INTRODUCTION TO THE METRIC SYSTEM

An introductory instructional Metric System Unit Guide
For grades 9 – 12

Based on Principles of Universal Design and Differentiated Instruction

Designed by

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Authors’ Note

This unit is designed for the entry-level science student to give them a basic understanding of the metric system and its applications. Why should you use the metric system?

We are living in a metric world where just about every country, except the USA, uses the metric system, and other countries are now telling us that they don't want to buy some of the products manufactured by U.S. companies if they aren't made to metric sizes (and if they aren't labeled in metric units). Many European Union (EU) countries, which have been good customers of U.S. companies, don't allow products into their countries unless they are made to metric system standards. We must operate in the world marketplace, and we can't stay competitive if we don't provide metric goods. With 99% of the rest of the world using metric, there is no chance we can persuade them to use our inches and pounds.

We designed our metric system unit due to the lack of understanding of the system and for its uses. Our unit will take approximately 1½ weeks. Our goal is for you to gain a basic understanding of the metric system and its uses.

Kathy Kelly is the School Social Worker. She has single handedly turned the lives around of hundreds of students.

Sue Schoenherr, the Special Education Department Head and lead Instructor, has been instrumental in insuring that PTHS has more than excellent services for our students.

Paul Ritter, General Science and Ecology Teacher who possesses the teaching skills to reach the most learning challenged students and actually have the students enjoy learning.

The authors have a combined teaching experience of over **50 years**. Holy Cats!
Standards

The Illinois State Standards that will be met are as follows:

11.A.1c Collect data for investigations using measuring instruments and technologies.
11.A.2b Collect data for investigations using scientific process skills including observing, estimating and measuring.
11.A.3c Collect and record data accurately using consistent measuring and recording techniques and media.

Resources for locating state standards:

Illinois State Learning Standards
http://www.isbe.net/ils/science/scg11.html

Developing Educational Standards
http://www.edStandards.org/Standards.html

MCREL
http://www.mcrel.org/standards/
Planning Pyramid

All Students will know
1. The metric units and abbreviations from kilo to milli.
2. The basic base units of length, mass, time, and temperature.
3. Accurately measure with a metric ruler and standard ruler.
4. Make simple measurements, record them, and then write their equivalents.

Most Students will know
1. How to convert from one unit to another in the metric system.
2. Match the most appropriate unit of measure with designated items.
3. Utilize the concept of area, distinguished the dimensions of width and depth.
4. Convert Celsius degrees to Fahrenheit degrees.

Some Students will know
1. How to convert from length to volume to mass.
2. Learn various methods of determining area.
3. Make a scaled drawing.
4. Explain the difference between mass and weight.
Teacher Library
Supplementary materials that we feel would be useful for all learners.

Familiar-item examples in the metric system
http://lamar.colostate.edu/~hillger/frame.htm
Examples of everyday item equivalences for metric units of length, mass, volume, and temperature.

Metric conversion worksheets
Conversion calculator
http://worldwidemetric.com/metcal.htm
LearningNeeds.com
http://www.learningneeds.com

A new interactive search wizard for locating appropriate educational products for students with special educational needs. Users can define their search using six parameters (grade, subject, etc.).

Resources for locating instructional materials:

Google
http://www.google.com
EdSoft Software Database
http://www.edsoft.com
Children’s Literature Web Guide
http://www.ucalgary.ca/~dkbrown/index.html
TrackStar
http://trackstar.hprtec.org
The WebQuest Project at San Diego State University
http://edweb.sdsu.edu/webquest/webquest.html
Learner Activities

Conversion calculator
http://worldwidemetric.com/metcal.htm

Metric system conversion sheet
http://cspace.unb.ca/nbco/pigs/measure/measure1.html

Metric conversion worksheets

Smile Metric Style (group activity)
http://www.theteachersguide.com/lesson%20plans/Math/MEA0008.html
Assessment

1. The students will be given a self-study guide for the metric system.
2. Hands on laboratory activities with rubric for assessment.  
3. Criterion based assessment activities (tests, quizzes).
4. Portfolio assessment.

Resources for locating assessment materials:

Scoring Guide for Student Projects  
http://www.ncrtec.org/tl/sgsp/index.html

RubiStar  
http://rubistar.4teachers.org

Electronic Quizzes  
http://www.funbrain.com  
http://quiz.4teachers.org/  
http://school.discovery.com/quizcenter/quizcenter.html

Authoring Software  
http://www.inspiration.com (Kidspiration)  
http://www.hyperstudio.com
For students that can not read at grade level or that have a reading disability we will have the test read to the student.

http://www.readplease.com/

For students who have difficulty comprehending material the student will be allowed to use the auto summarize tab in MS word.

Students with difficulty mastering the vocabulary will have access to virtual thesauruses.


The students who need the instructional materials in another language other than English.

http://systransoft.com/

For the student who has difficulty with handwriting, voice recognition software will be provided or voice activated recorder.

Students who need test taking practice will be given practice work sheets or pre-test will be read them.

Students who have difficulty completing homework will be given the opportunity to schedule time for extra help before and after school.