

How Many Steps
Does it Takes,
For a Cat to
Catch a Fish



Step ①



Little Kitty wants to catch a fish from the pond.

The problem is: How can I get the fish??



In Mawr's Levels of Analysis, this is Computational Theory — Identify what problem is being solve.

(Mawr, 1982)

Step ②



Little kitty started planning
in their little brain...

How should I get the fish?

- Mark one specific fish!
- Watch carefully!
- Catch!



In level 2 of Marr's, this is
Representation & Algorithm —
the strategies and steps used to solve
the problem

(Marr, 1982)

Step ③!!



Here goes the little kitty
observing the fish...



And here goes the little kitty
catching the fish!



Level 3 of Marr's Levels of Analysis is the final
step, which is called "Hardware Implement":

How are these steps implemented in physical or
biological hardware?

(Marr, 1982)

We might overlook this... 

In Step 2, it's not only about
breaking the problem into steps: 
it's also where the learning process
happens. 

Level 2 of Mowr's Levels of Analysis, called
Representation & Algorithm, is about learning
the strategies for solving the problem.   

The Kitty learns through Operant Conditioning:
Trial and error, reinforced by food rewards.





(Skinner, 1938)

In fact!

Scientists had shown long ago that cats can learn through Operant Conditioning!!

Thorndike's Puzzle Box (1898):

Cats were placed inside a box with a latch. At first, they tried random actions (scratching, meowing, pawing). Eventually, they discovered that pulling the latch opened the door to food outside. Over repeated trials, the cats escaped faster and faster.

This demonstrated Operant Conditioning:

Successful behaviors reinforced by rewards are repeated.



Thank You for Reading!

Marr, 1982:

Marr's Levels of Analysis

Skinner, 1938:

Operant Conditioning

Thorndike, 1898:

Cats in Puzzle Box

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