

Progressive Education Society's
**MODERN COLLEGE OF
ARTS, SCIENCE & COMMERCE
SHIVAJINAGAR, PUNE - 411 005.**

(*Star College Award, DBT, *CPE Status, UGC, *A' Grade, NAAC, *Best College Award, UoP.)

Department of Psychology

Experiment / Test No. : 2

Date : 15/11/2019

Title of the Experiment / Test : Problem solving.

Subject's Name : H.T

Student's Name : Madhura Vivek Pawar

Class : MA (I) Roll No. : 1865120



Signature of the Teacher

PROBLEM SOLVING.

- STATEMENT OF THE PROBLEM :-

To follow the subjects process of thinking while solving the problem by using wiggly blocks puzzle.

- INTRODUCTION :-

1) Defination of Problem :-

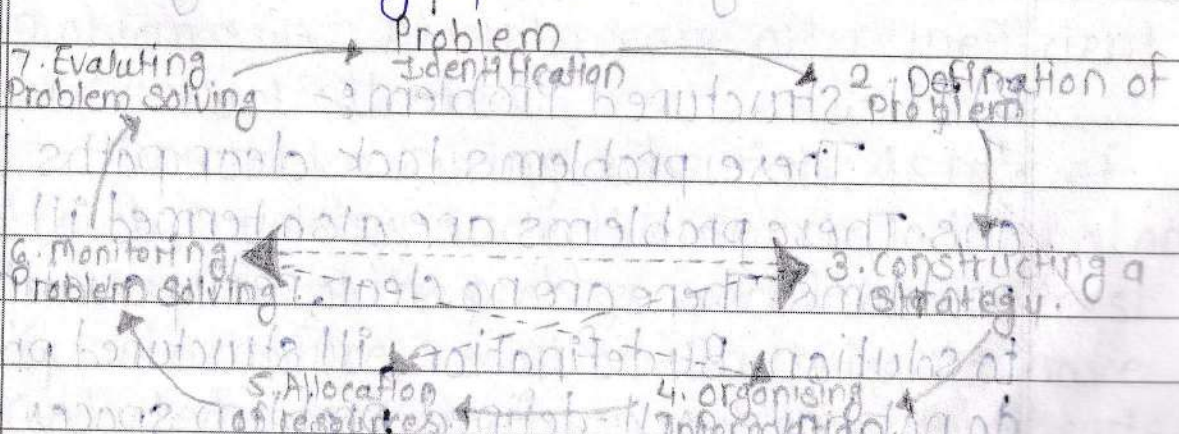
“A problem is a negative thing which causes obstacles, they are unfamiliar and bring lots of negativity. Hence, by using thought process, trial and error method, insights using images solutions are deducted.”

“A problem is the occurrence of an event in the form of an obstacle that cannot be removed.

Blocking the goal seeking activity of a person which cannot cope with learned behaviour.”

“A problem is a situation that is unsatisfactory causes difficulty for people. Any thing, matter, person etc. that is difficult to deal with, solve or overcome are known as problems.”

2) Problem solving cycle :-



3) Types of Problems :-

Problems can be categorised according to whether they have clear paths to a solution.

A) Well-structured Problem :-

These problems have clear paths to solution. These problems also are termed well-defined problems. These problems had clear paths, if not necessarily easy path, to their solutions. People seem to make three main kinds of errors when trying to solve well-structured problems. These errors are :

(i) Inadvertently moving backward :-

They revert to a state that is further from the end goal.

(ii) Making illegal moves :-

They make an illegal move, that is, a move that is not permitted according to the terms of the problem.

(iii) Not realizing the nature of the next legal move :-

They become stuck, they do not know what to do next, given the current stage of the problem.

B) Ill-structured Problem :-

These problems lack clear paths to solutions. These problems are also termed ill defined problems. There are no clear, readily available paths to solution. By definition, ill structured problems do not have well-defined problem spaces. Problem solvers have difficulty constructing appropriate mental representations for modeling these problems.

and their solution.

c) Insight and Non-insight Problem:-

In these problems solution or understanding or solving strategy comes to you suddenly. Like 'Aha' movement. Often, an insight involves reconceptualizing a problem or a strategy in a totally new way. Insight often involves detecting and combining relevant old and new information to gain a novel view of the problem or of its solution.

4) Approaches To Problem Solving:-

A) Algorithm and Heuristic:-

An algorithm is a method that will always produce a solution to the problem, sooner or later. One example of an algorithm is the method called systematic random search, in which you try out all possible answers using a specified system.

Newell and Simon (1972) observe that the time taken to search for an answer to a problem is roughly proportional to the total size of the problem space. The problem space is all the possible solutions to the problem that have occurred to the problem solver. Algorithms are often inefficient and unsophisticated.

In problem solving, a heuristic is rule of thumb, involving a selective search, looking at only the portions of the problem space that are most likely to produce a solution. Psychologists have conducted more research on problem solvers' heuristic than on their algorithm.

B) The means-Ends Heuristic Approach:-

When you use means-ends heuristic, you divide the problem into a number of subproblems or smaller problems. The name means-ends heuristic is appropriate because it involves figuring out the 'ends' you want and the figuring out the 'means' you will use to reach those ends. As ~~well as~~ Sweller and Levine (1982) note, means-end analysis concentrates the problem solvers attention in difference between the current problem state and the goal state.

C) Computer stimulation:-

Newell and Simon (1972) have explained means-ends analysis with computer simulation approach. In studying problem solving, computer simulation offers the same advantage method in connection with computer simulation of language process: It forces the theorist to be clear and unambiguous about the concepts of the theory. Newell and Simon developed a computer program called General Problem Solver (GPS), which is a program, whose basic strategy is means-ends analysis. The goal of the GPS is not simply to solve problems, in the most efficient way, but to mimic the process that normal humans use when they tackle these problems.

GPS has 3 different methods:-

i) The transform method involves creating a new, transition state.

ii) The apply operator method involves finding a state to which the operator can be applied.

iii) The reduce method involves a search for the

right operator for the situation.

5) Methods of Problem Solving :-

A) Trial and error method :-

We know that thinking begins with a problem and thinkers make implicit search to solve the problem. Implicit searching behaviour is directed towards finding out an appropriate response to unravel the knot for which he has no ready made response. To achieve this goal while thinking. One manipulates different ideas, images or other symbols, formulates certain hypothesis and implicitly tests the hypothesis. This is implicit trial and the hypothesis. This is implicit trial and error. Scientific discoveries involved careful testing of hypothesis, a controlled and well planned trial and error. In our everyday life situations also while dealing with various problems, we made a planned trial. Thus, thinking process involves implicit, trial and error.

B) Insight Thinking Method :-

Very often solutions to a problem through mechanical trial trial and error is not possible. Such problems require quite novel approach to the problem which comes to the mind, of all sudden flash. When sudden flash comes individual feels delighted and is usually expressed in 'Aha' experience. This sudden flash is insight. He works according to the flash and finds the problem solved. We often have experience of suddenly seeing a correct solution after a period

of unsuccessful trial and error. According to Gestalt psychologists insight results from cognitive processes which restructures the problem in the mind. This helps a sudden flash of new idea.

6) Processes Involved In Problem Solving:-

A) Incubation:-

The subject finds his efforts were useless. At this stage he engages in some other work and may also forget, he left a problem unsolved. This is the phase of inactivity in search for attaining productivity.

B) Illumination:-

The subject may have sudden insight into the solution. It is to be thought an accidental phenomena. It is in past experiences. It comes in the form of idea.

C) Evaluation:-

The sudden flashed solution is followed by evaluating its appropriateness by rigorous testing procedures. This stage focuses on the solution being fully worked out.

D) Revision:-

In some areas the solution may need some modification or revision. This stage evaluation of testing and revision is compiled together.

E) Verification :-

It often occurs in case of some problem occurs that they do not check their solution after a period of illumination. But that is important. One problem must be attended once again with new method.

7) Stages In Problem solving :-

A) Problem Identification :-

Identifying a situation as problematic is sometimes a difficult step. People might identify the wrong source of a problem, which will render the steps thus carried or useless.

B) Defining Problem :-

It is vital to define a problem and represent it well, enough to understand how to solve it.

C) Constructing A Strategy :-

It is to plan a strategy for solving the problem. It may involve breaking down the whole into manageable elements to arrange them into something useful.

D) Organizing Information :-

This is another crucial step to the process. The person tries to integrate all the information. It might involve collecting reference or even collecting one's own ideas. At this step, one organizes it strategically, finding a representation that best enables one to implement the strategy.

E) Allocating Resources:-

We also face the process of having limited resources. These include time, money, space etc. We need to know when to allocate which resource. When mental resources are allocated to planning on a large scale, time and energy can be saved.

F) Monitoring:-

You need to document your process as you are finding a solution. If one is not making as much progress needed. One needs to reevaluate their approach or look for new strategy.

G) Evaluating the Problem Solving:-

One needs to evaluate the solution to find out if it's the best possible solution to the problem. The evaluation might take a while or happen immediately. It's important to evaluate the outcome of the progress.

8) Factors Influencing Performance In Problem Solving:-

A) Mental Set:-

One factor that can hamper problem solving is mental set - a frame of mind involving an existing model for representation a problem, a problem context or a procedure for problem solving. Another term for mental set is entrenchment. When problem solvers have an entrenched mental set, they fixate on a strategy that normally works well in solving this particular problem.

B) Functional Fixedness :-

Functional fixedness is the inability to realize that something known to have a particular use may also be used for performing other functions. Functional fixedness prevents us from solving new problems by using old tools in novel ways.

C) Past Experience :-

The conclusion drawn from earlier experiments that a subject will solve a problem if he has necessary functions available. We learned from our past experiences. If the solution does not work earlier, we are less able to follow that strategy for further.

D) Motivation :-

When motivation is very low the animals are easily diverted from the problem by extraneous factors and behaviour tends to deteriorate into a series of non-goal directed acts. These are the results of the experiment on chimpanzees.

- VARIABLES :-

Independent Variable :- The wiggly blocks puzzle.

Dependent Variable :- Method used by subject to solve puzzle.

- MATERIAL :-

Wiggly block puzzle.

Stopwatch.

Wooden screen.

Record sheet.

Stationary:

- PLAN OF THE EXPERIMENT :-

- 1) To present dismental wiggly block and a demo block.
- 2) Note down time, movements, observation and X introspection after each trial accurately.
- 3) Continue the experiment until the subject cannot reduce the time required for solving the puzzle problem. Criteria is two consecutive trials approximately same time.

- PRECAUTION :-

- i) The experimenter should not show the puzzle to the subject before the experiment.
- ii) Keep demo block in front of the subject throughout the experiment.
- iii) The experimenter should not provide any cue from facial expressions or pass any remarks while subject is solving the puzzle.
- iv) Minimum 9 movements in each trial is required.
- v) Puzzles should not be arranged in front of the subject.
- vi) The experimenter should himself learn how to solve the puzzle before beginning the experiment.
- vii) The experimenter should record the time movements and observations very carefully.

- PROCEDURE :-

The experimenter checked all the material required and cubical was arranged. Subject^{was} called

inside the cubical and seated comfortably. Rapport was established, and following instructions were given :-

"In this experiment I shall present you a puzzle. Here the blocks kept are to be arranged to form a cube like this (show demo block). Inside colour of block is black and outside colour is brown or wooden colour. While arranging block, if you pick one block and put down on the table, it will be counted as one movement. Try to ~~use~~ construct it as fast as you can and I will record the time taken and movements." The plan of the experiment was strictly followed. Experimenter recorded time and movements on each trial. The experiment was continued until the time taken by the subject was stable. Observations made were carefully noted down after each trial and during trial.

RESULT TABLE.

Trial	Time	Movements	Observations	Introspection.
1.	671 sec.	 	The subject was trying hard to arrange the puzzle. she find it very difficult. she is trying to see any logic by which she can arrange like colour, edges. she is not looking very confident.	I find difficulty in arranging the puzzle. I thought I will not be able to arrange it. But I tried to focus on edges of the blocks.
2.	240 sec	 	The subject was trying to arrange puzzle by using previous logic, she has used in 1 st trial. she has arranged base very fast. while arranging other parts she has taken time.	In this trial, I find the puzzle bit easy than previous one. I focused more on inner edges and colours.
3.	182 sec.	 	The subject constructed middle part first. Now	In this trial, I arranged base first and according

Trial	Time	Movements	Observation	Introspection.
-------	------	-----------	-------------	----------------

3			she got idea of how to arrange it. she arranged middle and base part first.	to that I arranged remaining puzzle.
---	--	--	---	--------------------------------------

4.	36 sec		The subject easily arranged the puzzle. She was confident while arranging the puzzle.	Now I got the logic so its easy for me to arrange the puzzle.
----	--------	--	---	---

5.	40 sec	 	The subject arranged middle part and base easily and other parts according to that.	I focused on edges to arrange the puzzle.
----	--------	------	---	---

6.	38 sec	 	The subject confidently arranged the puzzle. Very easily and rapidly.	I was conscious about the time so tried to do it as fast as I can.
----	--------	------	---	--

- DISCUSSION :-

Statement of the problem is, to follow the subjects process of thinking, while solving the problem ~~wigglly~~ by using wiggly block puzzle.

"A problem is a negative thing which causes obstacles, they are unfamiliar and bring lots of negativity?" Hence, by using thought process trial and error method, insights, using images solutions are deduced. Problem solving is the process or act of finding a solution to a problem.

The subject was called inside the cubical and seated comfortably. Rapport was established and instructions were given.

In first trial time taken by subject is 671 sec. She arrange puzzle in 55 movements.

In this trial subject was trying very hard to arrange puzzle. She was not confident in this trial. She mentioned in her introspective report that, firstly she thought that she will not be able to arrange it, but then she tried to focus.

In second trial time taken by subject was 240 sec and movements were 35. In this trial time and no. of movements were suddenly decreased. The subject tried to use previous logic to arrange puzzle. According to subject, this time she find the puzzle bit easy.

In third trial time taken by subject was 182 sec and movements were 20. Here the subject has constructed base easily. and according to that she has arranged other parts.

In fourth trial time taken by subject to

arrange puzzle was 36 sec. She arranged puzzle in 10 movements. Subject easily arranged the puzzle. She mentioned in her introspective report that, in this trial is g she got the logic of how to arrange puzzle.

In fifth and sixth trial time taken by subject was 40 sec and 38 sec respectively. Movements for both the trials were 15. Subject very confidently arranged the puzzle easily and rapidly, she has used her previous knowledge to arrange puzzle.

Throughout the discussion, we can see that there is sudden upliftment and retardment in movements and time to arrange puzzle.

There are two graphs. one graph shows times taken per trial and second graph shows no. of movements per trial. From graphs we can see that time taken and movements taken were decreased trial by trial, which refers that insight method was used by the subject. to solve the problem (to arrange puzzle).

- CONCLUSION :-

Insight method was used by the subject.

- INTROSPECTIVE REPORT :-

"Overall, I found this experiment very interesting and challenging. In 1st few trials I find the puzzle very difficult but further when I am able to find the logic, it was very interestingly. Firstly, when I am not getting any logic, I thought that, I will not be able to arrange it.

But then I tried to focus. I focused on the colours and edges of the blocks presented in front of me. First I tried to arrange base first and then according to that I tried to arrange remaining puzzle. In 4th trial, I get the logic of the puzzle, so from that trial onwards it is easy for me to arrange puzzle. In last trial, I am very conscious about the time, I want to arrange puzzle as fast as I can. In overall trials, I used logic of edges and colour of blocks to solve this puzzle.

— References :-

✓ Matlin, M (1994) Cognitive process, London
~~Stenberg~~ ^{missi, mitor}

✗

Name: Madhura Vivek Pawar Expt. No. _____

Class: MA.7 Roll No. 1865120

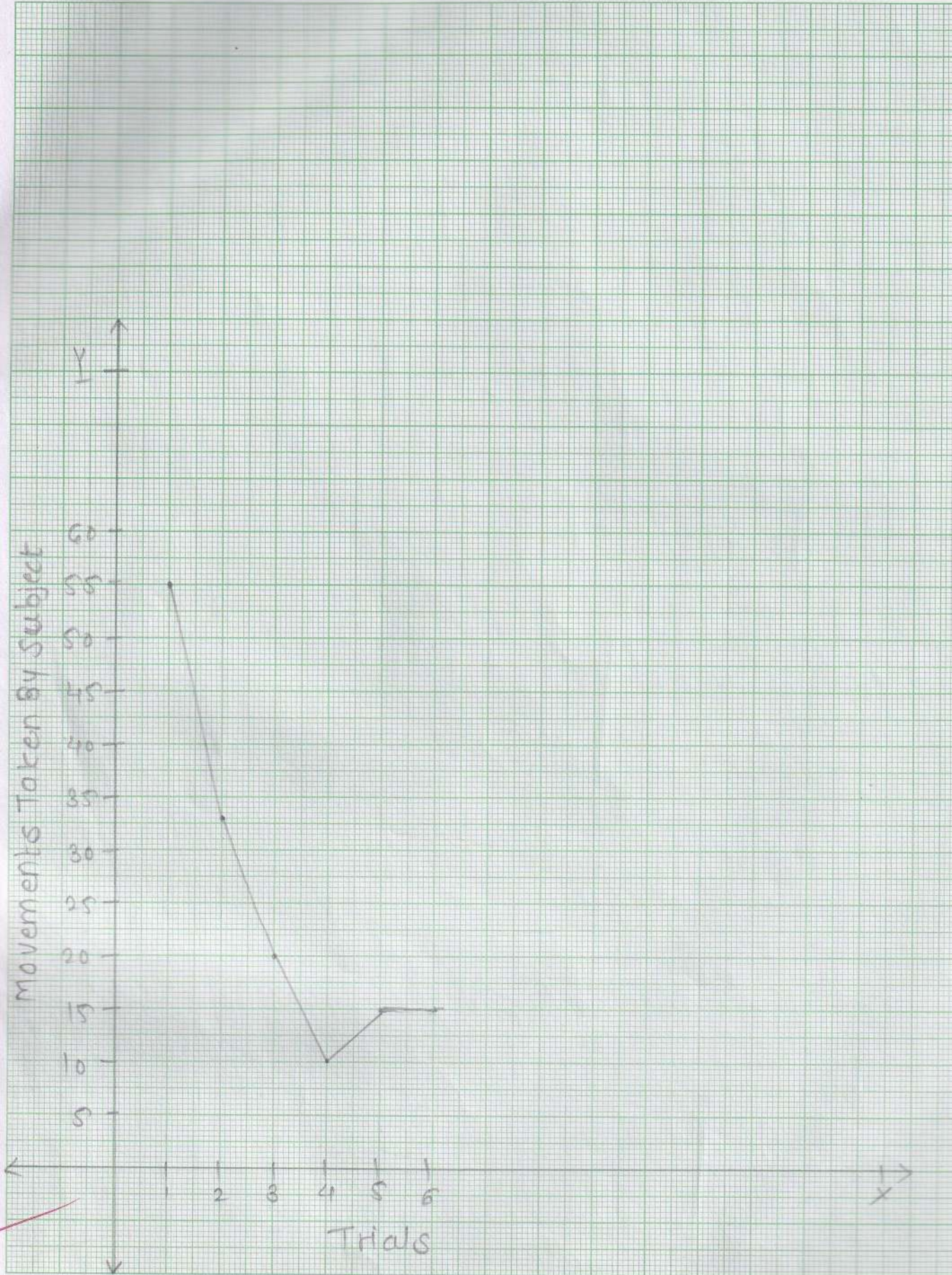
Title of the Graph: Graph showing no. of movements per trial

Origin = (_____)

Slope = _____

Scale
on x - axis, 1 cm = 1 trial
on y - axis, 1 cm = 5 movements

Intercept
on x - axis = _____
on y - axis = _____



Name : Madhura Vivek Pawar

Expt. No. : _____

Class : MA-J Roll No. : 1865120

Title of the Graph : Graph showing time taken Per trial.

Origin = ()

Slope = _____

Scale	
on x - axis, 1 cm = 1 trial	
on y - axis, 1 cm = 100 sec.	
Intercept	
on x - axis =	
on y - axis =	

