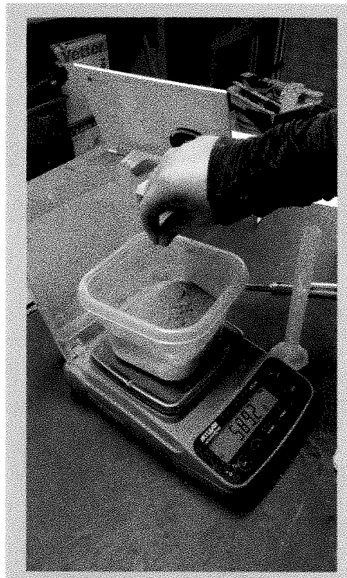
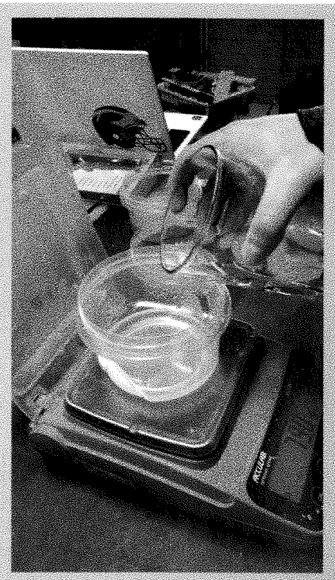
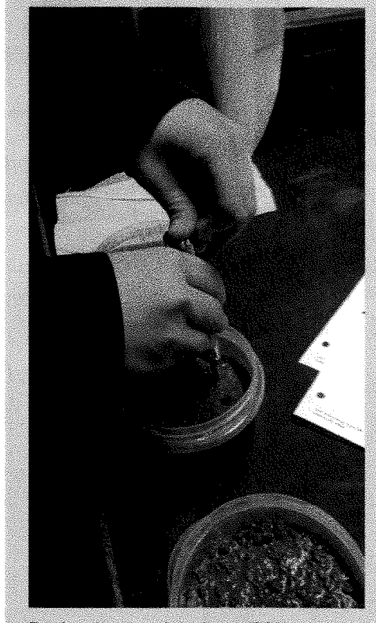


Measuring the amount of cement needed for a concrete [mortar] mixture



Measuring the amount of water needed for a concrete [mortar] mixture

Mixing cement, sand, and water to make concrete [mortar]



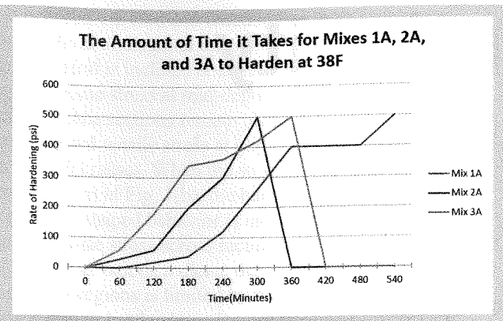
Testing the rate of hardness (ROH) of concrete with a penetrometer

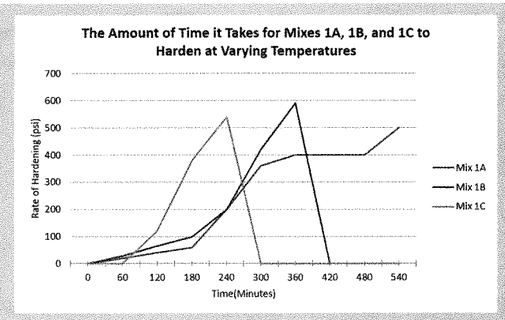
When I handed my proposal to Mr. Miller, my science teacher at STEM Middle School, he looked it over and asked, "How are you going to measure the rate at which the concrete sets?" Having done some research before turning in my proposal, I replied, "I'm going to use a handheld penetrometer, which is basically an instrument that measures the rate of hardening of a material." Later, when my grandfather and I were actually conducting the experiment, I discovered the unit of measurement penetrometers use and what each of those measurements mean.

Overall, the experiment, from start to finish, took about 11 hours (not including the science fair poster board). Once we weighed and combined each ingredient with water of the appropriate temperature and placed them in the right environment, we measured each sample about every 30 minutes. Every time we measured the samples, I kept a log to keep track of the time it took each sample to fully set and what the psi of each sample was.

Summary of concrete mixture data

Mixes	Concrete Temps	Ambient Control Temps
1A	48.0°F	38.0°F
1B	48.0°F	63.0°F
1C	48.0°F	85.0°F
2A	70.5°F	38.0°F
2B	70.5°F	63.0°F
2C	70.5°F	85.0°F
3A	95.0°F	38.0°F
3B	95.0°F	63.0°F
3C	95.0°F	85.0°F





Science fair project quantitative data (some of the graphs made to summarize results)

I asked my grandfather to do this experiment with me because I was, and still am, very interested in the field of concrete. I wanted to learn more about how he supports his family and what he has dedicated pretty much his entire life to. From moving from St. Louis, MO, to Little Rock, AR, and then to Michigan, my grandfather has shown time and time again how much he loves his job. As a renowned concretist who has never lost sight of what really matters—family—he is a perfect example of what people aspire to be, what many can only dream of being.

Abby Pinch presenting her science fair project results

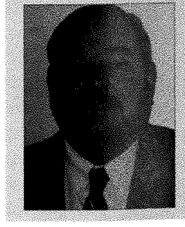
A Blue-Ribbon Result

As a result of her efforts, Abby was awarded the only blue ribbon among the seventh-grade classes. Her advisor was very impressed with not only the work she had done but also her presentation.

We need to engage potential "superstars" at a very early age. In the case of someone like my granddaughter, who is already indicating that she is drawn to the sciences, this is the perfect time. The more interaction we have with young people, pointing out the outstanding benefits of the concrete industry, the better off our industry will be going forward.

Our industry needs to rejuvenate itself continuously. If your son or daughter, granddaughter or grandson, or a neighbor child asks you to help them with their science fair project, jump at the chance. You may be starting the career of our next superstar.

Selected for reader interest by the editors.



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