TOPIC 2.13:	**Measurement** (Learning outcomes by syllabus reference: OP1, part OP2)
HOW MANY LESSONS?	4 – 5 lessons

KEYWORDS / TERMS TO BE TAUGHT			
Length	Area	Volume	Mass/matter
Metre (m)	Metres squared (m^2)	Metres cubed (m^3)	Kilogram (kg)
Metre stick	Callipers	Vernier callipers	Electronic balance
Opisometer	Trundle Wheel	Measuring cylinder	Overflow can
Beaker	Meniscus	Units	Regular/Irregular

KEY CONCEPTS IN THE LESSON (OBJECTIVES)		
*What students **must** know or be able to do*	*What students **should** know or be able to do*	*What students **could** know or be able to do*
To be able to give examples of measurement from everyday experience To be able to measure length, area, volume and mass using appropriate equipment	To be able to select appropriate methods for measuring volume in a variety of circumstances Reinforcement: To be able to write up experiments in a systematic way	To be able to manipulate volume formulae to calculate an unknown quantity

SEQUENCE OF LESSON
1. Introduce the concept of measurement. Seek level of prior knowledge of class. Allow students to relate personal experiences of measurement. This could be facilitated by using the *Measurement Introduction* PowerPoint,

handing out concrete objects, performing measurements at appropriate slides and encouraging student input during the presentation.

2. Carry out experiments in groups to perform measurements. Discussion of key vocabulary, results and conclusions.

3. Students record results and write up experiment as they are doing the practical work.

4. Review – whole class discussion/dissemination of ideas/extra information. Possibility of using the strategies set out in *Tackling Word Problems in Science and Mathematics* in the *Toolkit* section of this resource pack, to help students to develop skills in solving word problems.

5. Further class work/homework – see *Measurement Worksheet*. Extension challenges for more able students.

1. DIFFERENTIATE BY CONTENT (In what ways can I vary the content of what I am teaching?)		
(A) Complexity of content: (concrete, symbolic, abstract)		
Concrete	*Symbolic*	*Abstract*
Real materials associated with measurement, e.g. rulers, metre sticks, opisometers, trundle wheels, callipers, vernier callipers, measuring cylinders, electronic balance	Units of measurement and their symbols, Illustrations, images of measurement	Why do we measure? Appreciation of the significance of measurement in our daily lives and in science
(B) Variety of resources		
As listed above. Also potential use of school grounds for further exploration of material related to measurement.		
(C) Variety of learning environments		

Classroom, school laboratory, school grounds, e.g. curved lines of basketball court

2. DIFFERENTIATE BY PROCESS (How will I teach the lesson?)
Sequence of lesson as laid out above ➢ Introduction – using concrete or symbolic material or a general class discussion ➢ Divide class into groups. Assist the students, as required, to plan, carry out the experiment, record results and draw conclusions as appropriate. Enable the extension of students' thinking and language use. For resources, guidance and support related to facilitating student experiments and investigations, see **www.juniorscience.ie**

3. DIFFERENTIATE BY OUTCOME / PRODUCT **(How will the student demonstrate understanding?)**
See *Worksheets*, *Classroom Activities* and *Experiments* sections of this resource pack. • Students may use a template from the *Experiments* section to assist them with the write-up. • Whole class review work completed at end of class • Homework: *Measurement Worksheet* if not used for class work. Specify time to be allocated to this work at home

FINALLY - ANY OTHER POSSIBILITIES FOR THIS LESSON?
• Estimating various measurements and then measuring them • Collage of scenes showing measurement • Other written activities, e.g. a log of the different types of measurement and units encountered by students in one day • Extension exercise: How can we measure something very big? • Cross-curricular links: Maths • Internet search for material on measurement • Suggested Internet links include **www.juniorscience.ie**, www.bbc.co.uk/schools, **www.scoilnet.ie**, **www.skoool.ie** and **http://classroom.jc-schools.net/sci-units/matter.htm** • For advice on enhancing curricular access through the use of mobile ICT, see **www.laptopsinitiative.ie**