Name_____ Period _____ Date _____

Concrete Structures

STEM Sims

Lesson 5: How Does Rebar Size Affect Concrete Strength?

Rebar is shorthand for what the building community calls reinforcing bars, which are metal bars placed inside concrete structures to provide additional strength. How does the thickness of rebar affect 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. Place one piece of #3 rebar in the center of the form mold.
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 15 days 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 "Rebar Center" button to choose a new size of rebar for the concrete.
8. Click on the "Testing Center" and repeat the experiment.
9. Repeat steps 7 – 8 to test two more different rebar sizes.

Table 1.

Trial	Rebar Size	Cement (bags)	Air (bags)	Sand (bags)	Water (bags)	Gravel (bags)	Weight Supported (kg)
1	3	4	4	4	4	4	
2		4	4	4	4	4	
3		4	4	4	4	4	
4		4	4	4	4	4	

Do You Understand?

1. Which size of rebar resulted in the strongest concrete?

2. Discuss the relationship between rebar size and concrete strength.