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Simulation Data

Complete the table with the data from your simulation.

How much power can the generator provide?	
Generator Capacity	**Maximum Number of Houses Powered (X1000)**
0 %	**0**
10 %	
20 %	
30 %	

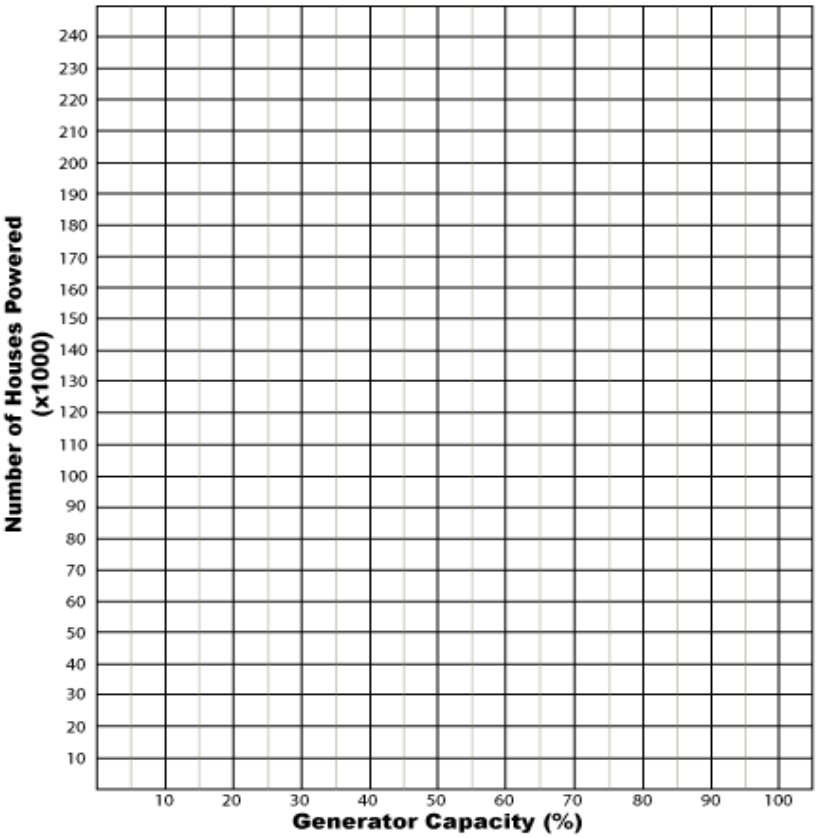
Write then graph the ordered pairs for the Generator Capacity and Houses Powered from above.

(0 , 0)

(____, ____)

(____, ____)

(____, ____)



Find the data difference for each range of generator capacity.

Generator Capacity Data Difference	Houses Powered (X1000) Data Difference
0% and 10%	
10% and 20%	
20% and 30%	

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Mathematical Verification

Complete each section.

What is the number of houses that are powered if the generator capacity is 0%? _____(x1000)

What is the ordered pair for the y – intercept (b) of the line for our generator capacity data? (___,___)

b = _____

Compute the slope of the line using any two known points from our data.

Point 1 = (X_1 , Y_1) _____ Point 2 = (X_2 , Y_2) _____

$$m = \frac{Y_2 - Y_1}{X_2 - X_1} = \text{----------} = \text{----------}$$

m = _____

Write the equation of the line in slope-intercept form (y = m x + b). _____

Using the slope-intercept form above, answer the following questions.

1. How many homes can be powered if the generator is running at 75% capacity? _____
2. What capacity of the generator is needed to power all 120,000 homes in Solville? _____
3. What is the maximum number houses the generator can power? _____
4. Would you recommend the selected generator to the mayor and city council? Why or Why not.

_____

_____

This curriculum is produced by Advanced Manufacturing & Prototyping Integrated to Unlock Potential (AMP-IT-UP), National Science Foundation Award #1238089. Georgia Institute of Technology's Center for Education Integrating Science, Mathematics, and Computing (CEISMC).

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Insulation Procedure

Write a procedure that will collect the data about the insulation material and thickness to produce power for Solville. You are not required to use all lines. However, try to include each step of the test.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Complete the table with the data from your simulation.

Data Table #1 Number of Houses Powered			
Insulation Material Thickness (cm)	**1. Adobe**	**2. Fiberglass**	**3.**
0			
1			
2			
3			
4			
5			

Write the equation of line in slope-intercept form for each material.

1. Adobe = slope (m) _____ y-intercept (b) _____ Equation _____
2. Fiberglass = slope (m) _____ y-intercept (b) _____ Equation _____
3. _____ = slope (m) ____ y-intercept (b) _____ Equation _____

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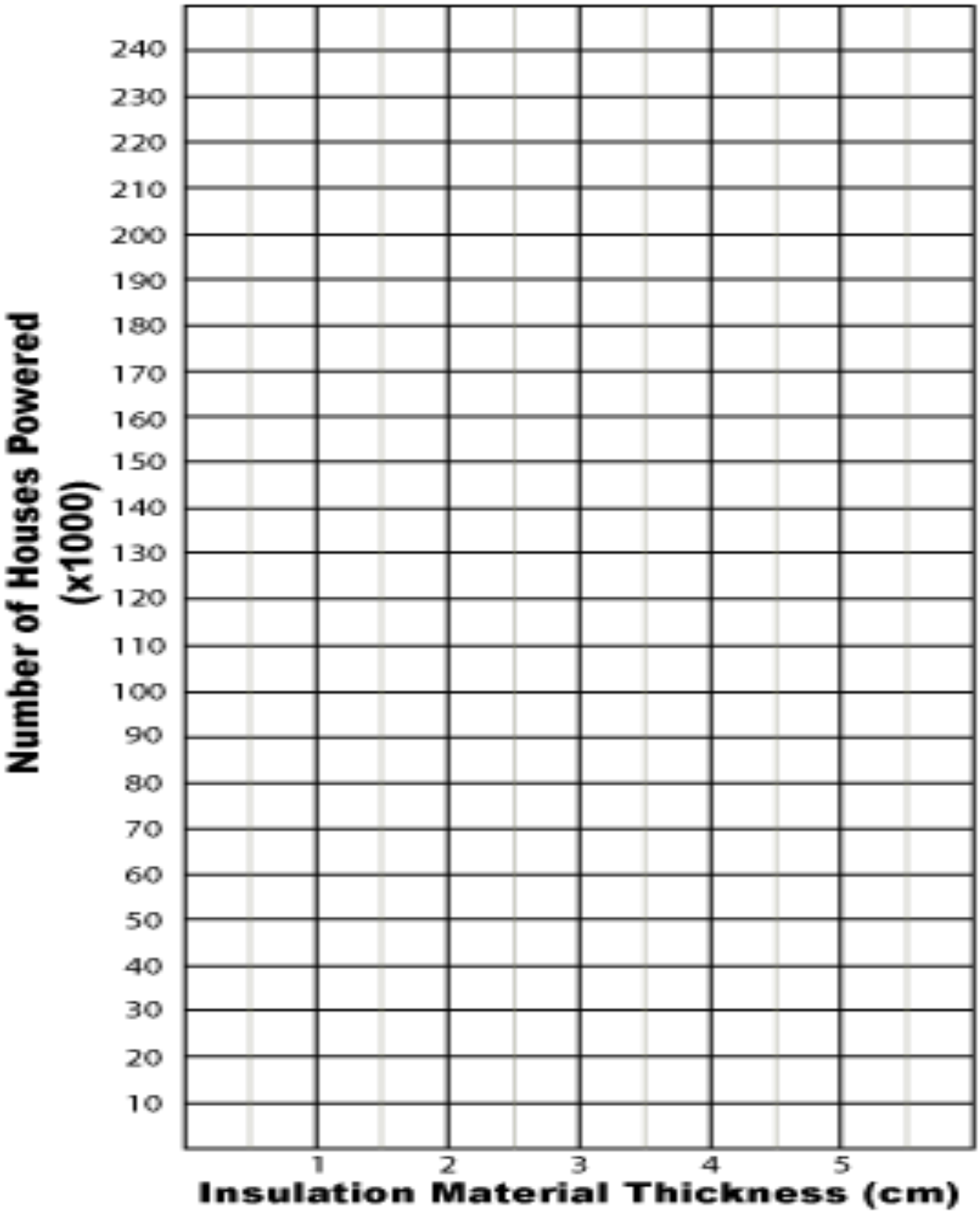
Insulation Graph

Complete the graph using the data.



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Insulation Data

Complete the table below with the data and equations for all of the insulation materials.

Data Table #2					
Insulation Material	**Number of Homes Powered (x1000)**		**Slope (m)**	**y-intercept (b)**	**Equation in slope-intercept form (y=mx+b)**
	1 cm	**5 cm**			
Adobe	(1 , 37)	(5 , 92)	55/4	23	y=(55/4)x+23
Aerogels	(1 ,)	(5 ,)			
Brick	(1 ,)	(5 ,)			
Fiberglass	(1 ,)	(5 ,)			
Grass	(1 ,)	(5 ,)			
Mud	(1 ,)	(5 ,)			
Vaccum Panels	(1 ,)	(5 ,)			
Wood	(1 ,)	(5 ,)			

Answer the question below using the equations your created in the table. Show your work below the question.

1. How many houses can you power if you had 7 cm of Mud insulation? _____

2. How many centimeters of Wood is needed to power all of Solville? _____

3. How many houses can you power with only 4 cm of Aerogels? _____

4. To power 150,000 homes you would need how much Fiberglass? _____

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Clean Energy Recommendation

Write a letter to the mayor and city council of Solville and recommend whether the generator is big enough and which insulation materials should be considered for use in the power plant. Include evidence for why you chose the insulation materials that you did.

Your letter should include the following sections:

1. Introduction that states your claim for the generator and plant insulation
2. Data/Evidence that supports your claim for the generator and plant insulation
3. Why does this support your decision and may reference how it compared to other materials