Math Trades 1

Fraction Video

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

INSTRUCTOR KEY\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



**Video Link**:

<https://youtu.be/n-aFi7kbg-M>

**Summary**: When the strength of a weld is inspected, the measurements of discontinuities need to be added. In this video, you will look at the criteria for passing a weld inspection test and combine fractional inch measurements to determine if the specimen being tested would pass.

**NWTC Information:** Northeast Wisconsin Technical College is a nationally-ranked, two-year public college where students prepare for high-tech careers and begin their bachelor’s degrees. NWTC is one of 16 colleges in the Wisconsin Technical College System. The College has three campuses in Green Bay, Marinette, and Sturgeon Bay; five regional learning centers in Crivitz, Luxemburg, Niagara, Oconto Falls, and Shawano; and several additional sites.

**Part 1 (0:00-0:57)**

* Play video (0:00-0:21), pause at (0:22) to answer the discussion questions
* What do you think some of the technical terms used so far mean – “vertical”, “bend”?
	+ Vertical: This is referring that Austin was welding something vertically, up and down.
	+ Bend: A weld is looked at closer by bending the material and inspecting what happens when the part is bent.
* Play video (0:23-0:52), pause at prompt (0:53-0:57) at “Break 1” for class discussion
* What does it mean to take two specimens – the face and the root and bend them 180°?
	+ First the piece will be cut along the lines drawn.
	+ Bending the face section will mean bending it down so that the wider part of the weld is on the outside, at the top of the bent part.
	+ Bending the root sections will mean bending it up so that the wider part of the weld is on the inside and the narrow part of the weld is on the top of the bent part.
	+ To see an image of this go to : [http://www.arcraftplasma.com/welding/weldingdata/physical.htm and see Figure 13-2](http://www.arcraftplasma.com/welding/weldingdata/physical.htm%20and%20see%20Figure%2013-2).
* When and why do you think weld specimens are tested?
	+ To become certified and to get hired at certain jobs, welders need to pass weld inspection tests.
	+ Weld test specimens prove a welders ability to perform a weld.  Test specimens tested during a welding procedure qualification prove a welding procedure works and the weld made will function as engineering has designed.
	+ If time allows, go to <http://www.aws.org/certification> to look at the American Welding Societies page on certification and various endorsements that can be added to certifications and <http://dsps.wi.gov/sb/docs/sb-boilerstrucweldbroch10823.pdf> to look at the State of Wisconsin requirements about being a qualified welder.

**Part 2 (0:58-1:58)**

* Play video (0:58-1:53), pause at prompt (1:54-1:58) at “Break 2” to answer the discussion questions
* What are discontinuities?
	+ For images of examples of discontinuities: <http://www.arcweld.co.nz/Data/Default/Documents/Literature/WC514%20Weld%20Discontinuities.pdf>
	+ A discontinuity is an interruption of the typical structure of a material, such as a lack of homogeneity in its mechanical, metallurgical, or physical characteristics. A discontinuity is not necessarily a defect.
* Describe in your own words what the criteria of this test are?
	+ Basically, a discontinuity can’t be over 1/8”. If there are none over 1/8”, add up the smaller discontinuities that are over 1/32” and what these add up to needs to be less than or equal to 3/8”.
* Give an example of a set of discontinuities that would pass the test. Give an example of a set of discontinuities that would not pass.
	+ - Answers Vary

Pass: $\frac{1}{8}+\frac{1}{8}=\frac{2}{8}=\frac{1}{4}"$

Does Not Pass: $\frac{1}{4}$” does not pass due to being over $\frac{1}{8}$”

OR $\frac{1}{8}+\frac{1}{8}+\frac{1}{8}+\frac{1}{8}=\frac{4}{8}=\frac{1}{2}$ does not pass due to exceeding a total of $\frac{3}{8}$”

**Part 3 (1:59-2:34)**

* Play video (1:59-2:29), pause at prompt (2:30-2:34) at “Break 3” for class discussion
* Based on the lengths of the discontinuities John had measured in Austin’s specimen being $\frac{1}{32}, \frac{3}{64}, \frac{3}{32}", and \frac{1}{16}"$, what are the total discontinuities that count?
	+ $\frac{3}{64}+\frac{3}{32}+\frac{1}{16}=\frac{3}{64}+\frac{6}{64}+\frac{4}{64}=\frac{13}{64}"$
* Does Austin’s weld pass the test?
	+ - Yes, $\frac{3}{8}=\frac{24}{64}$, which is less than $\frac{13}{64}"$

**Part 4 (2:35-4:04)**

* Play video (2:35-4:04) and verify that you got the same total of the discontinuities and compared correctly to determine that Austin does pass the weld inspection test.