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International Trade (Lesson #1)

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International Trade

Instructor's Hints

This lesson is intended to provide motivation for the students to appreciate the use of an International System of Units.

The students are divided into small groups, around lab tables. The measuring instruments are provided to each group. Each group is treated as a different "country". Each country is given a different set of measuring instruments: A ruler is a colored strip of paper marked off in ten divisions. Each country is given a different length for its ruler. A liquid volume measuring cup is a colored plastic cup marked off in ten divisions. Each country has a cup with a different volume. A pan balance with ten metal washers as the balancing units. Each country has a different size of washer for its mass unit. The name of a country was based on the color of its "ruler" and same color of its measuring cup.

Mark of a 10 metre course in the hallway outside the lab room.

Country's Supplies

Each country is given a supply of energy (symbolized by pieces of wire that will need to be measured in length), food (symbolized by pretzels that will need to be measured by mass) and water (which will need to be measured by volume) at the start. Each country has a different kind of pretzel.

When setting up the countries at the start, before class starts, the instructor makes sure that the various countries have very different amounts of the natural resources.

Each country is required to trade with every one country at least once.

We prefer groups of four students. In our lab sections of 24 students we had six different countries. So we had six different colors of paper and cups as well as six different sizes of washers. Our pan balances had measuring bars on them and allowed a person to measure up to 10 grams without using any weighs. Those bars were covered by masking tape at the beginning of the lab so the balances could only be used to balance the pretzels against the washers for mass measurements.

Comments

It is not unusual to have students make a few trades before they notice that the measuring instruments used by the different countries are different.

We have used the lesson as a combination of physics and economics, particularly when using it in teacher or faculty development workshops, by also making paper money on color paper to match the color of the measuring ruler and cup. We used a symbol of a capital A on its side with two vertical lines drawn through it. We called the unit of money "ADAPTers" instead of dollars. We said that the value of all the resources of the country were equal to the value of paper ADAPTers they had. We gave each country 300 ADAPTers. However, this makes the lesson much more complex for first year college students.

When you add the money to the exercise you can use the sum of all the trades and values exercise at the end. The total amount of stuff at the end should be the same as at the beginning, of course, yet every country will have a greater value at the end than it had at the beginning since they tend to trade for scarce items in their country.

International Trade

Exploration Activity

The classroom is divided into different countries, each table being a sovereign nation. Each country has its own natural supply of water, food (i.e. pretzels), energy resources (i.e. wire).

Objective

Trade with the other countries to obtain a fair share of water, food and energy for your people.

Procedure:

1. Before you begin trading, take an inventory of your natural resources. Record in a table the kind, amount and unit of each length, volume or mass of resource, e.g.

Resource Kind	Amount	Unit (L.V or M)

2. Keep a record of all of your transactions. You must trade at least once with each of the other countries. Indicate in a table the name of the country with whom you traded, the item and amount of what you gave, and the item and amount of what you got in the trade.

3. Finally, record in (yet another) table your final inventory. Determine your gains and losses.

Concept Invention:

A) Discuss the following questions with the other citizens of your country. Write your answers on a page to include in your write-up.

- 1) What made trading easy?
- 2) What made trading difficult?
- 3) What trading strategies made trading with other countries easier?
- 4) What trading strategies made trading with other countries more difficult?
- 5) If the countries all met together to establish some rules or methods for trading, what would you suggest that they discuss in an attempt to ease trade relations?
- 6) Be prepared to report your country's ideas to the rest of the world. Record the conclusions of the global discussion.

Concept Application: Use of Systeme International (SI) units

Prefixes - All SI units use standard prefixes to scale the size of the measurement. For example, a kilowidget is 1000 widgets; a centifoobar is 1/100 of a foobar. The common prefixes are:

mega - (M)	1,000,000
kilo - (k)	1000
centi - (c)	1/100
milli - (m)	1/1000

So a kilowidget is written as kwidget. If the widget is abbreviated as w, then a kilowidget would be written as just kw. How much money is one kilobuck? _____

I. Length. The basic SI of length is the **metre** (m). (Note the spelling.) A metre is about 39 inches. Use a metre stick to measure the following things (record your answers.) Include in your write-up (a) your height and your arm span in both metres and centimetres (cm).

II. Liquid Volume. The basic unit of liquid volume in the SI is the **litre** (l). One litre is about the same as a quart. Use a graduated cylinder to measure the volume of 1 cup of water in litres and centilitres.

III. Mass. The basic SI unit of mass is a **kilogram** (kg). A kilogram weights about 2.2 pounds in Lincoln. Use a pan balance to compare standard masses to the mass of the following items:
a wooden block
a washer
a cup of water Record these masses in grams & kilograms

IV. Please make a data table with a partner and use a SI tape measure to measure all of your dimensions necessary to purchase items of clothing. Give length measurements in centimetres.

Circumference of neck	Inseam (skirt length)
Circumference of head	Chest
Waist	Foot length
Arm length	Foot width
Body mass in kg	

V. Go into the hallway and measure the length of your typical walking step size in metres, using the 10-m course marked on the hall floor. (Do you want steps per metre or metres per step?) Do it three times and take your average recording your results in your lab book. Compute the average length of your typical walking step in metres_____. Pace off the length and width of the lab room. Compute their values in metres. Determine the area of the floor from these values. Compare this value to what you get from counting floor tiles which are 9 inches square.

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Write-up: Due at the beginning of the next lab period.

1. Write a short essay on the exploration activities (which were the exploration activities???) What made them confusing? What helped you understand them? How were they related to the subsequent parts of this lab?
2. Go to the Reference area the University Library and read about the history of SI units. Write a short essay on the history of SI units. Why are the SI units so little used in Nebraska?
3. Layout a map of the campus on paper with squares showing your residence hall (or the student union), Andrews Hall, and Ferguson. Use the average length in metres of your step that you determined in the lab to measure the distance between these buildings (i.e. count your steps between buildings and convert to metres). Record the distances on your map. Put an arrow on your page indicating North. Have north at the top of your map.

A note about lab:

Your lab pages are for recording your raw data, doing quick calculations and drawing rough graphs. It doesn't have to be neat, but that might help you later understand what you did. You should collect your pages into a notebook and bring them to lab and use them.

The purpose of a lab write-up is to convey information. The degree of success you achieve in attaining this goal depends mainly on the content but also on the look of the write-up. Your report should be neatly done and sensibly organized. Include everything asked for in the lab*.

Photocopies of group data are acceptable. The text of your lab write-up should be typed or word processed. You may wish to create a generic cover page that you modify slightly for each lab write-up. You should attach your actual lab pages to your write-up as appendices.

* This means you should ALWAYS include at least one data page in your write-up that contains the raw data, i.e. numbers, units, observations, etc. that you actually recorded in the laboratory.