseque.com	free	
Loopy HD By: A Tasty Pixel	IOS	Live looping	https://loopyapp.com	£3.99	
Music Learning Lab By: Generategy LLC	IOS	Useful music education tool. Lessons on pitch, sounds and musical symbols	http://musiclearninglabapp.com	free / £1.99	
Music Memos By: Apple	IOS	Adds bass & drums to your recorded piano or guitar and gives chord chart for your song!	https://www.apple.com/uk/music-memos/	free	
Musyc By: Fingerlab	IOS	Really sweet way of "building" music. Bouncing sounds on surfaces	https://itunes.apple.com/us/app/musyc/id489836689	free +in app purchase	
Nodebeat-Playful Music By: AffinityBlue	IOS Android	Generative beat based visual app. Can be gentle or	http://nodebeat.com	£2.99 £1.69	
Noise By: Roli Ltd	IOS	Fun music making similar to Launchpad but more advanced	https://roli.com/products/software/noise	free	
Orphion By: Sebastian Trump	IOS	Configurable virtual pads that play instrument that sounds "between string instrument and percussion." Timbre changes depending on how you play the circles	http://www.orphion.de/	£4.99	
Pitch Painter By: Morton Subotnick	IOS	Music composition finger painting app	http://www.creatingmusic.com/2012/pitchpainter.html	£3.99	
Plasma Sound HD By: RM Mobile	Android	Multi touch XY synth app with visual	https://play.google.com/store/apps/details?id=com.rj.processing.plasmasound	free	
Puffin Rock By: Penguin	IOS Android	Mixing sounds by moving cute woodland characters	http://puffinrock.com	£1.99	
Reason Compact By: Propellerhead	IOS	Basic version free. Nice synth sounds. Paid version gives control over synth parameters	https://itunes.apple.com/us/app/reason-compact-make-music/id1253419004	free +in app purchases £9.99	
Remixlive By: MIXVIBES	IOS Android	Play loops, drums on pads and make tracks	http://www.mixvibes.com/remixlive-remix-app/	free +in app purchase	
Sensory Light box By: Cognable	IOS Android	Very visual sound making apps. Some quite stimulating	https://lightbox.cognable.com	£3.99 £2.39	

Sensory Electra By: Sensory App House Ltd	IOS Android	Visual electricity sound making	https://www.sensoryapphouse.com/electra/	free	
Skoog Scratch By: Skoogmusic	IOS MAC OS PC	Record up to 5 samples on 5 coloured tiles	http://skoogmusic.com/support/getting-started-skratch/	free	
Singing fingers By: Beginner's Mind	IOS	Multicolour finger painting with sound recording. Playback and explore sound recording painting	http://singingfingers.com	£0.99	
Social Story Creator By: Touch Autism	IOS	Create stories with pictures, recordings and text	http://touchautism.com/app/social-stories-creator-library/	free	
Sound Forest By: Justin Alexander	IOS	Compose a song using a collection of musical trees and creatures	https://www.soundforestapp.com	Free In app purchase £1.99	
SoundPrism By: Audanika GmbH	IOS	Quick music making on grid – notes / chords / 4 x sounds	http://www.soundprism.com	Free	
Tachyon By: Wizdom Music LLC	IOS	Visual interface. Blend between 2 sounds.	http://www.wizdommusic.com/products/tachyon.html	£1.99	
Thumbjam By: Sonosaurus LLC	IOS	Over 40 high-quality real instruments multi-sampled or sample your own sounds. 100's of scales. Configure size, controls	https://thumbjam.com	£8.99	
Toca Band By: Toca Boca AB	IOS	Mixing sounds by choosing characters	https://tocaboca.com/app/toca-band/	£3.99	
Tone Pad Pro By: Loftlab	IOS	Simple sound matrix sequencer 16x16	https://itunes.apple.com/us/app/tonepad/id315980301	free (with ads) £0.99	
Tunetrace By: QApps	IOS	Pictures and photos into music	http://www.qappsonline.com/apps/tunetrace/	free	
TuneTrain By: Jiyong Lee	IOS	Create melodies by drawing the route of the train with height corresponding to pitch. Also notates melody	https://itunes.apple.com/us/app/tunetrain/id702713073	free	
Vio By: Boon LLC	IOS	Transform your voice and change the sound with beautiful visual interface	https://itunes.apple.com/gb/app/vio/id595726666	free	

GUIDANCE, ADVICE, & FURTHER READING

This lists some of the resources considering the potential benefits and potential harm of the use of digital tools for young children.

Research and studies on issues related to online activity, gaming or passive screen viewing has not been the focus in gathering these resources.

In considering the potential for negative effects of using devices for music making, we can also consider the benefits of music making (see for example, Susan Hallam's The Power of Music, MEC).

More Sensory Apps – Bloom, Cause & Effect Sensory Light Box

Guidance and Advice Resources

How does the time children spend using digital technology impact their mental well-being, social relationships and physical activity?

An evidence-focused literature review. Unicef Office of Research-Innocenti. Kardefelt-Winther, D. (2017)

<https://www.unicef-irc.org/publications/pdf/Children-digital-technology-wellbeing.pdf>

Royal College of Paediatrics and Child Health (RCPCH) guidance on screen time

<https://www.rcpch.ac.uk/resources/health-impacts-screen-time-guide-clinicians-parents>

Children's Commissioner Digital 5 A

(based on 5 ways to wellbeing)

Connect, Be Active, Get Creative, Give to others, Be Mindful

<https://www.childrenscommissioner.gov.uk/2017/08/06/digital-5-a-day/>

Young Children and Screen time – A good Start: A Guide for Parents and Carers.

<https://www.childnet.com/ufiles/Young-children-and-screen-time---a-guide-for-parents-and-carers.pdf>

Screen time boundaries, Childnet International. <https://www.childnet.com/blog/screen-time-new-resource-and-top-tips>

Media and Young Minds, Council On Communications And Media.

Pediatrics Nov 2016, 138 (5) e20162591; DOI: 10.1542/peds.2016-2591

<https://www.childrenscommissioner.gov.uk/2017/08/06/digital-5-a-day/>

Connections: Parenting Infants in a Digital World. 2018. Dr Donna Kernaghan. Barnardo's NI. <http://www.barnardos.org.uk/connections-parenting-infants-in-a-digital-world.pdf>

Technology and Interactive Media as Tools in Early Childhood Programs Serving Children from Birth through Age 8. NAEYC and the Fred Rogers Center.

https://www.naeyc.org/sites/default/files/globally-shared/downloads/PDFs/resources/topics/PS_technology_WEB.pdf

Families and screen time: Current advice and emerging research. Media Policy Brief 17. London: Media Policy Project, London School of Economics and Political Science.

<http://eprints.lse.ac.uk/66927/1/Policy%20Brief%2017-%20Families%20%20Screen%20Time.pdf>

Family Time with Apps: A Guide to Using Apps With Your Kids. The Joan Ganz Cooney Center.

http://joanganzcooneycenter.org/wp-content/uploads/2015/08/jgcc_familytimewithapps.pdf

The Center on Media and Child Health (CMCH) at Boston Children's Hospital (BCH). Includes a database of research

<https://cmch.tv>

Online safety guidance and support - 'Keeping children safe in education' (KCSIE) guidance Department for Education (DfE). <https://www.gov.uk/government/publications/keeping-children-safe-in-education--2>

Scholars' open debate paper on the World Health Organization ICD-11 Gaming Disorder proposal

<https://akademai.com/doi/full/10.1556/2006.5.2016.088>

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In considering the potential for negative effects of using devices for music making, we can also consider the benefits of music making (see for example, Susan Hallam's *The Power of Music*, MEC).

More Sensory Apps – Bloom, Cause & Effect Sensory Light Box

Summary of Royal College of Paediatrics and Child Health (RCPCH) guidance on screen time

The majority of the literature that does exist looks only at television screen time.

Many of the apparent connections between screen time and adverse effects may be mediated by lost opportunities for positive activities (socialising, exercise, sleep) that are displaced by screen time.

Recommendations

Our primary recommendation is that families should negotiate screen time limits with their children based upon the needs of an individual child, the ways in which screens are used and the degree to which use of screens appears to displace (or not) physical and social activities and sleep. We would also adopt the expert recommendation that screens are avoided for an hour before the planned bedtime.

We have developed four key questions for families to use as a guide to examine their screen time:

- Is screen time in your household controlled?
- Does screen use interfere with what your family want to do?
- Does screen use interfere with sleep?
- Are you able to control snacking during screen time?

Use of devices in the Early years

“In the UK, 53% of three- to four-year-olds use a tablet at home, with one in seven pre-schoolers owning their own” - Ofcom. Children's media use and attitudes report, 2015.

“On average children spent about 17 hours a week in front of screens at two years old, increasing to almost 25 hours a week at three years, before falling to 11 hours a week at five years of age” - JAMA (Journal American Medical Association) Pediatrics

A study in 2011 found 68% of children under the age of 2 use screen media in a typical day, and that average screen time was 2.05 hours per day.

Media use by children younger than 2 years. Brown, A., Mulligan, D. A., Altmann, T. R., Christakis, D. A., Clarke-Pearson, K., Falik, H. L., Noland, V. L. (2011). *Pediatrics*, 128(5), 1040-1045. <https://doi.org/10.1542/peds.2011-1753>

Young Children (0-8) and digital technology: A qualitative exploratory study across seven countries. Joint Research Centre, European Commission.

Chaudron S., Beutel M.E., ernikova M., Donoso V., et al., (2015).

Accessed at <http://publications.jrc.ec.europa.eu/repository/handle/JRC93239>

Infant media viewing: first, do no harm. Christakis, DA. (2010). *Pediatric annals*, 2010 Sept. : 578-82.

Screen time use in children under 3 years old: A systematic review of correlates.

Duch, H., Fisher, E. M., Ensari, I., & Harrington, A. (2013). *International Journal of Behavioral Nutrition and Physical Activity*, 10, 102. <https://doi.org/10.1186/1479-5868-10-102>

The Techno-literacy practices of young children. Marsh, J. (2004). *Journal of Early Childhood Research*, 2 (1)51- 66.

Zero to Six: Electronic Media in the Lives of Infants, Toddlers and Preschoolers. Rideout V, Vanderwater E, Wartella E. (2003). Vol 2003. 2003, Menlo Park: The Henry J. Kaiser Family Foundation.

Importance of doing together

Study of infant play as a solo play and joint play “examined how adult brain activity related to infant attention”, “suggested that parents are neurally responsive to their infants during social play, and that, when the parent is more neurally responsive, the infant is more attentive.” - Parental neural responsivity to infants’ visual attention: How mature brains influence immature brains during social interaction. Wass SV, Noreika V, Georgieva S, Clackson K, Brightman L, et al. (2018)

“the presence of a competent co-viewer appears to boost babies’ language learning from screen media, much like the ways these processes facilitate learning in live scenarios.” - Screen media and language development in infants and toddlers: An ecological perspective. Linebarger & Vaala, 2010.

“In summary, for children younger than 2 years, evidence for benefits of media is still limited, adult interaction with the child during media use is crucial, and there continues to be evidence of harm from excessive digital media use.” - Media and Young Minds, Council On Communications and Media

“it could be that young children passively watching television may not be engaging in exploratory play, connecting with caregivers, or interacting with peers, and disrupted sleep due to screen use could interrupt baby-caregiver bonds.” - A large-scale test of the goldilocks hypothesis: quantifying the relations between digital-screen use and the mental well-being of adolescents. Przybylski, A. K., & Weinstein, N. (2017)
See also Ed Tronick’s “still face experiment” looking at parent and child interaction and the impact on the child when the parent does not give any visual social feedback.

“this long- held focus on the quantity of digital media use is now obsolete, and that parents should instead ask themselves and their children questions about screen context (where, when and how digital media are accessed), content (what is being watched or used), and connections (whether and how relationships are facilitated or impeded).” - Families and screen time: Current advice and emerging research. Blum-Ross, A. and S. Livingstone (2016)

Health and Wellbeing

Effects of screentime on the health and well-being of children and adolescents: a systematic review of reviews. Stiglic N, Viner RM. In: BMJ Open 2019

13 reviews - 6 addressed body composition; 3 diet/energy intake; 7 mental health; 4 cardiovascular risk; 4 for fitness; 3 for sleep; 1 pain; 1 asthma.

Conclusions

“There is evidence that higher levels of screentime is associated with a variety of health harms for CYP, with evidence strongest for adiposity, unhealthy diet, depressive symptoms and quality of life.”

- “We found moderately strong evidence for associations between screentime and greater obesity/adiposity and higher depressive symptoms; moderate evidence for an association between screentime and higher energy intake, less healthy diet quality and poorer quality of life.”

- “There was weak evidence for associations of screentime with behaviour problems, anxiety, hyperactivity and inattention, poorer self-esteem, poorer well-being and poorer psychosocial health, metabolic syndrome, poorer cardiorespiratory fitness, poorer cognitive development and lower educational attainments and poor sleep outcomes.”

- “There was no or insufficient evidence for an association of screentime with eating disorders or suicidal ideation, individual cardiovascular risk factors, asthma prevalence or pain. Evidence for threshold effects was weak.”

Development

Screen media and language development in infants and toddlers: An ecological perspective. Linebarger, D. L., & Vaala, S. E. (2010). *Developmental Review*, 30, 176–202. <https://doi.org/10.1016/j.dr.2010.03.006>

Association Between Screen Time and Children’s Performance on a Developmental Screening Test. Madigan, Racine, Browne, et al. (2019). *JAMA Pediatrics*, American Medical Association. Jan 28, 2019. <https://jamanetwork.com/journals/jamapediatrics/fullarticle/2722666>

- Relatively large study - 2441 mothers and children , Data collected when the the children were 24, 36, 60 months
- Excessive screen time can impinge on children’s ability to develop optimally;

“As technology use is entrenched in the modern-day lives of individuals, understanding the directional association between screen time and its correlates, and taking family-based steps to engage with technology in positive ways may be fundamental to ensuring developmental success of children growing up in a digital age.”

Criticisms on study

“the study did not take into account what the children were using the screens for, and that the influence of screens had a smaller effect than other factors such as family income, the child’s sleep and whether they were read to.”

“data shows that the association with screen time is weaker than that between developmental outcomes and good sleep, reading to the child, and maternal positivity” “We would, in the light of this paper, reiterate our advice that families spend time interacting as a family, that screens are not allowed to interfere with sleep, and that screen-based interaction is no substitute for in-person contact... parents should balance screen time with other activities.”

Dr Max Davie, of the Royal College of Paediatrics and Child Health

<https://www.theguardian.com/society/2019/jan/28/study-links-high-levels-of-screen-time-to-slower-child-development>

Nonverbal emotion-cue recognition

Five days at outdoor education camp without screens improves preteen skills with nonverbal emotion cues

Yalda T. Uhls, Minas Michikyan, Jordan Morris, Debra Garcia, Gary W. Small, Eleni Zgourou, Patricia M. Greenfield, *Computers in Human Behavior*, Volume 39, 2014, Pages 387-392,

- “examined whether increasing opportunities for face-to-face interaction while eliminating the use of screen-based media and communication tools improved nonverbal emotion-cue recognition in preteens.”
- 51 preteen who spent 5 days and nights at nature camp without devices.
- Less screen time increased young people’s ability to “read facial emotions and other nonverbal cues to emotion”.
- “implications of the research are that people need more face-to-face interaction, and that even when people use digital media for social interaction, they’re spending less time developing social skills and learning to read nonverbal cues.”

Parental Supervision

Touchscreen generation: children’s current media use, parental supervision methods and attitudes towards contemporary media. Kostyrka-Alchorne, K. , Cooper, N. R. and Simpson, A. (2017).

Digital Screen-Time Limits and Young Children’s Psychological Well-Being: Evidence From a Population-Based Study. Przybylski, A.K. and Weinstein, N. (2017). *Child Development*. 90 (1)e56-e65. <https://onlinelibrary.wiley.com/doi/full/10.1111/cdev.13007>

Impact of Adult use of media

Mothers’ and fathers’ media parenting practices associated with young children’s screen-time: a cross-sectional study. Tang, L., Darlington, G., Ma, D., (2018) Haines, J. *BMC Obesity*, 2018; 5 (1) DOI: 10.1186/s40608-018-0214-4

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Music technology: new literacies in the early years. Mcdowall, Janet. (2003). Australian Computer Society, Inc. This paper was presented at the IFIP Working Group 3.5 Conference: Young Children and Learning Technologies, held at UWS Parramatta in July 2003 <http://crpit.com/confpapers/CRPITV34McDowall.pdf>

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Play

Children's Virtual Play Worlds: Culture, Learning and Participation. Burke, A. and Marsh, J. (eds) (2013). New York: Peter Lang.

Exploring Play and Creativity in Pre-Schoolers' Use of Apps: Final Project Report. Marsh, J., Plowman, L., Yamada-Rice, D., Bishop, J.C., et al., (2015). Accessed at: www.techandplay.org.

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"iPads, digital play and pre-schoolers". Verenikina, I., and Kervin, L., (2011). in He Kupu vol. 2, no. 5 (2011), pp. 4-19.

Sleep Disruption

Impact of light-emitting eBooks before bed. Chang, A., Aeschbach, D., Duffy, J., Czeisler, C., (2015). Proceedings of the National Academy of Sciences Jan 2015, 112 (4) 1232-1237; DOI:10.1073/pnas.1418490112

Electronic media use and sleep in school-aged children and adolescents: A review. Cain N., Gradisar M. (2010). Sleep Med2010;11:735-42.

EMF and RF

Electromagnetic field (EMF) - "Our electricity power supply and all appliances using electricity are the main sources of ELF fields; computer screens, anti-theft devices and security systems are the main sources of IF fields;

Radio frequency (RF) fields - radio, television, radar and cellular telephone antennas, and microwave ovens are the main sources of RF fields"
<https://www.who.int/peh-emf/about/WhatIsEMF/en/>

The Sensitivity of Children to Electromagnetic Fields. American Academy of Pediatrics, Kheifets, L., Repacholi M, Saunders, R. van Deventer, E. August 2005, VOLUME 116 / ISSUE 2

"Concerns about the potential vulnerability of children to radio frequency (RF) fields have been raised because of the potentially greater susceptibility of their developing nervous systems; in addition, their brain tissue is more conductive, RF penetration is greater relative to head size, and they will have a longer lifetime of exposure than adults." Kheifets 2005

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Study links high levels of screen time to slower child development. By Nicola Davis. 27 January 2019.

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Worry less about children's screen use, parents told. By Alex Therrien & Jane Wakefield

BBC News Online. 04 January 2019.

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By Alex Therrien

Health reporter, BBC News. 04 January 2019.

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