Key Stage 4

Alcohol and the adolescent brain

Student worksheet

How the brain changes during adolescence

Adolescence is the period where a child matures into an adult, around the age of 12-25.

During adolescence, different areas of the brain are developing at different rates. The parts of the brain involved in emotional responses develop first, while those involved in keeping emotional, impulsive responses in check take longer to mature fully. Such imbalances might be the reason why teenagers have an appetite for new experiences but may also act on impulse, without regarding risk.

The effects of alcohol

Alcohol acts on the neurones in the brain and disrupts the communication between them and other cells of the body.

Scientific studies have provided evidence that drinking alcohol during the period of brain development in adolescence can have permanent effects.

There are two areas of the brain that are particularly sensitive to alcohol during this period.

Hippocampus - responsible for memory and learning.

Alcohol can cause neurones in this area to become damaged.

Prefrontal lobe - the front part of the cerebral cortex and the last area to develop. It is important for planning, judgement, decision making, impulse control and language.

This area of the brain changes the most during adolescence and is vulnerable to the effects of alcohol during its development.

Your task

Work in a team to create three images highlighting the dangers of alcohol on the adolescent brain for a social media campaign.

They should:

- Target university students (ages 18-21).
- Be based on scientific evidence (not opinion).
- Contain a short amount of text. This should be short, concise and engaging so people read it and understand the message.

http://www.oxfordsparks.ox.ac.uk/content/brain-development-teenagers
### Key Stage 4

**Alcohol and the adolescent brain**

**Information cards**

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<th>A</th>
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<td><strong>A</strong> Scientists carried out memory tests on two groups of adolescents. The group that drank heavily performed worse on the tests than the control group (who did not drink).</td>
<td><strong>B</strong> Studies of adolescents show that heavy and extended alcohol use is associated with a 10% reduction in the size of the hippocampus.</td>
<td><strong>C</strong> Dr Hawkins is a psychologist working at a university. She talks to many students that drink heavily and has noticed that some of them make bad decisions in their lives.</td>
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<td><strong>D</strong> Scientists gave adolescent and adult rats alcohol, the equivalent of a four-day alcoholic binge. They then removed their brains and studied them. All the rats showed some areas where neurones had died, but the damage was at least twice as severe in the adolescent rats, and it occurred in some areas that were entirely healthy in the adults.</td>
<td><strong>E</strong> Alyssia is a 20 year old university student. She has been binge drinking at weekends since she was 17. She is finding it difficult to concentrate during her lectures and remembering information.</td>
<td><strong>F</strong> Research with heavy drinking adolescents shows that these young people have smaller prefrontal lobes than young people of the same age who do not drink.</td>
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