Gypsum mortar: calcium sulfate heat it up, get plaster of paris

Lime mortar

Gypsum-lime mortar

Hydraulic cement, reacts with water, but does not dissolve in water

Quick lime + fine pozzolana + water = binder for concrete

CaO + Al2O3%SiO2 +H2O

C+A+S+H = CASH

Roman concrete has high compression strength

Catenary uniform shape that evenly distributes loads

Flying buttresses arches supported by other arches

Natural cements: had everything you needed in it

Portland Cement: added clay to kiln

Problem is these cements set very quickly

Fix this by adding gypsum, gives you like 2 hours to pour and set cement

Cement hydration

C3S + 5.3H > C-S-H +1.3CH

C-S-H Causes Stuff to Harden

Cement + water + Sand + rock = concrete

70% of concrete is aggregates

7-15% is cement

Concrete is very cheap

Concrete is weak in tension

Steel: good in compression, good in tension

Reinforced concrete, put steel inside concrete

High strength/weight ratio

Challenge with concrete: Durability

Concrete has a very high ph, this stops steel from rusting

Salts can get through concrete and corrode steel

Cement making is 5-8% of worlds CO2 output