SAMR: An EdTech Quintet Perspective

Ruben R. Puentedura, Ph.D.

Tech acts as a direct tool substitute, with functional improvement

Substitution Tech acts as a direct tool substitute, with no functional change

Redefinition Tech allows for the creation of new tasks, previously inconceivable

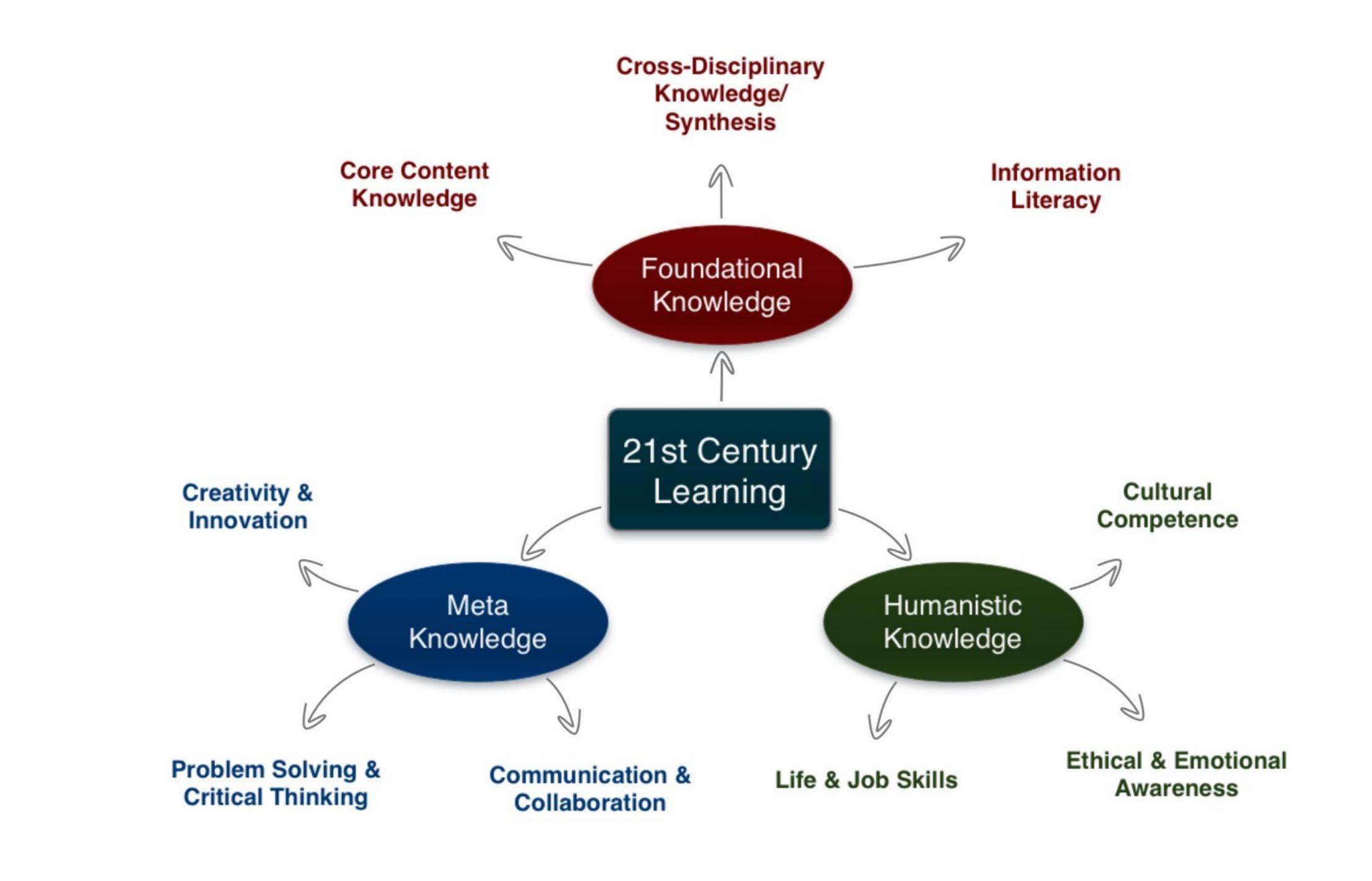
Modification Tech allows for significant task redesign Transformation

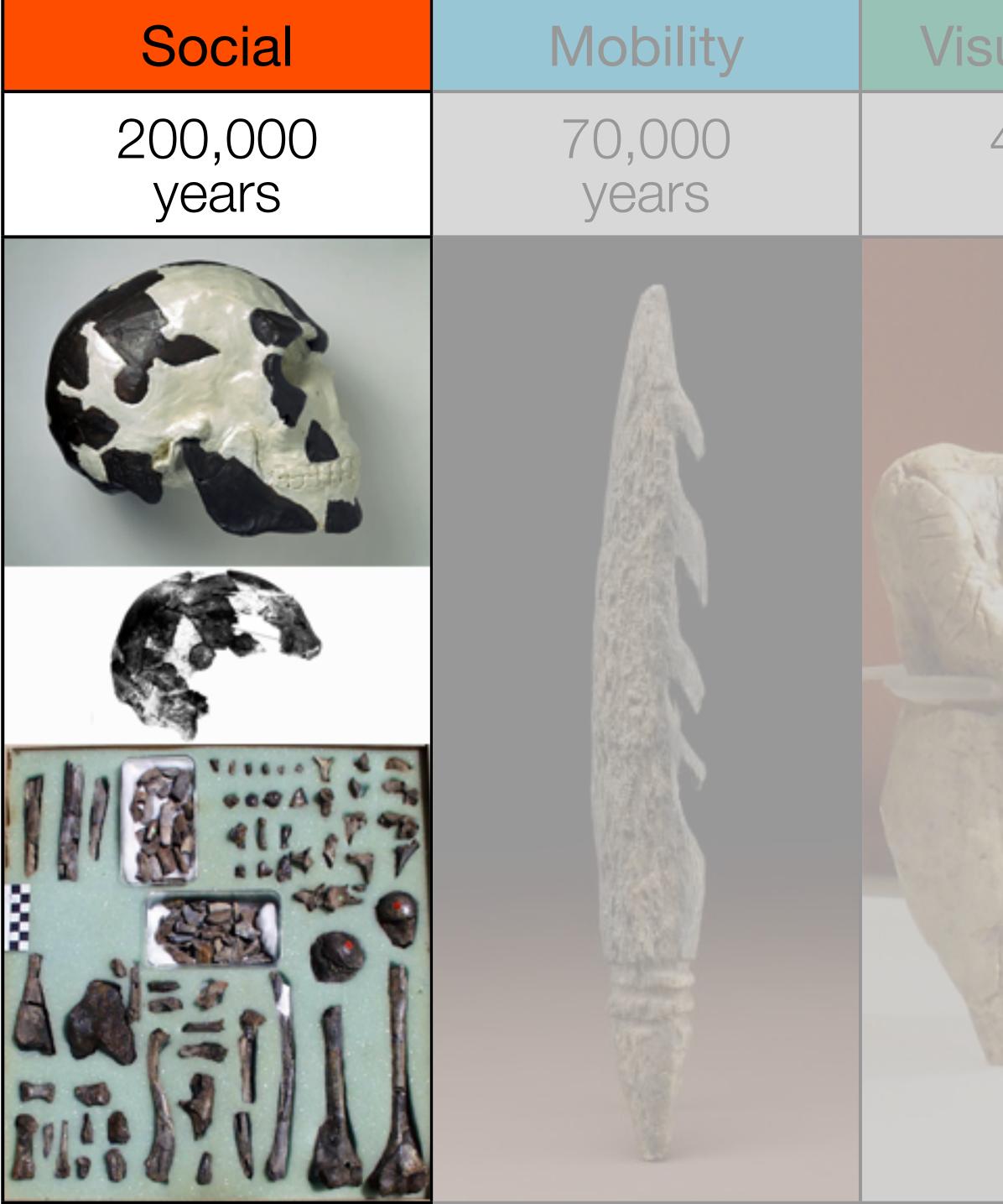
Augmentation

Social	Mobility	Visualization	Storytelling	Gaming
200,000 years	70,000 years	40,000 years	17,000 years	8,000 years
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ualization	Storytelling	Gaming
40,000 years	17,000 years	8,000 years





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Substitution

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William Rosen

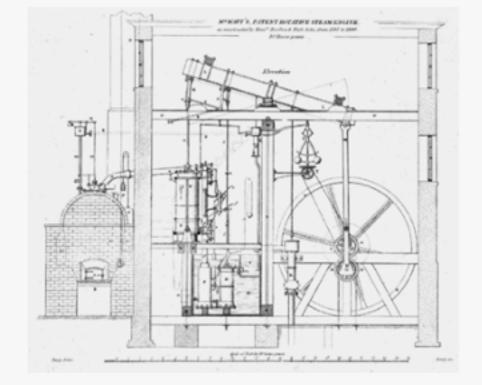


Fig. 5: The caption for this technical drawing reads "Mr. Watt's Patent Rotative Steam Engine as constructed by Messrs. Boulton & Watt, Soho, from 1787 to 1800. 10 Horse power." By 1787, the engine had evolved considerably from the earlier versions, using the sun-and-planet gear to drive the large wheel; the Watt linkage to connect the beam with the cylinder, on the left; and even Watt's feedback-

driven flyball governor—the two balls hanging above and to the left of the large wheel—to control

440 of 850

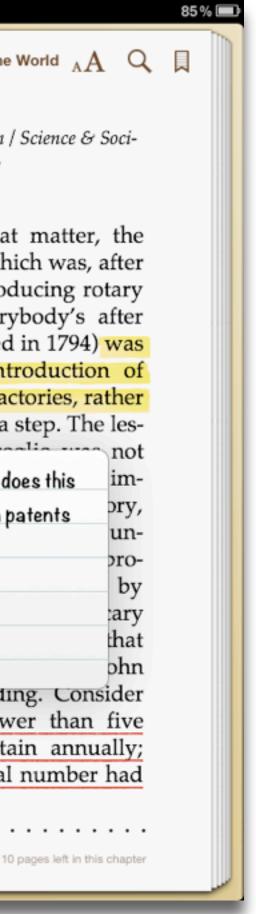
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The Most Powerful Idea in the World ${}_{\mathrm{A}}\mathrm{A}$ Q 🔲

the wheel's speed. Science Museum / Science & Society Picture Library

THE SUN-AND-PLANET (or, for that matter, the crank plus connecting rod, which was, after all, Watt's first choice for producing rotary motion, and would be everybody's after the Wasbrough patent expired in 1794) was a huge step toward the introduction of steam power into mills and factories, rather than pumps. But it was only a step. The lesson of the Washrough imbrasilia mon not Get data & graph this; how does this immei ory, pro but compare with later trends in patents unissued per year? con protect by 178 ary that pac ohn ĥad Locke in the centur, preceding. Consider that from 1700 to 1740, fewer than five patents were issued in Britain annually; from 1740 to 1780, the annual number had

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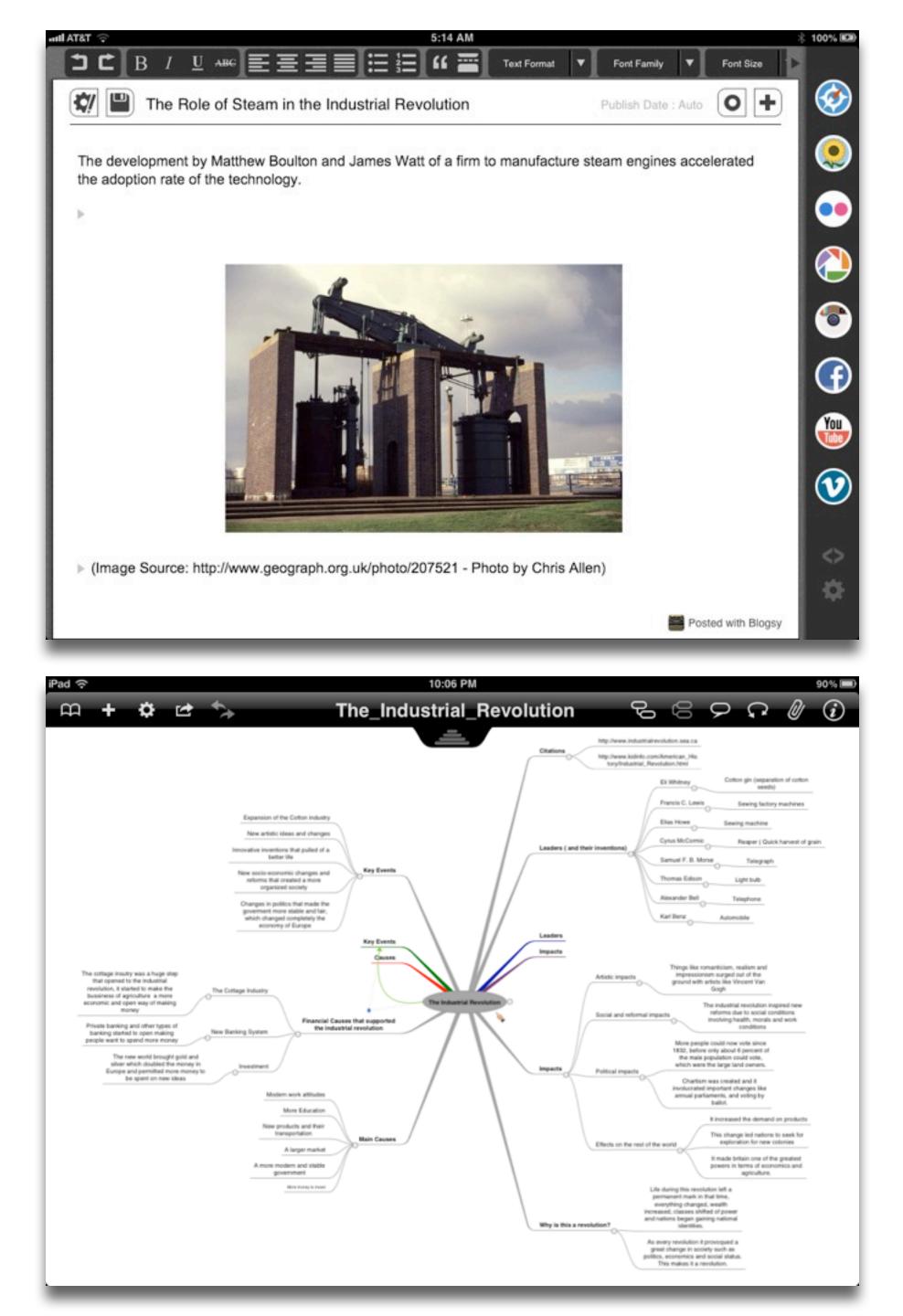


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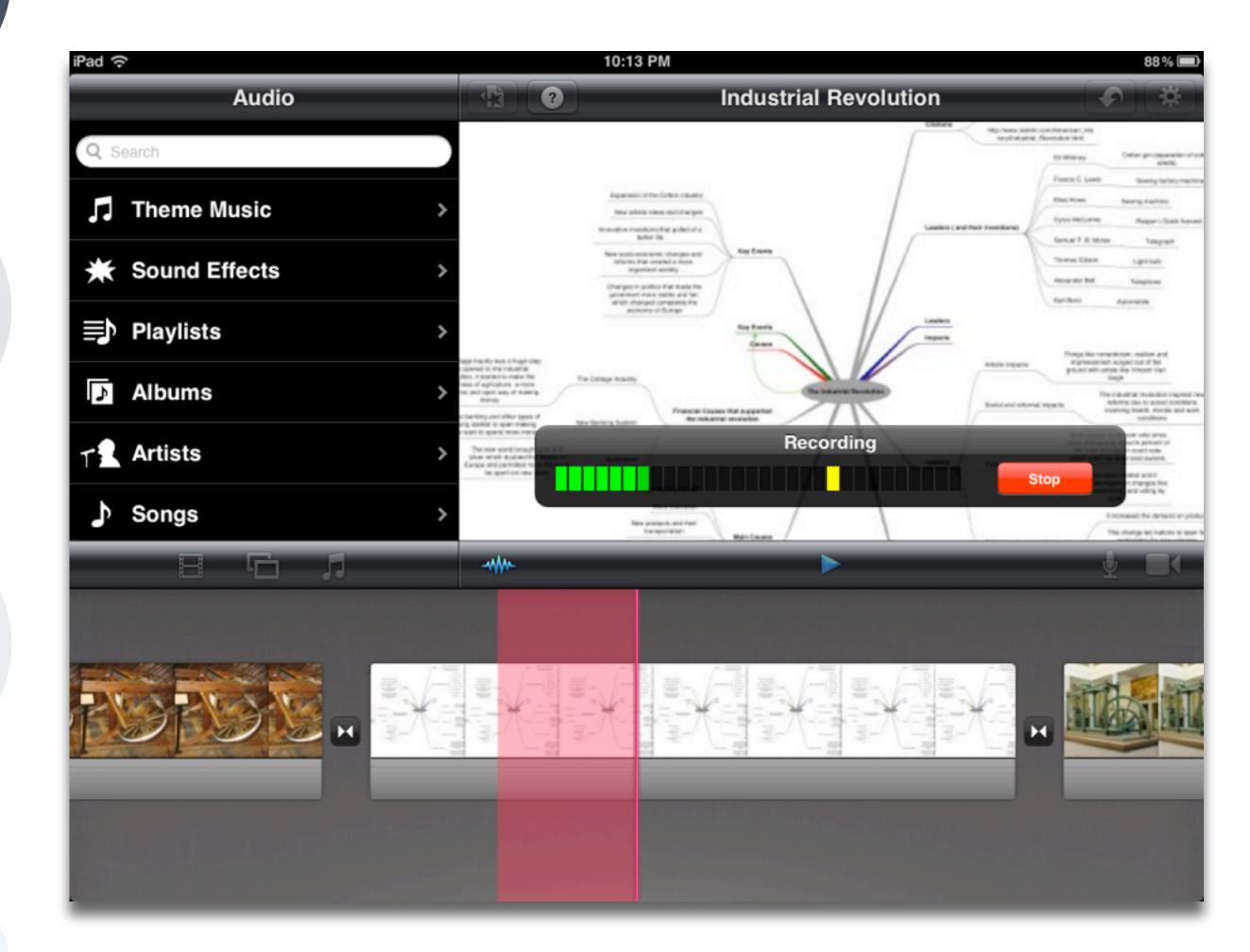


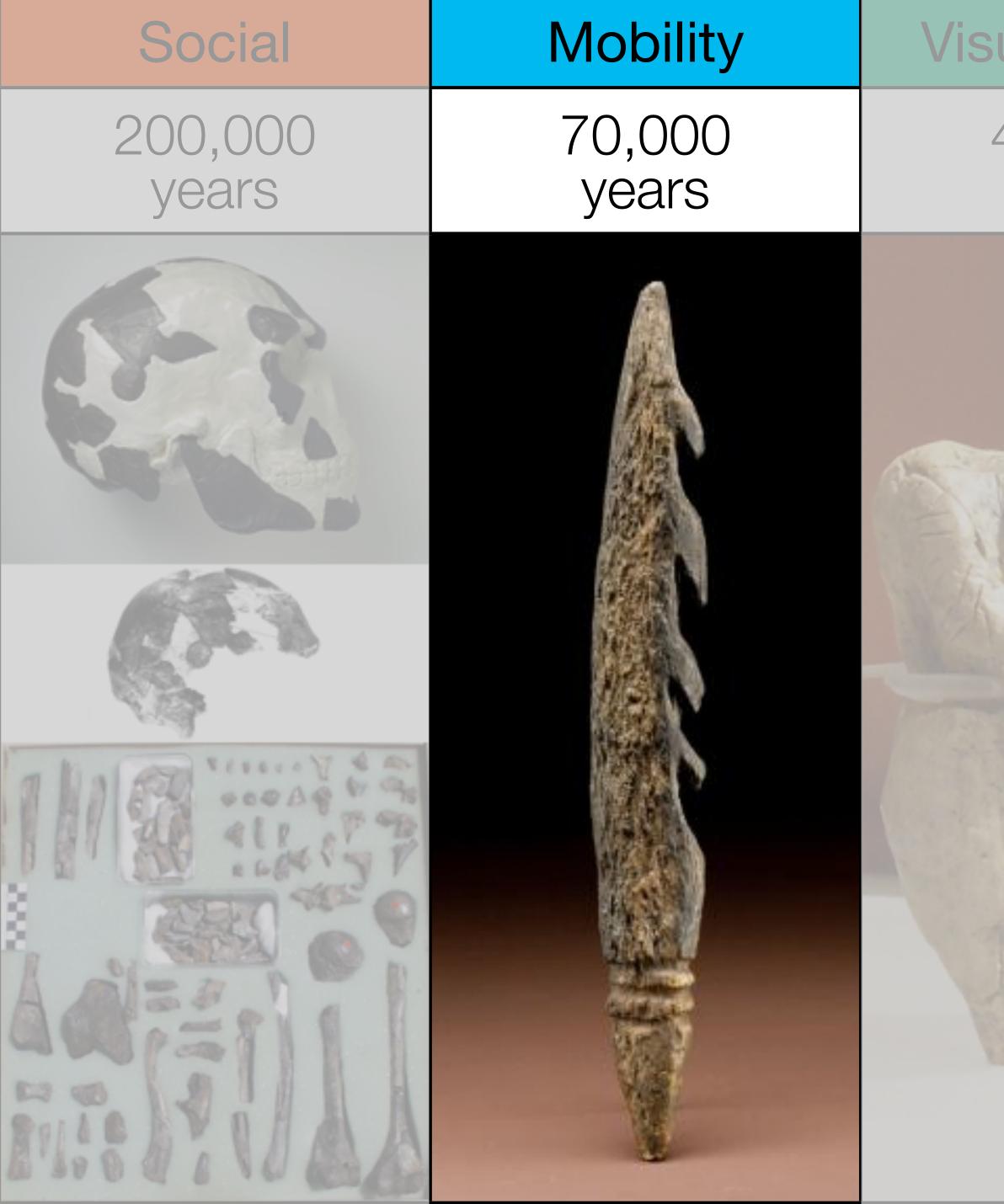
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40,000 years	17,000 years	8,000 years





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Aquatic Biomes

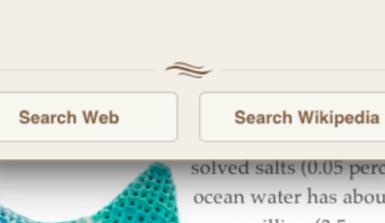
Aquatic biomes cover 75 percent of the surface of the Earth. The aquation d terrestrial biomes are similar in some ways

bi•ome | 'bī,ōm |

noun Ecology

a large naturally occurring community of flora and fauna occupying a major habitat, e.g., forest or tundra.

ORIGIN early 20th cent.: from BIO- 'life' + -OME



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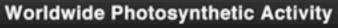
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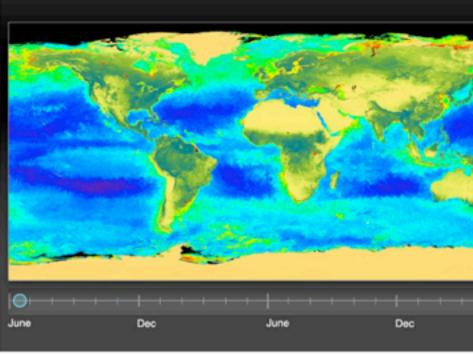
solved salts (0.05 percent), whereas ocean water has about 35,000 parts per million (3.5 percent).

> Some aquatic organisms are adapted to both conditions for parts of their lives, such as salmon and some eels, but it

is more common for organisms to be confined to one of the two environments.

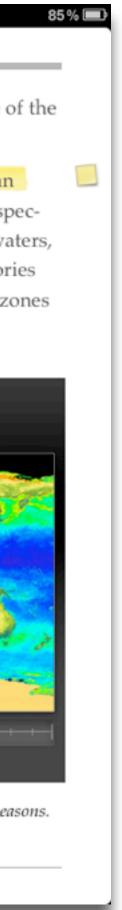
Aquatic environments have less variation globally than those on land. Taking a broad view (the lumper's perspective), there are four kinds of aquatic biomes: surface waters, deep waters, shores, and bottoms. Within these categories are a variety of distinctive marine and freshwater life zones that are frequently designated as separate biomes.





Interactive The latitudes of peak photosynthesis change with the seasons.

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EURADIAN CULLARED-DUVE

Streptopelia decaocto Locally common, exotic

121/2-13 in. (32-33 cm)

Recent colonizer of N. America from Caribbean but native to Eurasia; rapidly increasing and spreading. Slightly chunkier than Mourning Dove, paler beige, and with square-cut tail. Note narrow black ring on hindneck. Grayish undertail coverts. Three-toned wing pattern in flight.

SPOTTED DOVE

Streptopelia chinensis Uncommon, local, exotic

12 in. (30-31 cm)

Note broad collar of black and white spots on hindneck. A bit larger than Mourning Dove; tail rounded with much white in corners. Juvenile: Lacks collar, but can be told by shape of spread tail.

ROCK PIGEON (ROCK DOVE, DOMESTIC PIGEON)

Columba livia Common, exotic

121/2 in. (32 cm)

Typical birds are gray with *whitish rump, two black wing bars,* and broad, dark tail band. Domestic stock or feral birds may have many color variants.

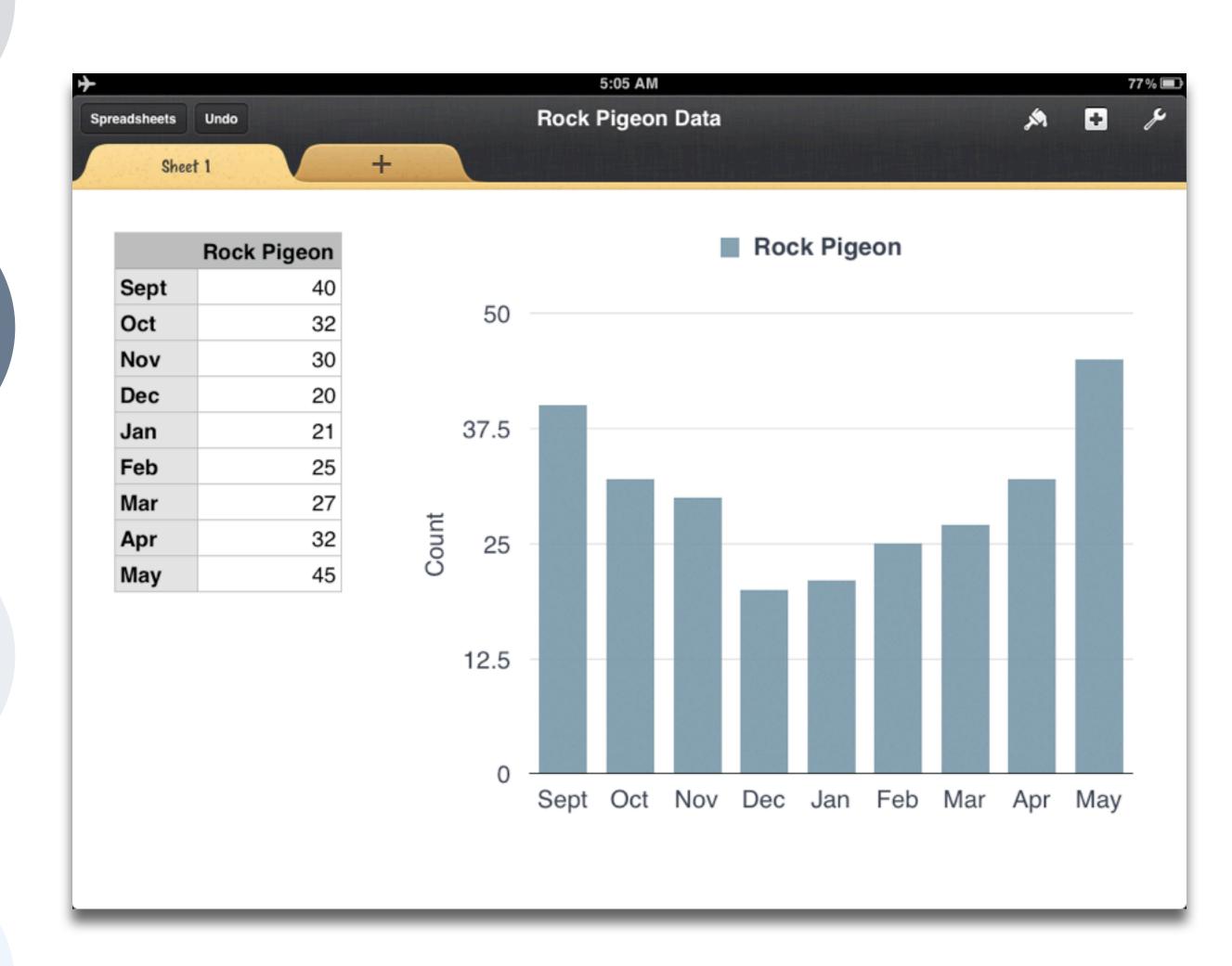


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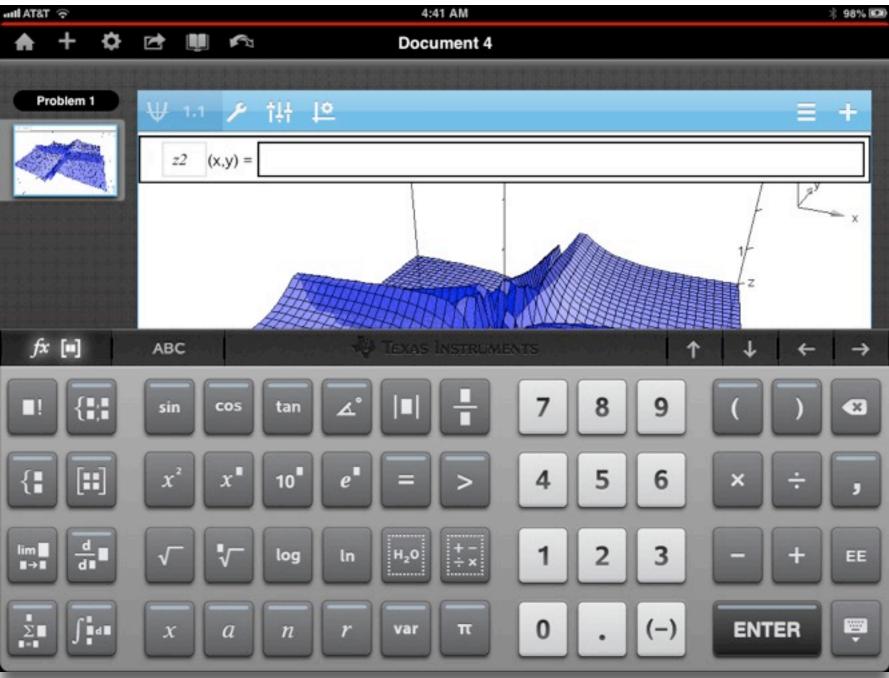
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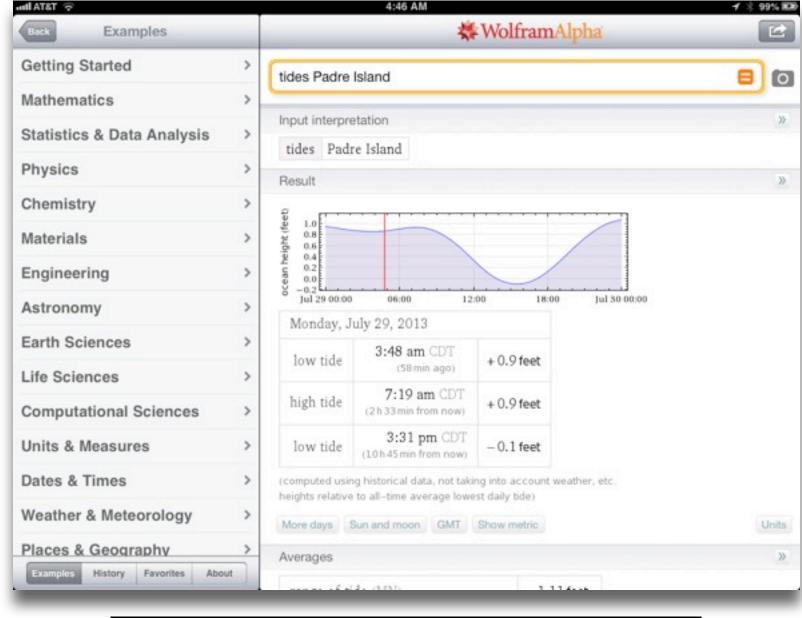


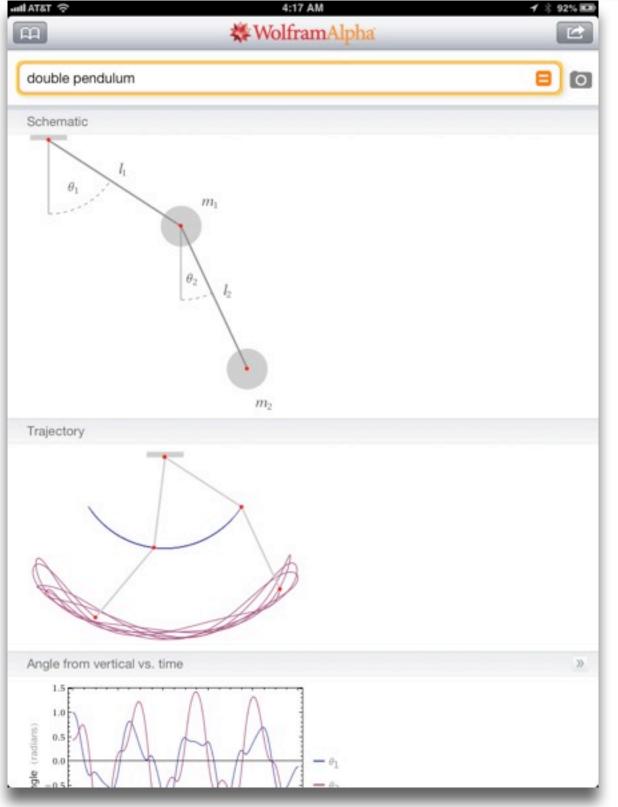
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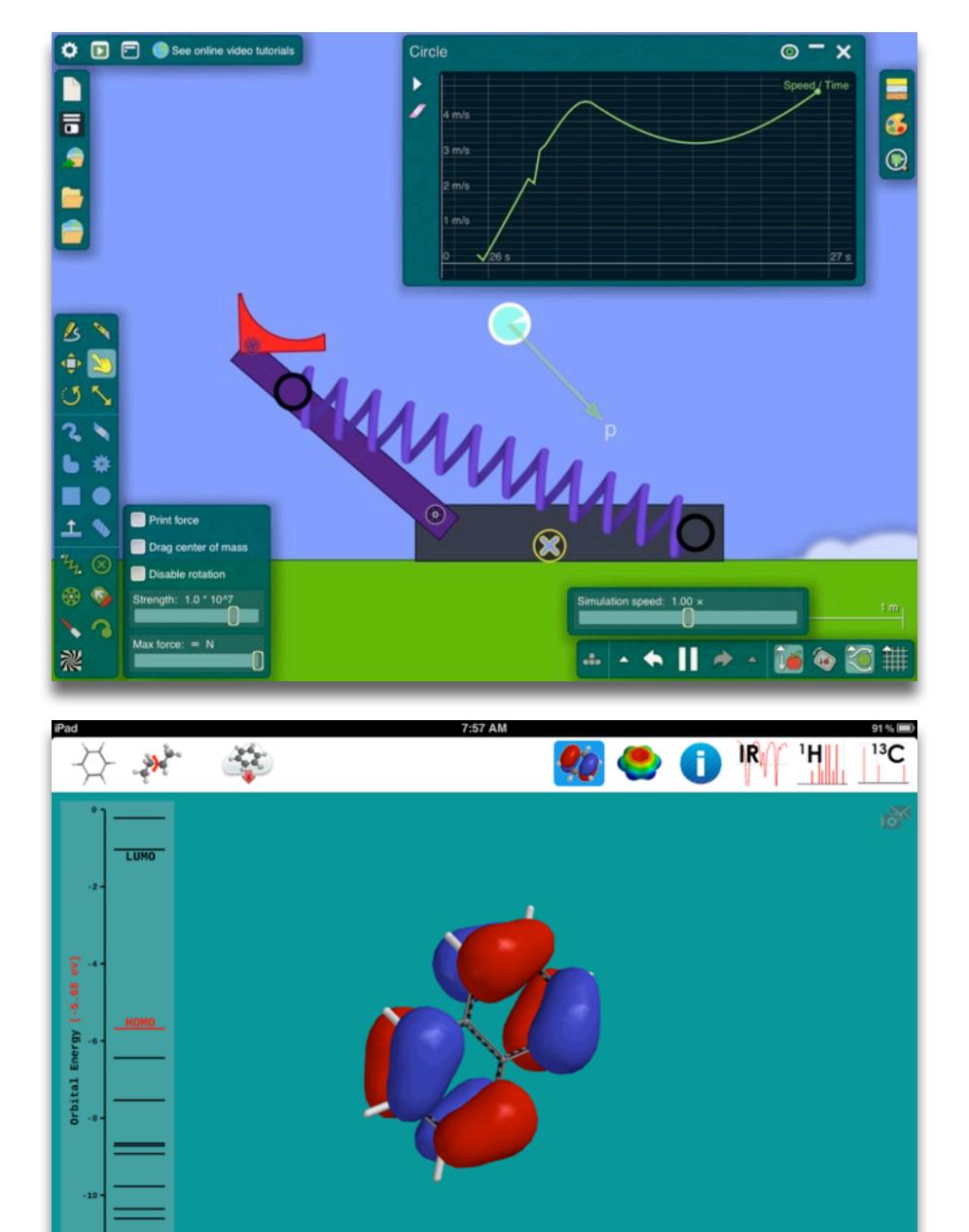
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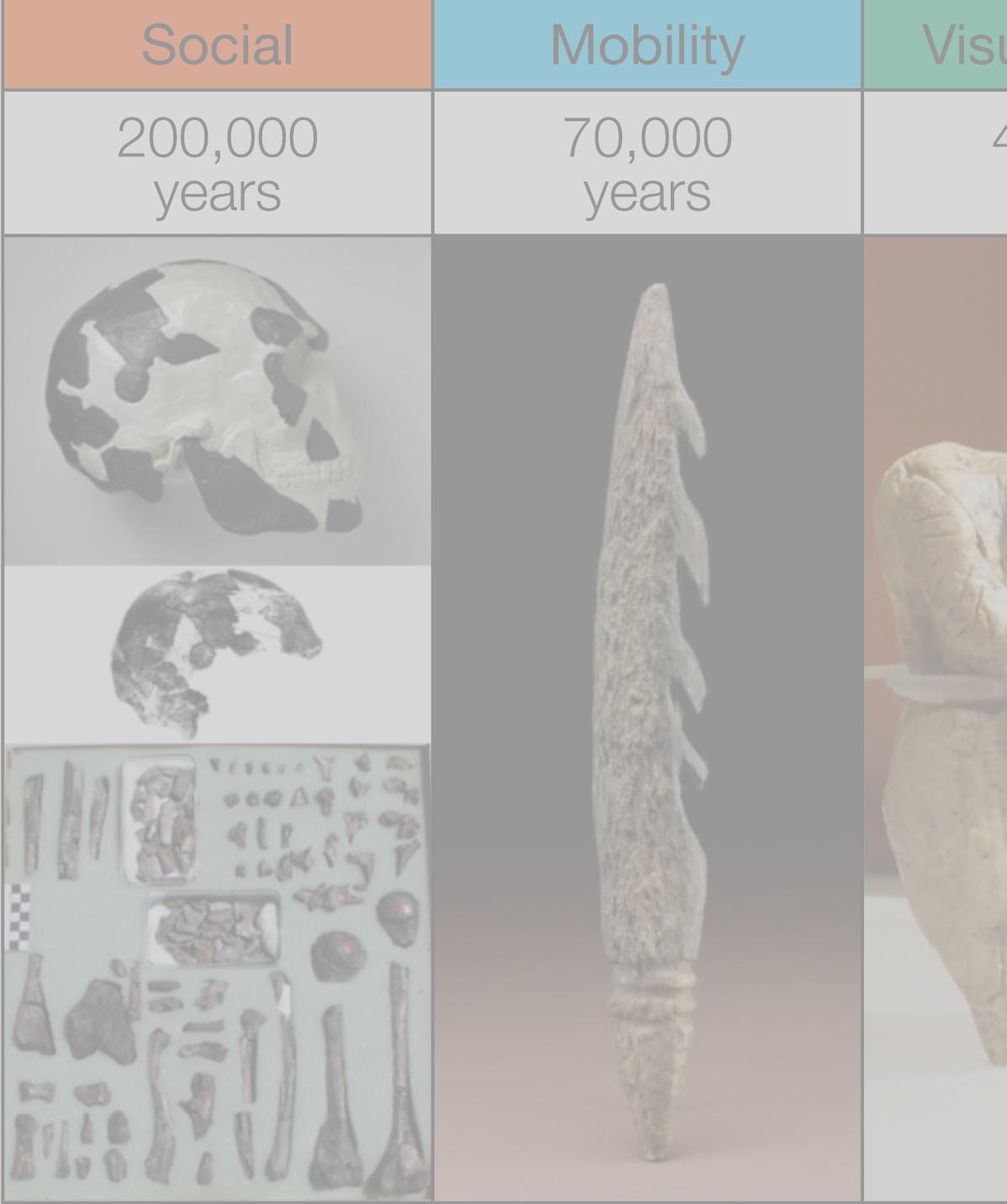
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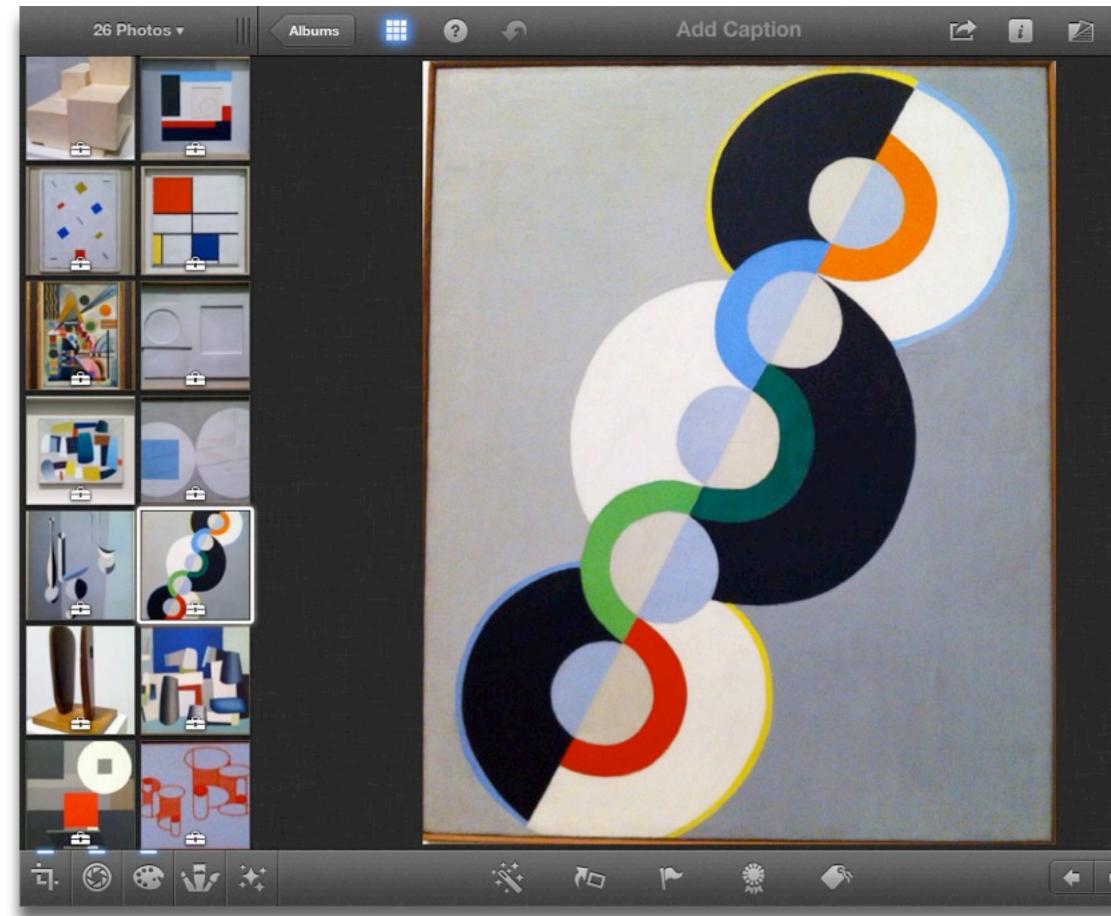




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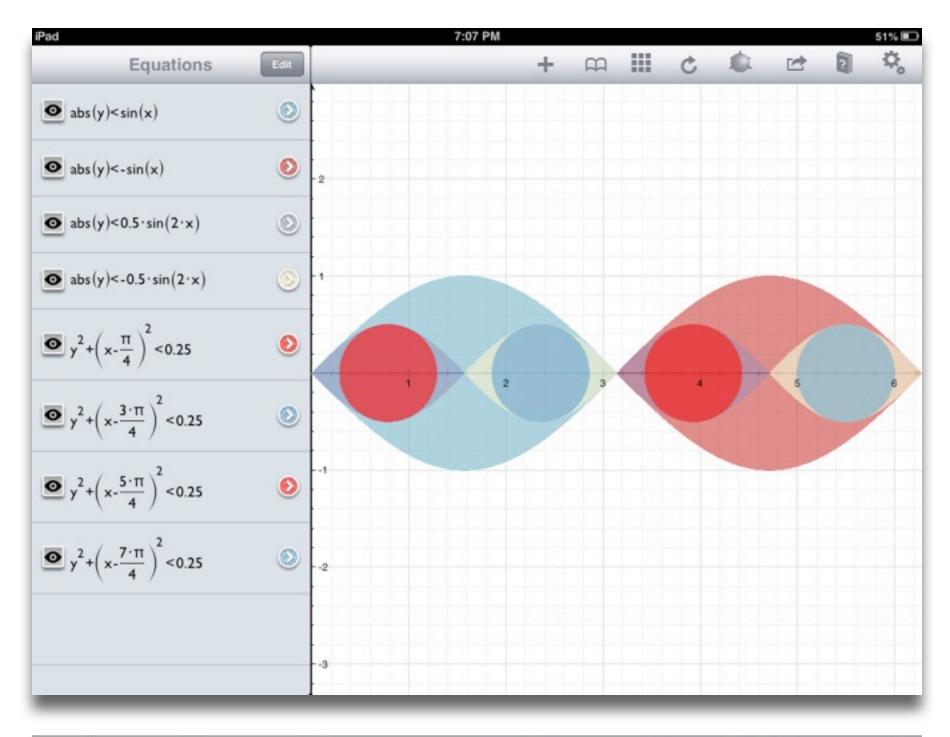


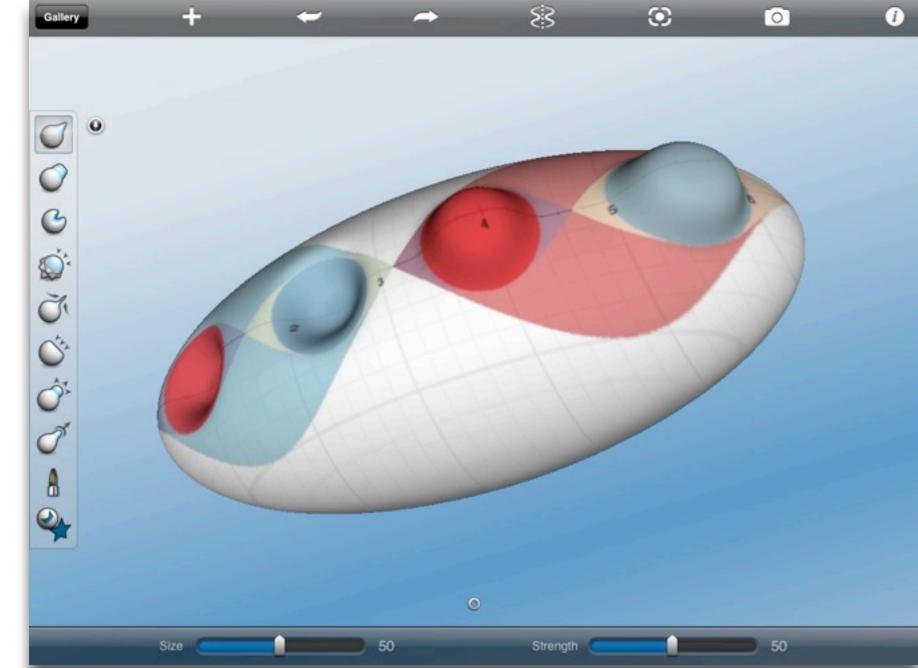
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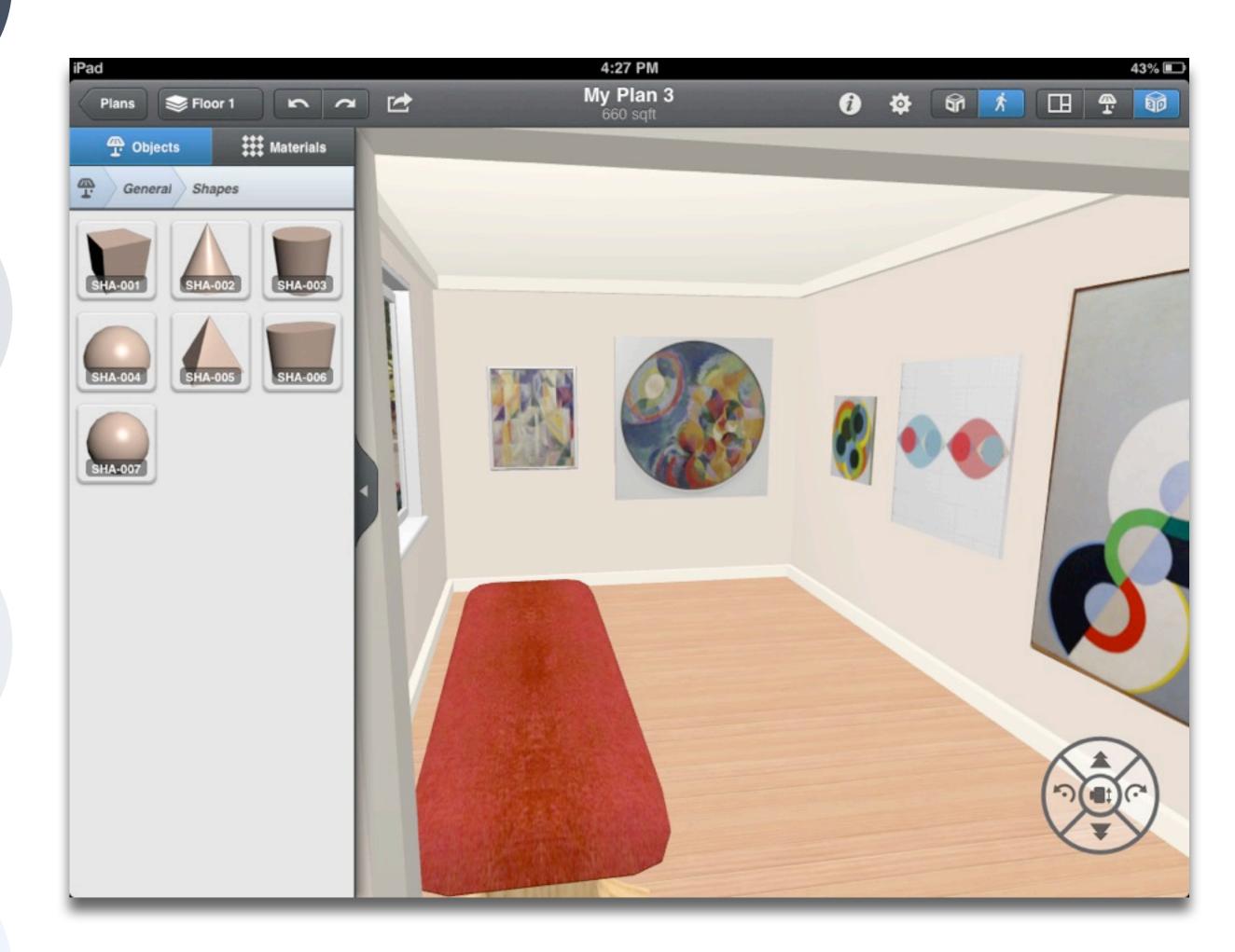


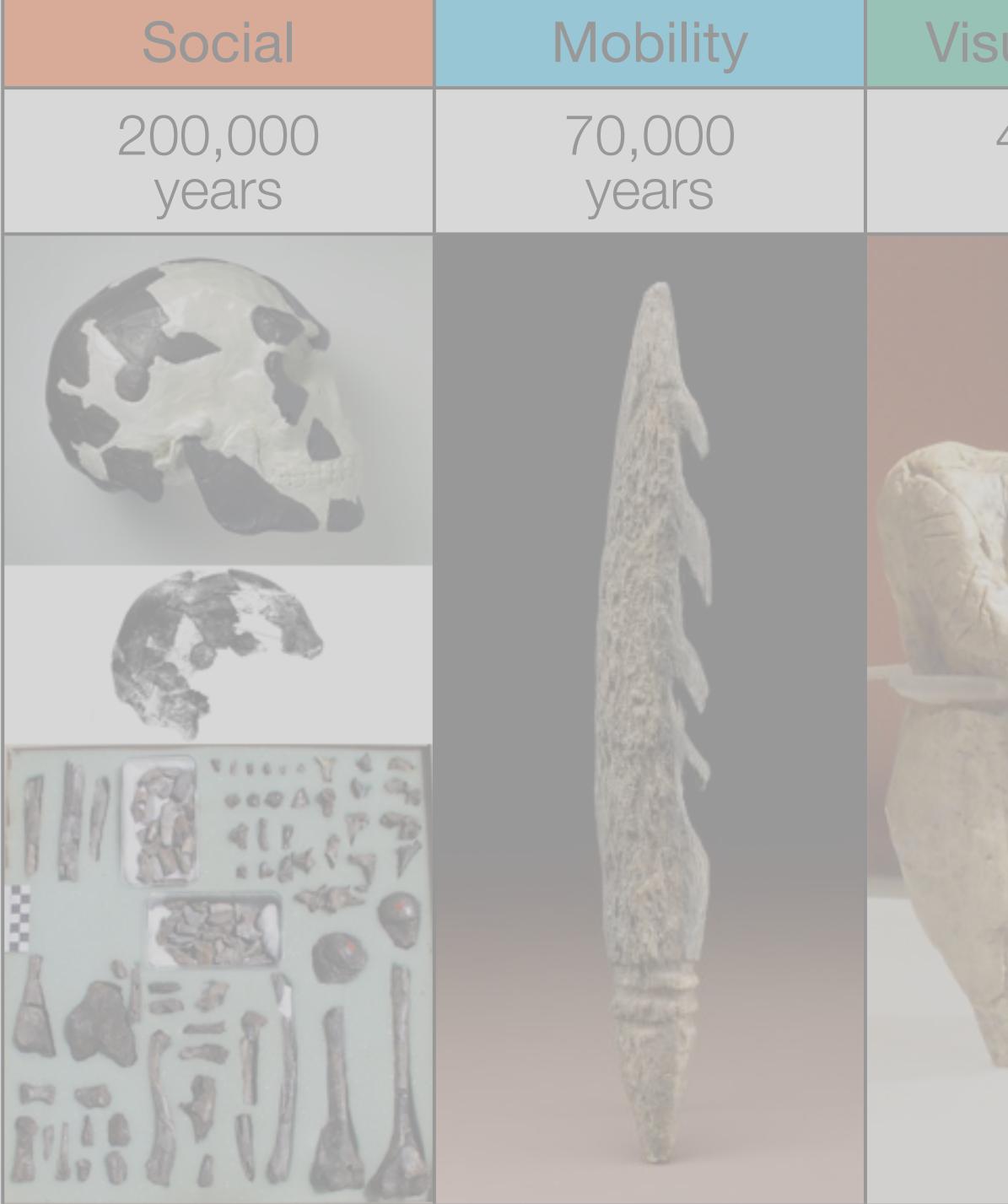
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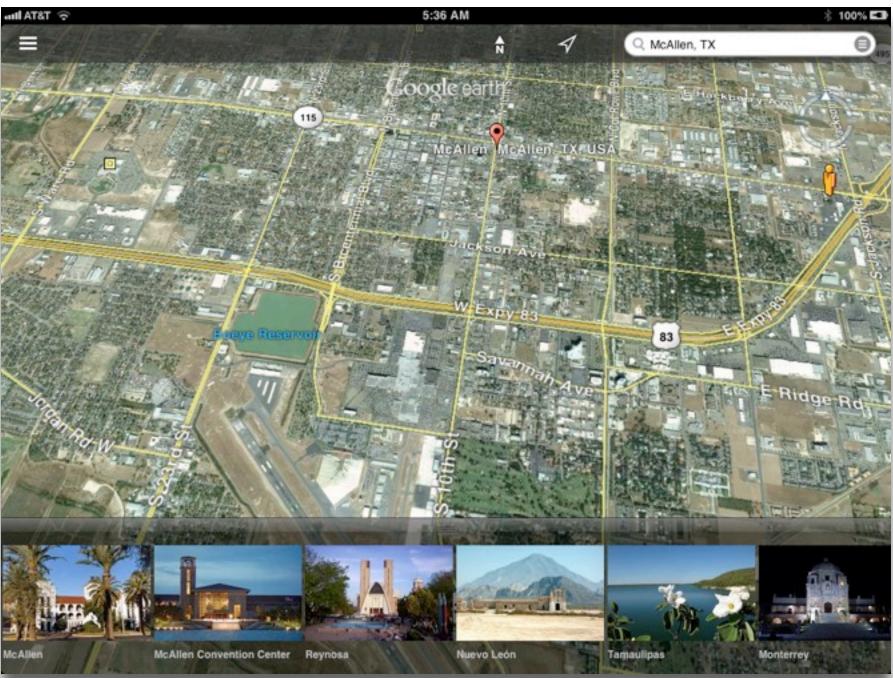


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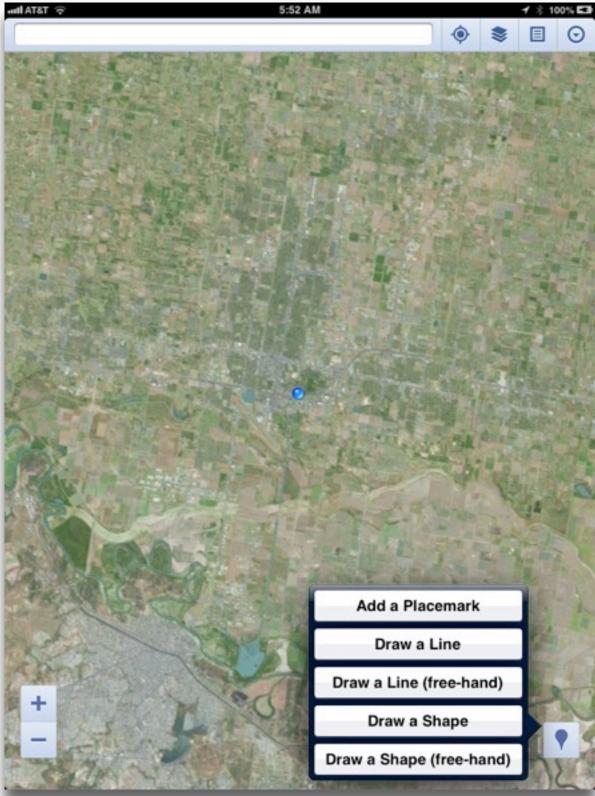
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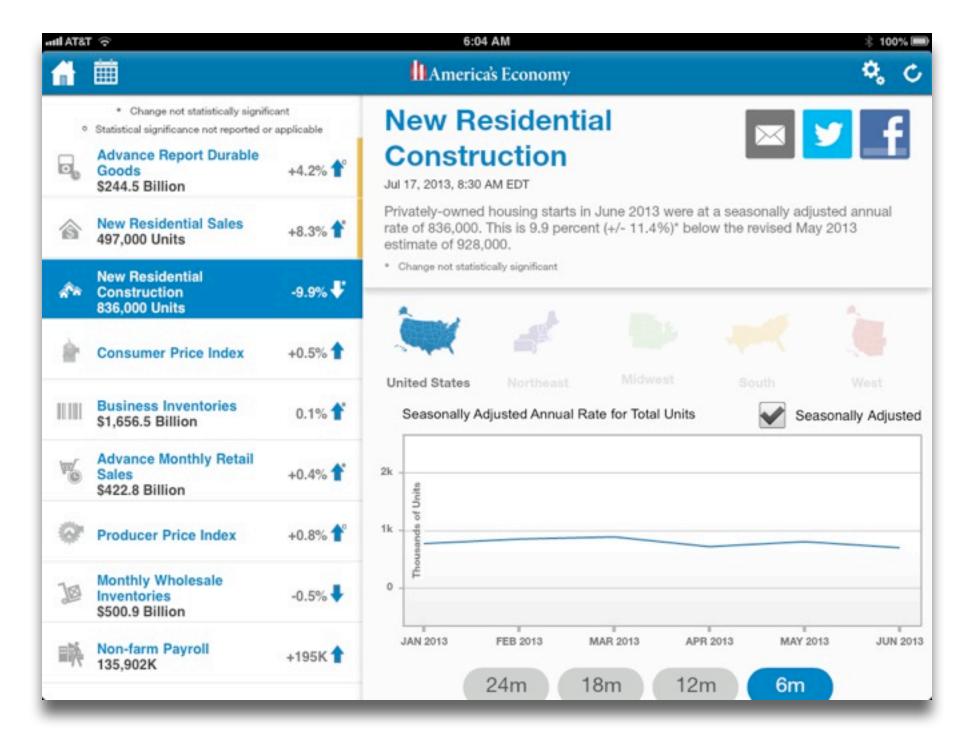


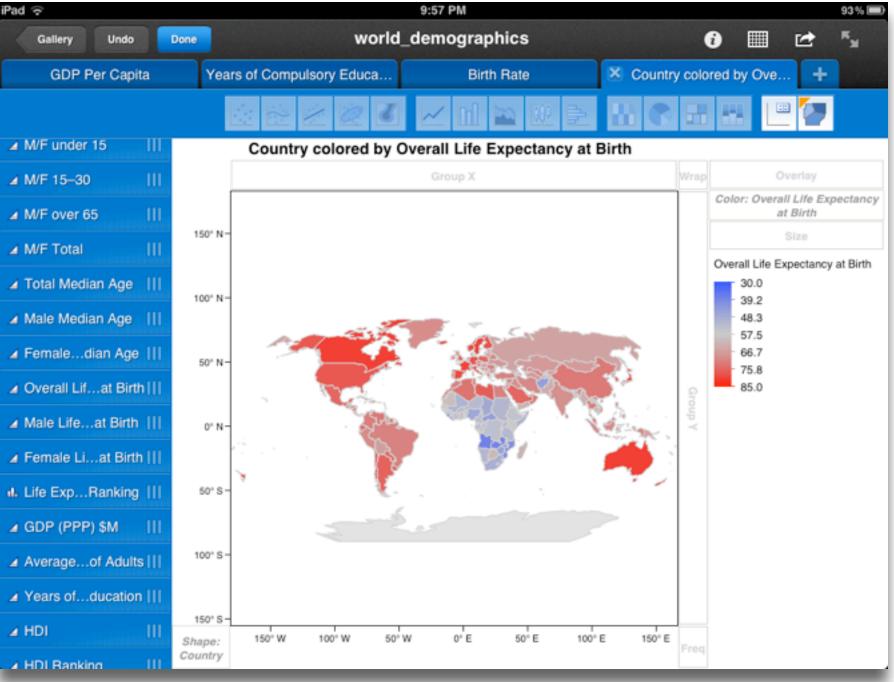
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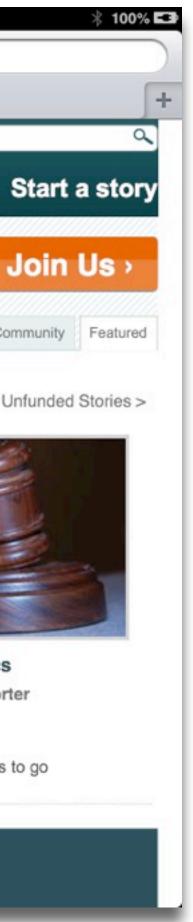
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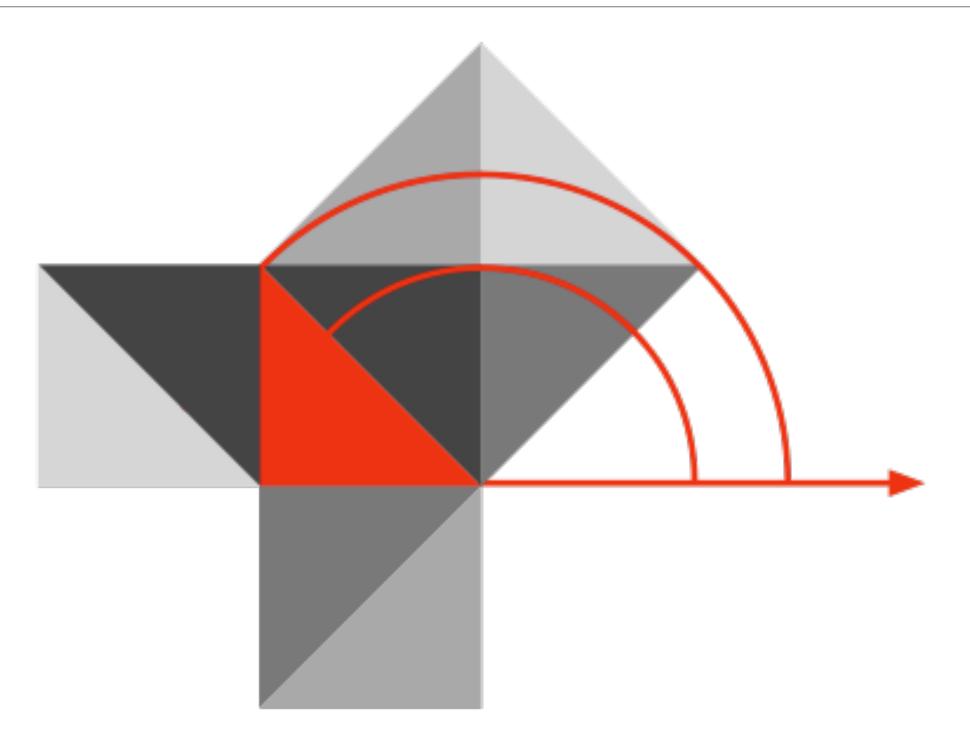
Resources

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