

Video: <https://youtu.be/fwIujHq-Jac>

**Video Summary:**

Manufacturers need to make sure that orders get placed but that they don’t make too much extra so that they have to store it in their warehouse. As they make a changeover from one product to another, they need to determine how much they still need to make. Companies also want to make sure that their manufacturing machines are running smoothly, so they need to keep track of how much scrap product is made.

**Common Core Mathematical Content Standards:**

**4.NBT.4:** Fluently add and subtract multi-digit whole numbers using the standard algorithm.

**6.RP.3c:** Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving find the whole, given a part and the percent.

**7.RP.3:** Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, percent increase and decrease, percent error.*

**Common Core Mathematical Practice Standards:**

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.

3. Model with mathematics.

**Teacher note:** *Please preview the entire video and pre-work solutions in order to anticipate students’ needs, misconceptions and materials unique to your classroom.*

The student work page at the end of the lesson will give students a place to jot down ideas and work through answers as they are following along with the video.

**Rockline Industries- Biography:**

Rockline Industries is one of the largest producers of consumer products, specializing in wet wipes and coffee filters.  Our passion is delivering customer solutions based on innovation, service, and best value.   We are a family owned company since 1976, and have grown from 35 people to an organization of over 2,500 Associates developing, making, and shipping our products around the world.   These products include disposable paper products like coffee filters, disposable wipes, and baking cups.

One thing that hasn’t changed throughout our history is our desire to be the best in the world.   Our values are best expressed in our desire to do business **RRITE**.  To us this means we must:

**Renew** - As a family owned business with no stock price or dividend pressures, we invest all earnings back into the business. This is both in process and in our people to drive growth and continuous improvement.  We recruit top talent in all areas, and provide the best technology available.

**Respect** - We foster a culture of respect in all of our relationships. This includes our Associates, customers, suppliers, the environment, and the communities in which we operate. Our Operating Principles support high performance and guide our decision making. We treat others as we want to be treated.

**Integrity**- Nothing is more important than Rockline’s reputation. We strive to “Do the right thing” - always.

**Teamwork** – Our Associates work together in cross functional teams to meet customer needs and expectations, as well as internal goals and objectives. Individual goals are secondary to team goals.

**Excellence** - Achieving best in the world status starts with our Associates. We strive to be “Best in class” in all we do.

Rockline’s most valued assets are our Associates and the knowledge and experience they possess. From our President and CEO, Randy Rudolph - ***“ At Rockline, we are about our people – good people. Quality  people.  People you can depend on who take pride in their work. These people are what we call the Rockline Advantage .”***

**Pre-Activity Discussion**

Question to ask students: As companies use production lines and change products after each order, how can employees make sure that they have enough materials on the floor so that they don’t run out for the order? What can happen when a product is running on the production line and something happens that it doesn’t turn out correctly? How often do you think this can happen?

Discussion: As companies switch products on their production lines, employees need to make sure they have enough materials to complete the order. They often need to calculate how much they will need before they run out of materials on the floor. They also have to calculate for “scrap” in case there are products that had mistakes.

**Part 1**

* Play Video (0:00-1:04), pause at (1:05) to answer the discussion questions.
* The employees are discussing the change-over of product and one of the employees has never done it before, so they are working together to make sure he has everything he needs to finish out the order. Since the order called for 10,000 completed units, and 2500 are completed already, they still need to make 7,500 units. Since there are some pieces on the floor (or in the cell), how many do they still need?
* Have students work through this problem. Discuss methods and answers as necessary.
* Answers:

7500 finished products needed

7500 – 3500 canisters = 4000 canisters

7500 – 2000 closures = 5500 closures

7500 – 4200 labels = 3300 labels

**Part 2**

* Play Video (1:05 – 1:46), pause at (1:46) to answer the discussion questions.
* Now the employees want to calculate how much extra they might need in case of scrap product and then they need to use that to calculate exactly how much of each component they will need from the warehouse.
* Have students work through this problem. Discuss methods and answers as necessary.
* Answers:

7500 x 0.02 = 150 canisters for scrap

7500 x 0.03 = 225 closures for scrap

7500 x 0.05 = 375 labels for scrap

4000 canisters + 150 canisters = 4150 canisters total

5500 closures + 225 closures = 5725 closures total

3300 labels + 375 labels = 3675 labels total

**Part 3**

* Play Video (1:46 – 2:43), pause at (2:43) to answer the discussion questions.
* Obviously, the employees cannot ask for individual components, so they need to calculate how many pallets or boxes of each piece they will need. There are 1000 canisters per pallet, 500 closures per box, and 3000 labels per box.
* Answers:

4150 canisters ÷ 1000 canisters per pallet = 4.15 pallets of canisters

5725 closures ÷ 500 closures per box = 11.45 boxes of closures

3675 labels ÷ 3000 labels per box = 1.225 boxes of labels

**Part 4**

* Play Video (2:43 – 4:14), pause at (4:15) to answer the discussion questions.
* Companies must monitor how much scrap is being made during production to make sure that they can keep customer prices down. The employees must calculate how much scrap was made from the production line.
* Answers:

Percent scrap = (Labels used – Labels on finished product)

Labels used

Percent scrap = (8250 – 7500)

8250

Percent scrap = 750 = 0.091 or 9.1% scrap

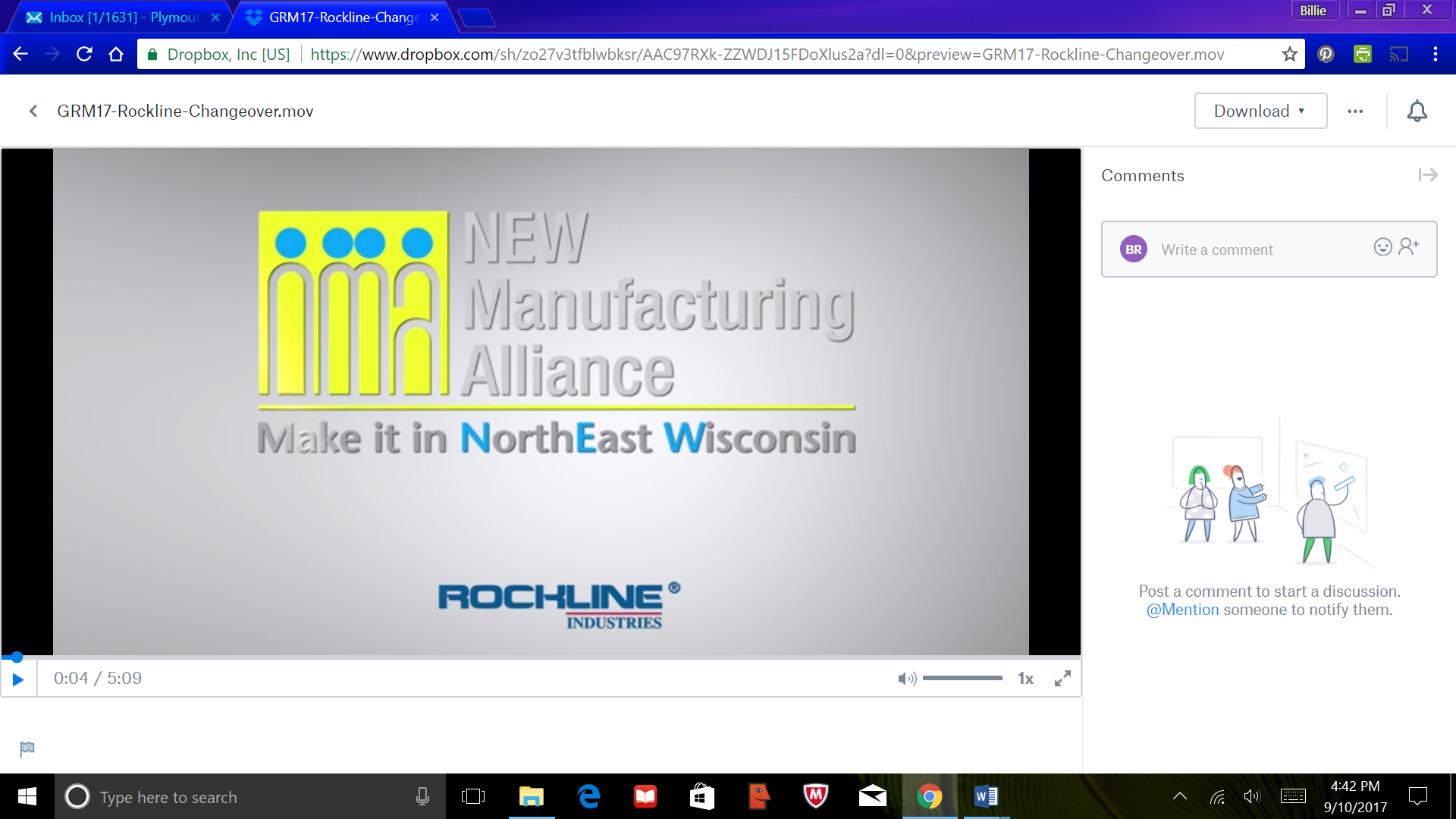
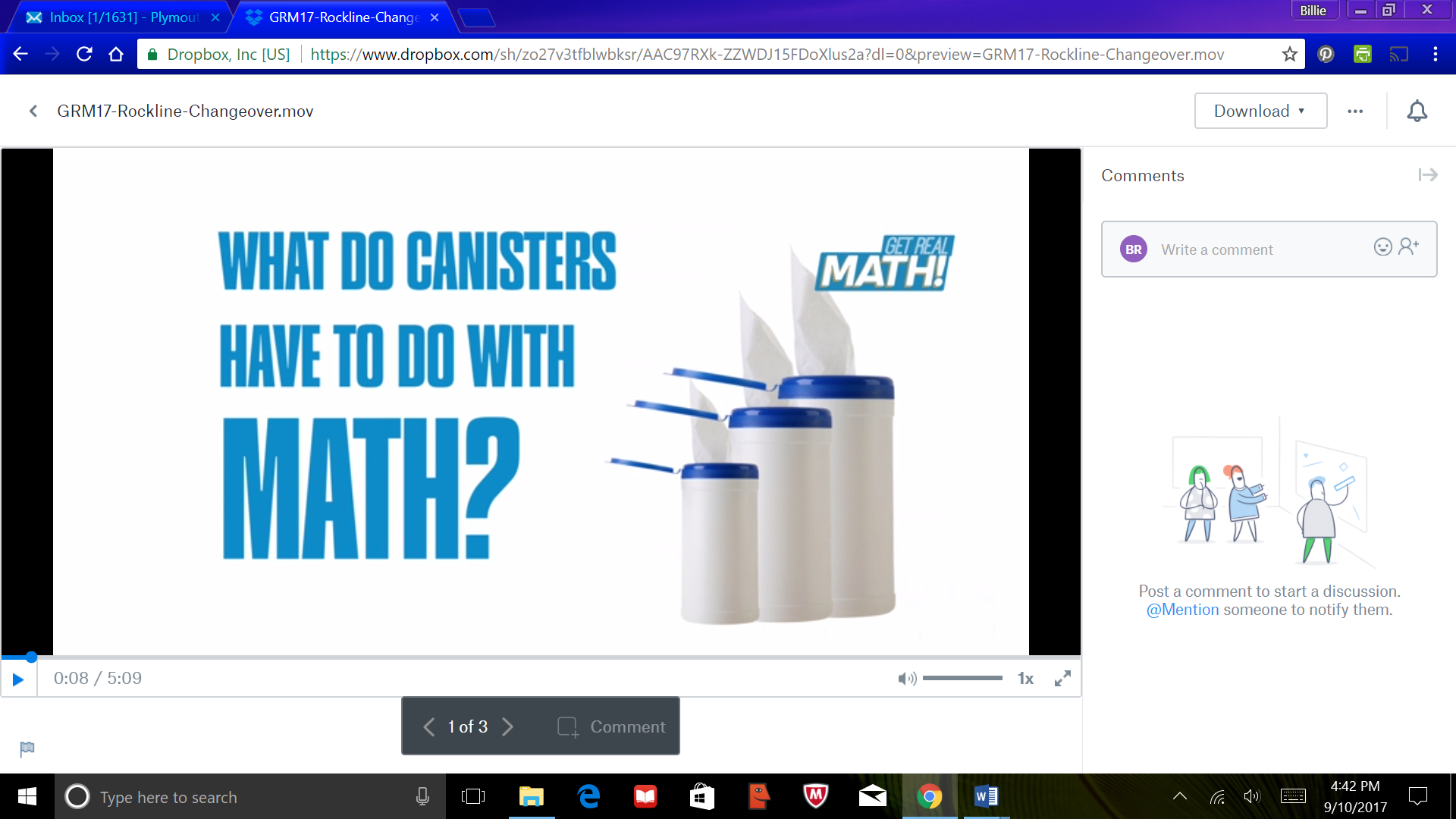
8250

**Part 5**

Play Video (4:15 – 5:09).

* Why might the company need to make sure that they don’t have more than 5% scrap on the labels?

Student Work Page



Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Part 1**

How much of each component do they still need to complete the order?

**Part 2**

How much scrap is needed for each component?

How many of each component should be brought out from the warehouse to complete the order?

**Part 3**

How many boxes or pallets of each component will need to be brought from the warehouse?

**Part 4**

What is the percentage of scrap that was made during production?