

Apple Pie

Administration Instructions

Task:	Fall Benchmark Assessment	
Grade Level:	8	
Timeframe:	October (1 day)	
WCSU NNs Addressed:	NN	Target Level of Knowing
	8.1	<i>Students will be able to solve linear equations with one variable algebraically, and relate to the context they model. (Level 4)</i>
	8.3	<i>Students will be able to use functions to model relationships between quantities and move fluidly between representations. (Level 3)</i>
CCSS Addressed:	8EEB5, 8EEC7, 8FA2, 8FB4	
<u>Math Practices</u> Addressed:	MP1: Make sense of problems and persevere in solving them. MP2: Reason abstractly and quantitatively. MP3: Construct viable arguments. MP4: Model with mathematics. MP6: Attend to precision.	
Materials & Tools:	<i>Graph paper, (calculator), student sheet “Apple Pie”</i>	
Estimated Duration:	<i>5 minute intro, 25 minute task.</i>	
Teacher Directions:	<p><i>Expose students to problems with extraneous information in advance. Facilitate conversations about how you know what matters. Emphasize transferable skill: Creating thinking and problem solving (PS1) - Observe and evaluate situations in order to define problems.</i></p> <p><i>Facilitate a conversation about profit, costs and revenue.</i></p> <p><i>(Decide on use of a calculator - may with certain students?)</i></p> <ol style="list-style-type: none"> 1. Distribute papers. 2. Read through the directions as students follow along. 3. Check for understanding of directions. 4. Give students the estimated time to complete the task. 5. Remind students to show all work <u>and use words</u> in their explanations. 	

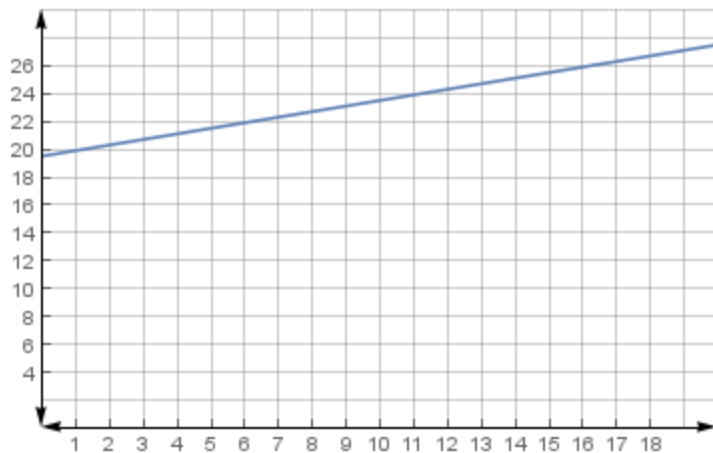
Apple Pie

	6. If a student needs scaffolding after attempting the problem, you may offer them a table or a graph (this would give them a maximum score of 3 for PI 8.3). Students may choose either a table or a graph.
Accommodations and supports:	<i>Calculator</i> <i>Provide a table and/or graph templates</i> <i>Balance scales/algebra tiles for those that need it (Level 2)</i> <i>Extra time for those students with these accommodations.</i> <i>Scribe when necessary</i>

Table Scaffold 1	
Number of Pies	Total Expenses
5	\$21.50
10	\$23.50
15	\$25.50
20	\$27.50

Table Scaffold 2	
Number of Pies	Total Expenses
0	\$19.50
1	\$19.90
2	\$20.30
3	\$20.70

Graph Scaffold



Apple Pie

Learning targets:

- I can use symbolic methods to solve equations with a variable on both sides and grouping symbols. (Level 3).
- When given a context for a linear model, I can generate a table, graph, and equation. (Level 4).
- I can observe and evaluate situations in order to define problems.

Students are baking apple pies to sell for a fundraiser.

FUNDRAISING GOAL:

- Make at least a \$75.00 profit.

EXPENSES:

- It costs \$2.00 to make 5 pies.
- You will have to spend \$19.50 on advertising for your fundraiser.

Income:

- You plan to sell the pies for \$8.75 each.

1. Make a **graph** (on a separate sheet of graph paper), **table** and **equation** to show the relationship between the number of pies (**x**) and your total expenses (**y**).

- a. **Graph:** (separate sheet)

- b. **Table:**

- c. **Equation:**

Apple Pie

2. What is the cost to you to make 1 pie? Provide supporting work.

3. Where is this reflected...

In the graph? Explain.

In the table?

In the equation?

Apple Pie

4. Decide how many pies you need to make and sell to reach your fundraising goal. Justify your answer ***symbolically using variables and expressions and show that you can solve equations algebraically.***

Extension:

A rival school is doing the same fundraiser. Their expenses are the same, but they decide to sell their pies for \$9.75. If they sell 40 pies, what is the minimum number of pies you would need to sell in order to make the same profit?

Apple Pie

Scoring Guide:

<i>8.1 Solve linear equations with one variable algebraically</i>			
Level 1	Level 2	Level 3	Level 4
<p>I can write, interpret and use variable expressions and simple equations in real-world settings (mastery of 6.6)</p> <p>I can use properties of operations and equivalence to simplify algebraic and numeric expressions. (mastery of 7.4)</p> <p>I can use properties of operations to solve linear equations involving the distributive property. (mastery of 7.5).</p>	<p>I can use concrete balance scale models to sketch and solve: Equations with a variable on both sides and grouping symbols.</p>	<p>I can use symbolic methods to solve: Equations with a variable on both sides and grouping symbols.</p>	<p>I can explain how equations relate to the context they model.</p> <p>I can apply my understanding of linear equations to formulate questions and to model and solve real life problems.</p>
Notes/Evidence:	Notes/Evidence:	Notes/Evidence:	Notes/Evidence:

Apple Pie

Scoring Guide:

<i>8.3 Use functions to model relationships between quantities and move fluidly between the four representations of a function (table, graph, equation, context)</i>			
Level 1	Level 2	Level 3	Level 4
<p>When given a table representing a linear relationship, I can find the rate of change</p> <p>When given a simple linear equation ($y=2x$), I can generate a table of coordinate pairs</p>	<p>When given a graph, I can make a table.</p> <p>When given a table, I can sketch a graph on graph paper</p>	<p>When given an equation, I can create a table and a graph</p> <p>When given a graph, I can generate an equation and table</p> <p>When given a table, I can generate an equation and graph</p>	<p>When given a context for a linear model, I can generate a table, graph, and equation</p> <p>I can create a context for a table, graph, and equation</p>
Notes/Evidence:	Notes/Evidence:	Notes/Evidence:	Notes/Evidence: