

# HOW TO TEASE YOUR STUDENTS' BRAINS

*by David Chau*

Question: Forwards, I am heavy; backwards, I am not. I'll give you a minute to think about it. Did you get it? Are you curious about the answer? Like many teachers I always start off a class with a warm-up--a question to get my students thinking. I often use riddles, logic problems, and other types of brain teasers that encourage students to look at things differently. Have you been thinking about the question? The answer is "ton".

Using brain teasers as stimulation works because the brain is elastic. What we now know as neuroplasticity allows the brain to reorganize itself through its own brain activity. According to Stanford University, "brain workouts help the brain reorganize connections more quickly and stimulate reorganization when the brain is not capable of reorganizing on its own." [1] In this way brain teasers help my students, who are newcomers to Ontario, to adapt to the stimuli of a new environment by breaking down the fossilized areas of their brains, which may be inhibiting their language skills or cultural integration. Perhaps, by examining various questions that target different areas of the brain, including those used in logic, reasoning, semantics, or visual perception, the brain can overcome barriers to its transformation in order to facilitate second language learning. Indeed, a study at UCLA showed that when participants underwent cognitive training, they had an "improvement in both immediate and delayed memory skills, as well as language skills." [2]

In class, the best brain teasers are the ones that are easy for even beginner level ESL learners to understand, yet cognitively complex. The answer may seem elusive at first, or the question itself may not make sense, yet the answer, once revealed, elicits a "Why didn't I think of that?" reaction. One Japanese student I had always held her head in her hands and made a slight shake every time I revealed the answer, as if her brain had suddenly grown a new lobe. None of my questions require advanced degrees in either science or math. In fact, paradoxically enough, it is often the scientists and economists with advanced degrees who seem to have the most difficulty as they try to apply their algorithms and formulae in figuring out a problem that requires no more than using grade one math or looking at the question in a different way.

The following is a list of types of brain teasers, what students can learn from each one, and an example for each. Can you solve them? Answers are given at the end.

**Gender Stereotyping:** Many of my students come from rigid patriarchal societies where women may not have the same rights as men. These brain teasers help students understand that in Canada, their freedoms are not restricted by their gender.

1. *A boy was rushed to the hospital emergency room. The ER doctor saw the boy and said, "I cannot operate on this boy. He is my son." But the doctor was not the boy's father. How could that be?[3]*

**Semantics:** With these types of questions, it is essential to understand that words or expressions can have different meanings in different contexts.

2. *A clerk at a butcher shop stands five feet ten inches tall and wears size 13 sneakers. What does he weigh?[4]*

**Misperception:** To solve these types of questions, students must question their own assumptions--assumptions that perhaps make the questions more difficult than they actually are. I always ask my students what they picture in their heads and how that picture could be different. I ask them to think (and see) outside the box.

3. *A bus driver was heading down a street. He went right past a stop sign without stopping, he turned left where there was a "no left turn" sign, and he went the wrong way on a one-way street. Then he went on the left side of the road past a cop car. Still - he didn't break any traffic laws. Why not?[5]*

**Logic:** Western civilization and culture have been influenced by classical traditions of logic and reasoning. By demanding logic, these questions can help our students become better critical thinkers who can reason through deceptive arguments.

4. *Three boxes are all labeled incorrectly, and you must get the labels right. The labels on the boxes read as follows:*

*[box 1] nails*

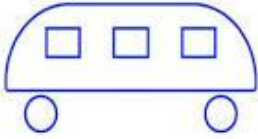
*[box 2] screws*

*[box 3] nails and screws*

*To gain the information you need to move the labels to the correct boxes, you may remove a single item from one of the boxes. You may not look into the boxes, or pick them up and shake them, etc. Can this be done? If so, how? If not, why not? [6]*

**Visual and Tactile Perception:** These questions are a thrill for the visual or tactile learner and can be a nice break from grammar and text-focused lessons, yet they are no less complex than the previous questions.

5)



*Which way is the bus going? Left or right?[7]*

6) *If you had an infinite supply of water and a 5-litre and 3-litre bucket, how would you measure exactly 4 litres?[8]*

Another advantage of using these brain teasers is that it gets the students involved. And in the end, it is not the final answer that should be the main goal, but rather the process of getting to the answer--verbalizing and reasoning, listening to various perspectives, working together with other classmates as a team to fulfill a singular objective. A brain teaser is able to accomplish all of the learning objectives that we have as ESL teachers.

The “warm-up” has become a staple in my classroom and, before the lesson of the day, as the students get settled into their seats, they eagerly anticipate the question. In my class evaluation following the course, it is often the brain teasers that the students have the most interest in. Every term, there are always one or two students who wish the whole class involved just brain teasers.

These days, employers are looking for people who think outside the box and can give creative and innovative solutions. Our students already have the advantage of coming from a different culture and speaking another language. Brain teasers are not only great for studying English and Canadian culture, but they are also a fun way for students and teachers to interact, while preparing them for the workplace.

### ***Answers***

1. The doctor is the boy’s mother, of course!
2. What does a butcher do? He weighs meat.
3. How did you envision the driver? Walking or driving?

4. The key to this question is that ALL the labels are wrong. So if you pick a nail out of the nails and screws box [Box 3], what does that box have to contain? Nails, of course. And if Box 3 contains nails, then Box 1 must be screws and Box 2 must be nails. Voilà!
5. School children do better on this one than adults. Where's the door? Can't see it? It must be on the other side. So which direction is the bus traveling?
6. Try this on your own, working it out step by step. If you're stuck, you can ask your students.

***Is your brain itching for more brain teasers? You can check out these sites:***

<http://brainden.com/>

<http://kids.niehs.nih.gov/games/riddles/index.htm>

<http://www.braingle.com/index.php>

### ***References***

- [1] Hammond, K. (2010). Neuroplasticity. Stanford University. Retrieved from <http://www.stanford.edu/group/hopes/cgi-bin/wordpress/2010/06/neuroplasticity/#strategies-for-promoting-brain-reorganization>
- [2] Woollaston, V. (2013, June 26). Proof that brain training games DO boost memory and language skills in older people. Daily Mail. Retrieved from <http://www.dailymail.co.uk/sciencetech/article-2348721/Proof-brain-training-games-DO-boost-memory-language-skills-older-people.html#ixzz33sCs9TTL>
- [3] <http://www.squiglyplayhouse.com/BrainTeasers/CleverBrainTeasers.html>
- [4] <http://www.forbes.com/sites/work-in-progress/2012/05/15/10-brainteasers-to-test-your-mental-sharpness/>
- [5] <http://justriddles.blogspot.ca/>
- [6] <http://brainden.com/forum/index.php/topic/484-truth-in-packaging/>
- [7] <http://sharpbrains.com/blog/2007/02/24/exercise-your-brains-visual-logic-brain-teaser/>
- [8] <http://puzzles.nigelcoldwell.co.uk/twentytwo.htm>