

Activity Level/Scope:

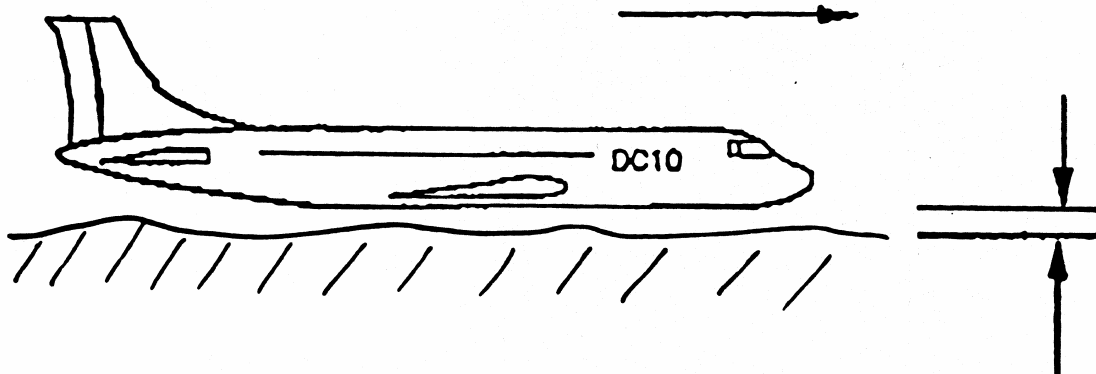
This is a valuable activity that can be used to augment a science or engineering class from the middle school level and up (8th graders and above). The teaching points that this activity brings to bear include:

- Researching and writing an original 100-word summary about a science or technology topic, which is in the area of study of the present course.
- Placing the topic of that summary in context with the rest of the physical universe with a basic unit-of-measure.
- Learning how to and writing an academic caliber footnote documenting the source of the summaries information.
- Getting published on-line and hence creating a short-publication that the student can include in their resume as a published work in the future.
- Most importantly, the student should gain an understanding of the importance of gaining a perspective on the units-of-measure that quantify the topics of study of the present course.

Background:

www.units-of-measure.com

Have you ever read or been told something similar to.... "that star is 10 light years away" or "an object is a micro-inch long" and had no real sense as to how large or small those quantities are? This website will allow you to gain perspective on



2.54 x 10 ⁻⁸ meters	<u>Hard Disk Drive Head Flyheight</u>	Data Storage
<p>The magnetic head in a hard disk drive flies extremely close to the magnetic recording disk. The standard unit of measure for this distance in the disk drive industry is in μinches (10⁻⁶ inches). About 1 μinch or 25.4 nanometers is a typical flyheight for today's (2002) hard drive heads. To put this in perspective for a standard nano-slider magnetic head, which is about 2 mm long, this would equate to a DC10 aircraft flying approximately 4 mm off the surface of the ground. The accuracy in altitude would be maintained to better than ±0.2 mm during the entire flight.</p>		
Source: Unknown		Fred Thomas, Technologist – Ogden, Utah USA

..... these and over 20 other basic "units-of-measure" used to quantify the physical world around us. This informative perspective will be provided in bite size chunks of

information called "Perspective Blocks." Illustrated above is one such "Perspective Block." --- Interestingly 1 micro-inch is also the about the length that a stubble of hair grows on a man's face in 1 second.

The magnitude of these quantities are organized and published into groups of three (3) adjacent orders of magnitude ranging from 10^{24} to 10^{-24} . There are also groups for quantities greater than and less than 10^{24} and 10^{-24} respectively as well. Hence, a total of 18 database groups for each "unit-of-measure." PDF files of each of these three (3) order of magnitude sets, for all of the included units-of-measure are found on the "Perspective Block Search" page of this site.

The units-of-measure website is intended to be a community of information giving perspective to the physical world around us. All visitors are invited to visit our "Contribute a Perspective Block" page and provide all with some of your own unique perspectives.

Assignment:

- 1) Hand out this three-page assignment summary to the students. Discuss and have them fill in due dates for all required portions of this assignment found below. Also provide them with the "instructional 4-character code" obtained via email for your class at admin@units-of-measure.com .
- 2) Have students go to www.units-of-measure.com on the internet and browse to the "Educational & External Links" page of the website. They should print out the following two short documents.
 - a. Classroom Background Article - *Perspectives on Science & Technology ... one small bite at a time.* and
 - b. Classroom Instructional Handout - *Writing a "Perspective Block."*
- 3) Students should read the articles prior to the next class time addressed to the assignment (1 week after handout). They should be prepared to discuss why obtaining a sound perspective on the magnitudes of the units-of-measure used to quantify the topics to be studied in class is important.

Date due/class discussion: _____

- 4) Students are assigned to research and write one or more "Perspective Blocks" about topics of interest that relate to the topics being studied in the class (2 weeks allotted usually). Topics could be assigned or selected by the student. This also goes for the selected unit-of-measure. Having all students explore a single unit-of-measure, at a time, is a good way for the class to obtain some further focus and perspective. This is the choice of the instructor.

The students should use the *Writing a "Perspective Block"* instructions to aid with this task. The final "Perspective Block" with footnote should be

