Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**The PB&J Project**

**Production and Operations**

**TASK: Operational Plan**

*As avid PB&J eaters, you and your business associates are opening your own PB&J factory. You will sell your sandwiches to cafés, gas stations, and grocery retailers. Your production facility has been constructed and you are getting ready to start hiring employees and pricing your product. Follow the steps below to begin this process.*

* 1. An integral part of assembling any mass-produced product is consistency. Therefore, your team needs to put together an operational plan for how the PB&J sandwiches will be assembled. In the space below, write your operational plan.

**Operational Plan**

* + - **Resources Needed**: Circle the resources your employee(s) will use to assemble each PB&J sandwich. In order to keep start-up production costs low, these are the only resources available to you. (You can assume all employees handling food will wear gloves)

peanut butter

grape jelly

bread

knife

spoon

plate

napkin

* + - **Who**: How many employees will be required to assemble one PB&J sandwich? Circle your response. (Packaging will take place in another department.)

1

2

3

4

* + - **How To**: List the steps your employee(s) will follow to assemble one PB&J sandwich.

**TASK: Standards**

***DO NOT proceed until you have ran your trial assembly (i.e. made your trial PB&J sandwich)!!***

*Now that we have had the chance to test your operational plan, your group will modify as necessary and make a few more decisions. As a group, answer the following questions.*

* 1. What would you change about your Operational Plan (resources needed, number of employees, and/or the steps to follow)? Why would you make these changes?
  2. **Standard**: To plan for the mass production of our PB&J sandwiches, we must set a standard for which we will measure our production by. Not only will this ensure a quality product for our customers, but it will also let our assembly team know what a perfect PB&J looks like according to our company. Describe the perfect PB&J sandwich that your team will measure all others against. (ratio of peanut butter to jelly, cut or uncut, etc.)

**TASK: Determine Raw Material Cost**

*Follow the instructions below to find the Raw Material Cost for each PB&J sandwich.*

* 1. A loaf of Wonder bread is $2. Assuming each loaf has 20 slices of bread, how much does the **bread cost** per sandwich? (Hint: The cost of one slice of bread is $2 ÷ 20.)

**Bread**: $\_\_\_\_\_\_\_\_\_

* 1. Jiffy peanut butter is $3 for an 18 ounce jar. Each sandwich requires 2 ounces of peanut butter. Find the **cost of peanut butter** per sandwich. Round your answer to the penny.

**Peanut Butter**: $\_\_\_\_\_\_\_\_\_

* 1. Smucker’s grape jelly costs $2 per 18 ounce jar. If each sandwich has 2 ounces of jelly, what is the **cost of jelly** per sandwich? Round your answer to the penny.

**Jelly**: $\_\_\_\_\_\_\_\_\_

* 1. Now let’s find the **Raw Material Cost** **per PB&J** by adding the costs of each raw material above.

**Raw Material Cost**: $\_\_\_\_\_\_\_\_\_

**TASK: Calculate Labor Cost**

*Your team must also calculate the labor cost in making each PB&J sandwich. Follow the instructions below.*

* 1. It takes 1 ½ minutes to assemble each PB&J sandwich. Since employees are paid on an hourly basis, we need to convert this time into hours. How many **hours** does it take to make one PB&J sandwich? Record your answer out to the thousandths place (3 digits after the decimal). (Hint: How many minutes in an hour?)

**Hours**: \_\_\_\_\_\_\_\_\_ hr.

* 1. Now find your labor cost per sandwich. Sandwich makers earn $10/hour. Calculate the **labor** cost by multiplying the number of hours it takes to make one sandwich by a sandwich maker’s hourly wage.

**Labor**: $\_\_\_\_\_\_\_\_\_

**TASK: Determine Selling Price**

*In order to find the Selling Price of each PB&J sandwich, we must also calculate the Production Cost, Operating Expenses, and Break-Even Price of each sandwich.*

* 1. Find the **Production Cost** of each sandwich by adding the Raw Material Cost and Labor Cost per PB&J.

**Production Cost**: $\_\_\_\_\_\_\_\_\_

* 1. There are other **Operating Expenses** that go into the cost of each sandwich (building expenses, equipment use, etc.) We will estimate these additional expenses. Let’s assume the Operating Expenses are equivalent to 50% of the Production Cost per sandwich. Round to the nearest penny.

**Operating Expenses**: $\_\_\_\_\_\_\_\_\_

* 1. The **Break-Even Price** is the price at which we would not lose or make money on the sale of a sandwich. This is found by adding the Production Cost and Operating Expenses.

**Break-Even Price**: $\_\_\_\_\_\_\_\_\_

* 1. Finally, the **Selling Price** is the price you want to charge your customers. It must be more than the Break-Even Price in order to be profitable. What would you sell your sandwiches for?

**Selling Price**: $\_\_\_\_\_\_\_\_\_

* + - Why did you choose this price?

**TASK: Summary**

*Summarize our PB&J activity.*

* 1. What did you learn about production and operations through this activity?

**EXTRA CREDIT!**

*Our PB&J factory opens for production on April 2nd. Based on the orders coming in so far, we need to plan for the production of 4,000 PB&J sandwiches on our first day.*

* How many units (a unit is 1 loaf of bread or 1 jar of peanut butter/jelly) of each raw material must we order for delivery by April 1st?
* How much will this order of raw materials cost in total?
* What is the total cost of your first day of production? (Include the cost of raw materials, labor costs, and operating expenses.)