

**CONBAT+**



# CONTENT BASED TEACHING ConBaT+ UNITS OF MEASUREMENT

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For the Teacher

Gayane Hovhannisyan

2/7/2011



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# UNITS OF MEASUREMENT

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## INTRODUCTORY INFORMATION

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**INSTITUTE:** Waterford Institute of Technology, Ireland

**TARGET GROUP:**

age 12-16

**SUBJECTS:**

Geometry, History, Geography

**AIMS:**

1. To develop an understanding the concept of measurement.
2. To discover the anthropocentric principle of measures in different sciences.  
Learning about the units of measure.
3. To learn the base units of the International System of Units (SI).

**KEY COMPETENCIES REGARDING:**

**COMMUNICATION IN LANGUAGE(S):**

**Communication in L1**

- Learning the units of measuring weight, length, temperature et c.
- Activating the names of anthropocentric units of measurement of physical dimensions

**Communication in FL(s)**

- Discovering the international system of measurement
- Learning the names of culturally diverse measurement units – own language, language of classroom, language under study

**LEARNING TO LEARN:**

- Using the measurement units in own activity. Learning how to measure.



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- Comparing the international system of measurement with the culture-specific units.

**DIGITAL COMPETENCES:**

- Appropriate selection of information on the internet

**SOCIAL AND CIVIC COMPETENCES:**

- Knowing how to communicate ideas.

**TIMING OF THE OVERALL ACTIVITIES:**

- 3 hours

**RESOURCES AND MATERIALS NEEDED:**

- The Internet, a ruler, a scale, paper and pen.



## NOTES FOR THE TEACHER

### WORKSHEET 1

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**Activity 1.a:** warm-up and sensitising the pupils to the theme of study.

**Activity 1.b:** a good opportunity to include all the languages and cultures of the class.

### WORKSHEET 2

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Learners discover the meaning of a very famous picture and learn new words. They also become aware of the origin of words.

### WORKSHEET 3

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Learners tackle a difficult text by breaking it up into short and varied tasks. Here, 5 short sub-tasks can be completed as single activities by separate groups in the class. When finished, each group reports on the task and the content to the the rest of the class.

**Activity 3.b** is a good opportunity for learners to discover word boundaries in English.



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### MEASURING THINGS USING OUR BODY.

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**Timing:** 1 academic hour

**Material required:** Paper and a pen a ruler.

**Grouping:**  or   + whole class



## WORKSHEET 1

**Brainstorming session: *why do we have units of measurement?***

To measure..., to make..., to buy..., to sell..., to gauge..., to evaluate..., to understand..., to manage..., to compare..., to trade..., to count..., to own..., to rule..., to describe..., to draw...

1.a. How big, tall, fast, heavy, strong, powerful, deep, expensive, precious are you?

In pairs, use the table below to record all the 'things' that can be measured. Don't forget to place the appropriate unit of measurement next to the thing.

When you have finished, compile a class table of measurable 'things'. Don't forget that almost anything around you and in your life can be measured!

**Table 1: *Units of measurement***

<b>Thing</b>	<b>Unit of measurement used by the class</b>	<b>Units of measurement used in your culture</b>

In pairs, choose a unit of measurement and find an appropriate object or place or 'thing' to measure. You can measure a desk, a classroom, the schoolyard, but also water in a jug or the electricity, fuel and water consumed by the school!. Use the Table 2 below to record your work and report to the class.



**Table 2: *How big, tall, fast, heavy, strong, powerful, deep, expensive, precious is...?***

1.b.Design a poster or make a PPT presentation which represents all the units of

Unit of measurement	Thing	Measurement

measurement used by the class





WORKSHEET 2.

Unit of measurement

Thing

Measurement

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## UNITS OF MEASURE ACCORDING TO LEONARDO DE VINCI

**Timing:** 1 academic hour


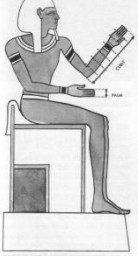
**Material required:** worksheet 2

**Grouping:** A small cartoon icon of a person with arms raised, representing a group or class.

1) Match the picture to the unit of measurement to the definition

Picture	Unit of measurement	Definition
a. A close-up photograph of a human hand, palm facing up, against a dark background.	<b>Fathom</b>	1. The length of a man's foot
b. A photograph of a human foot, showing the side profile.	<b>Span</b>	2. Old English word <i>fæðm</i> meaning embracing arms or a pair of outstretched arms (used to measure depth of water).
c. A photograph showing several human hands raised in the air, palms facing forward.	<b>Handbreadth</b>	3. The breadth of a male human hand (used for height of a horse for example)
d. A photograph of several vertical sticks or branches of varying lengths, some with small horizontal branches.	<b>Foot</b>	4. From the word for a straight branch or rod
e. A photograph of a person with their arms raised in a 'V' shape, holding an acoustic guitar.	<b>Cubit</b>	5. The Egyptian hieroglyph for the unit shows the symbol of a forearm subdivided into 7 'palms' of 4 'digits'



<p>f.</p> 	<p><b>Ell</b></p>	<p>6. The width of a human hand</p>
<p>g.</p> 	<p><b>Yard</b></p>	<p>7. From Proto-Indo-European *el- "elbow, forearm. The length of a man's arm.</p>



### WORKSHEET 3: THE VITRUVIAN MAN BY LEONARDO DA VINCI

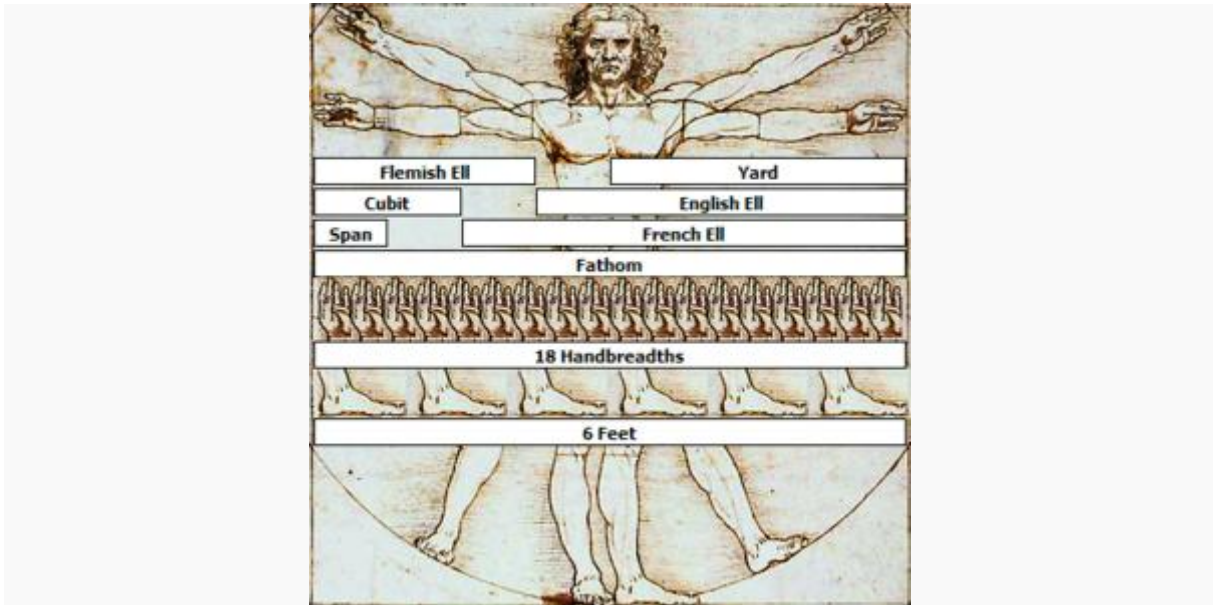
**Timing:** 1 academic hour

**Material required:** worksheet 3

**Grouping:** 

a) **In pairs, study the picture and the short text below.**

Jump tonavigation, search



This derivation of the Vitruvian man by Leonardo Da Vinci depicts nine historical units of measurement: the Yard, the Span, the Cubit,, the Flemish Ell, the English Ell, the French Ell the Fathom the Hand, and the Foot. Da Vinci drew the Vitruvian man to scale, so the units depicted here are displayed with their proper historical ratios.

b) Now, in can you explain to the class where the name for each of these measures comes from? Can you give the measurement of your desk in Ell? In Foot? In Handbreadths? In Fathom? In Cubit? Remember the work you completed in Worksheet 2.



## WORKSHEET 4: DISCOVERING THE HISTORY OF MEASUREMENT THROUGH WORDS

**Timing:** 2 hours

**Material required:** worksheet 3

**Grouping:** 

### History of measurement

From Wikipedia, the free encyclopedia

1.a. Find synonyms (similar words) or explanations for each word in **bold print**:

Units of measurement were among the **earliest** tools invented by humans. Primitive societies needed measures for constructing **dwellings** of an **appropriate** size and shape, **fashioning** clothing, or exchanging food or **raw materials**.

Earliest:

Dwellings:

Appropriate:

Fashioning:

Raw materials:

1.b. Something's wrong! The spaces between the words have disappeared! Can you put a line between each word and re-write the sentences correctly?

Theearliestsystemsofweightsandmeasuresseemtohavebeencreatedsometime

betweenthe4thand3rdmillenniaBCbytheancientpeopleslivingbetweenEgyptand

theIndusValley.Theeasternpeoplesachievedgreataccuracyinmeasuringlength,mass,andtime.

1.c. The weight units have been mixed up. Can you put them in the correct order?  
Check <http://www.etymonline.com> to discover the origin of the word *ounce* and why it is abbreviated as *oz*.

The smallest division ever recorded on a scale of the Bronze Age was approximately 1.704mm. Weights were based on **units of 100, 0.2, 500, 20, 2, 5, 10, 50, 0.5, 0.05, 200, 1 and 0.1**, with each unit weighing approximately 28 grams, similar to the English ounce or Roman uncia.



**1.d. The paragraphs have been jumbled up. Number the sentences/paragraphs in the correct order**

When it was necessary to compare the capacities of containers such as gourds or clay or metal vessels, they were filled with plant seeds which were then counted to measure the volumes

Early Babylonian and Egyptian records indicate that length was first measured with the forearm, hand, or finger and that time was measured by the periods of the sun, moon, and other heavenly bodies.

When means for weighing were invented, seeds and stones served as standards. For instance, the carat, still used as a unit for gems, was derived from the carob seed.

Other systems were based on the use of parts of the body and the natural surroundings as measuring instruments.

**1.e. Count the number of times the word *Human/s* appears in this paragraph. Can you explain why you think the word appears so often?**

Can you explain why we need human scaled objects? (in your own words).

Can you give more examples of human scaled objects?

**Human scale** means "of a scale comparable to a human being".

Humans interact with their environments based on their physical dimensions, capabilities and limits. The field of anthropometrics (human measurement) is not perfect, but it's still true that human physical characteristics are fairly predictable and objectively measurable. Buildings scaled to human physical capabilities have steps, doorways, railings, work surfaces, seating, shelves, fixtures, walking distances, and other features that fit well to the average person.

The word *human/s* appears \_\_\_\_\_, because -  
\_\_\_\_\_  
\_\_\_\_\_



## ASSESSMENT

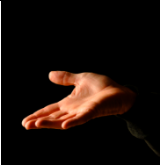



- Can you draw a human scaled object? What units of measurement will you use?
- Can you draw a non-human scaled object? What units of measurement will you use?
- What is the metric system?
- Do you think the metric system has advantages or disadvantages over the units of measurement you have seen in these tasks?

**Answer sheet:**


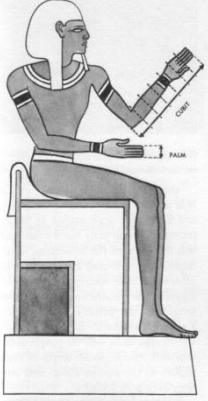

### Worksheet 1

**Activity 1.a:** you can include Watts, carat, km/hr, *etc.*

### Worksheet 2

Picture	Unit of measurement	Definition
a. 	<b>Span</b>	6. The width of a human hand
e. 	<b>Fathom</b>	2. Old English word <i>fæðm</i> meaning embracing arms or a pair of outstretched arms (used to measure depth of water).
b. 	<b>Foot</b>	1. The length of a man's foot
f. 	<b>Handbreadth</b>	3. The breadth of a male human hand (used for height of a horse for example)



 <p>d.</p>	<p><b>Yard</b></p>	<p>4. From the word for a straight branch or rod</p>
 <p>g.</p>	<p><b>Cubit</b></p>	<p>5. The Egyptian hieroglyph for the unit shows the symbol of a forearm subdivided into 7 'palms' of 4 'digits'</p>
 <p>c.</p>	<p><b>El</b></p>	<p>7. From Proto-Indo-European *el- "elbow, forearm. The length of a man's arm.</p>

**Worksheet 3: see worksheet 2 for answers.**

**Worksheet 4**

**Activity 1.a:**

Earliest: first. Dwellings: houses. Appropriate: correct. Fashioning: making. Raw materials: give examples such as iron, crude oil,

**Activity 1.b:**

The earliest systems of weights and measures seem to have been created sometime between the 4th and 3rd millennia BC by the ancient peoples living between Egypt and the Indus Valley. The eastern peoples achieved great accuracy in measuring length, mass, and time.

**Activity 1.c:**

- 0.05, 0.1, 0.2, 0.5, 1, 2, 5, 10, 20, 50, 100, 200 and 500

"unit of weight," early 14c., from Old.French. unce (12c.), from Latin. uncia "one-twelfth part" (of a pound, foot, etc.), from Latin. unus "one" (see [one](#)). The Latin. word had been





adopted in Old.English. as ynce (see [inch](#)). It was one-twelfth of a pound in the Troy system of weights, but one-sixteenth in avoirdupois. Abbreviation oz. is from Italian. onza. Also used in Middle.English. as a measure of time (7.5 seconds) and length (about 3 inches). (www.etymonline.com)

#### Activity 1.d:

3. When it was necessary to compare the capacities of containers such as gourds or clay or metal vessels, they were filled with plant seeds which were then counted to measure the volumes
2. Early Babylonian and Egyptian records indicate that length was first measured with the forearm, hand, or finger and that time was measured by the periods of the sun, moon, and other heavenly bodies.
4. When means for weighing were invented, seeds and stones served as standards. For instance, the carat, still used as a unit for gems, was derived from the carob seed.
1. Other systems were based on the use of parts of the body and the natural surroundings as measuring instruments.

#### Activity 1.e.



Count the number of times the word *Human/s* appears in this paragraph. Can you explain why you think the word appears so often?

The word appears 5 times because it shows the importance of measuring things around us, in relation to us, humans.