Name:

APPLICATION: Graphing Wages and Linear Equations

Level 1

TEACHER TIP: Print one copy of these wage cards for each group of 3 students for the **Level 1** activity. Cut along each row and fold in half so that one side shows "Team Member" and the other side shows "Compensation Package."

Comparing Compensation
Congratulations on being hired! Please flip over your wage card to see how much you'll be making at your new job. On your first day, you're discussing your compensation with the other new hires in your group.

Part 1: Equations

1. **Write an equation that represents each team member's compensation. Your equation should represent a relationship between hours worked (x) and total pay (y). Please put the equation for each team member in the boxes below.**

Team Member 1	Team Member 2	Team Member 3

2. **Using the equations that you wrote, who do you think got the best compensation deal?**

3. **What does the slope represent in each equation?**

4. **What does the y-intercept represent in each equation?**

Part 2: Graph
Nice work!

5. **Now graph each of these equations on the SAME coordinate grid.**

Part 3: Reflect
Well done! Your final task is to answer the questions below. You can use either the equations or the graph to help you complete the questions.

6. **If each team member works 30 hours next week, which member of your team has the best compensation package?**

7. **During which range of hours is each team member's compensation package the most beneficial? (For example: "From 10 hours to 18 hours, Team Member 99 makes the most money")**

Level 2

Part 1: Minimum Wage

Minimum wage is the lowest hourly wage that an employer can pay you. Each state sets its own minimum wage but that wage must be at least $7.25 per hour, which is the national minimum wage set by the federal government.

1. **What is the minimum wage in your state? Visit MinimumWage.com and write your answer below.**

2. **What is the average monthly rent in your state? Visit World Population Review and write your answer below.**

3. **Write an equation for your state's minimum wage where x represents hours worked and y represents total pay.**

4. **There have been proposals to increase the federal minimum wage to $15 per hour. Write an equation for representing a $15 minimum wage where x represents hours worked and y represents total pay.**

Part 2: Reflect

Open this Desmos Graph and enter equations for minimum wage and one representing the $15 minimum wage, then use the point sliders to answer the questions below.

5. **How many hours would you need to work to pay for one month of rent in your state if you were paid minimum wage?**

6. **How many fewer hours would you need to work to pay rent if the minimum wage was raised to $15 per hour?**

7. **A common guideline given by financial advisors is that you should spend no more than 30% of your gross income on rent. Assume you work 160 hours per month (~40 hours per week). What percentage of pay is being used to pay for rent in your state if you make:**
    a. Minimum wage?

    b. $15 per hour?

Level 3

A Living Wage

A. Visit [MIT Living Wage Calculator]
B. Click your state
C. Click your county

Consider each of the households living in your county.

- **Family 1:** A married couple with one child: Due to the high cost of childcare, one parent stays home to care for the child while the other works 40 hours per week making $18 per hour. They also receive a monthly stipend of $50 to cover work related expenses.
- **Family 2:** A married couple with two children who are in school. Both adults are working 40 hours per week with one making $16 per hour while the other makes minimum wage. One of these workers pays $25 per month in union dues.
- **Family 3:** A fulltime student who only has the time to work 20 hours per week making $2 more than the minimum wage. They have a gerbil as a pet.

Part 1: Equations

1. **Write an equation for the monthly wages of each family, including any bonuses or wage reduction.**

Family 1	Family 2	Family 3

Part 2: Graph

2. **Graph each equation on the same grid, using different colors to represent each family.**

Part 3: Reflect

3. **A living wage is defined as "the hourly rate that an individual in a household must earn to support his or herself and their family." Using the information provided on the MIT Living Wage Calculator, do any of the families make enough to earn a living wage?**

4. **Based on the Typical Expenses section for your county on the MIT Living Wage Calculator, how many hours does each family need to work per month to cover housing expenses. (Note that the values in Typical Expenses section are ANNUAL expenses, so you will need to divide by 12 to get MONTHLY expense**

5. **Family 1 and Family 2's lines intersect. What does that intersection represent in the context of hours worked and wages?**