

Unitizing

Science, Mathematics



Unitizing is very important in learning of mathematics. It is a mental operation that helps to understand and solve complex mathematical problems by separating classifying the values involved into units. Unitizing is grouping of a known number used in representing quantities. It is useful in understanding the value as well as developing counting strategies (Wright, Leeson & Geake, 2002). In addition, unitizing is very useful in understanding and developing the meaning of division as well as multiplication of both natural numbers and fractions.

Unitizing is used in quite many settings in mathematical objects. These settings include geometry, algebra, measurements, number and operations and in data analysis and probability. In geometry, unitizing is very important in visualizing changes, in addition or multiplication and in developing the ability to reason, predict and represent knowledge appropriately. Unitizing is also very useful in algebra, where it is applied in both structural and procedural algebra. Procedural algebra is how to solve a problem where numerical values to solve algebraic equations are assigned, for instance;

Find x if $y = 7$ in $3x^2 - 4y = 20$ Here, $3x^2 - 4(7) = 20$
 $3x^2 - 28 = 20$
 $3x^2 = 48$
 $x^2 = 48/3 = 16$
 $x = 4$
 Unitizing here can be applied in for instance giving the value of x , which can be given as 2×2 or $2 + 2$. In this case '2' is unitizing.

Structural algebra involves use of letters to manipulate algebraic expressions. In number and operations, unitizing facilitates the understanding numbers and representing them. It is also useful in understanding fractions, for instance $1/2$ can be written as $1 \div 2$ or $1 \times \frac{1}{2}$?

Unitizing is very useful in understanding multiplication and division of natural numbers as well as fractions.

For instance, $2 \times 4 = 8$, can better be understood through learning many ways of approaching the problem. It can also be written as $2 \times (2) (2) = (2) (4)$ Or as $2 \times (2) (2) = (2) (2) (2)$. Unitizing 2 simplifies the understanding of the problem. More complex values can also be used such as: $4 \times 16 = 64$ this can be better understood by unitizing 4 such that the problem is represented as: $4 \times (4) (4) = (4) (4) (4)$ Developing understanding of division is also very much facilitated by the knowledge of unitizing.

For instance, in determining the number of 8's that are in 400, division should be performed as follows; $400/8 = 50$, here 8 is unitizing To get to understand this better, simpler figures than 400 should be used but still the value of the numbers should be restored. This can only be acquired through unitizing and it can be as follows, $800/2 = 400$ can be unitizing such that $240/2 = 120$ and this simplifies the problem. Section 2 Unitizing is very important since it simplifies mathematical operations and facilitates understanding of the operations.

It is important since it helps in development of deep and relevant reasoning especially when the unitizing value is being determined. Unitizing is so important since it facilitates the understanding of mathematical objects such as number and operations, especially in fractions, ratios and proportions. Unitizing helps in performing mathematical operations task with a lot of flexibility and confidence. Students should always be encouraged to practice unitizing in all their mathematical activities.

Failure for the students to unitize leads to operating with too complex values and hence difficulties arise in trying to solve the problems. Operating with

large numbers like for example multiplying 125 and 216 is quite hectic but if unitizing is applied, the operation becomes very easy and speed in generating the answer is increased. Section 3 Students frequently use unitizing especially in addition problems using the procedure of whole number, for instance, $8 + 14 = 22$ Can also be approached through unitizing such that: $8 + (7 + 7) = 22$ unitizing by using 7 can be practiced by the students. Students are also using unitizing in understanding part-whole concepts. For instance, students have used unitizing to be able to arrive at answers concerning fractions like, $\frac{?}{?} + \frac{?}{?}$. This can be written as $\frac{?}{?} + \frac{?}{?} = \frac{?}{?}$ whereby unitizing is done by $\frac{?}{?}$. However, unitizing may not be done on some operations for instance those that originate from mathematical objects like measurement (Anghileri, & Julia 2001). This is a key concept in maths especially for the appreciation of invariance of length and angle measure.

Students should not unitize in measuring angles since the size of the angle does not change. Similarly, the length measure does not change unless the size of what is being measured changes students also are unable to use unitizing in probability and data analysis especially when the problems are on formulation of questions that can be addressed with data and collect, organize and display relevant data to answer them. Section 4 Students should be posed with a lot of contexts and opportunities as well as representations that will facilitate their unitizing.

Many geometrical as well as algebraic problems should be provided to the students and they should be framed in such a way that unitizing is encouraged. Problems that require comparisons and representations by

variables as well as these that require practice of conceptual understanding such as addition and multiplication of fractions should be given to the students. This improves the students ability for unitizing, something that facilitates their solving strategies. Representations should be encouraged among students since it is through this that they will be able to organize, record and also communicate mathematical ideas.

Conclusion Unitizing is a very important mental function that is highly applicable in mathematics. It improves efficiency in solving mathematical problems. It helps students to develop a deeper meaning and understanding of mathematical operations such as multiplication, addition and division. It also enables students to develop diverse and applicable counting strategies as well as conceptual understanding. Therefore. Unitizing should highly be encouraged among the students for better performance in their solving of problems.