

Articular

AUGMENTED REALITY PUZZLE



Documentation of the practical
component of the thesis

Sophia Spivak

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Signed

Date

Note. The UI interfaces presented herein are designed for Apple iPad and iPhone, two consumer devices popular at the time of writing. The choice of Apple devices for the app is for convenience, as these were available to the researcher for testing the design drafts, and does not imply a preference over Android or any other platform. If the game was to be developed into a real-world application, it would support multiple platforms, including a downloadable app for personal tablet devices, not only smartphones. The AR functionality is designed for Vuforia and Unity, and is thus bounded by the limitations of these tools. It must also be noted this document does not contain every possible screenshot in the game. The screenshots provided show the key points in the user experience, to demonstrate game mechanics and aesthetics. Furthermore, the animal-related information displayed in the screenshots, such as animal “fun facts”, serves to illustrate the concept only, and not for assessment in terms of scientific accuracy.

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Photograph of the game components showing the application loaded onto an iPad tablet and an iPhone smartphone, as well as paper mock-ups of the puzzle pieces (to be made into wooden blocks) and the table mat. Not shown: iPad mount, storage container.



Articular

AUGMENTED REALITY PUZZLE

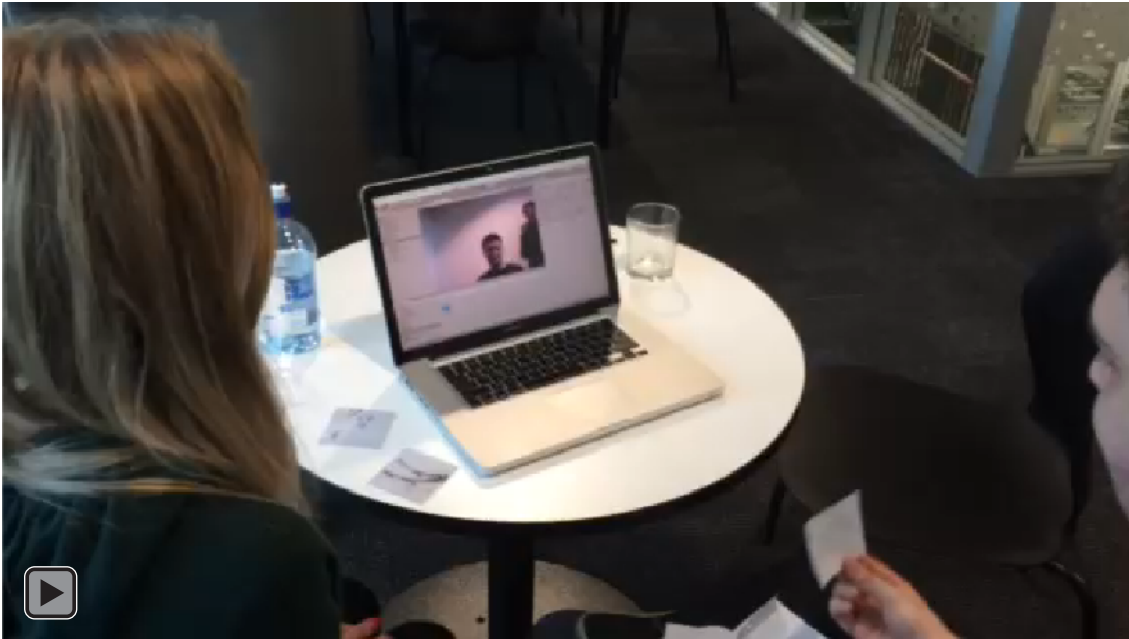


S HERE



Experiment
different
to create
wonderful

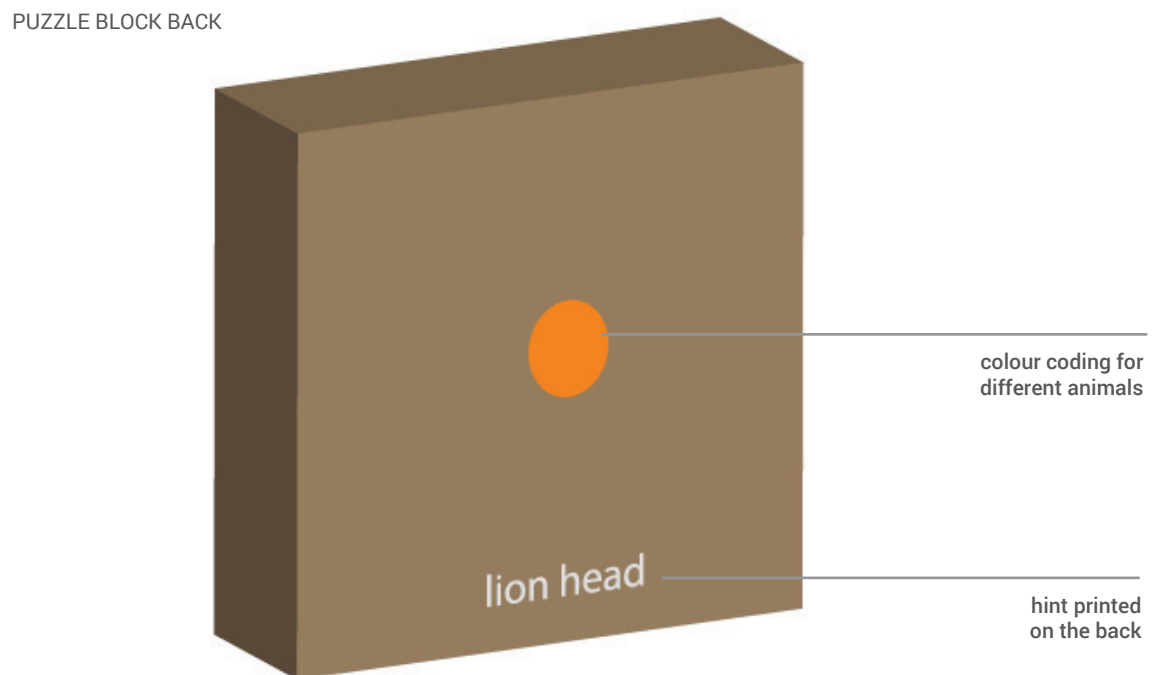
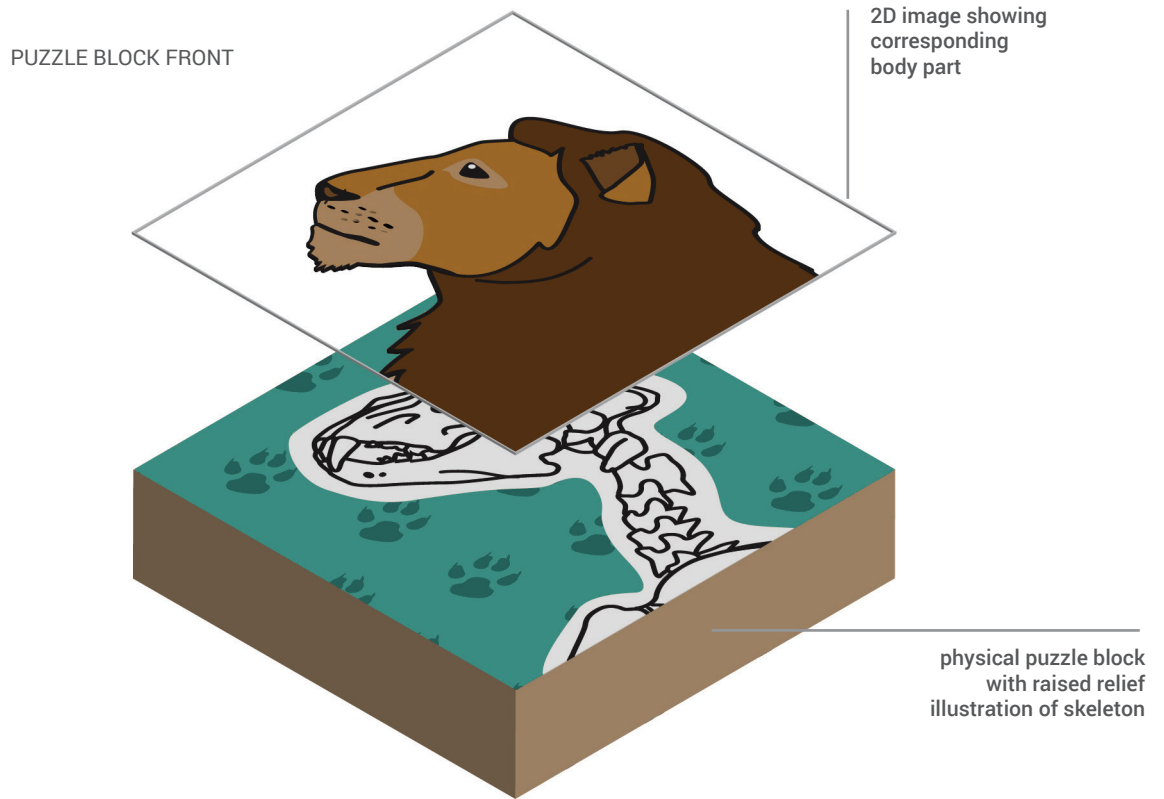
Concept design



Video still of a Vuforia test, showing the replacement of 2D AR images with a single 3D AR object.
Watch video online. URL: <https://vimeo.com/122497617>. Password: articular



Computer-generated visualisation of tangible puzzle blocks with a 3D AR object (lion), as would be seen through the tablet's camera.



area for extra
puzzle blocks

HOW TO PLAY

instructions



Place blocks under
the screen to see
the animal body part.



Match blocks
together to
make an animal.



ARticular

AUGMENTED REALITY PUZZLE



area for puzzle placement in front of the mounted iPad

^ PLACE YOUR BLOCKS HERE ^



See the animal come to life on the screen!



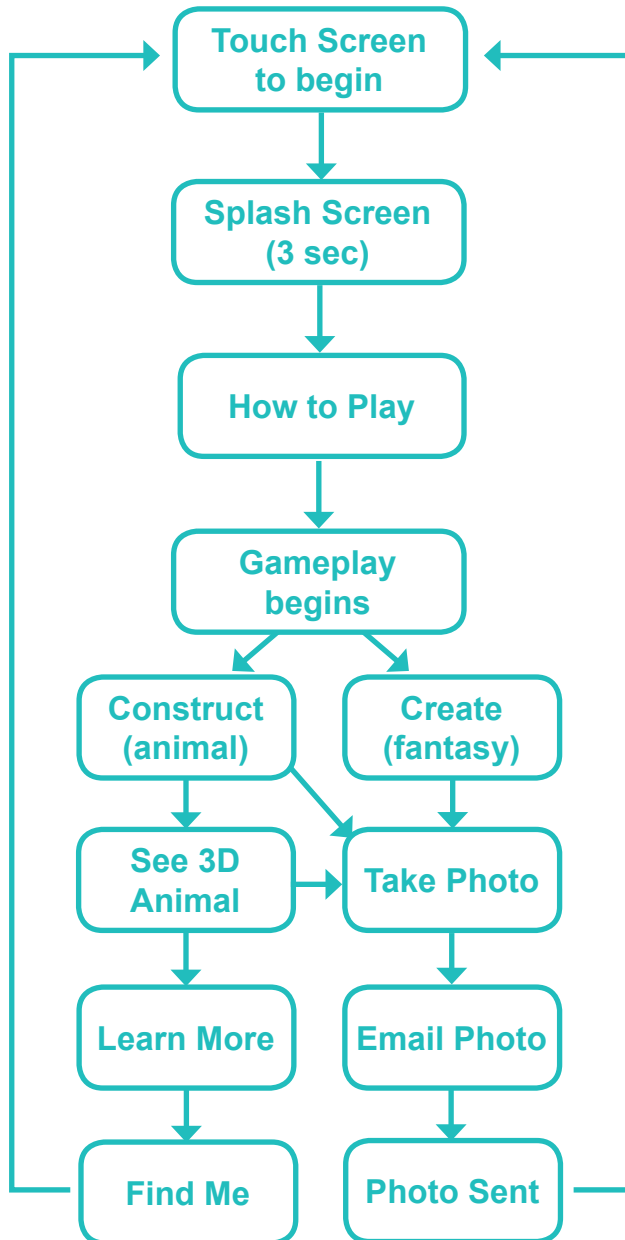
Experiment with different body parts to create weird and wonderful creatures!

Play ARticular on your own phone!

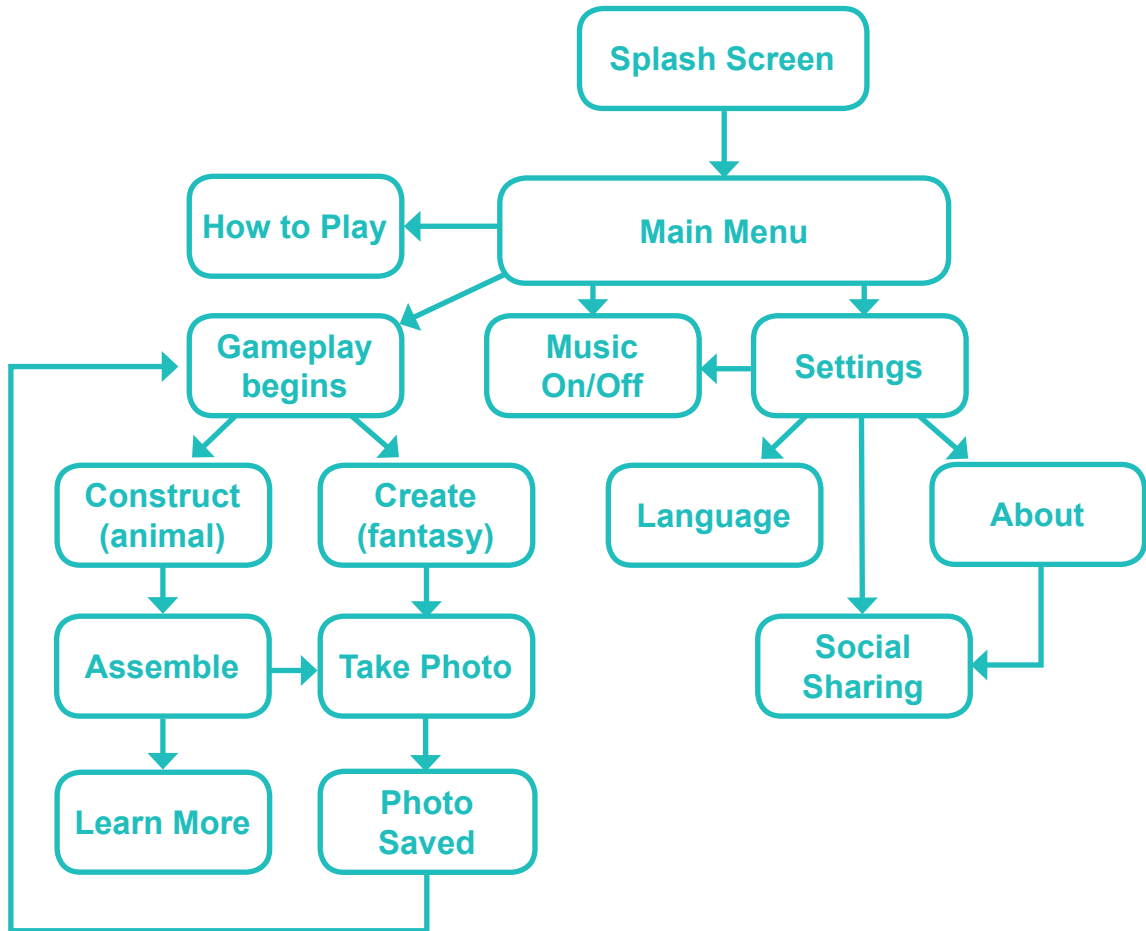
Scan this QR code to download the app to your phone. Blocks can be purchased from the museum store, or print your own.



QR code to download the app onto smartphones



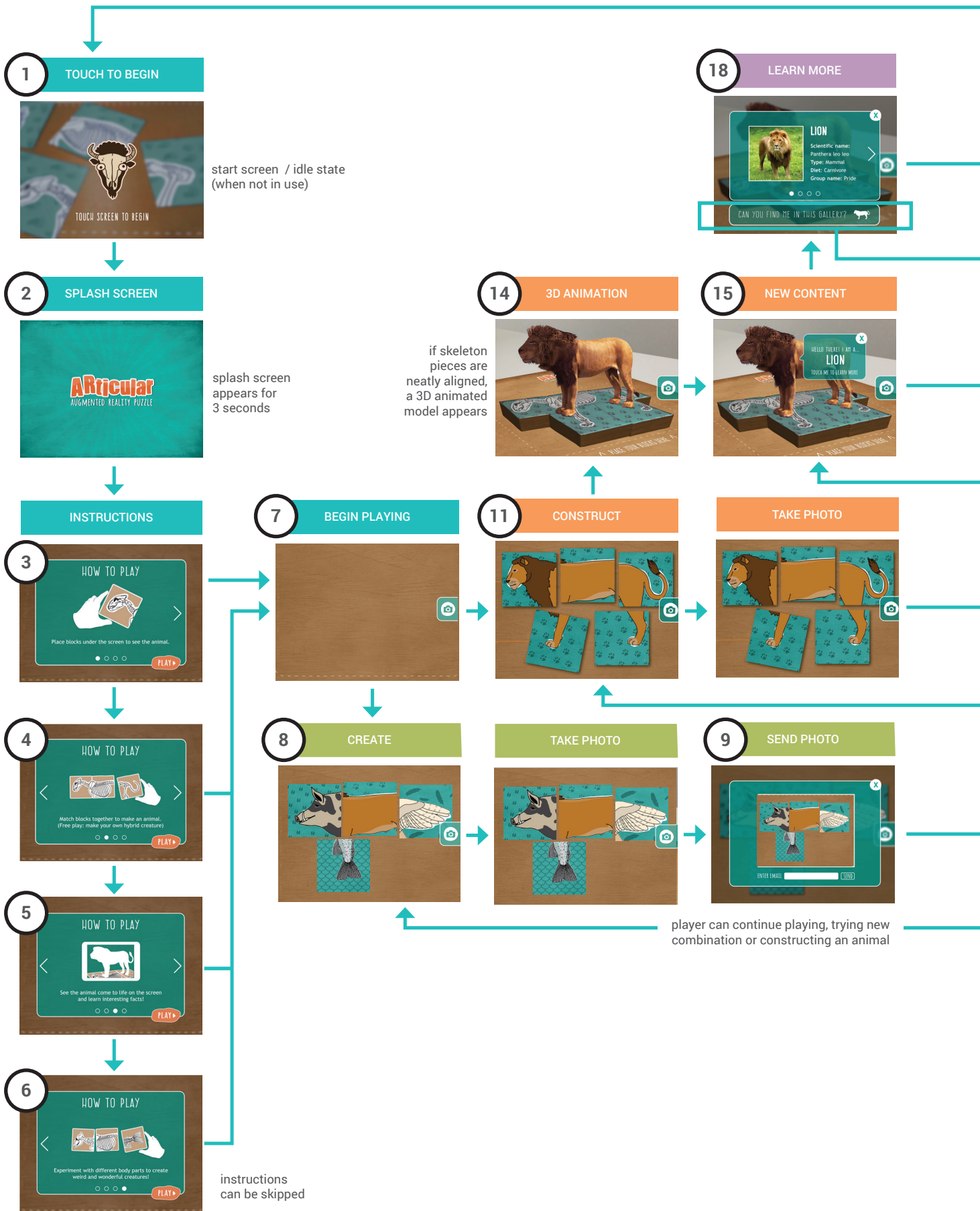
Simplified game flowchart for museum tablet.

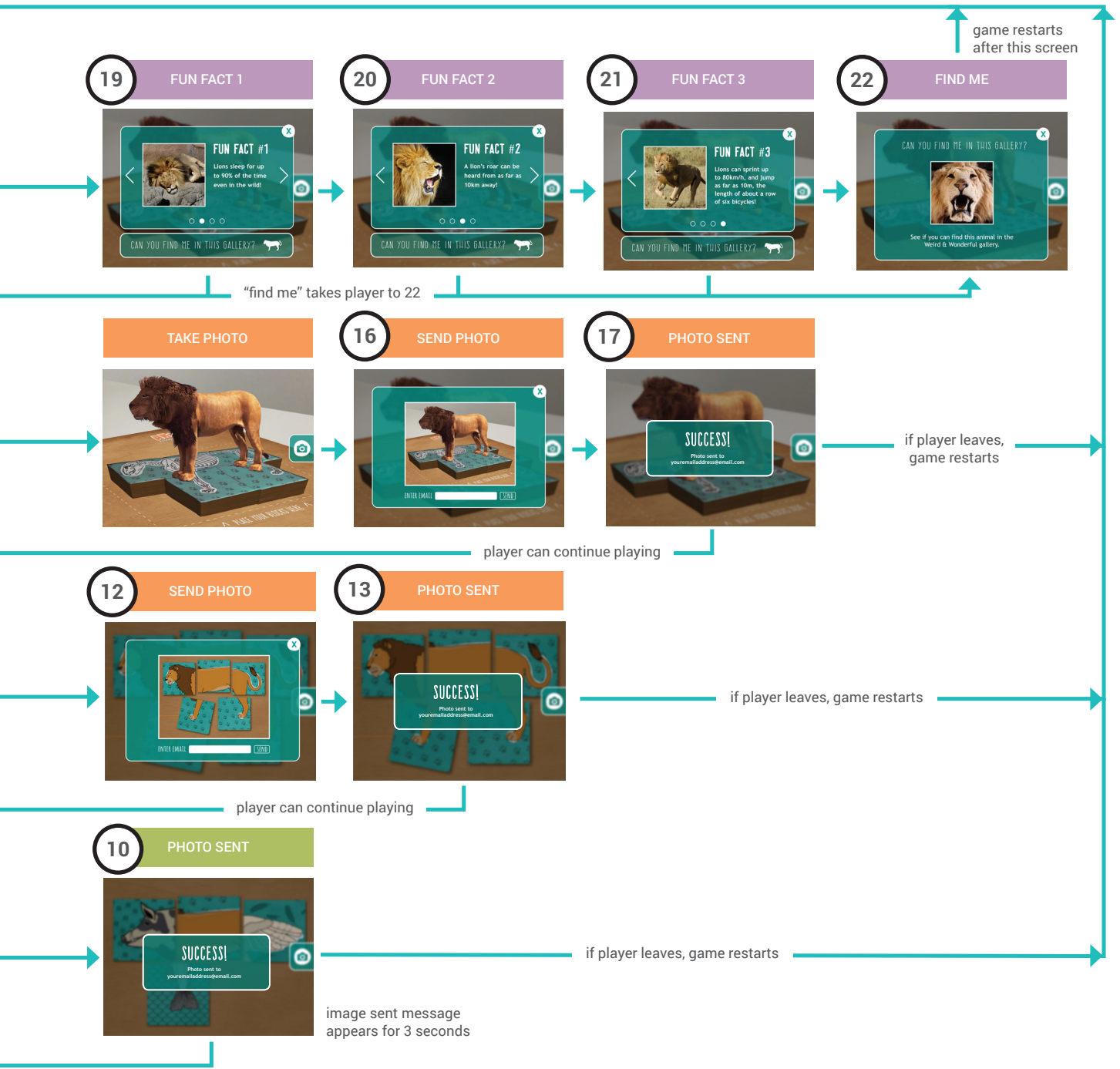


To quit the application, the player needs to press the Home button on the smartphone device.

Simplified game flowchart for personal smartphone.

ARticular UX journey in W&W gallery





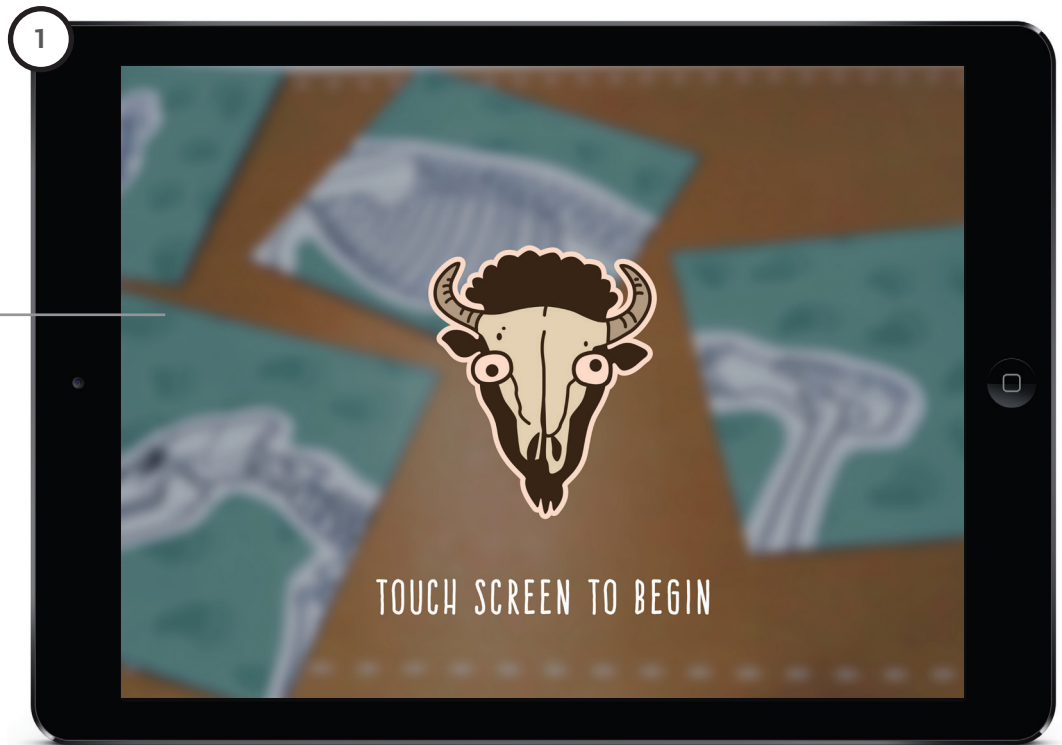
The flowchart above shows the UX journey on the iPad tablet only.

- ① INTERFACE DESIGN IMAGE NUMBER
- ➔ ACTION PATH
- GENERIC START
- CREATE PATHWAY
- CONSTRUCT PATHWAY
- EXTRA INFO WITHIN CONSTRUCT PATHWAY

ARticular museum tablet

Interface design





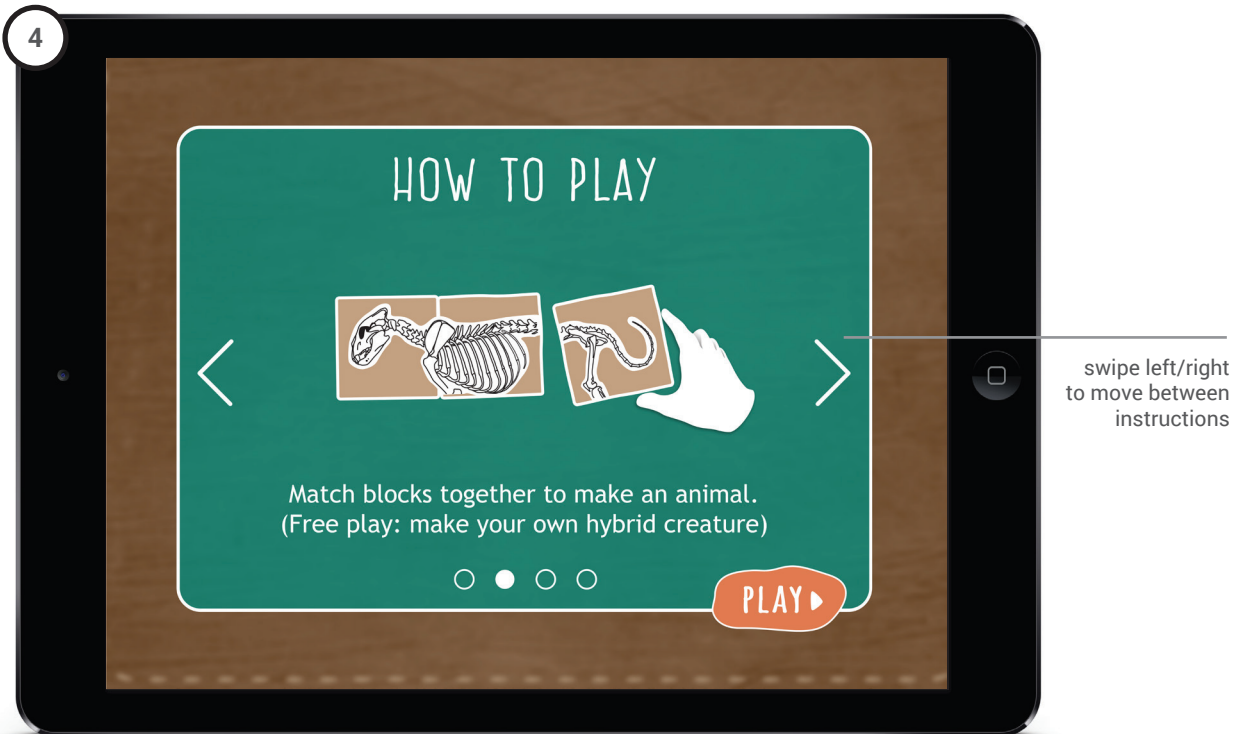
Start/Idle screen



Splash screen



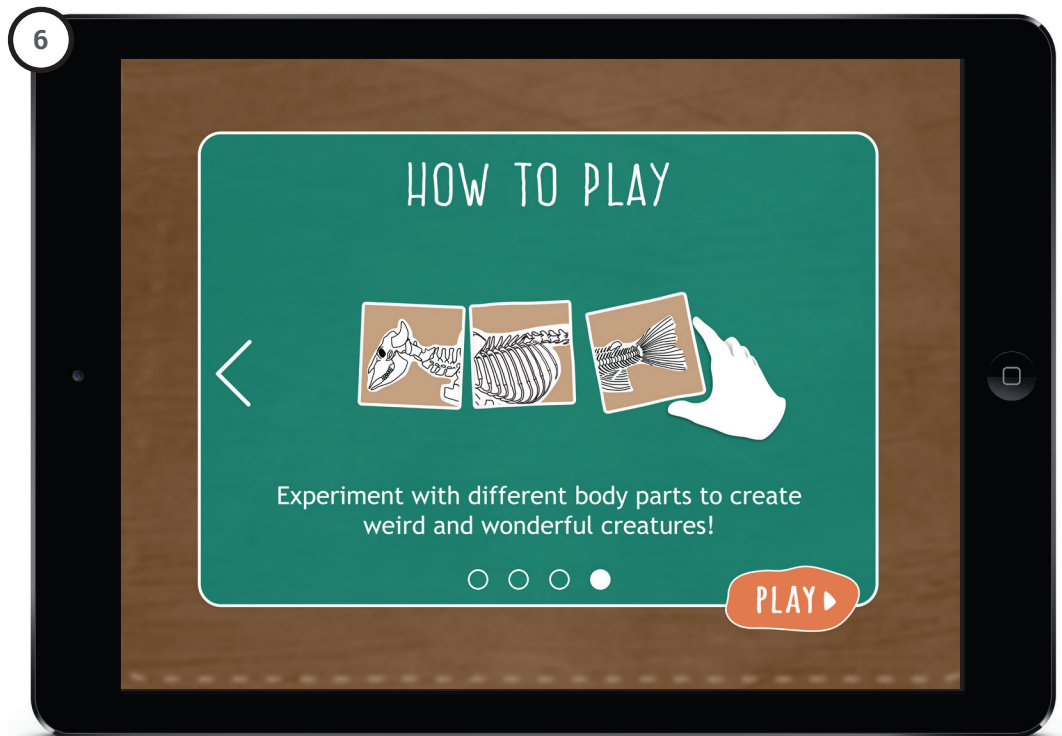
Instructions, step 1



Instructions, step 2



Instructions, step 3



Instructions, step 4

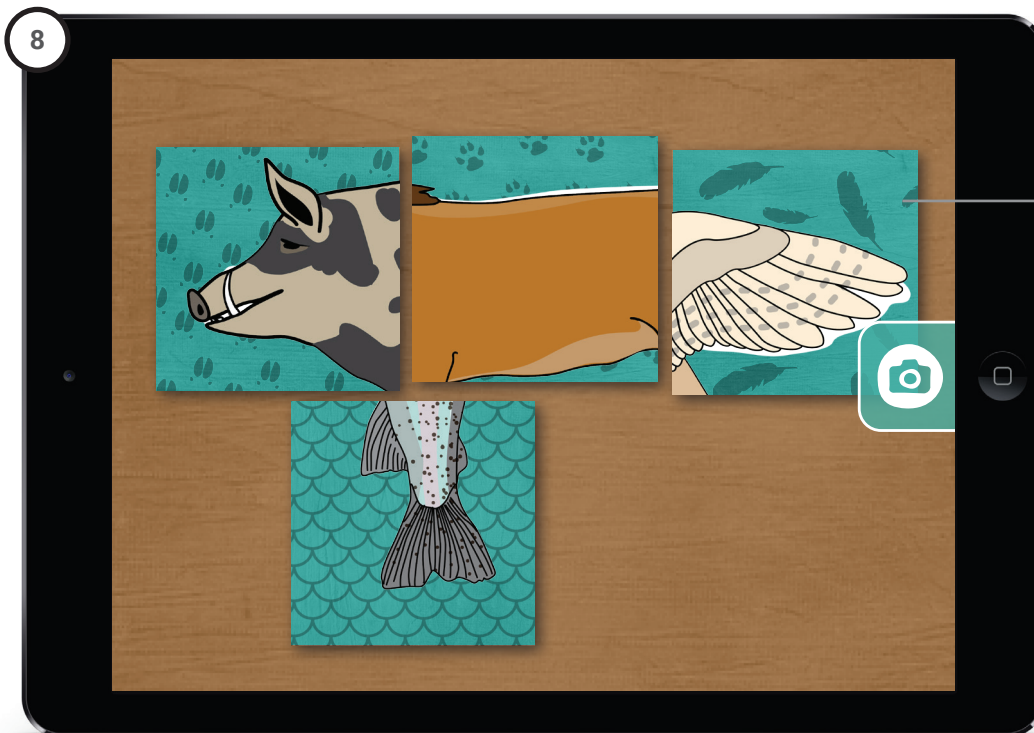
Museum tablet app interface design



start placing blocks in front of tablet

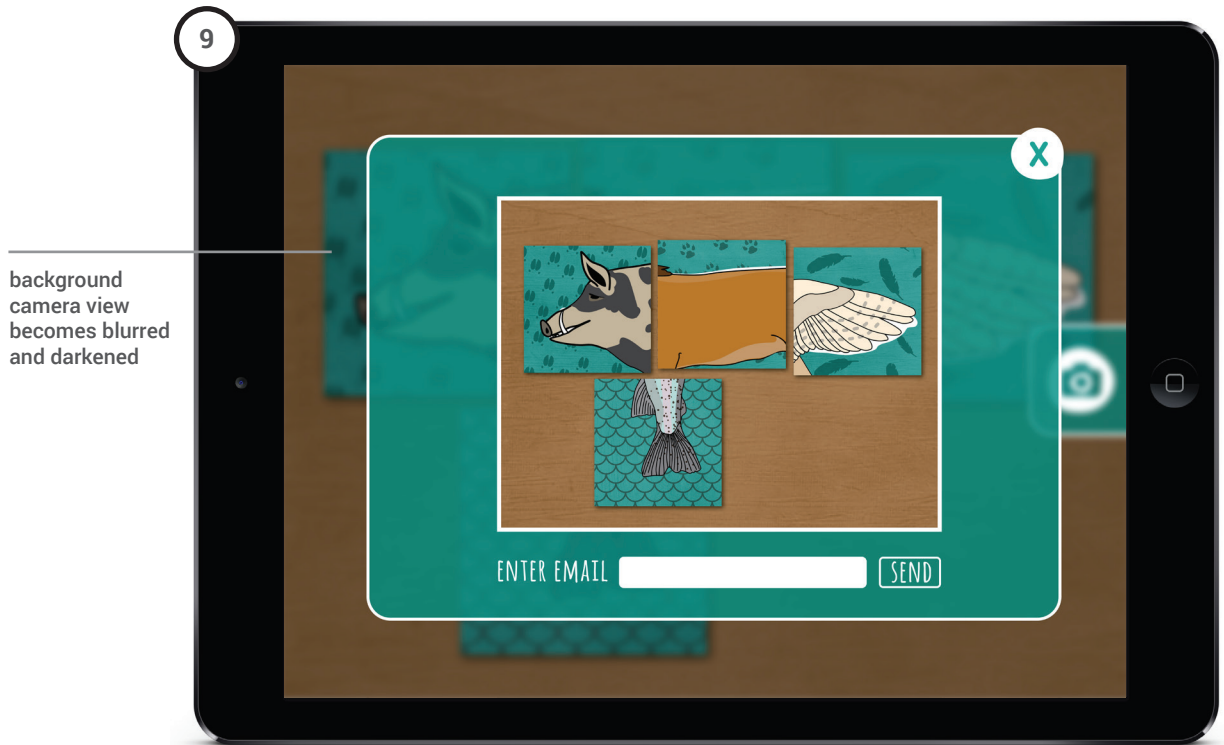
camera button is always present to allow user to take a photo

Begin play

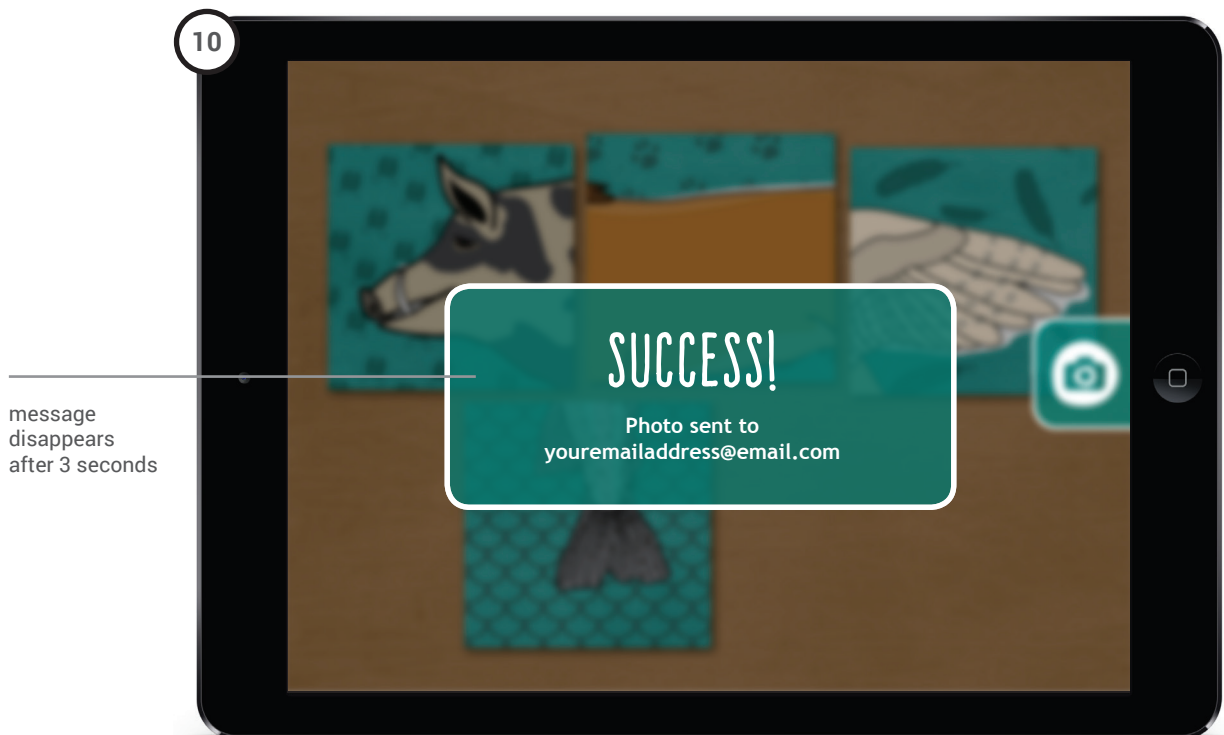


AR 2D images

Create a "weird and wonderful" creature, take photo

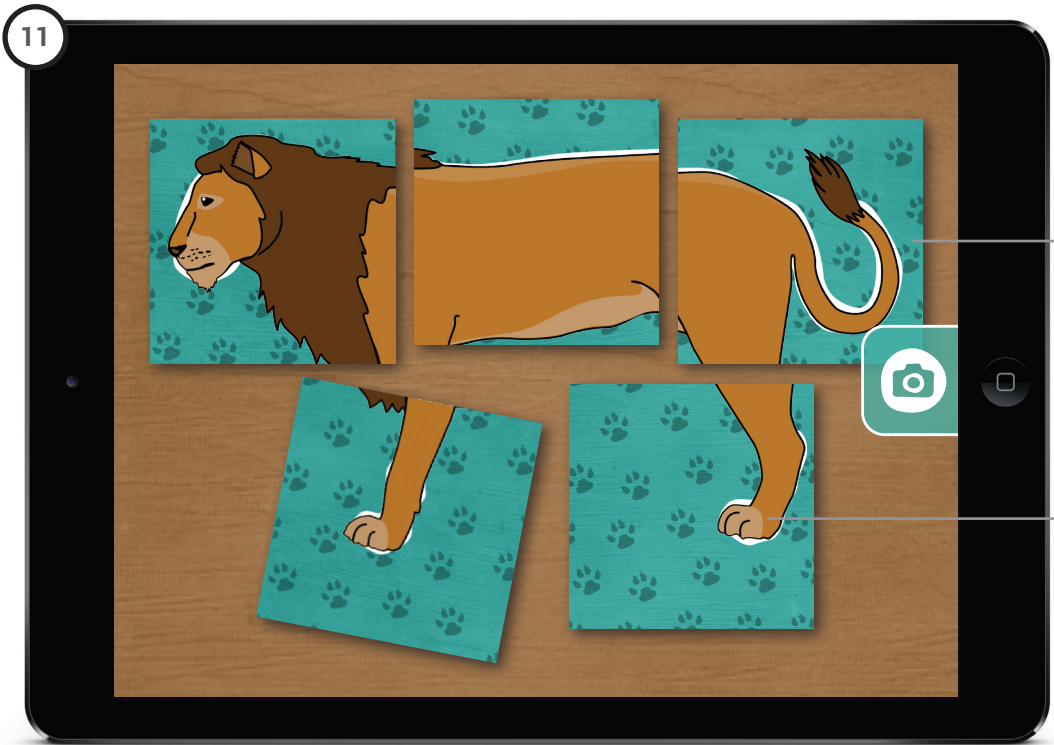


Send photo

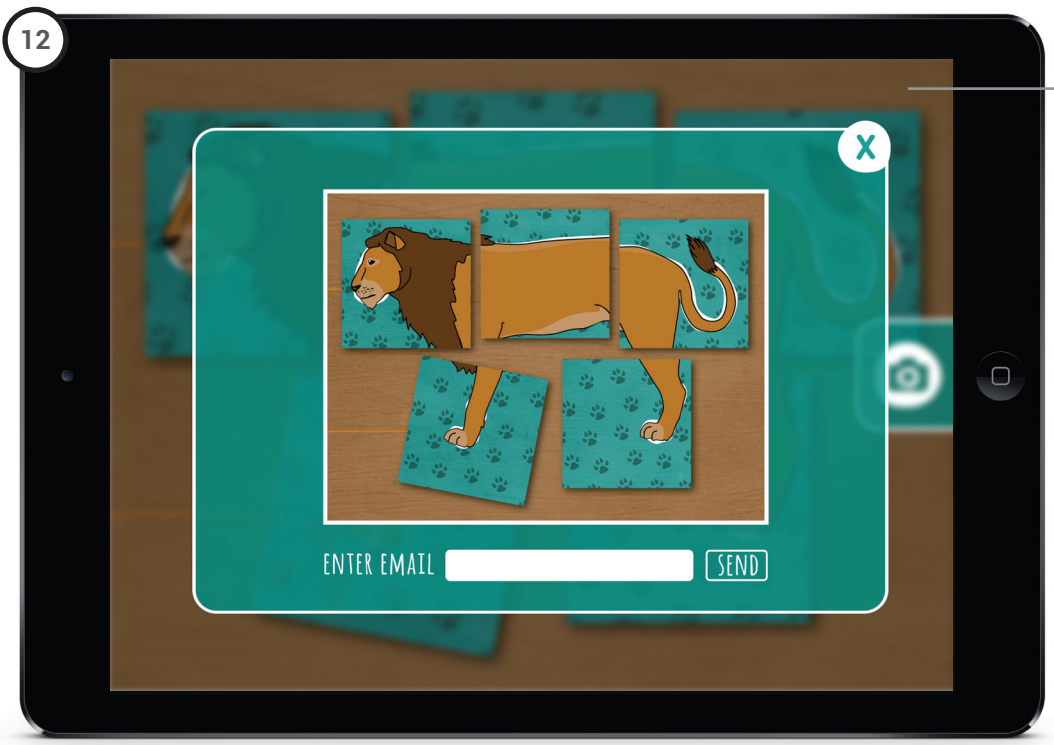


Confirmation of photo being sent

Museum tablet app interface design



Construct, can take photo any time

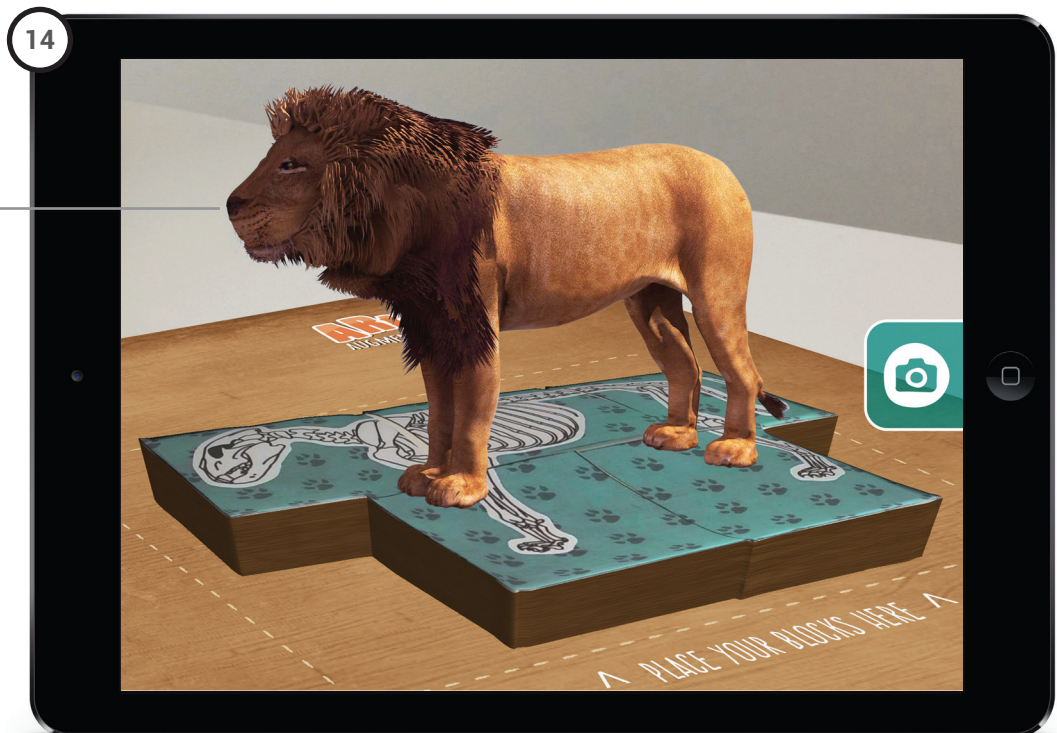


Send photo



message disappears after 3 seconds

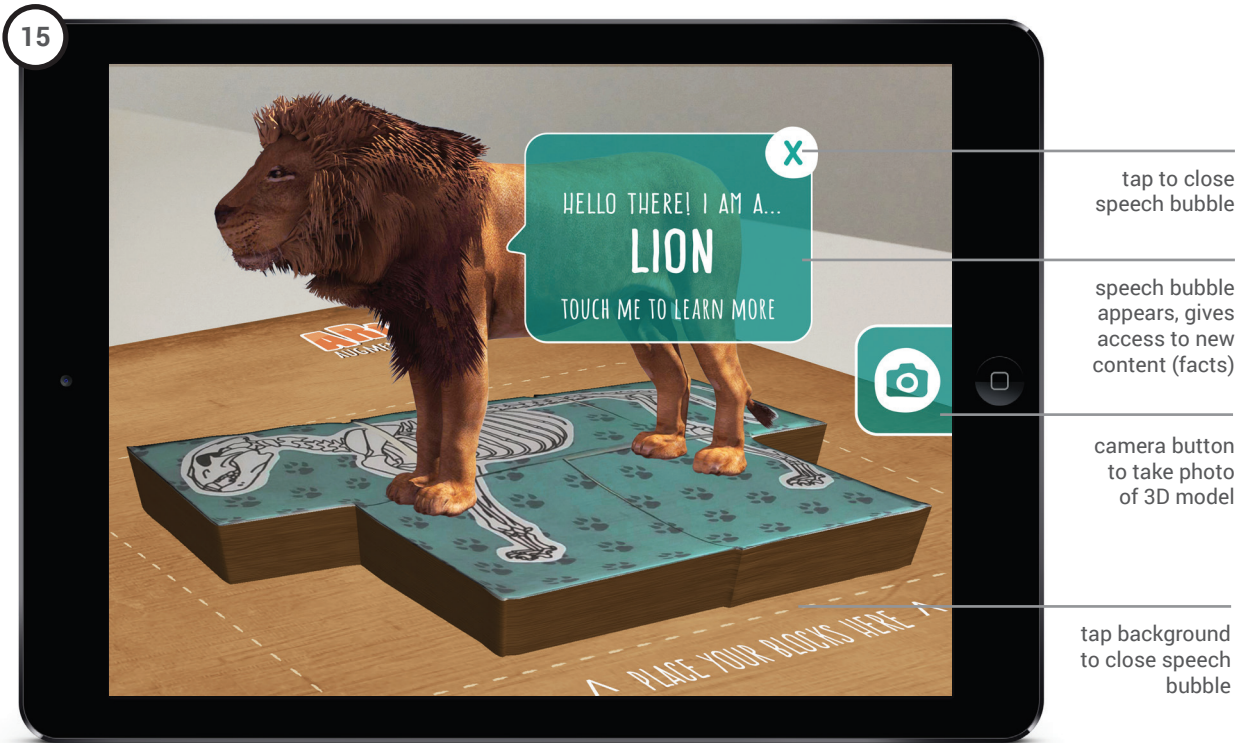
Confirmation of photo being sent



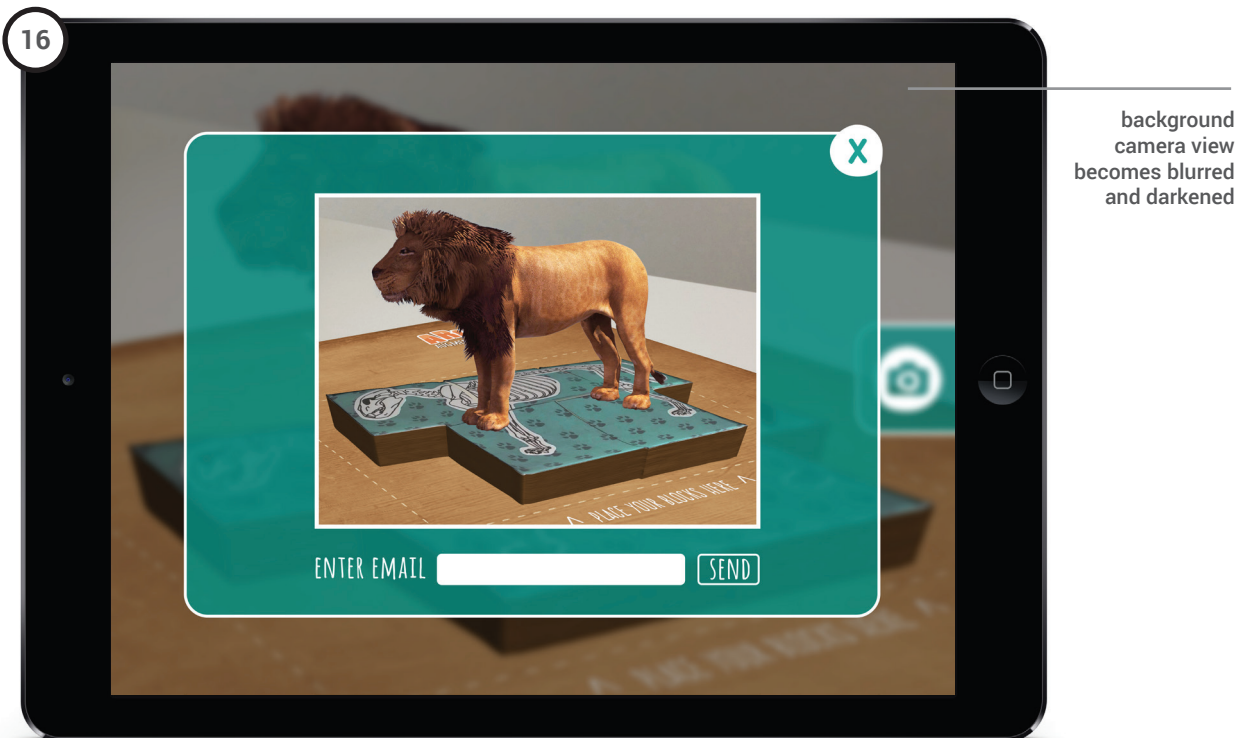
if a skeleton is arranged accurately with pieces neatly aligned, a 3D animated model appears

3D animation appears, shows animal moving around the screen

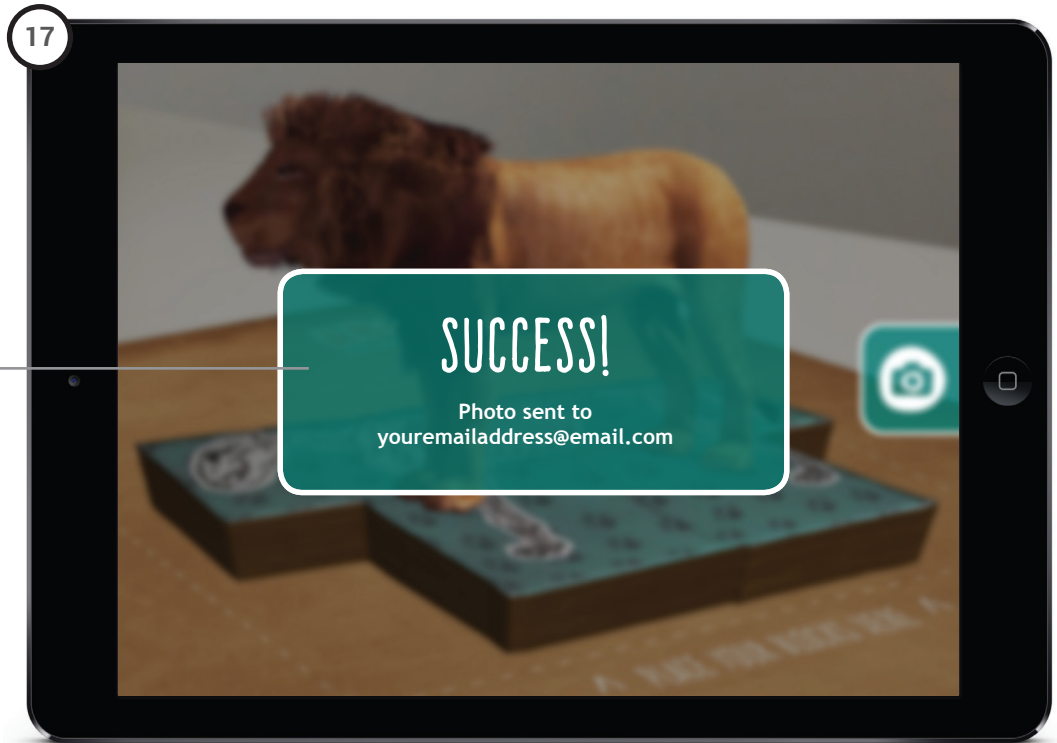
Museum tablet app interface design



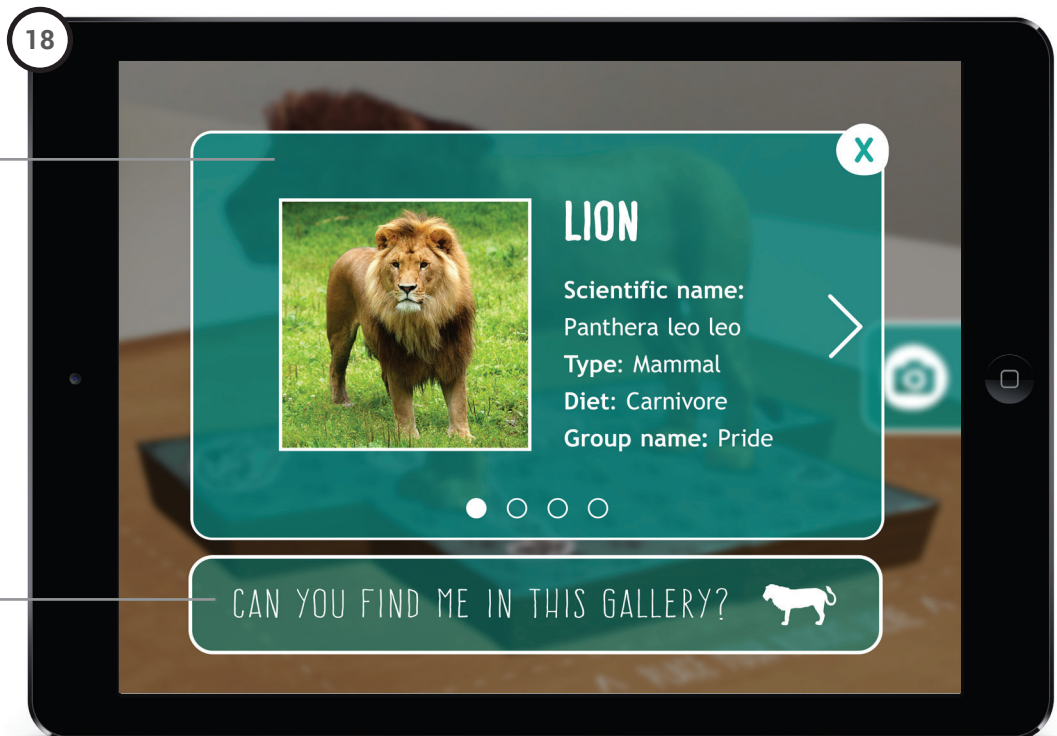
Tap for new content or take photo



Send photo



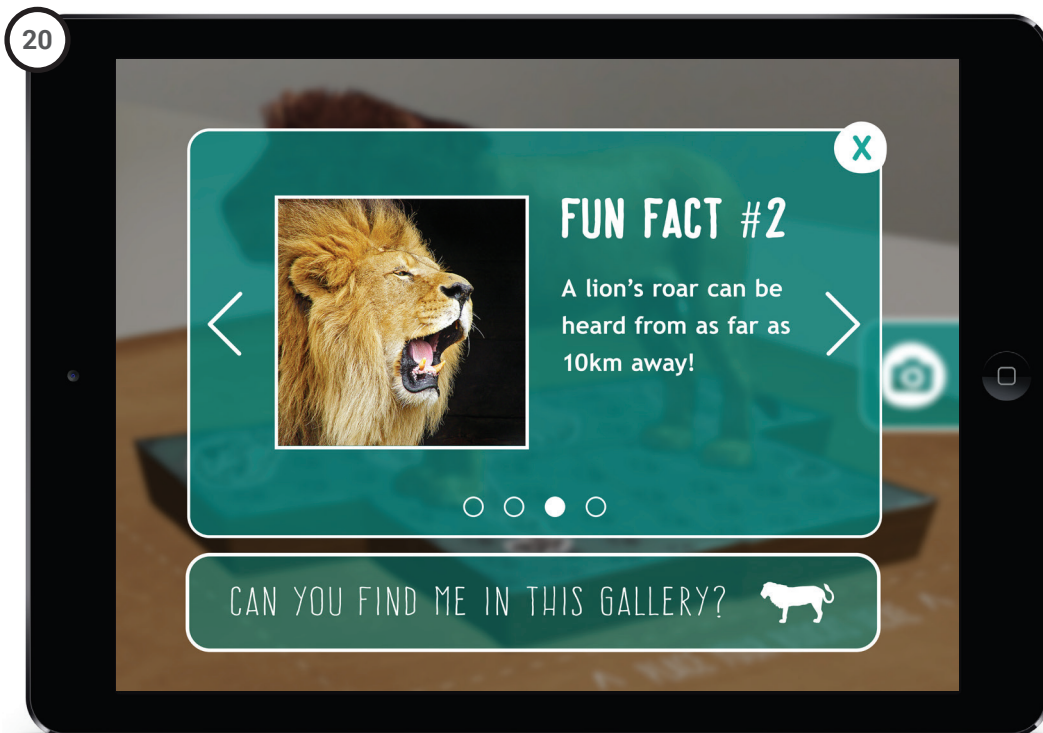
Confirmation of photo being sent



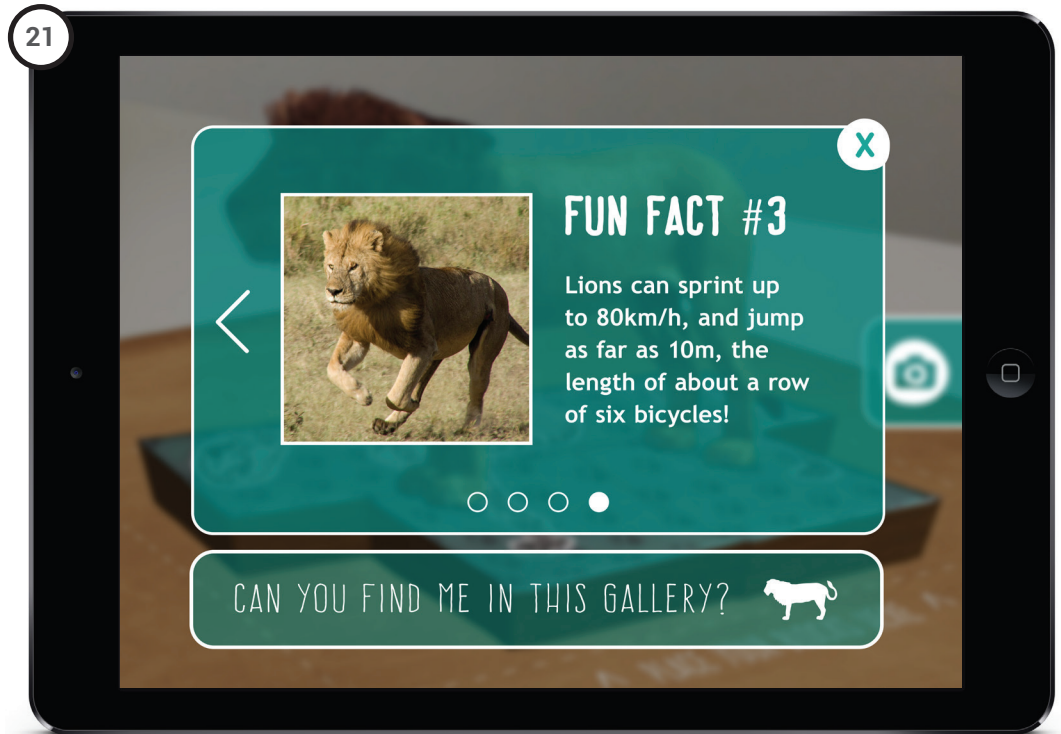
Learn more



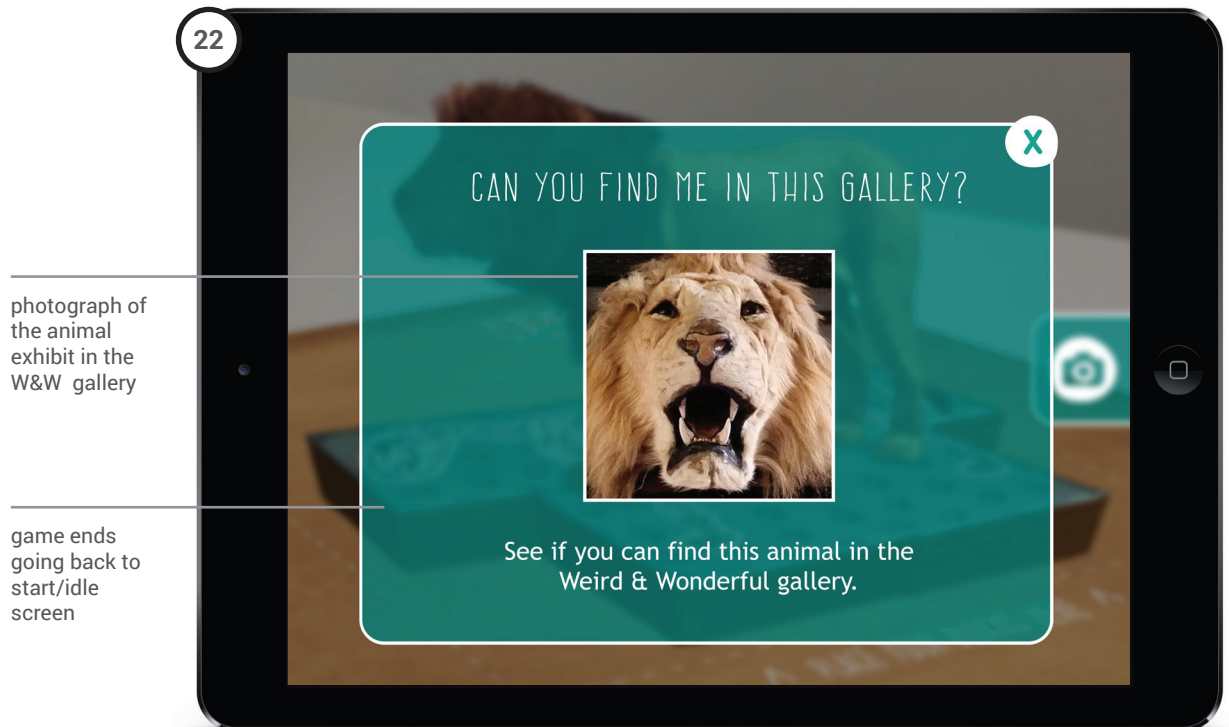
Fun fact 1



Fun fact 2



Fun fact 3



Find me at the museum

ARticular smartphone app

Interface design



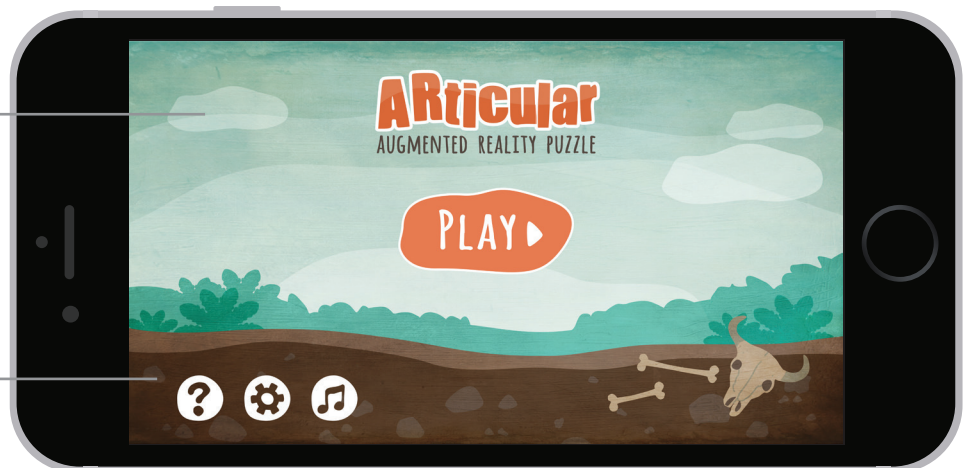


App icon



screen auto-rotates to horizontal view on start up

Splash screen

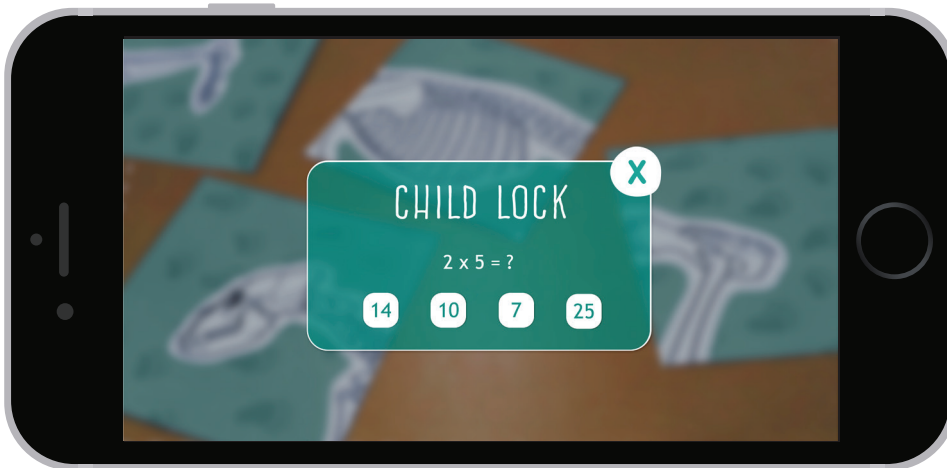


background could be animated with moving clouds to add visual interest

instructions, settings, sound on/off

Menu screen

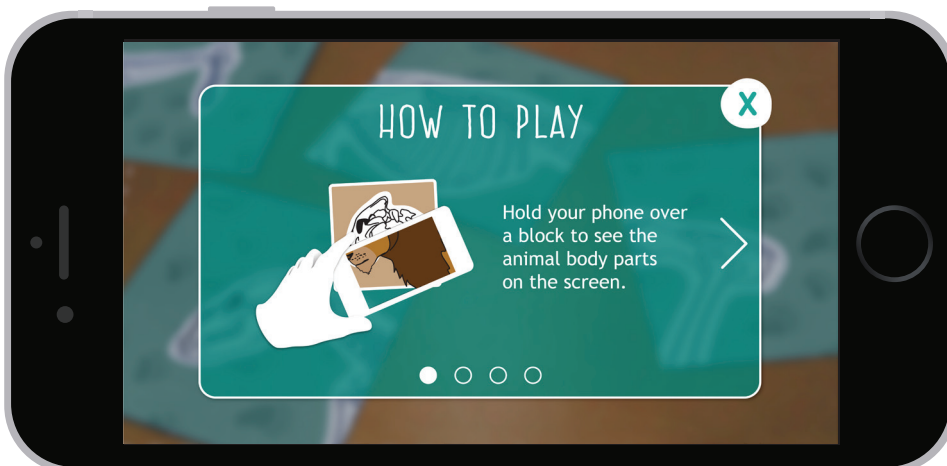
Smartphone app interface design



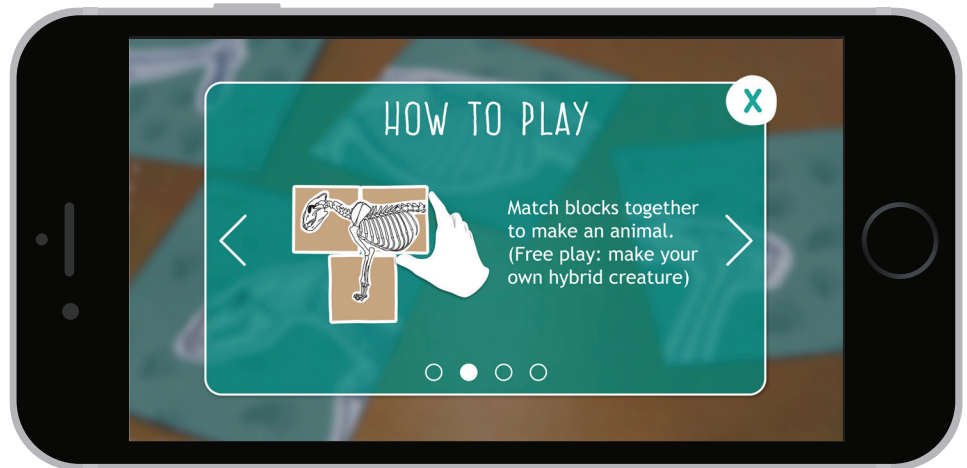
Parental control message appears before access to the settings page



Settings



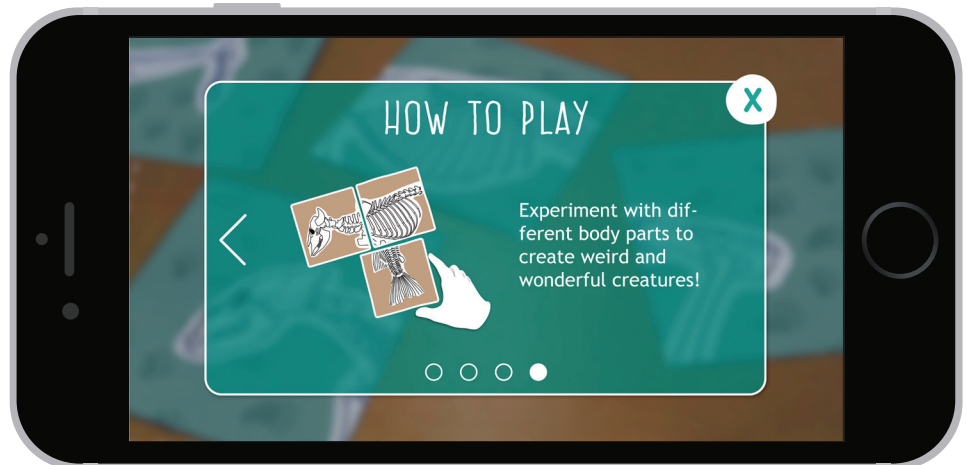
Instructions, step 1



Instructions, step 2

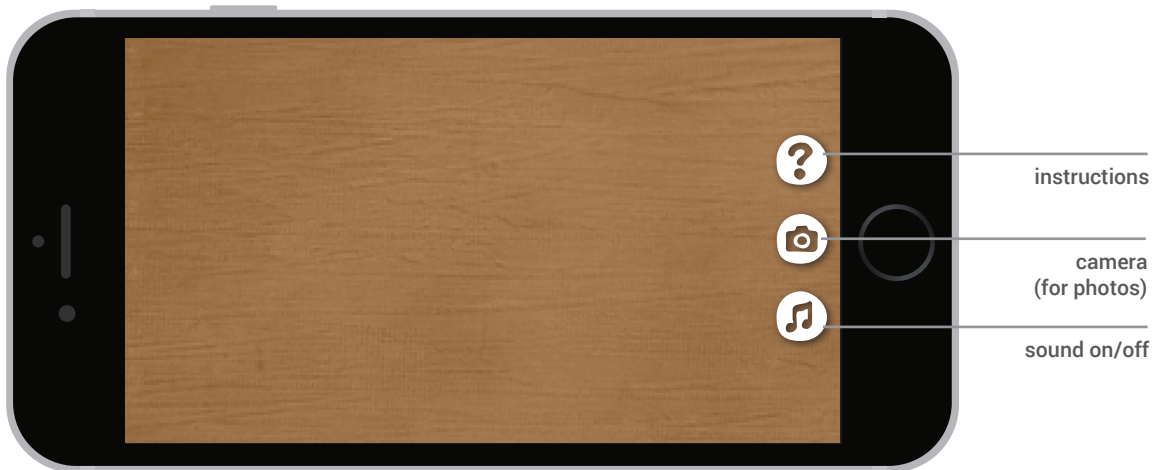


Instructions, step 3

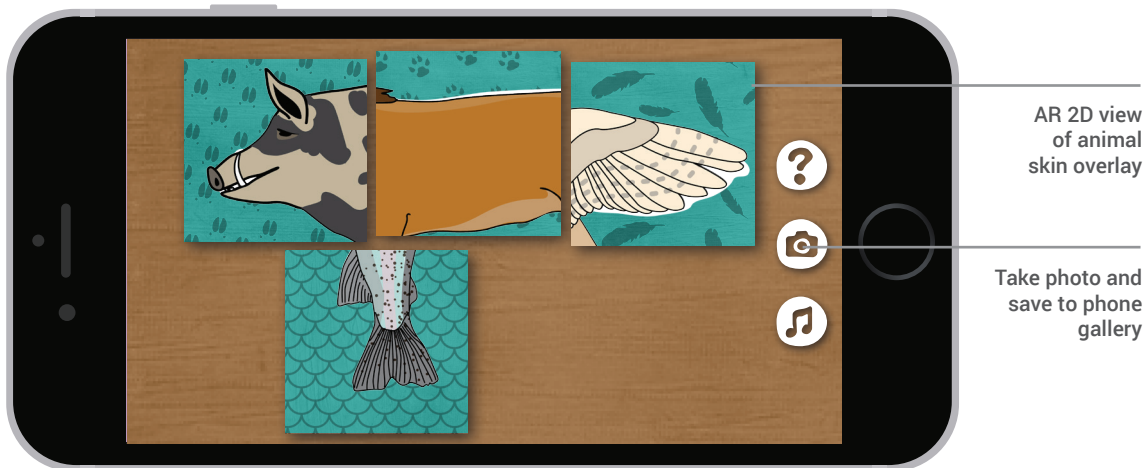


Instructions, step 4

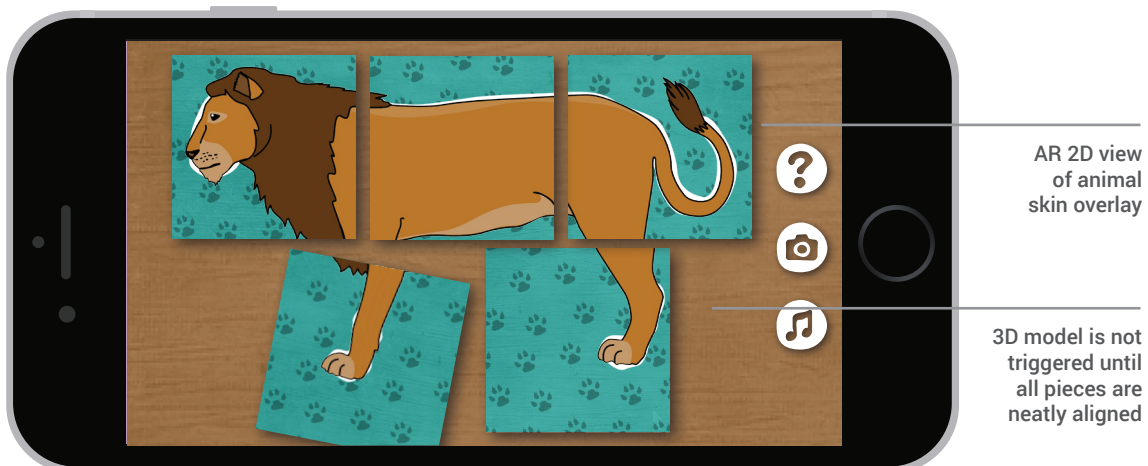
Smartphone app interface design



Begin play by placing blocks in front of the camera.



Create a "weird and wonderful" creature



Construct an animal skeleton

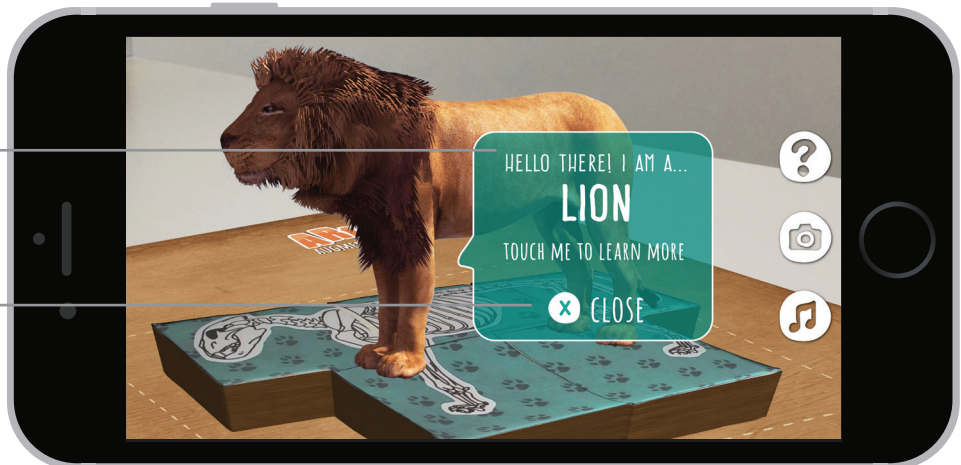
if a skeleton is arranged accurately with pieces neatly aligned, a 3D animated model appears



3D animation appears, shows animal moving around the screen

tap speech bubble or the 3D model for more info

tap close button or background to close speech bubble



Speech bubble appears after 5 seconds, and/or if the 3D animal is tapped

message disappears after 3 seconds

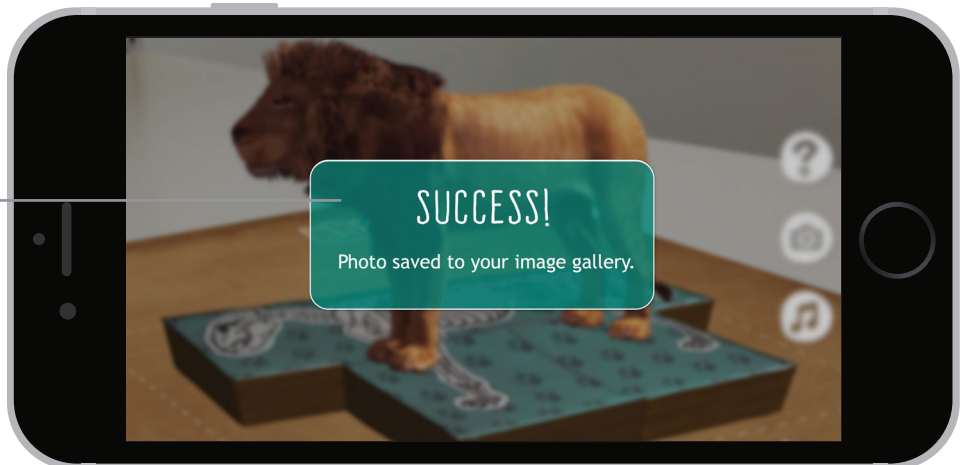
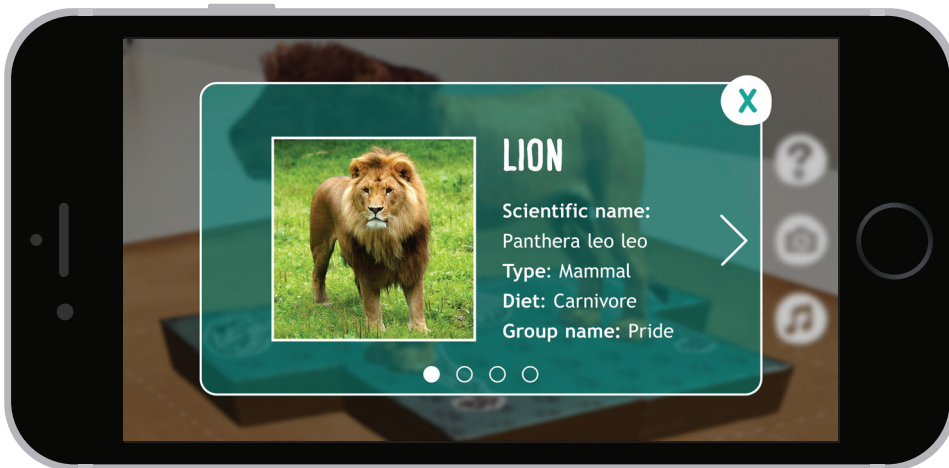


Photo saved confirmation

Smartphone app interface design



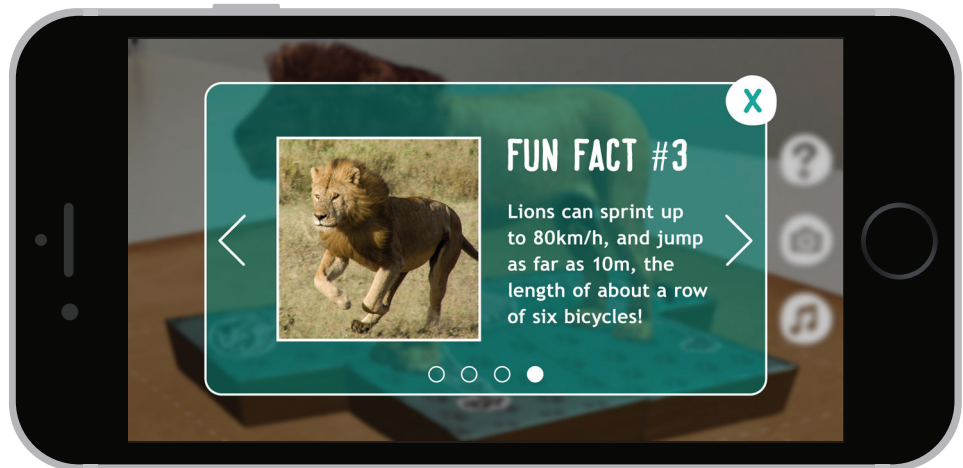
Animal information



Animal information

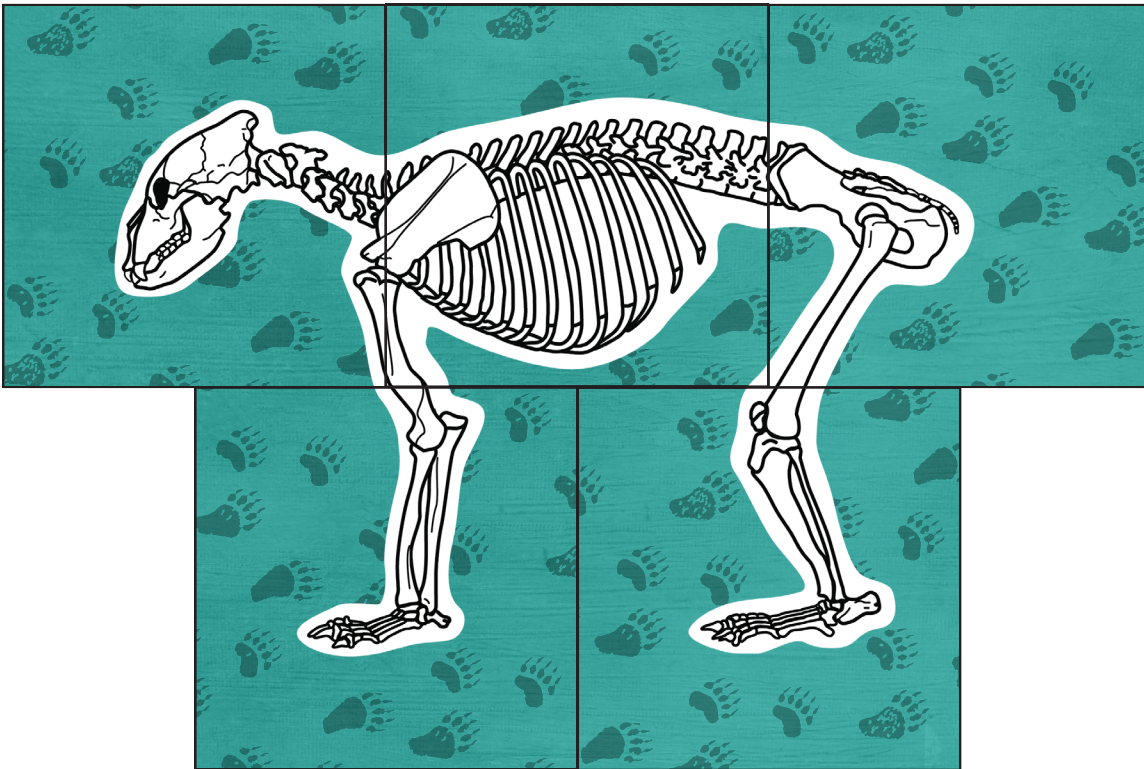


Animal information

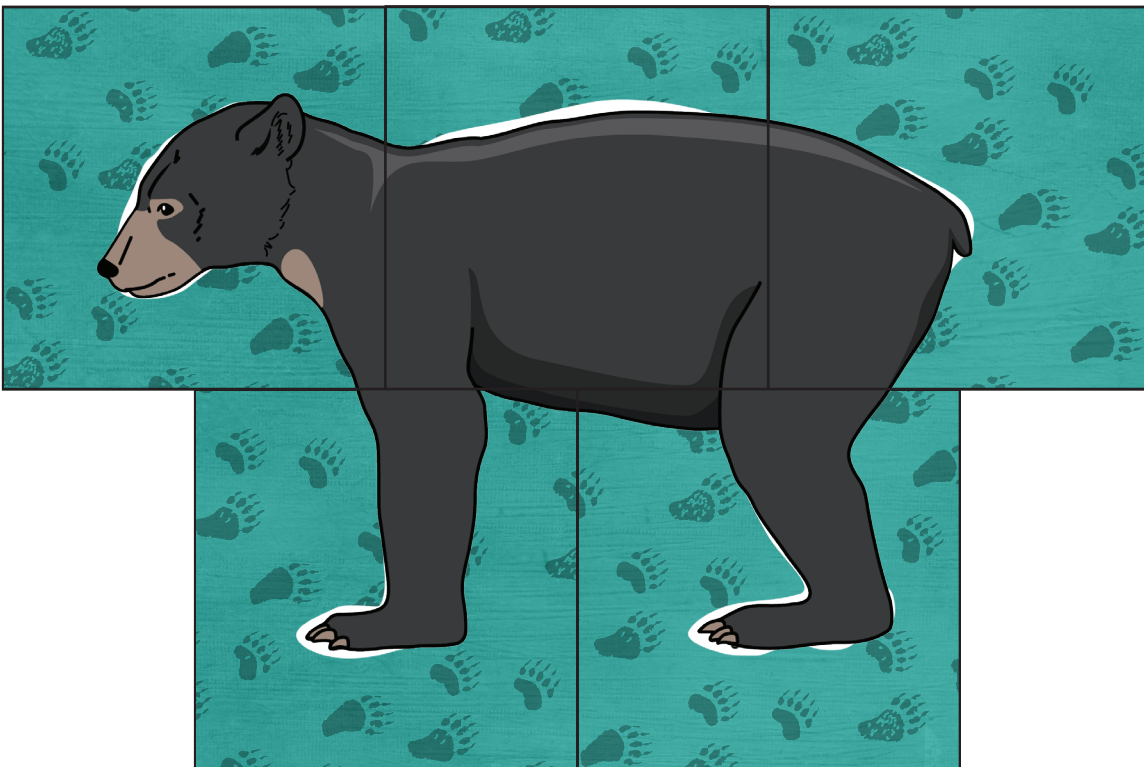


Animal information

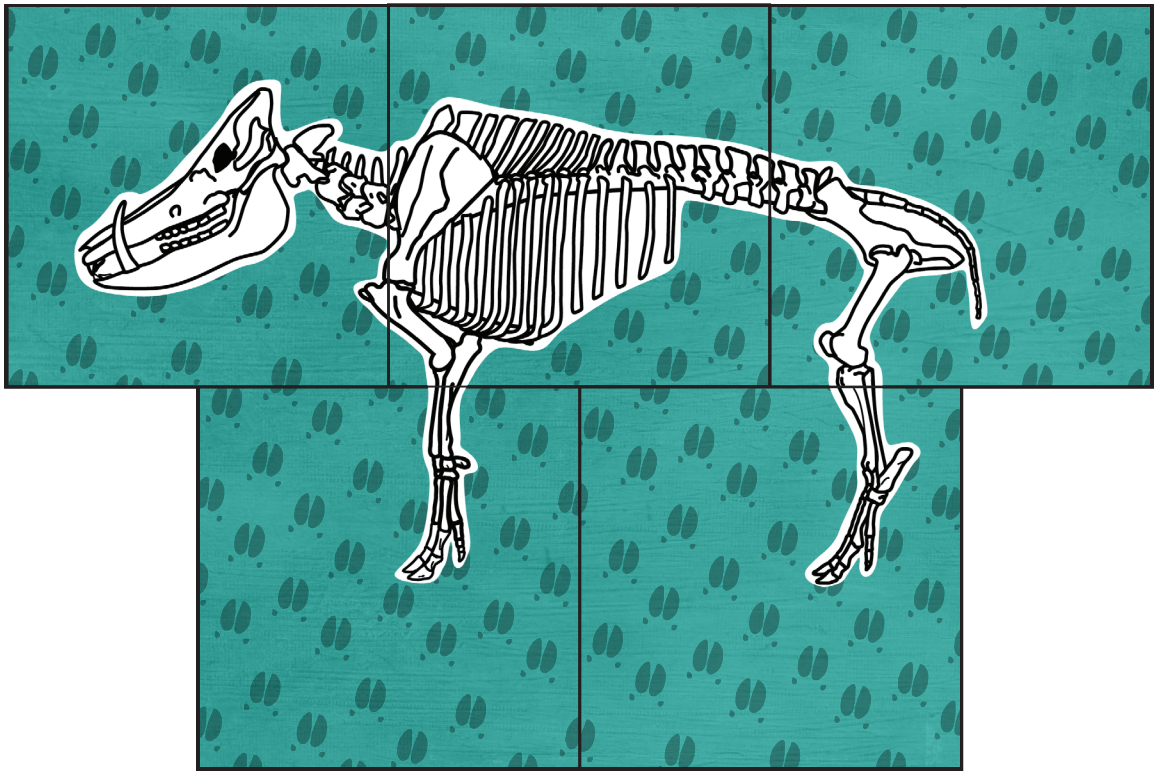
Puzzle piece artwork



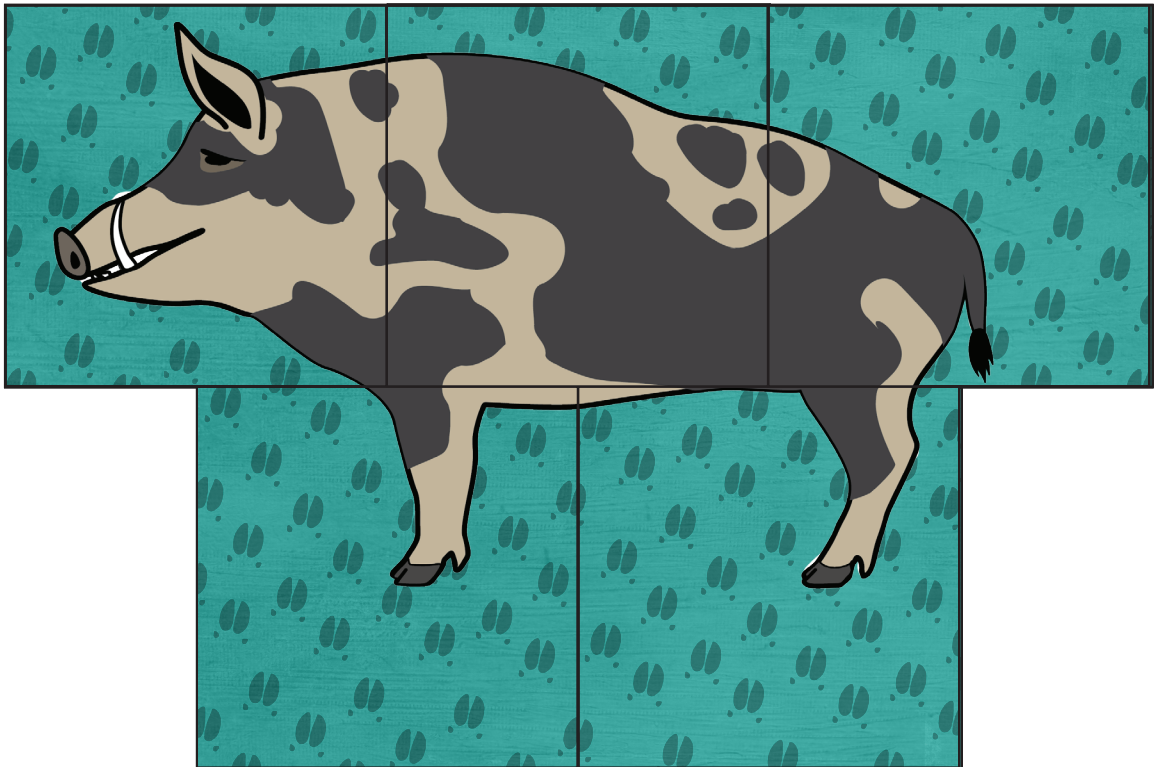
Bear skeleton (physical puzzle block artwork)



Bear body (2D AR overlay)

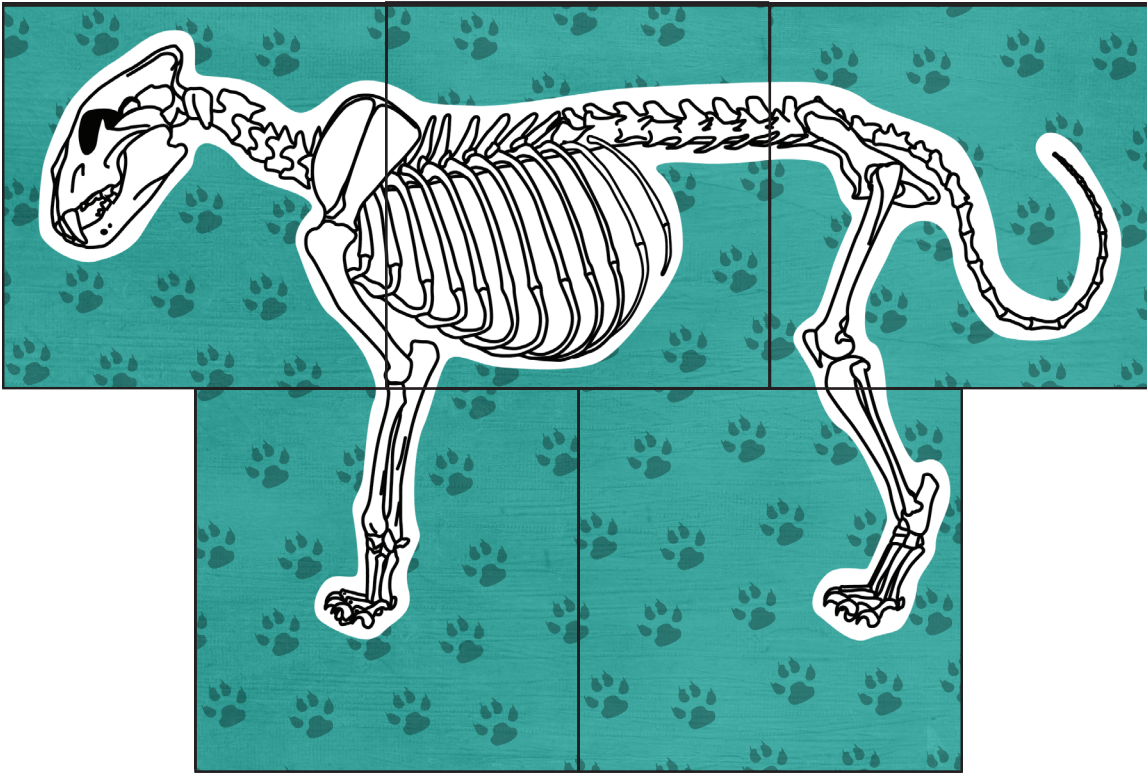


Wild pig skeleton (physical puzzle block artwork)

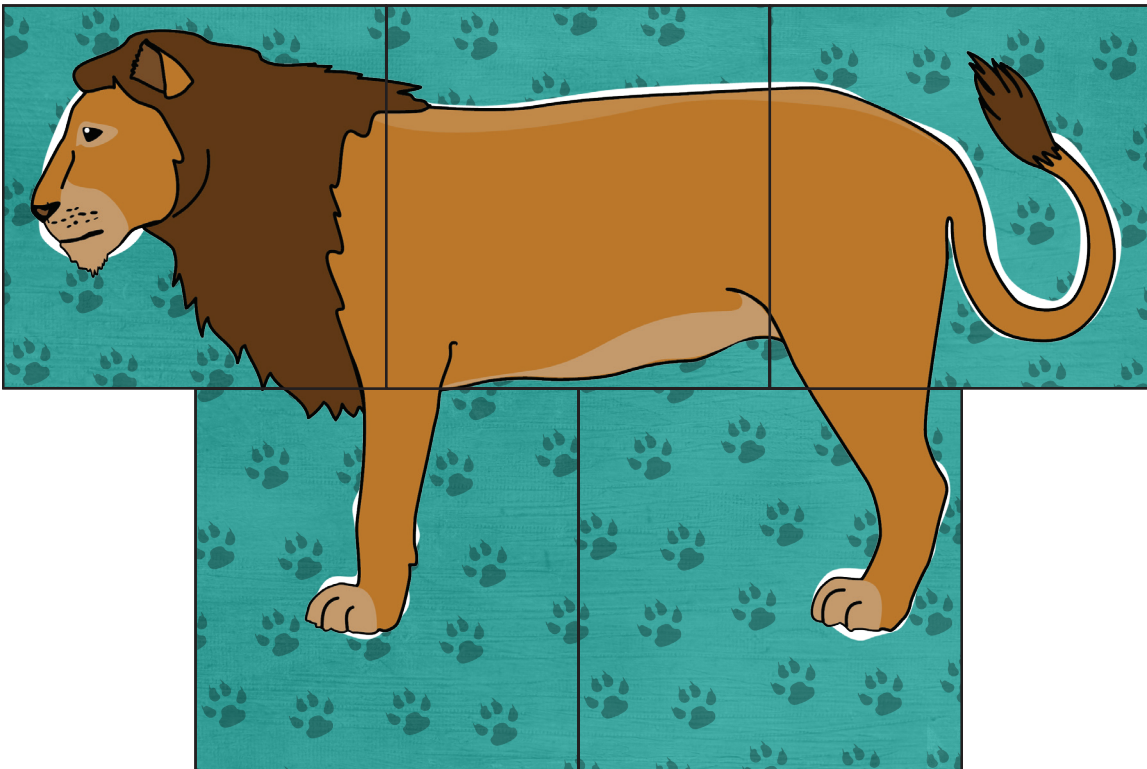


Wild pig body (2D AR overlay)

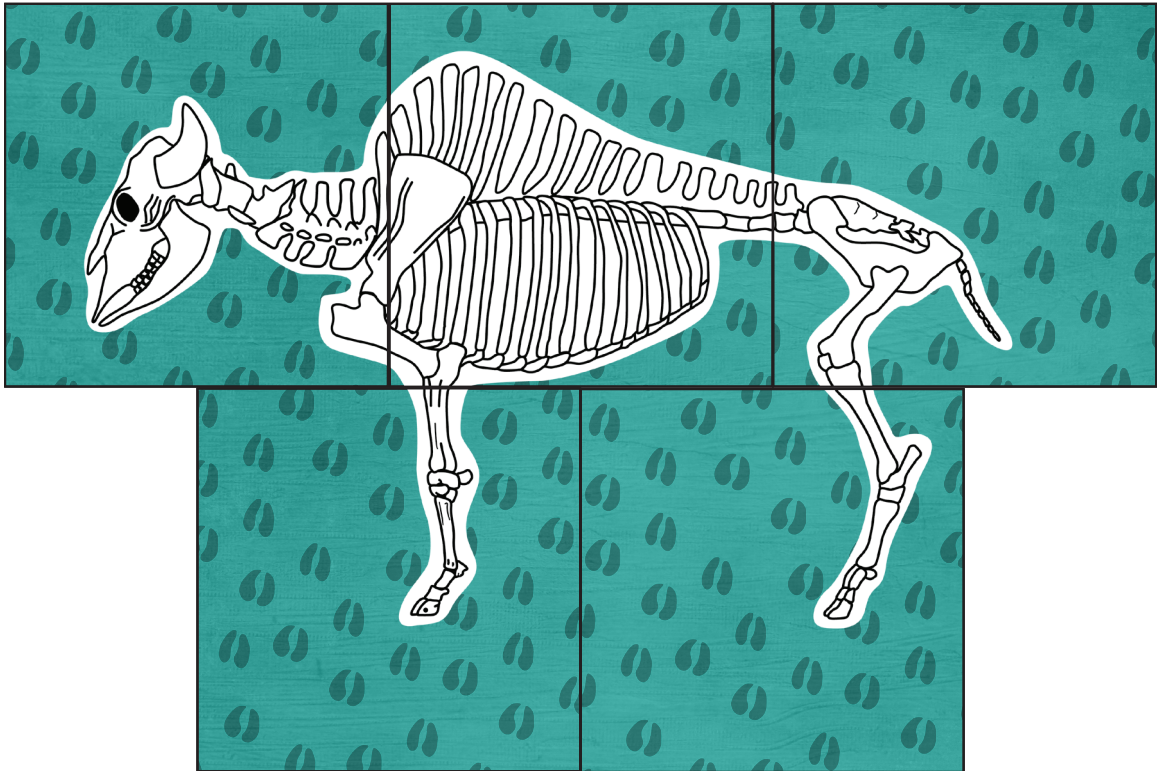
Puzzle piece artwork



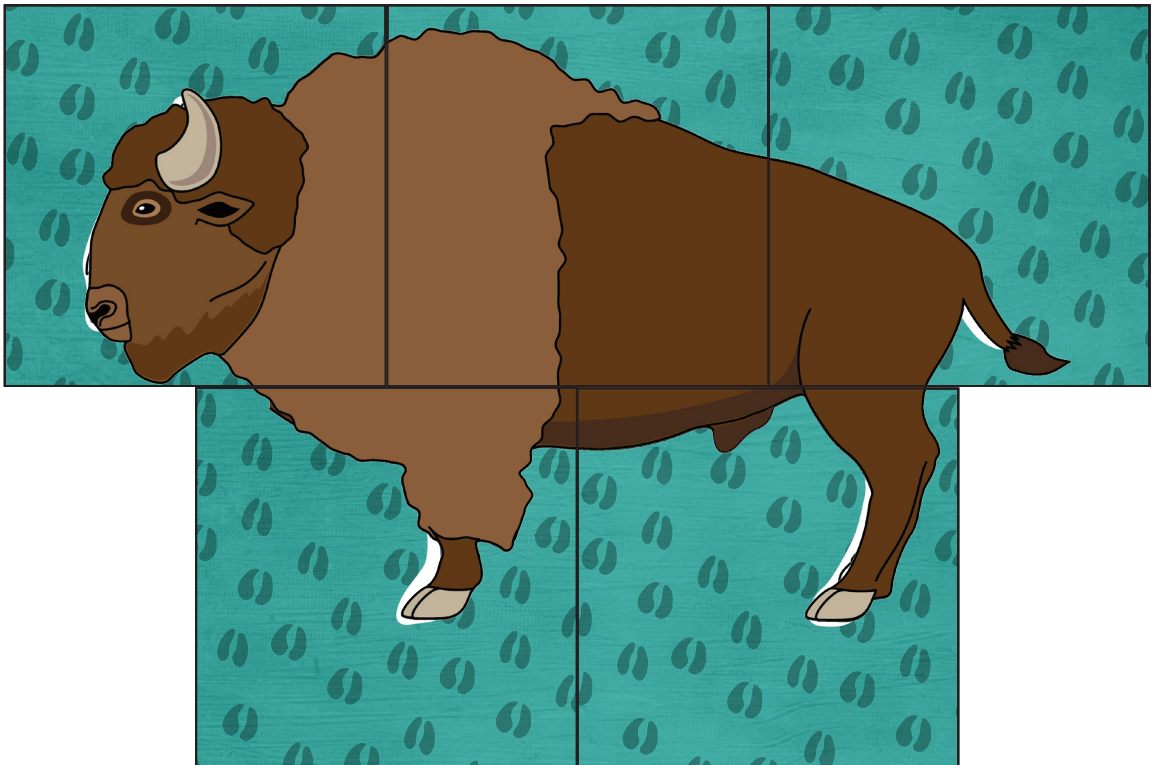
Lion skeleton (physical puzzle block artwork)



Lion body (2D AR overlay)



Bison skeleton (physical puzzle block artwork)



Bison body (2D AR overlay)

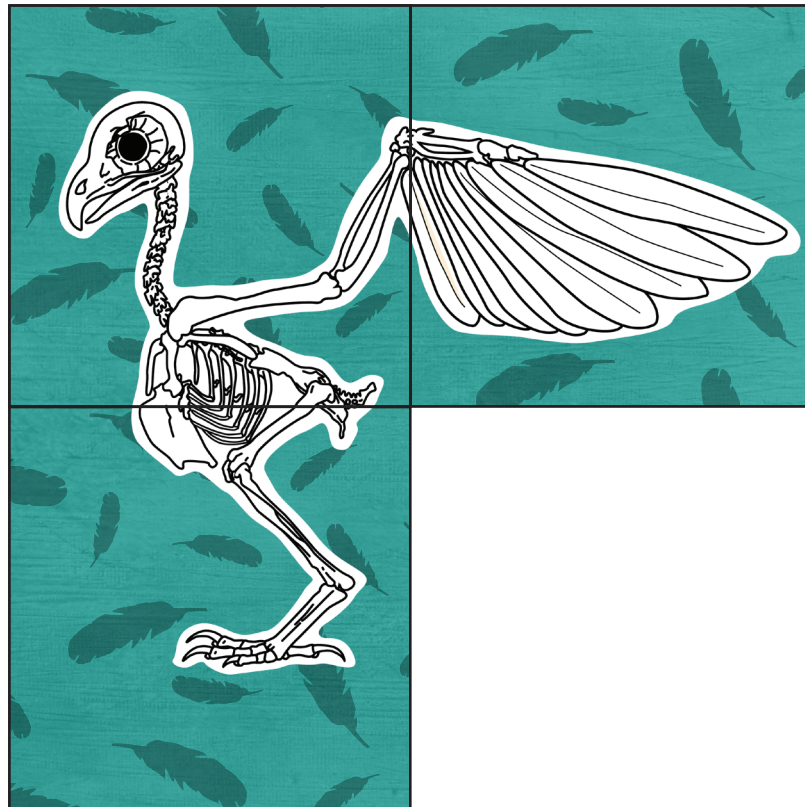
Puzzle piece artwork



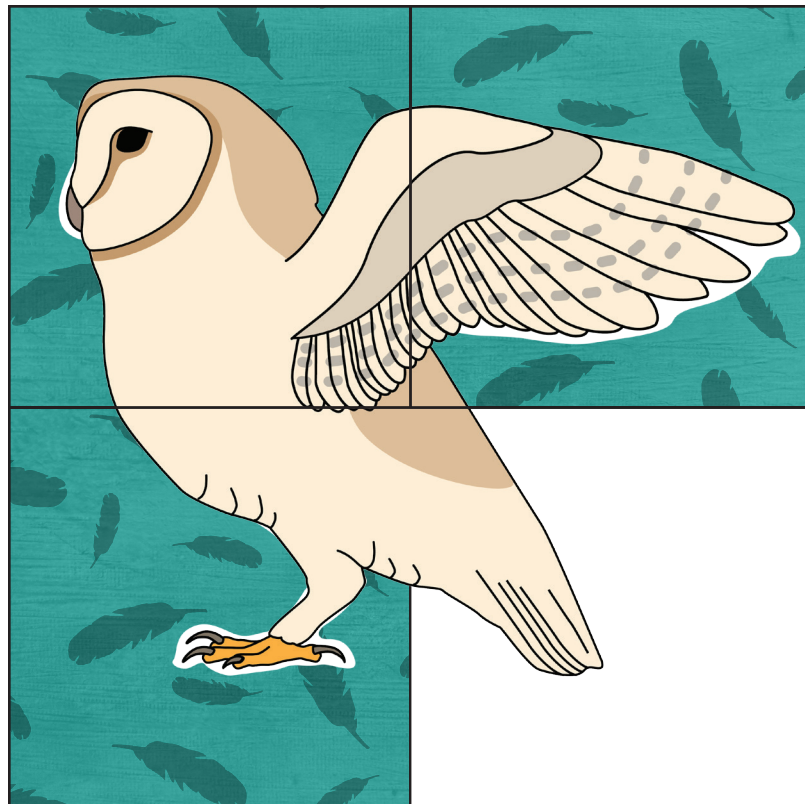
Trout skeleton (physical puzzle block artwork)



Trout body (2D AR overlay)



Owl skeleton (physical puzzle block artwork)



Owl body (2D AR overlay)

Image references



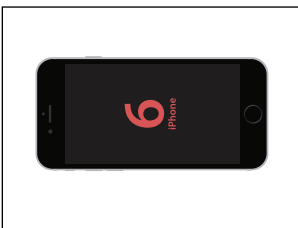
Tarrant, C. (2011). *Free texture fall returns* [Photograph]. Retrieved January 8, 2015, from <https://www.flickr.com/photos/jewellofdistressed/6482404905/in/gallery-59938397@N07-72157647847858334/>

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Pixeden.com. (2011). *iPad Air mockup*. Retrieved January 8, 2015, from <http://www.pixeden.com/psd-mock-up-templates/ipad-air-psd-vector-mockup>

Licence: Free for personal and commercial use.



Dreamstale.com (2014). *iPhone 6 flag vector mockup*. Retrieved October 28, 2014, from <http://www.dreamstale.com/freebie-iphone-6-flat-vector-mockup>

Licence: Free for personal and commercial use.



De Espona Infographica (2012). *Lion 3D model*. Retrieved February 1, 2015, from <http://www.cgtrader.com/3d-models/animals/mammal/lion-2>

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Mobile Tuxedo (2012). *Spead*. Retrieved June 4, 2014, from <http://www.mobiletuxedo.com/touch-gesture-icons/>

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[Image of generated QR code]. Retrieved March 04, 2015, from <http://www.qrstuff.com>

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whippets.chrichri (2012). *Lion_Leeuw_P7144603_@vh* [Photograph]. Retrieved January 08, 2015, from <https://www.flickr.com/photos/istelle/7652035690/in/gallery-59938397@N07-72157647847858334/>

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Keller, E. (2004). *Roaring lion* [Photograph]. Retrieved January 08, 2015, from <https://www.flickr.com/photos/tambako/494118044/in/gallery-59938397@N07-72157647847858334/>

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urbanchicken (2009). *Running lion* [Photograph]. Retrieved January 08, 2015, from <https://www.flickr.com/photos/suburbanchicken/4387458910/in/gallery-59938397@N07-72157647847858334/>

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Montgomery, J.C. (2012). *Nap time* [Photograph]. Retrieved January 08, 2015, from <https://www.flickr.com/photos/bibliobrat/9639136463/in/gallery-59938397@N07-72157647847858334/>

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Brad Flickinger (2012). *student_ipad_school - 234* [Photograph]. Retrieved January 08, 2015, from <https://www.flickr.com/photos/56155476@N08/6660141777/in/gallery-59938397@N07-72157647847858334/>

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Toca Boca. (2011). *Helicopter taxi* [Photograph]. Retrieved March 20, 2015, from <https://www.flickr.com/photos/tocaboca/5524322116/in/gallery-59938397@N07-72157647847858334/>

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