

**Video:** [**https://www.youtube.com/watch?v=twlsKX-zQak&feature=youtu.be**](https://www.youtube.com/watch?v=twlsKX-zQak&feature=youtu.be)

**Video Summary:**

How do companies use conveyor belts to help transfer products around their buildings? How could they use these conveyors to allow products to cool or dry? In this video, you will see how conveyors can be used in small spaces and you will be able to use knowledge of circumference of circles to find the length of chain needed to create a Spirex conveyor.

**Nercon Eng. & Mfg., Inc. - Biography**

**Nercon Eng. & Mfg., Inc.**has been engineering and manufacturing conveyor and consumer goods packaging equipment for over 38 years.  We are known for our expertise in design.  Our growing business currently employs about 150 people.  With the Nercon Corporate and Engineering office located in Neenah, Wisconsin and the production facility in Oconto, Wisconsin, our local family-owned business has been an active part of both the Fox Valley and Oconto area communities.

**Common Core Mathematical Content Standards:**

**7.G.4:** Know the formulas for the area and circumference of a circle and use them to solve problems.

**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.

**Pre-Activity Discussion**

Question to ask students: What is a conveyor? Where have you ever seen them used? How do companies allow their products to dry or cool before packaging them for stores?

Discussion: The conveyors in this video are for industry and look much different than the conveyor belts in grocery stores. The conveyor belts are referred to as “chain”. The company can use links of the chain to create conveyors of many different lengths and shapes.

**Part 1**

* Play Video (0:00-0:42), pause at (0:43) to answer the discussion questions.
* The Spirex conveyor has many rotations. What might be the information needed to determine how long the conveyor belt should be?
* Have students discuss necessary information that they might need.
* Answers: Information needed might include: how many turns/circles are on the conveyor, the diameter/radius of the conveyor, the height of the conveyor

**Part 2**

* Play Video (0:43 – 1:16), pause at (1:17) to answer the discussion questions.
* The Spirex shown in the diagram has 5.5 turns, is 144 inches tall, and has a radius of 24 inches.
  + Ask students if the radius of 24 inches will fit into a space that is 6 feet wide.
  + Students may not understand the idea of the “belt return”, which is the part of the conveyor that connects the beginning to the end to create a continuous loop.
* Have students work through this problem. Discuss methods and answers as necessary.
* Answers:

*C* =

*C* = (5.5 turns)

*C* =

*C* = 829.38 + height of Spirex + length of belt return

829.38” + 144” = 973.38”

When we add 973.38” to the additional length of the infeed and discharge, which is another 144”, the total length of the chain/conveyor is 1,117.38”.

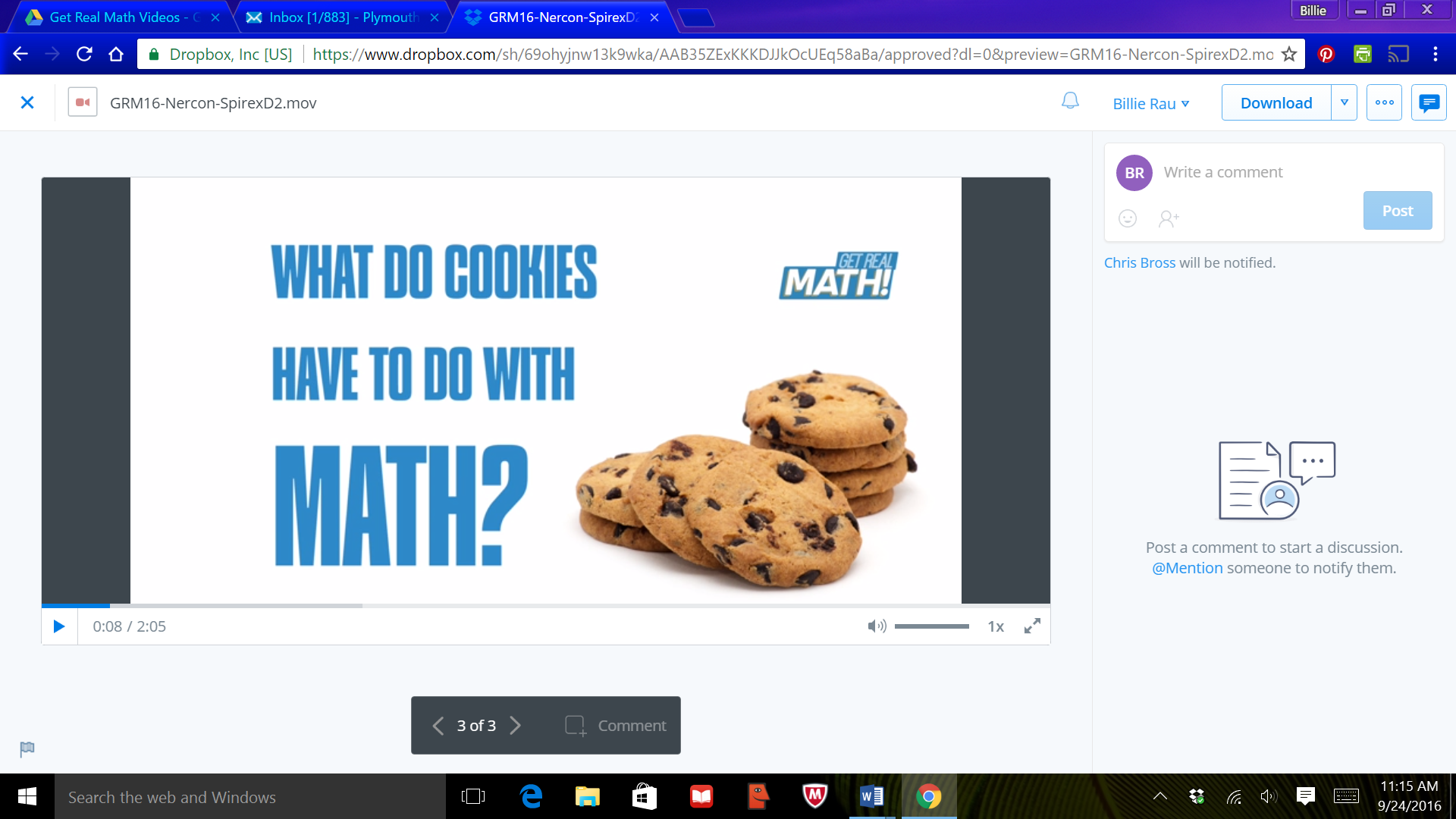
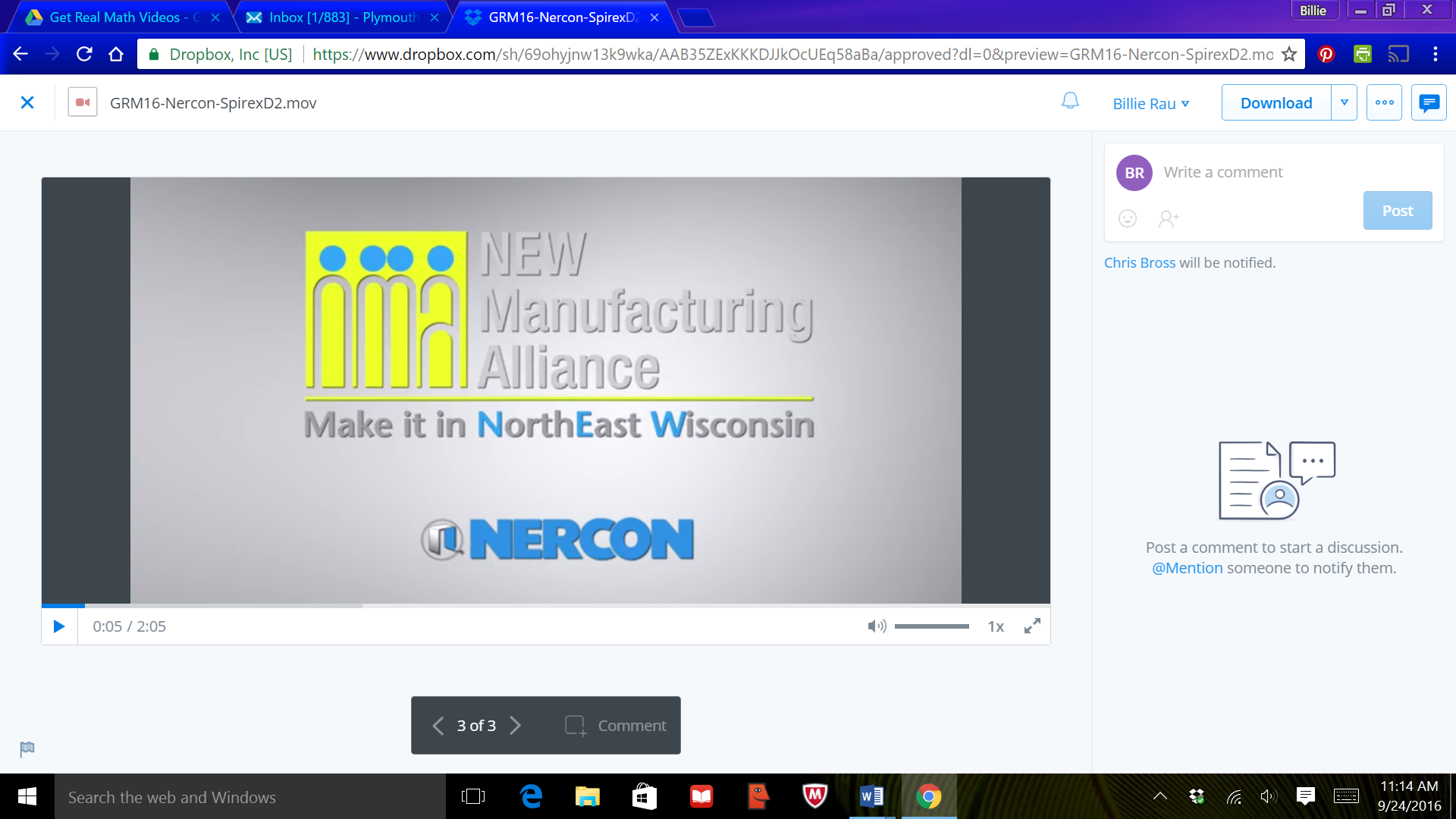
**Part 3**

* Play Video (1:17 – 2:05).
* Extension: Why does she say that she will order 94 feet of belt?
* Answer:

1117.38 inches of belt needed ÷ 12 inches per foot = 93.115 feet of belt

The company would need to round up to 94 feet of belt.

Student Work Page



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

What is a conveyor? How are they used?

**Part 1**

What types of information might be needed to order materials for the conveyor belt?

**Part 2**

What is the total length of the chain/conveyor belt that would be needed for the Spirex?

**Extension**

Why does she say that she will order 94 feet of belt?