Learning Material Covered in Each Elementary School Cycle

Measurement, pp. 17, 18 and 19			
A. Lengths, pp. 17-18			
Cycle One	**Cycle Two**	**Cycle Three**	**Reminder**
p. 17, no. A-1 Compare lengths using unconventional units p. 17, no. A-2 Constructs rulers using unconventional units			**Before using conventional units of measure**, Cycle One students **first** use unconventional units of measure to develop measurement sense by comparing lengths or units or measure, by measuring with their own personal rulers they have constructed and by constructing rulers. e.g.: We will need more paperclips than shoes to measure the length of the table.

Learning Material Covered in Each Elementary School Cycle

B. Surface areas, p. 18			
Cycle One	**Cycle Two**	**Cycle Three**	**Reminder**
Estimating and measuring surface area is not covered in Cycle One.	p. 18, no. B-1 Estimates and measures surface area a. using unconventional units	p. 18, no. B-1 Estimates and measures surface area b. using conventional units	Cycle Three students **measure surface area** using conventional units. They do not use relations (formulas), which they will construct in secondary school, because it is pointless to provide them with formulas that have no meaning for them. The students learn that measuring surface area consists in choosing a standard figure and counting how many standard figures are required to cover the surface. These measurement activities enable students to deduce the measurement using their operation sense (multiplicative structures). e.g.: I placed 5 rows of 10 unit squares (each square measuring 1 cm^2) on a surface to cover it. The area is 50 square units (or cm^2). **The students discover how to calculate area on their own.**

Learning Material Covered in Each Elementary School Cycle

C. Volumes, p. 18			
Cycle One	**Cycle Two**	**Cycle Three**	**Reminder**
Estimating and measuring volume is not covered in Cycle One.	p. 18, no. C-1 Estimates and measures volume a. using unconventional units	p. 18, no. C-1 Estimates and measures volume b. using conventional units	Cycle Three students **measure volume** using conventional units. When they begin studying this concept, it is pointless to provide them with formulas that have no meaning for them. Students learn that measuring the volume of a solid consists in choosing a standard solid and counting how many standard solids are required to fill it. These measurement activities enable students to deduce the measurement using their operation sense (multiplicative structures). e.g.: I placed 4 “storeys” containing 6 rows of 5unit cubes (each cube measuring 1 cm^3) in a solid to fill it. The volume is 120 cubic units (or cm^3). **The students discover how to calculate volume on their own.**
D. Angles, p. 18			
Cycle One	**Cycle Two**	**Cycle Three**	**Reminder**
Comparing angles as well as estimating and determining their measurement is not covered in Cycle One	p. 18, no. D-1 Compares angles	p. 18, no. D-2 Estimates and determines the degree measurement of angles	In elementary school students do not construct acute and obtuse angles. Cycle Two students construct right angles when they construct perpendicular lines (see p. 15, no. C-5).

Learning Material Covered in Each Elementary School Cycle

E. Capacities, p. 18			
Cycle One	**Cycle Two**	**Cycle Three**	**Reminder**
Estimating and measuring capacity is not covered in Cycle One		**First year of the cycle (Grade 5)** p. 18, no. E-3 Establishes relationships between units of measure (e.g.: 1 L = 1000 mL, $\frac{1}{2}$ L = 500 mL)	It is important to include fractions when students establish relationships between units of measure of capacity. e.g.: $\frac{\mathbf{1}}{\mathbf{4}}$ L = 250 mL
F. Masses, p. 19			
Cycle One	**Cycle Two**	**Cycle Three**	**Reminder**
Estimating and measuring mass is not covered in Cycle One		p. 19, no. F-3 Establishes relationships between units of measure (e.g.: 1 kg = 1000 g, $\frac{1}{2}$ kg = 500 g)	It is important to include fractions when students establish relationships between units of measure of mass. e.g.: $\frac{\mathbf{3}}{\mathbf{4}}$ kg = 750 g

Learning Material Covered in Each Elementary School Cycle

G. Time, p. 19			
Cycle One	**Cycle Two**	**Cycle Three**	**Reminder**
p. 19, no. G-1 Estimates and measures time using conventional units	p. 19, no. G-1 Estimates and measures time using conventional units		In Cycle One, students learn to read time and its representations and to calculate simple durations or time intervals (e.g. the duration of recess from 10:15 to 10:30, the duration of music class from 10:30 to 11:30). In Cycle Two, students estimate and measure more complex time intervals. e.g.: The duration of a bus trip from 3:50 p.m. to 5:07 p.m. or the duration of an appointment from 3:20 p.m. to 5:45 p.m.
H. Temperatures, p. 19			
Cycle One	**Cycle Two**	**Cycle Three**	**Reminder**
p. 19, no. H-1 Estimates and measures temperature using conventional units	p. 19, no. H-1 Estimates and measures temperature using conventional units	p. 19, no. H-1 Estimates and measures temperature using conventional units	Students begin to **represent** negative numbers on the thermometer only in Grade 4 (see p. 8, no D-1). In Cycle Three, students begin to **locate** negative numbers on the thermometer (see p. 8, D-3).