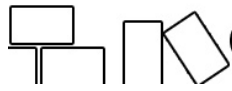


Name _____ Period _____ Date _____



Concrete Structures

STEM Sims

Lesson 4: How Does Curing Time Affect Concrete Strength?

Curing time is the length of time that concrete hardens before a load should be placed on the concrete. Concrete is formed through a chemical reaction. All chemical reactions are time dependent. How do you think that the curing time impacts the strength of concrete?

Doing the Science

1. Start the Concrete Structures Simulation by clicking on the “Sim” tab.
2. Click on the “Rebar Center” button. Do not select any rebar for this test.
3. Click on the “Mixing Center” button at the bottom center of the screen.
4. Select four bags from each of the five ingredients present. You must choose a total of 20 items to complete your mix.
5. Click on the “Testing Center” button. Set the curing time to 1 day then click on the “Mix & Cure button.
6. Test the strength of your concrete beam by adding weights. Record your results in Table 1 below.
7. Select the “Mixing Center” button to create a new curing time for the concrete.
8. Click on the “Testing Center” and select a curing time different than “1 day”.
9. Test the strength of your concrete beam by adding weights. Record your results in Table 1 below.
10. Repeat steps 7 – 9 to test two more different curing times.

Table 1.

Trial	Curing Time (days)	Cement (bags)	Air (bags)	Sand (bags)	Water (bags)	Gravel (bags)	Weight Supported (kg)
1	1	4	4	4	4	4	
2	4	4	4	4	4	4	
3	8	4	4	4	4	4	
4	12	4	4	4	4	4	

Do You Understand?

1. Which curing time resulted in the strongest concrete?

2. Discuss the relationship between curing time and concrete strength.