

Thinking

COGNITIVE PSYCHOLOGY

Thinking

- **Cognition** – mental activities associated with thinking, knowing, remembering, and communicating.

Convergent Thinking - systematic and logical attempt to reach a specific goal or answer.

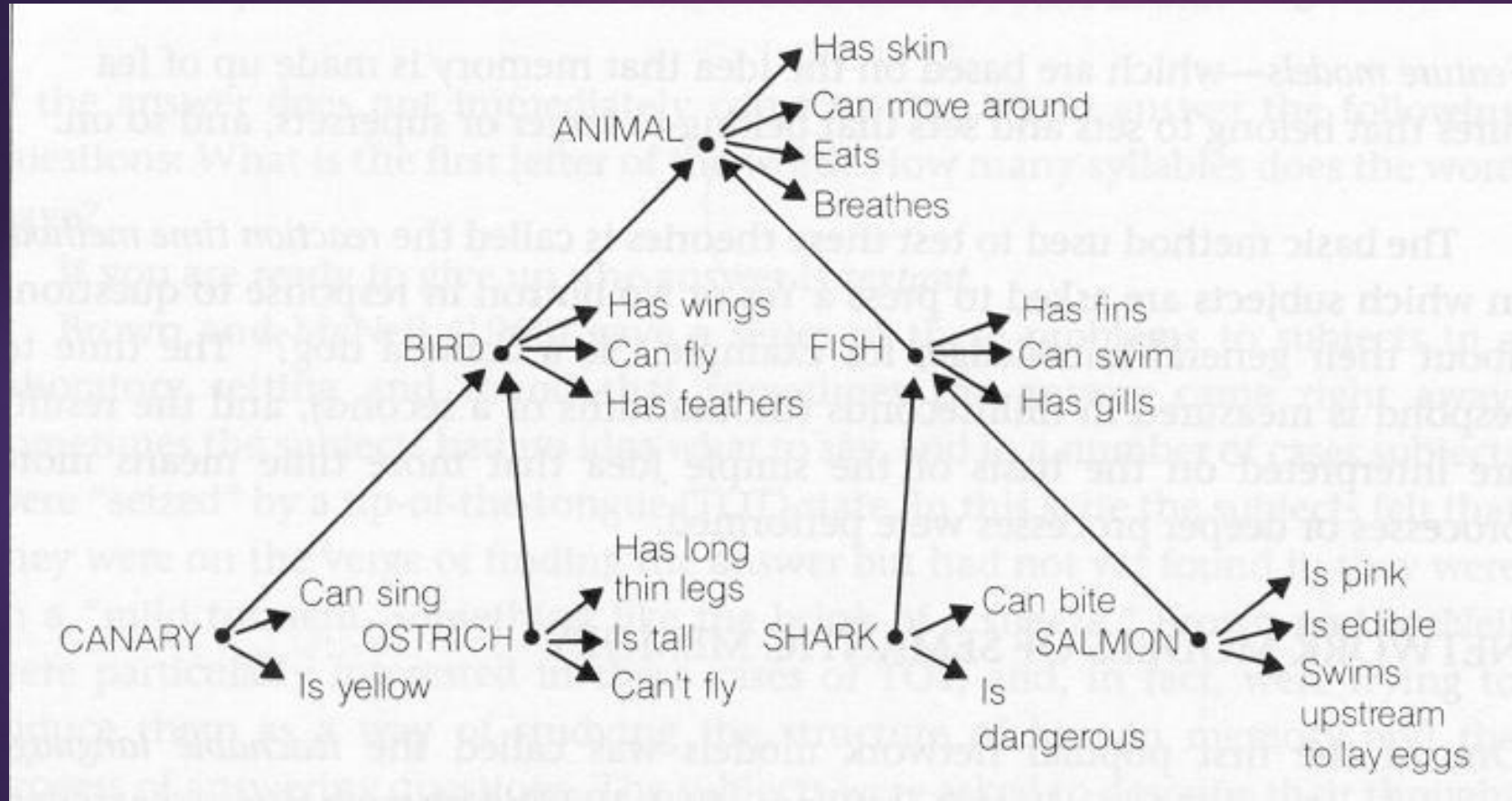
Divergent thinking - free flowing thoughts with no particular pattern, “thinking outside the box”.

Organizing Information

- **Concept** – mental grouping of similar objects, events, ideas, or people.
 - **Prototype** – a “typical” member of a category, one that has most of the defining features of that category
 - **Semantic Network** – arrangement of concepts that represents relations between different pieces of information and different concepts.



Semantic Networks



Problem Solving Strategies

- **Trial and Error**

- A problem-solving strategy in which several solutions are attempted until one is found that works.

- **Algorithm**

- A problem-solving procedure that is guaranteed to give a solution
- Used often in mathematics and computer programming

- **Heuristic**

- A mental shortcut that allows one to make judgments that are quick but often produces errors

The Problem with Heuristics

i before e...
except when you
run a feisty heist on
a weird beige foreign
neighbour

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Types of Heuristics

1. Availability Heuristic

- relying on information that is more readily available

ex) News coverage on lottery winners

2. Representativeness Heuristic

- assuming that if something is similar to items in a certain category, it also belongs to that category

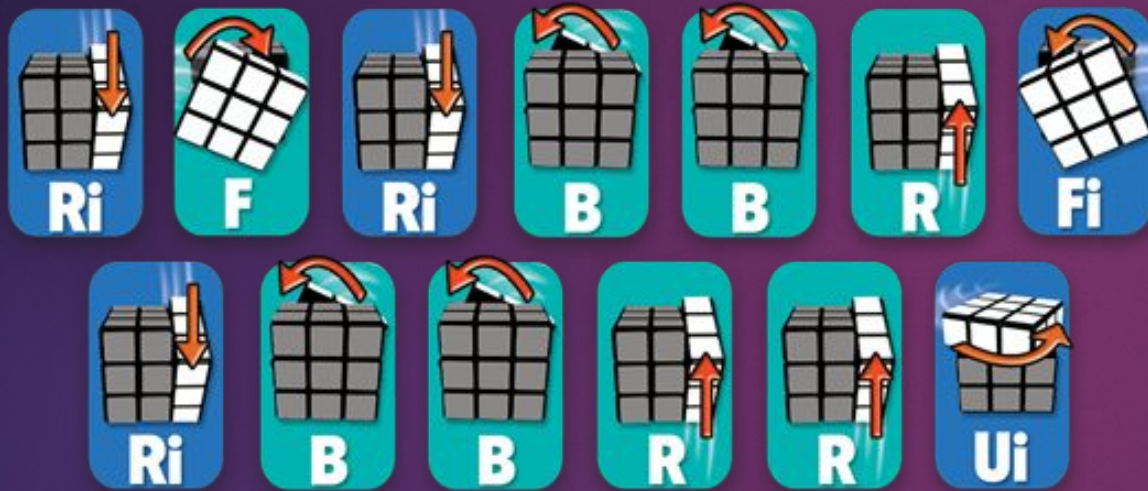
ex) Seeing a guy in a suit and fancy watch and assuming they are rich

3. Anchoring Heuristic

- making decisions based on ideas that are important to us

ex) My family are early risers so I believe that anyone who sleeps in past 8:00 am on a weekend is lazy.

Using Algorithms

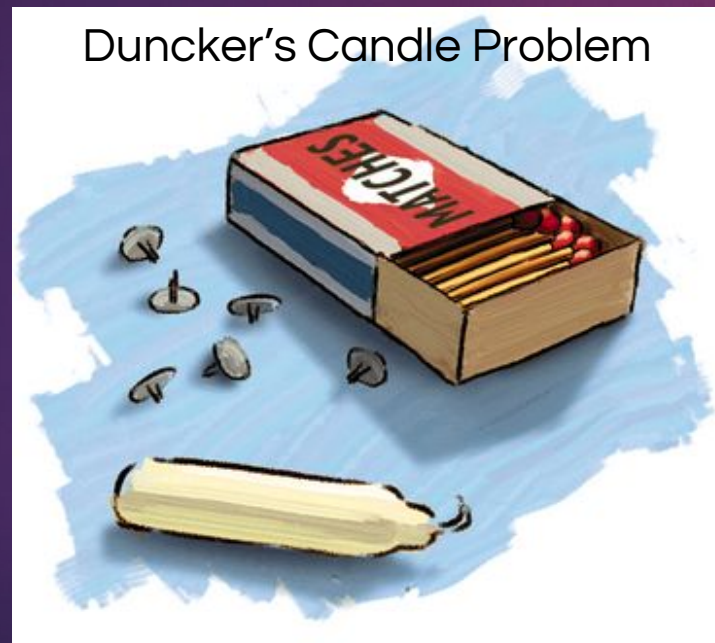


Errors in Problem Solving

- Fixation
- Mental Set
- Confirmation Bias
- Belief Perseverance

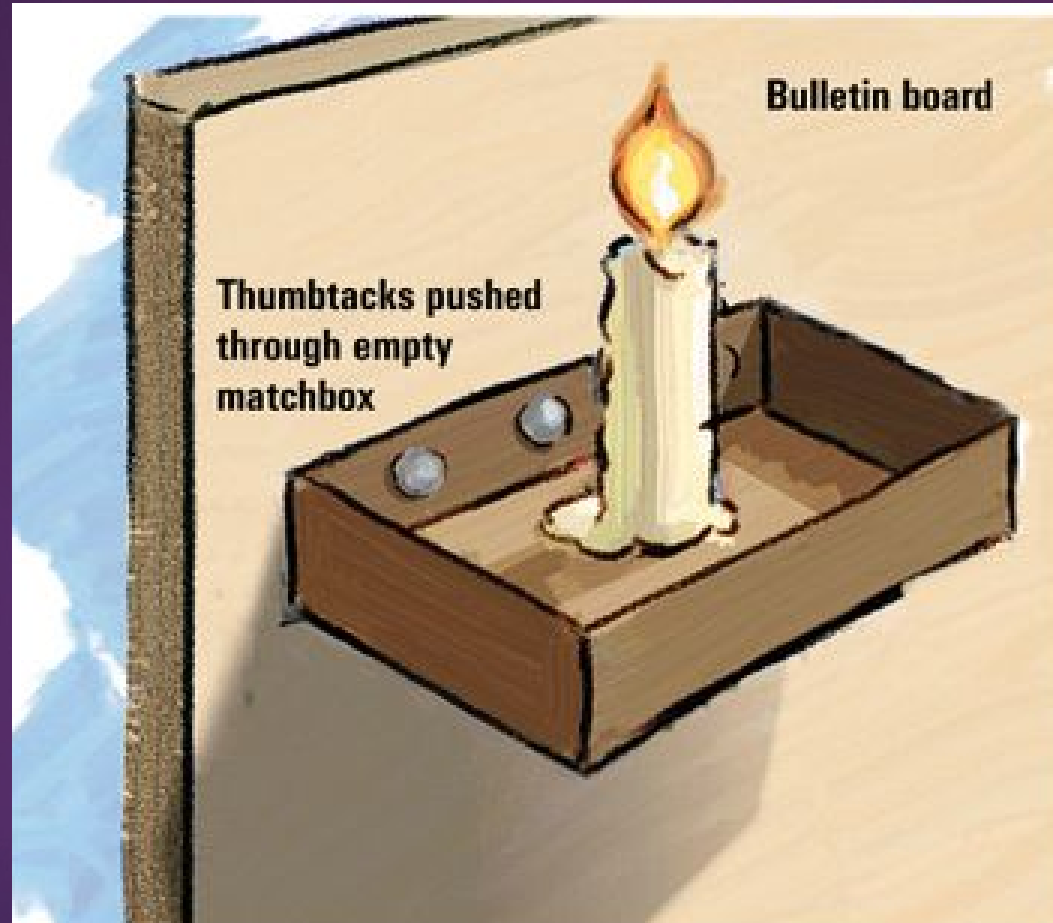
Functional Fixedness

- **Fixation:** inability to see a problem from a new perspective
- **Functional Fixedness:** Tendency to think of objects only in terms of their usual functions

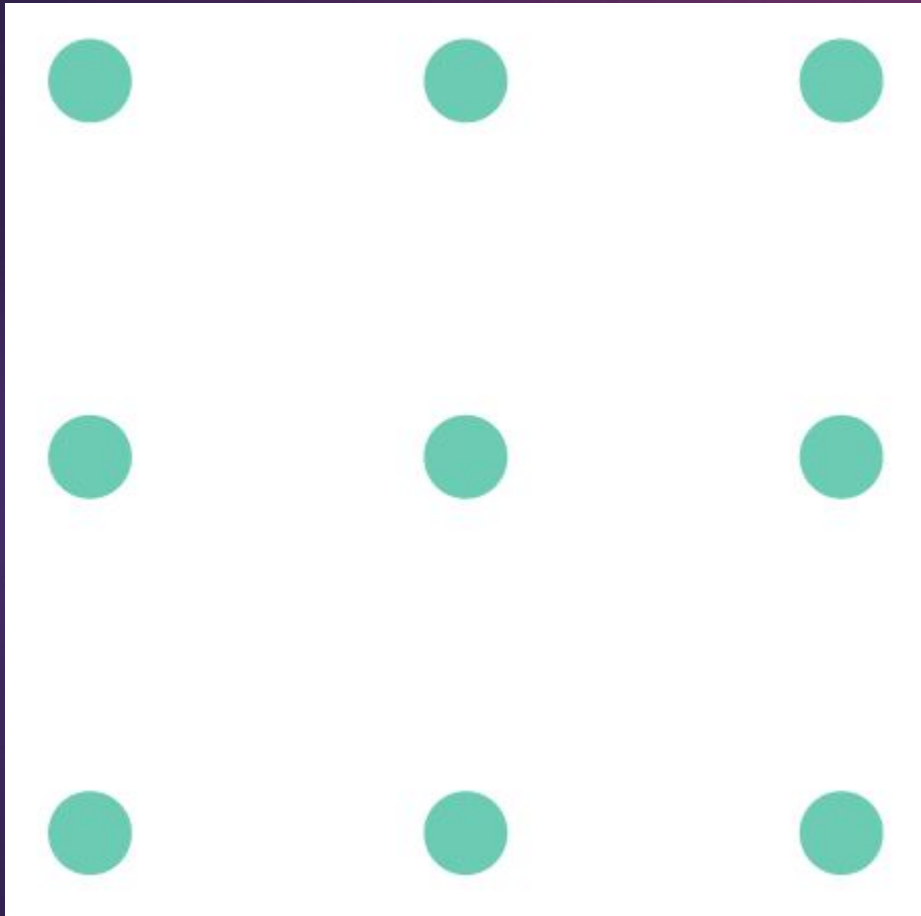


Using only the objects in the picture, how could you mount the candle to the wall?

Solution

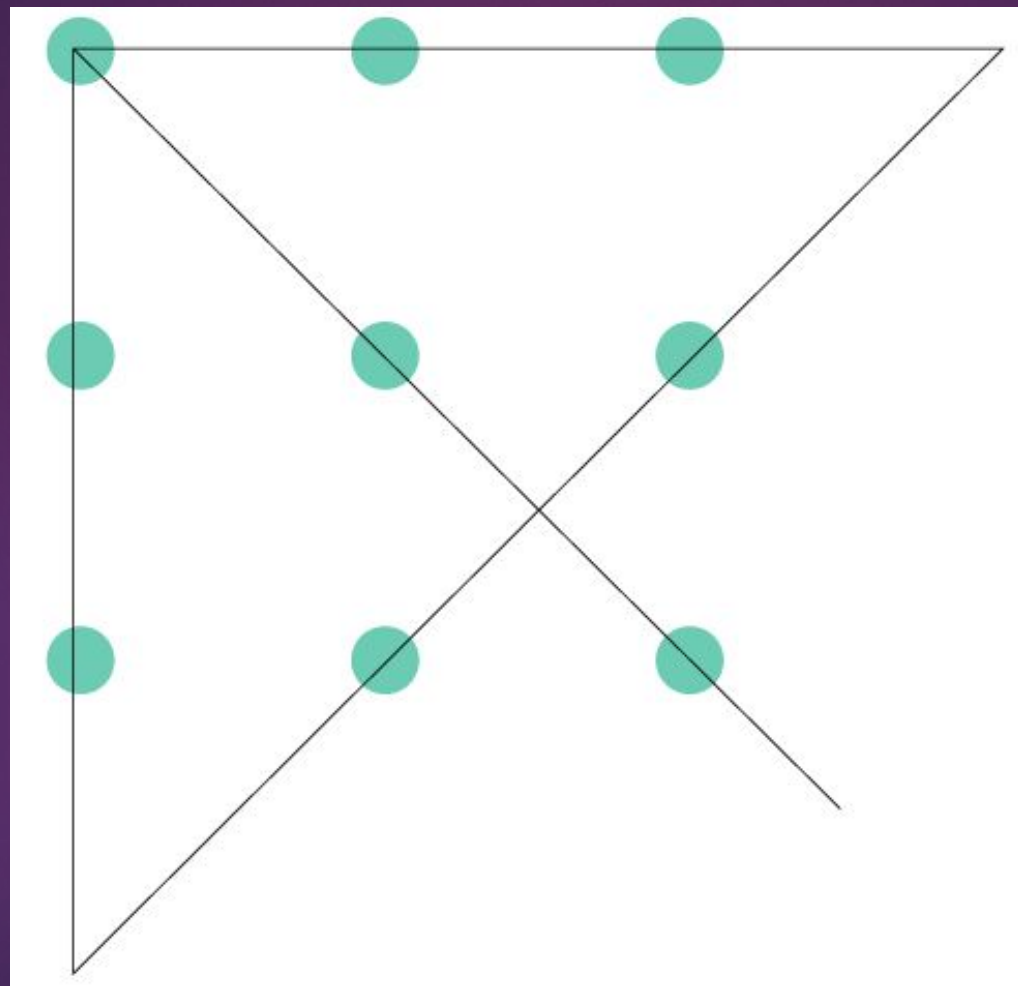


Fixation



- Connect all 9 dots
- Use only 4 lines
- Do not lift your pencil from the page after you begin drawing

Solution



Mental Set

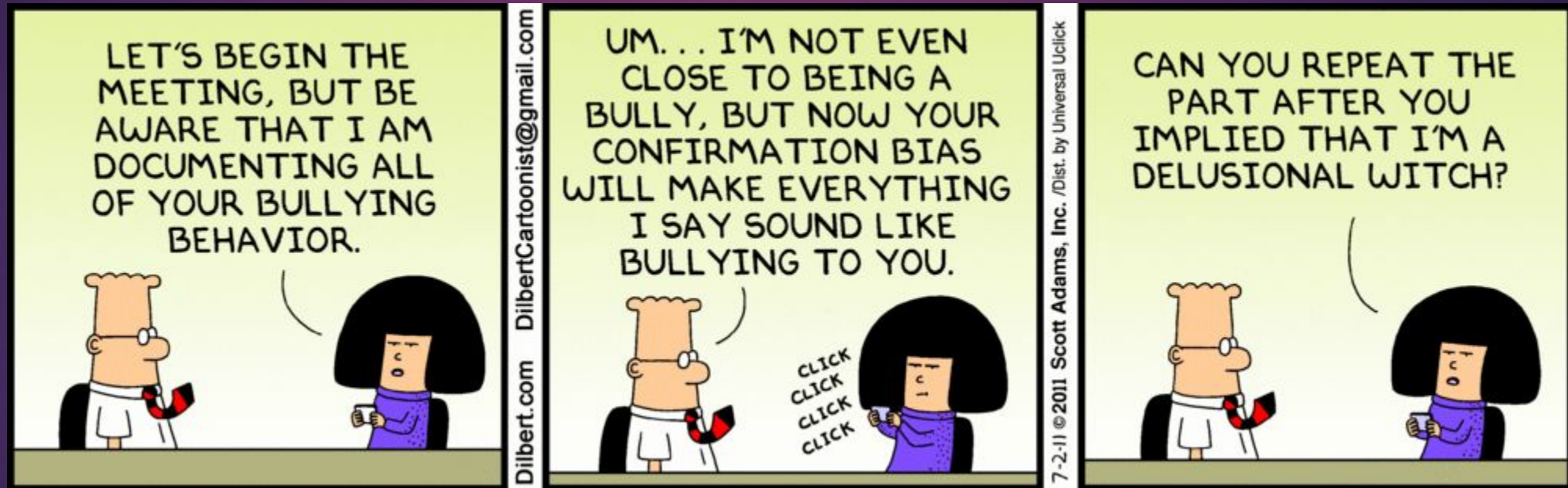
- Tendency to return to a problem-solving strategy that worked in the past
- May be effective at times but can create false assumptions

Examples

- A child asking for a band aid when they get a bruise or fall down
- Study methods
- Q: There are six eggs in a basket. Six people take one of the eggs each. How is it that one egg can still be left in the basket?

Confirmation Bias

- Tendency to search only for evidence that supports one's own beliefs



Belief Perseverance

- Tendency to cling to beliefs even after they have been discredited.
- Examples of belief perseverance:
 - Believing you are a good driver after several traffic tickets
 - First impressions

Creative Thinking

Creativity: the capacity to use information and/or abilities in new and original ways.

Psychologists don't know why some people think more creatively than others but they have identified some characteristics of creative thinking:

1. **Flexibility**
 - the ability to overcome rigid or one way thinking
2. **Recombination**
 - rearranging the elements of a problem to arrive at an original solution
3. **Insight**
 - sudden emergence of a solution by a recombining of elements

Test your creativity

Arrange six matches so that they form four equilateral triangles.

A man and his two sons want to get across a river. The boat they have available can hold a max of 200 pounds. The father weighs 200 pounds and the sons weigh 100 pounds each. How can all three people cross the river?

Are schools killing creativity?



Discuss

1. He says that children have an extraordinary capacity for innovation. Do you agree or disagree? Support with examples.
2. Do you agree that creativity is as important as literacy? Why?
3. If you're not prepared to be wrong, you'll never come up with something original. Do schools instill a fear of being wrong? If so, how can we fix this?