IS 228 Name: _____ C: ___
Roman Architecture Date: _____

The Western Roman Empire may have fallen more than 1,500 years ago, but its rich legacy of innovation and invention can still be seen today. The Romans were prodigious builders and expert civil engineers, and their thriving civilization produced advances in technology, culture and architecture that remained unequaled for centuries.

The Romans enjoyed many amenities for their day, including public toilets, underground sewage systems, fountains and ornate public baths. None of these aquatic innovations would have been possible without the Roman aqueduct. First developed around 312 B.C., these engineering marvels used gravity to transport water along stone, lead and concrete pipelines and into city centers. Aqueducts liberated Roman cities from a reliance on nearby water supplies and proved priceless in promoting public health and sanitation. While the Romans did not invent the aqueduct—primitive canals for irrigation and water transport existed earlier in Egypt, Assyria and Babylon—they used their mastery of civil engineering to perfect the process. Hundreds of aqueducts eventually sprang up throughout the empire, some of which transported water as far as 60 miles. Perhaps most impressive of all, Roman aqueducts were so well built that some are still in use to this day. Rome's famous Trevi Fountain, for instance, is supplied by a restored version of the Aqua Virgo, one of ancient Rome's 11 aqueducts.

Many ancient Roman structures like the Pantheon, the Colosseum and the Roman Forum are still standing today thanks to the development of Roman cement and concrete. The Romans first began building with concrete over 2,100 years ago and used it throughout the Mediterranean basin in everything from aqueducts and buildings to bridges and monuments. Roman concrete was considerably weaker than its modern counterpart, but it has proved remarkably durable thanks to its unique recipe, which used slaked lime and a volcanic ash known as pozzolana to create a sticky paste. Combined with volcanic rocks called tuff, this ancient cement formed a concrete that could effectively endure chemical decay. Pozzolana helped Roman concrete set quickly even when submerged in seawater, enabling the construction of elaborate baths, piers and harbors.

At its height, the Roman empire encompassed nearly 1.7 million square miles and included most of southern Europe. To ensure effective administration of this sprawling domain, the Romans built the most sophisticated system of roads the ancient world had ever seen. These Roman roads—many of which are still in use today—were constructed with a combination of dirt, gravel and bricks made from granite or hardened volcanic lava. Roman engineers adhered to strict standards when designing their highways, creating arrow-straight roads that curved to allow for water drainage. The Romans built over 50,000 miles of road by 200 A.D., primarily in the service of military conquest. Highways allowed the Roman legion to travel as far as 25 miles per day, and a complex network of post houses meant that messages and other intelligence could be relayed with astonishing speed. These roads were often managed in the same way as modern highways. Stone mile markers and signs informed travelers of the distance to their destination, while special complements of soldiers acted as a kind of highway patrol.

Arches have existed for roughly 4,000 years, but the ancient Romans were the first to effectively harness their power in the construction of bridges, monuments and buildings. The ingenious design of the arch allowed the weight of buildings to be evenly distributed along various supports, preventing massive Roman structures like the Colosseum from crumbling under their own weight. Roman engineers improved on arches by flattening their shape to create what is known as a segmental arch and repeating them at various intervals to build stronger supports that could span large gaps when used in bridges and aqueducts. Along with columns, domes and vaulted ceilings, the arch became one of the defining characteristics of the Roman architectural style.

Source: Andrews, Evan. Excerpts from *10 Innovations that Built Ancient Rome.* From History.com Nov 20, 2012