What does a Securement Device have to do with math?

**Video:** <https://youtu.be/iXdbrAVly0o>

**Video Summary:**

When manufacturing a company’s products, they take raw material and process that material into their product. This process results in scrap material of the raw material. Companies work to limit the amount of this scrap material to maximize their profit. This video highlights how companies calculate the amount of scrap material that occurs during production as well as converting that amount into a percent.

**About TIDI Products-**

TIDI® Products has a history of providing forward-looking solutions to healthcare professionals—solutions that help reduce the risk of contamination and deliver the highest-quality patient care. Each day, caregivers turn to TIDI Products for a supply of user-friendly, compliance-enhancing, and risk-reducing solutions. The TIDI Products portfolio of brands includes TIDIShield®, C-Armor®, Grip-Lok®, Sterile-Z®, Posey® and Zero-Gravity®. To learn more about our company, our history, and our products, please visit www.TIDIProducts.com.

**Common Core Mathematical Content Standards:**

**5.NBT.A.4:** Use place value understanding to round decimals to any place.

**5.NBT.B.5**: Fluently multiply multi-digit whole numbers using the standard algorithm.

**6.RP.A.3C:** Find a percent of a quantity as a rate per 100; solve problems involving finding the whole, given a part and the percent.

**7.RP.A3:** Use proportional relationships to solve multistep ratio and percent problems.

**Common Core Mathematical Practice Standards:**

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.

**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.

**Pre-Activity Discussion**

Question to ask students: When constructing something what is meant by ‘scrap’? What is a percent? How do you calculate a percent? If a recipe is written as a percent, what would the total percent of the entire recipe be?

**Part 1**

* Play Video (0:00-0:56), pause at (0:56) to answer the discussion questions.
* The employees are trying to determine how to decrease the amount of scrap for Machine 2 when producing securement devices, have students brainstorm how a manufacturer could possibly decrease scrap when making securement devices?

**Possible Answers:**

**recycle scrap**

**tune up machine 2 to make sure it is working properly**

**replace machine 2 if it is continuing to create excess scrap**

* Given the results from the days production can you help Pete and Brad determine if they have met the goal of under 5% to earn a pizza party? (See Student worksheet)
	+ 81 cases of good product were made in the production run
	+ There are 100 pieces in each of those cases
	+ If there are 2 pieces made per cycle
	+ They did 4216 cycles in the production run
	+ How many pieces did not meet the standard and are considered scrap?
* What is the number of good pieces made in the production run?:

**81 cases of good product x 100 pieces per case = 8100 good pieces of product total**

* How many total pieces did they produce (good and scrap)?

 **2 pieces per cycle x 4216 cycles = 8432 total pieces produced**

* How many pieces of scrap did they have in the production run?

 **8432 total pieces produced – 8100 good pieces produced = 332 pieces of scrap produced**

* What is the scrap percentage?

 **332 pieces of scrap ÷ 8432 Total pieces produced = .039**

* How do we represent that as a percent?

 **Multiply the decimal .039 x 100 = 3.9%**

* Did Pete and Brad get their Pizza party?

**Pete and Brad determined that they were able to decrease their scrap product to under 5% so they will get their pizza party!**

Student Work Page

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

1. The employees are trying to determine how to decrease the amount of scrap for Machine 2 when producing securement devices, have students brainstorm how a manufacturer could possibly decrease scrap when making securement devices?
2. Given the results from the days production can you help Pete and Brad determine if they have met the goal of under 5% to earn a pizza party?

o 81 cases of good product were made in the production run

o There are 100 pieces in each of those cases

o If there are 2 pieces made per cycle

o They did 4216 cycles in the production run

1. What is the number of good pieces made in the production run?
2. How many total pieces did they produce (good and scrap)?
3. How many pieces of scrap did they have in the production run?
4. What is the scrap percentage?
5. How do we represent that as a percent?
6. Did Pete and Brad get their Pizza party?