Key Stage 4 – Alcohol and the adolescent brain

Notes for teachers

At a glance

Adults drink more frequently than adolescents, but when adolescents drink they tend to drink larger quantities. There is evidence to suggest that the adolescent brain responds to alcohol differently from the adult brain. Scientists at the University of Oxford are researching into changes that take place in the adolescent brain, which could be used to explain these differences.

In this activity students will learn about how alcohol affects the brain and why heavy drinking in adolescence can lead to permanent brain damage.

Learning Outcomes

- Students learn how the brain changes during adolescence
- Students learn how alcohol affects the adolescent brain
- Students use scientific evidence to create a social media campaign

Each group of students will need

- Copy of student worksheet page 1
- Copy of student worksheet page 2

http://www.oxfordsparks.ox.ac.uk/content/brain-development-teenagers
Possible Lesson Activities

1. Starter activity
   - Give each student a post-it note. Ask them to write down one effect of drinking alcohol and stick the note to the board.
   - With the class's help, select the effects that are caused by alcohol's effect on the brain. Some examples of effects might be tiredness, loss of inhibitions, risk taking, slower reactions.
   - Show the class the animation 'Under Construction: Alcohol and the Teenage Brain' from the weblinks below. This is a good explanation of how alcohol effects different regions of the brain and introduces the fact that adolescent brains (ages 12-25) are more at risk from the effects of alcohol than mature brains.

2. Main activity: Designing the campaign
   - Play the animation ‘Brain Development in Teenagers’. Discuss with the class what changes are happening in the adolescent brain. Encourage students to ask any questions of things they don't understand or want to discuss further. Make sure students understand what is meant by neural strengthening and pruning.
   - Sort the class into groups of 3. Give each group a copy of page 1 of the student worksheet and ask them to read through it. Discuss the task they have been set, to design images for social media on the dangers of drinking alcohol on the adolescent brain.
   - Ask the class to suggest some permanent effects of heavy alcohol drinking in adolescence.
     - Memory and learning problems because of damage to the hippocampus.
     - Difficulty with planning, judgement, decision making and impulse control because of damage to the prefrontal lobe.
   - Give each group of students a copy of page 2 of the student worksheet. Explain that this contains information about the effects of heavy drinking on the adolescent brain. Only some of the information can be classed as scientific evidence. They should choose the information for their images from what they think are the most reliable sources.
     - Information card A: This is evidence from a scientific study so is reliable.
     - Information card B: This is evidence based on many scientific studies so is reliable.
     - Information card C: This is information from a professional person. However, it is only based on her experience so it not reliable evidence.
     - Information card D: This is information from a scientific study. However, it was carried out on rats and not humans. This affects its reliability.
     - Information card E: This is based on one person’s opinions so is not reliable evidence.
     - Information card F: This is evidence based on many scientific studies so is reliable.
   - Groups should design the three images for their campaign. This can be done on paper or digitally. Depending on time, this could be completed for homework.

3. Plenary
   - Ask groups to present their campaign to the rest of the class. The campaigns could be peer assessed based on the criteria on page 1 of the student worksheet.
   - Initiate a discussion with the class: Based on the evidence they have read, do they think the legal drinking age in the UK should be raised from 18? They might be interested to learn that in some countries the age is just 16, and in some regions in India it is 25. They should be able

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to justify their opinions using evidence to support it, whether they are for or against a change.

Weblinks

http://www.oxfordsparks.ox.ac.uk/content/brain-development-teenagers

Brain Development in Teenagers animation

https://www.youtube.com/watch?v=g2gVzVlBc_g

Under Construction: Alcohol and the Teenage Brain


Further information on alcohol on the developing brain

http://www.oxfordsparks.ox.ac.uk/content/brain-development-teenagers