## Unit 5 Lesson 3: More Movement

### 1 Moving a Graph (Warm up)

#### Student Task Statement

How can we translate the graph of $A$ to match one of the other graphs?



### 2 New Hours for the Kitchen

#### Student Task Statement

Remember the bakery with the thermostat set to $65^{∘}F$? At 5:00 a.m., the temperature in the kitchen rises to $85^{∘}F$ due to the ovens and other kitchen equipment being used until they are turned off at 10:00 a.m. When the owner decided to open 2 hours earlier, the baking schedule changed to match.





1. Andre thinks, “When the bakery starts baking 2 hours earlier, that means I need to subtract 2 from $x$ and that $G\left(x\right)=H\left(x−2\right)$.” How could you help Andre understand the error in his thinking?
2. The graph of $F$ shows the temperatures after a change to the thermostat settings. What did the owner do?
* 
1. Write an expression for $F$ in terms of the original baking schedule, $H$.

### 3 Thawing Meat

#### Student Task Statement

A piece of meat is taken out of the freezer to thaw. The data points show its temperature $M$, in degrees Fahrenheit, $t$ hours after it was taken out. The graph $M=G\left(t\right)$, where $G\left(t\right)=-62\left(0.85\right)^{t}$, models the shape of the data but is in the wrong position.

| $t$ | $M$ |
| --- | --- |
| 0 | 13.1 |
| 0.41 | 22.9 |
| 1.84 | 29 |
| 2.37 | 36.1 |
| 2.95 | 36.8 |
| 3.53 | 38.8 |
| 3.74 | 40 |
| 4.17 | 42.2 |
| 4.92 | 45.8 |



Jada thinks changing the equation to $J\left(t\right)=-62\left(0.85\right)^{t}+75.1$ makes a good model for the data. Noah thinks $N\left(t\right)=-62\left(0.85\right)^{\left(t+1\right)}+68$ is better.

1. Without graphing, describe how Jada and Noah each transformed the graph of $G$ to make their new functions to fit the data.
2. Use technology to graph the data, $J$ and $N$, on the same axes.
3. Whose function do you think best fits the data? Be prepared to explain your reasoning.

#### Images for Activity Synthesis





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