

# ARITHMETIC INSTRUCTION

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Comparatively speaking, arithmetic appears to be the most difficult subject to learn in the curriculum it being an exact science.

The following suggestions are offered with the hope that they can be of help in the improvement of the teaching and learning of arithmetic.

## *Daily Drill on Fundamental Processes*

a. Every arithmetic recitation should be opened with a snappy drill on fundamental processes or on combinations previously taught.

b. The materials to be drilled upon should be those found difficult as revealed in progress tests. It is a waste of time drilling on facts or materials already mastered.

c. The use of flash cards is stressed, but care should be taken so that when competition is injected into the drill all members or a majority of the members of the class are benefited.

d. Drill should be of short duration—say, the first two or three minutes of the recitation period.

e. The value and importance of the diagnostic drill cards in arithmetic cannot be over-estimated.

## *Presentation of New Principles*

a. After a snappy drill on fundamentals, the new principle should be taught vividly with the use of objects and the blackboard. Use only small figures in the presentation.

b. Employ *varied situations* until the new principle is fixed in the pupils' mind.

c. Keep the principle being taught in the foreground and end the presentation with a generalization by the pupils.

## *Application*

a. After the principle has been sufficiently taught and correct generalization made, give exercises and *problems* involving the same principle.

b. Administer a short quiz to test the effectiveness of instruction and to determine pupil difficulty.

## *Inductive Presentation*

A new principle can be best presented inductively by employing the following steps:

- a. Preparation
- b. Presentation
- c. Comparison and contrast
- d. Generalization
- e. Application

## *Problem Solving*

a. In the application of the new principle, problems involving the business and social practices of the locality should be given in abundance to supplement the problems in the text.

b. Much training should be given to the interpretation of problems. Pupils should be encouraged to study each problem carefully and choose the method of solution that seems to them to require the least figuring.

c. The following steps in attacking a problems should be known by the pupils:

(1) Study and analyze the problem carefully and get a concrete picture of the situation. Illustrations or drawings should be encouraged.

(2) State clearly what the problem asks for.

(3) Collect all data needed to find what is wanted.

(4) Carefully analyze the data and discover the relation of the data to what is wanted.

(5) Make the computation and check every operation in order to be sure that no mistakes have been made.

(6) Examine the answer and see if it is reasonable. If it is not reasonable, examine every result and make a second analysis.

d. When a pupil fails to get the correct answer to a problem, the teacher should endeavor to find the cause of the failure and attempt to remove the cause.

e. Pupils should be encouraged to solve problems without a pencil, as in real life.

f. Pupils should be trained to make their own original problems involving the principle just taught.

g. Avoid the use of undesirable problems involving misleading facts, trivialities and absurdities, useless methods and operations, ambiguities and fallacies, and fantastic situations.

### Progress Tests

a. After a certain teaching unit or group is covered, a progress test should be conducted to determine pupil difficulties and to check the effectiveness of instruction.

b. A test record should be invariably kept to serve as basis for the determination of what combinations or facts need to be drilled upon.

### Remedial Instruction and Thoroughness of Work

a. An ideal instruction is one that leaves nothing to be desired. Every subject matter taught should be dealt with thoroughness until it is mastered.

b. The result of tests should be carefully scrutinized and diagnosed with the end in view of determining the point of error and applying remedial instructions.

c. The more advanced pupils should be utilized in remedying deficiencies during off-recitation periods. Flashcards may be given to these pupils for drilling those who need help before and after classes.

d. As in all other subjects, mastery must be the watchword. One subject matter or principle should be thoroughly mastered by the pupils before taking up another.

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