Measurement

Overview

This lesson will help to prepare student to read a ruler. It is designed so that they not only know how to read the ruler but also become faster and more accurate with the measurements they take.

Enduring Results

Students will develop an understanding of the attributes of design (Standard 8)

Students will develop an understanding of engineering design (Standard 9)

Students will develop abilities to apply the design process (Standard 11)

Objectives

1. To read a ruler within $1/16^{th}$ of an inch

2. Have the ability to read a ruler faster and more accurately

3. Follow instruction to create a simple layout

Teacher Preparation

You will simply need to know how to use and read a ruler. Bringing in different types of rulers (i.e. ones that read from the end or measures with different increments) can be helpful.

Content Outline

A. Increments on a ruler
    1. 1"
    2. ½"
    3. ¼"
    4. 1/8"
    5. 1/16"

B. Laying out lines
    1. Distances away from lines on a ruler
    2. Line lengths from written instructions

C. Accuracy and speed
    1. Reading a ruler more quickly using the provided marks
    2. Making sure to read the correct lines while measuring

Activities/Case Studies

Reading a Ruler

Time: Two class periods

Day One:

On the first day of instruction I start extremely basic. The method that go about this almost seems elementary, but every time I do this lesson I realize how many students really struggle with reading a ruler and actually get something out this simple lesson.

The first thing I do is explain how a ruler is laid out. To do this I actually divide the chalk board or marker board into 1/16ths. This gives the students a giant visual of what is meant by a $1/16^{th}$. From here I divide it further into 1/8ths, and then into 1/4ths, and then finally into 1/2ths. I think this just makes it easier for the student to visualize, rather than pointing to an actual ruler and all those extremely small marks.

From here I go through the process of explaining what each mark represents. At this point I also point out the basic math that is involved, which is basic fraction reduction. I make it a point that people refer to $8/16^{th}$ as ½ and so on down the line.

After I believe that I have gotten across the basic layout of the ruler, I then pass out a work sheet that has a measurement activity on it. The worksheet is included in this packet. The students then go through and make the measurements that the worksheet asks for, what this does is give the students a chance to test their skills along with an opportunity to ask questions and really get familiarized with the ruler.

Day Two:

This day is more a fun learning experience day. I first recap what was gone over the day before. After this I hand out a work sheet that again tests and reinforces the students skills in measurement. This worksheet ends up being kind of fun for the students because through their correct measurements, they end up making a drawing. The worksheet is included in this packet.

To finish off the lesson the students play a measurement game on the computer. This game becomes a competition between the students and ends up reinforcing their measurement skills. The game on the computer can be found at the following website: www.rickyspears.com/rulergame

Again, this lesson may seem elementary, but, like I said before, I am shocked at the number of students who struggle to read a ruler, even seniors in high school. Every student can benefit from this activity. Measurement is a basic skill that everyone should be able to demonstrate.

Assessment

Complete the Ruler Measurement work sheet
Complete the Measurement Picture
Students will compete for the highest score in the ruler reading game

Resources

Nice illustration of ruler increments - http://www.onlineconversion.com/faq_05.htm

Ruler Game - www.rickyspears.com/**ruler**game

About the Author

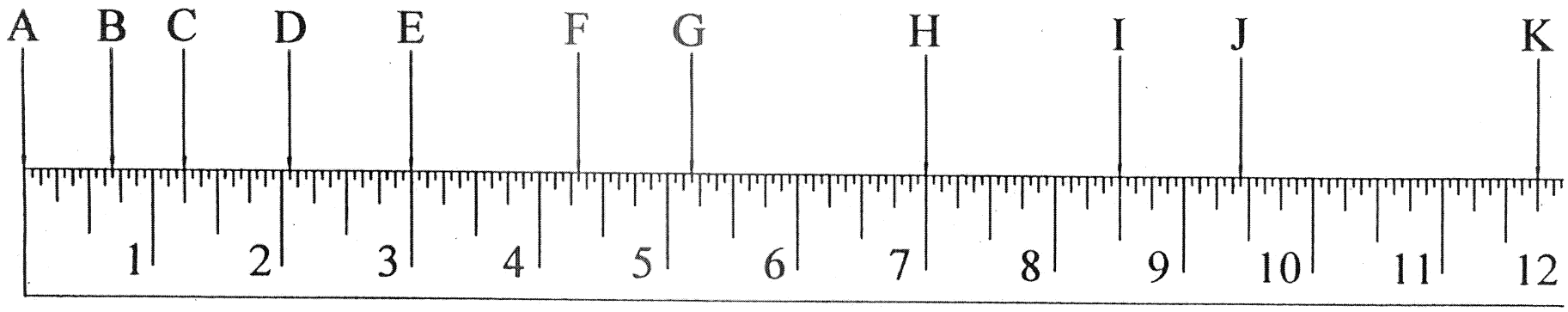
This is my second year teaching at East De Pere high school. I love the job and am having a great time teaching. I have been fortunate enough to be in a great district which has supported our program and have been able to get a lot of new equipment for our labs and start a PLTW program. Our student numbers have now tripled from my first year and we have hired a new teacher and will be looking for another one soon.

Alex Hammel
Technology Education

Name _____

Period _____

Ruler Measurement



A to B _____

A to C _____

A to D _____

A to E _____

A to F _____

A to G _____

A to H _____

A to I _____

A to J _____

A to K _____

F to G _____

E to F _____

E to K _____

H to I _____

H to J _____

H to K _____

READING A RULER NAME _____

Date ___/___/___ Period _____ St. # _____

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MEASURE PICTURE #1 INCH, HALF, QUARTER of an INCH

BE SURE TO CHECK EACH INSTRUCTION WHEN YOU COMPLETE IT.

- ☐ 1. Place your ruler on Line AB. Measure 2-1/4" across from Point A. Make a dot to mark this point. Call it Point E.
- ☐ 2. Place your ruler on Line BD. Measure down 3-3/4" from Point B. Make a dot to mark this point. Call it Point F.
- ☐ 3. On Line BD, measure down 5-1/4" from Point B. Make a dot to make this point. Call it Point G.
- ☐ 4. On LINE BD, measure down 6" from Point B. Make this Point H.
- ☐ 5. Point I is on LINE AC, 6-3/4" from Point A.
- ☐ 6. Point J is on Line AC, 4-3/4" from Point A.
- ☐ 7. Point K is on Line AC, 3-1/4" from Point A.
- ☐ 8. Draw a line to connect Point J with Point G.
- ☐ 9. Draw a line to connect Point I with Point H.
- ☐ 10. Draw a line to connect Point E with Point F.
- ☐ 11. Draw a line to connect Point E with Point K.
- ☐ 12. Point L is on Line J G, 2-1/4" from Point J.
- ☐ 13. Connect Point E with Point L.
- ☐ 14. Point M is on Line E L, 4" from Point E.
- ☐ 15. Connect Point M with Point F.
- ☐ 16. Point N is on Line E L, 4-1/2" from Point E.
- ☐ 17. Connect Point K with Point N.
- ☐ 18. Point O is on Line I H, 1-1/2" from Point I.
- ☐ 19. Connect Point O and J.
- ☐ 20. Point P is on Line I H, 5" from Point I.
- ☐ 21. Connect Points P and G.

What does your picture show? _____

END

A B C D