Be a Surveyor's Helper

From 1763 to 1767, surveyors Charles Mason and Jeremiah Dixon marked the line that separated the colonies of Maryland and Pennsylvania, including what is now Delaware. To do this, Mason and Dixon needed specialized instruments like compasses and surveyor's chains, like this one on display at the Seaford Museum.

All surveyor's chains were the same length – 22 yards.

How long is a surveyor's chain in feet? _____

Until about 100 years ago, a "chain" was a common term for expressing distance; much like we use the term "yards" today.

What are three (or whatever number you prefer) other units of length or distance?

1. _____

2. _____

3. _____

There are 1,760 yards in one mile. Use another piece of paper to figure out how many *chains* are in a mile.

There are _____ chains in 1 mile.

**Intermediate
Lesson 1.3**

In the previous question, did you multiply or divide?

I _____ because _____

_____

_____

Mason and Dixon marked the border between Maryland and Pennsylvania with stones that looked like this one not far from Seaford.

They were placed every 5 miles. Using another piece of paper, figure out how many *chains* were between each marker.

There were _____ *chains* between each marker.

Did you multiply or divide?

I _____ because _____

_____

_____

The Mason-Dixon line is about 315 miles long. With a marker every five miles, how many stone markers were used?

The Mason-Dixon Line has _____ stone markers.

Project: Make and Use a Survey *String*

Materials: A piece of string between 1 and 2 feet long
Two pencils (pens or crayons will do)
Masking or painter's tape
A clear path on the floor of about 10 feet in length.
Optional: a helper

Getting Started: Tie each end of the string to a pencil
Choose a starting point at one end of the path on your floor.
Put a piece of masking tape on that starting point
Use one of your pencils to draw a dot on the tape.

Survey the Line: Put one pencil on the dot.
Keeping the first pencil on the dot, stretch the sting tight and set the
other pencil on the floor going in the direction of your path.

We will call this length "1 STRING"

DO NOT MOVE THE SECOND PENCIL
Swing the first pencil around so that it's now opposite where it started
This is where you might need a helper.

You have now measured 2 STRINGS

Keep going until you have measured 5 STRINGS from the start
Place a piece of tape under the pencil and make a dot.

Check Your Work: Begin again at the point you just marked
Measure 5 STRINGS going back to where you started.

Did you end up EXACTLY where you started? _____

If you did not end up at exactly the same spot, why do you think that is?

If you did end up at exactly the same spot, why do you think some people might not?

_____

_____

How would this difference become a problem for surveyors using chains 250 years ago?

_____

_____

What tools do surveyors have today that Mason and Dixon didn't have in 1763?

_____

_____

There are some old measuring units that are still used today. Match the unit on the left with what it measures on the right.

Hand   **Amount of Firewood**

Square   **Height of a Horse**

Cord   **Size of a Roof**

Other Ideas for using your Survey String

Use your Survey String to measure the lengths of objects in your house

Use what you know about fractions to ESTIMATE extra lengths to the nearest

1/4 STRING,   1/2 STRING, and 3/4 STRING

What I measured: Length:

_____   _____ STRINGS

_____   _____ STRINGS

_____   _____ STRINGS

_____   _____ STRINGS

_____   _____ STRINGS

Make a much bigger Survey String (4' or more) and measure distance outside.

What I measured: Length:

_____   _____ STRINGS

_____   _____ STRINGS

_____   _____ STRINGS

_____   _____ STRINGS

_____   _____ STRINGS

Answers:

A surveyor's chain is 66 feet long.

There are 80 chains in 1 mile.

There were 400 chains between each marker.

The Mason-Dixon Line has 63 stone markers.

Hands measure the height of a horse at the shoulder.

    1 Hand = 4 inches

    A horse might be 15 hands, which is 60 inches, which is 5 feet tall at the shoulder.

    This unit of measurement dates to the Egyptians!

Squares measure the area of roofs.

    1 Square is 10 feet long and 10 feet wide, or

    1 Square = 100 square feet

Cords measure firewood.

    1 Cord is 4 feet tall, 4 feet deep, and 8 feet long, or

    1 Cord = 128 cubic feet