



## LESSON PLAN: Mind-Boggle

**Topic:** Memory

**Subject | Stream:**

Science

Psychology

**Grade Level:**

Intermediate | Grades 7-10

**Objective(s):**

- To learn about memory and recall.
- To identify how memory consolidation is impacted by brain tumours or chemotherapy.
- To recognize the effect on short-term memory due to the presence or absence of a distractor

**Brief Summary:**

Participants will learn the impact that brain tumours, chemotherapy, radiation have on memory consolidation.

In Part A of the activity, participants will mimic control settings – when the brain is functioning normally.

With the second scenario, Part B, participants will mimic experimental settings – when the brain is impacted by any of the aforementioned.

A distractor activity, performed in Part B, demonstrates how the brain's performance weakens when it is faced with a barrier.

Scores will be recorded after each part of the activity.

Comparatively, Part B scores should be lower than Part A as interference from a distractor decreases memory consolidation. Likewise, individuals with a normally functioning brain will have better memory consolidation than those without as they are faced with fewer interferences.





## Background Information:

Brain tumours impact the brain in several ways, depending on its location. Often, brain tumours impact memory formation and memory consolidation.

**Memory** is the process of storing experiences in the brain and recalling them later. People use their memories during every moment of their lives. They must remember words and ideas to speak or to write.

As wonderful as memory is, it isn't always perfect. It's normal to occasionally forget the name of somebody you just met or where you put your shoes. And of course, everyone has forgotten an answer on a test.

At any age, an injury to the head and brain can cause trouble with somebody's memory. Some people who are diagnosed with a brain tumour may need to learn old things all over again, like how to talk or tie their shoes.

Individuals diagnosed with a brain tumour may develop either retrograde or anterograde amnesia; that is, individuals may have difficulty remembering events prior to the tumour (retrograde) or in making new memories (anterograde).

It's not only the brain tumour that can cause challenges with memory. Treatments from chemotherapy and radiation to the brain can cause someone to have challenges with their memory, which increases the effort required for brain tumour survivors to recall memories.

Also, when someone has a disease in their brain or some type of injury to their brain, they may have difficulties with recognition as well (recognizes items or people) and may have difficulties with concentration in environments that have too much noise or distractions.

## Resources | Materials Required per Pair:

- 30 small objects  
(15 objects for Part A & 15 different objects for Part B)
- 5 cubes or items that are different colours.
- 1 tray
- Pen and paper
- A timer





## Activity Instructions:

### *Part A: Control*

Step 1: Assemble participants into pairs. Assign one individual to be the Moderator, and the other to be the Examinee.

Step 2: On a tray, Moderators are to collect 15 random objects and place them on the tray. At the same time, Examinees are to have their eyes closed such that they are not watching the Moderator.

Step 3: Upon cue by their Moderator (such as tapping the shoulder), Examinees are to open their eyes and view the items on the Moderator's tray.

Step 4: Examinees are given one minute, which will be set on a timer, to try and memorize as many of the tray's objects as they can.

Step 5: After one minute, Moderators are to place the tray away from their Examinee's sight, such as under the table.

Step 6: Examinees are now given five minutes, as set on the Moderator's timer, to list all the objects on the tray to the best of their ability.

Step 7: Once completed, Moderators must write down their Examinee's score of how many items were correctly recalled.

### *Part B: Experimental*

Step 1: Repeat Steps 2 and 4 from Part A, using the same sets of pairs. However, Moderators should collect 15 new objects (ones that were not used before) to be placed onto their trays.

Step 2: Following the minute of memorization, Moderators are to place the tray out of their Examinee's sight, such as under the table.





**Examinees will now be presented with the distractor activity.**

Step 3: Moderators are to obtain five identical cubes and place them on their table.

Step 4: Moderators are to tap the five cubes or items in any random order. Examinees must repeat the pattern once the Moderators are done. The game “Simon” could also be used for this part of the activity. The goal is to provide a distraction to the Examinee before recalling the list of objects on the tray)

- Repeat this step two more times, each time with a different pattern from the Moderator.

Step 5: Moderators must now ask Examinees to list all the objects that were placed on the tray earlier in this part of the experiment.

Step 6: The total number of correct responses will be recorded and compared to the score obtained at the end of Part A.

Step 7: Compare the scores from Part A and Part B. Did the Examinee do better in the first round? What difficulties did the Examinee have with recall? How did it make them feel?

