

GUIDELINE Science Workshop:

Why so distracted?

***Put yourself in the shoes
of ADHD individuals***



supported by the
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Luxembourg
National
Research Fund

General Information:

With this guideline we want to enable teachers and other scientists to carry out this science workshop about ADHD (attention deficit hyperactivity disorder) with their classes or visitors. More information about this neurological condition can be found on the next pages.

This workshop can be included in the teaching of neurobiology or learning as well as a way to encourage diversity and inclusion.

This is only a guideline. Use this instruction as a guideline only, feel free to adapt, extend, shorten!

You don't need to know everything. Maybe you're thinking: I don't know enough about the topic and may not be able to answer questions. So what? Nobody knows all the answers. Find them out together with your kids/students/workshop participants!

Share your feedback with us. How did it go? Anything that we can improve? Anything you changed? Let us know by [writing us an email](mailto:descom@uni.lu) (descom@uni.lu)!

We would also be interested to receive more detailed feedback from you and keep you informed about our offers. If you're interested, please drop us an e-mail so that we can contact you.

You can see pictures of this workshop carried out at a lycée in Luxembourg in [this news article](#).

Workshop Title:

Why so distracted? - *Put yourself in the shoes of ADHD individuals*

developed by Angélica Mendes and Félicia Jeanelle

What is the workshop about?

Put yourself in the shoes of people with attention deficit hyperactivity disorder (ADHD) to better understand their daily challenges. The workshop starts with a short interactive introduction to the topic (What is ADHD? How does it manifest? What is happening inside the brain?) including three questions designed to stimulate discussions. Afterwards two tests will simulate two conditions common for individuals affected by ADHD: overstimulation and hyperfocus.

#ADHD #neurobiology #neurodiverse #overstimulation #attention

Learning(s):

- Basics of ADHD (symptoms, neurobiology, demographics)
- Understanding of daily challenges of people with ADHD

Target Audience:

This workshop is suitable for a group of up to 25 people with **at least 15 years of age**. It is recommended to have at least 3 participants, but the workshop could also be performed with just one participant.

Materials needed:

- Loud speaker and music
- Smelly spray or strong perfume
- Earplugs

Optional:

- Second loudspeaker playing an audio of people arguing
- [Presentation slides](#)
- Torch
- [Science comic story about ADHD](#) from the third volume of LUX:plorations ([available for free in English, French, German, Luxembourgish and Portuguese](#))

Duration:

45 minutes

Introduction:

Individuals diagnosed with attention deficit hyperactivity disorder (ADHD) often stand out due to their inability to focus or their forgetfulness. They can also be hyperactive, impulsive or emotionally dysregulated. But actually, these are only some of the symptoms these neurodiverse persons can have. Their brains process information differently compared to neurotypical persons. This can lead to several problems or challenges in everyday life. To better understand these, this workshop aims at putting participants in the shoes of people with ADHD.

Workshop Description:

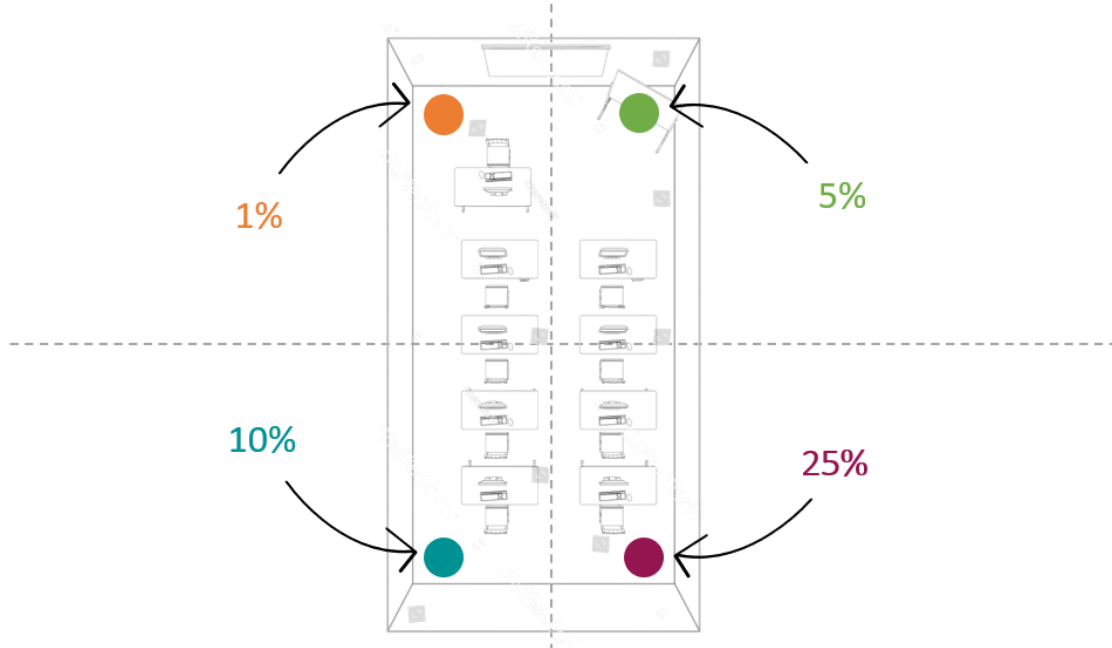
Part I:

The workshop starts with an introduction into the topic. If you have not informed the participants about the workshop topic yet, you could start by asking them what those famous people have in common: Simone Biles, Bill Gates and Jim Carrey¹. All of them were diagnosed with ADHD.

Ask your group what they know about ADHD. Can they describe it?

Now you follow up by asking participants 3 questions with 4 possible answers (each marked with a different color) respectively. Participants should answer them by positioning themselves in the respective corner of the room that represents the answer they choose. Example:

What is the prevalence of ADHD in Luxembourg (≤ 18 years old)?



¹ You could also choose Michael Phelps, Walt Disney or Albert Einstein, although the latter were not tested officially. You could also use characters from pop culture like Barney Stinson from *How I Met Your Mother* or Phil Dunphy from *Modern Family*

You might want to inform participants that it is ok if they do not know anything about ADHD. They can take a guess and the correct answers will be discussed together.

As workshop leader you can either:

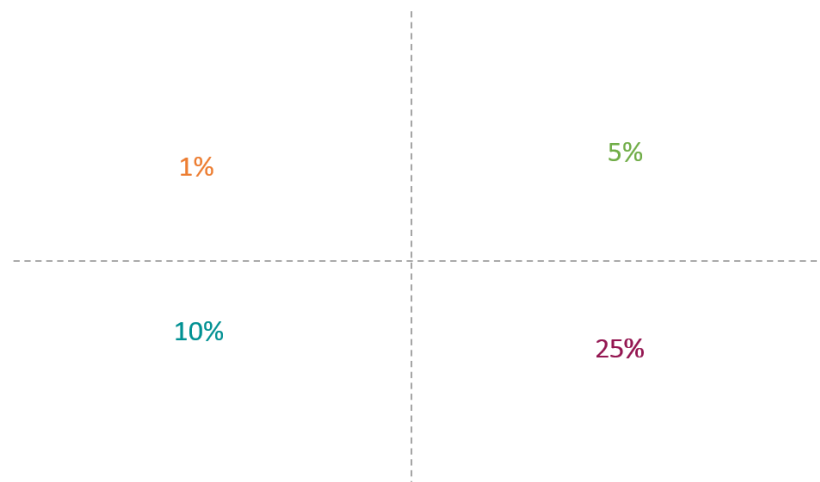
- collect answers to all 3 questions and then answer all of them after each other OR you can
- explain the correct answer after each question

Depending on your target audience one or the other approach is better suited, both have their pros and cons. You might ask yourself: Can they listen while standing in groups? Can they easily switch from discussion to listening? Can they listen for a longer period of time?

Note: Making people move and stand in groups is desired to support small discussions with people they might not talk to usually. Depending on the target audience this Q&A part could also be done via standard or online voting.

Question 1:

How many people in Luxembourg have been diagnosed with ADHD?



Answer:

5-6% people under 18 years of age are diagnosed with ADHD in Luxembourg². For adults the prevalence is 3-4%. On average, 1-2 pupils per class are affected³. As you can see, it has a high prevalence, for which it is important to understand how these individuals are affected.

² Source: official answer to the Luxembourgish ministries:
<https://men.public.lu/content/dam/men/fr/actualites/articles/questions-parlementaires/2021/11/211110-qp-5038.pdf>

³ Source: Interview with Cathy Mangen <https://today.rtl.lu/news/luxembourg/a/2121517.html>

Question 2:

Which of these is NOT a symptom of ADHD?

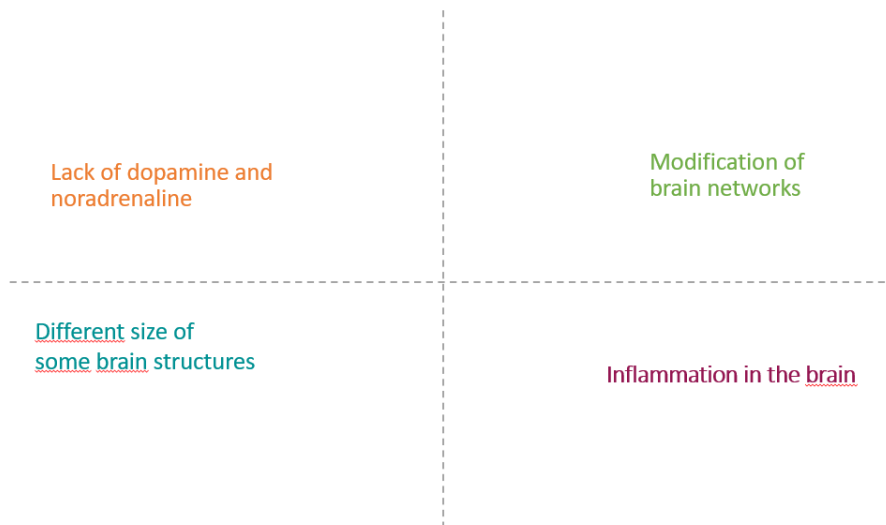


Answer:

Attention-deficit/hyperactivity disorder (ADHD) is a disorder characterized by a difficulty to sustain attention, hyperactivity-impulsivity, or a combination of both. Individuals with ADHD may struggle to resist impulses, follow directions, complete tasks and remain seated—among other signs and symptoms. However, they can also focus too much on one task/interest/activity, which is called hyperfocus. The symptom that is NOT involved in the disorder, is the “preference in avoiding social interaction”. This can be an individual difference, but it is not linked to the disorder.

Question 3:

What happens inside an ADHD brain?



Answer:

Most of you walked to the X option. Nevertheless, the correct answer is ALL OF THEM. This was a tricky question. ADHD is a multifactorial disorder, for which it cannot be explained only by one cause. There are

multiple events occurring in the brain that can cause these traits by changing brain function and structure. In addition, there are environmental factors⁴ like exposure to certain chemicals (even before birth) but also certain gene variations⁵ that make ADHD more likely. Nevertheless, one of the most studied is the lack of dopamine and noradrenaline⁶.

Do you know what dopamine and noradrenaline are?

They are so called neurotransmitters. Let's think of them as messengers inside your brain. In the right concentrations, they are responsible for filtering the information and making us able to focus. Dopamine and noradrenaline are in charge as well, of regulating emotions and inhibiting actions.

However, if we had less amount, it would be harder to filter the information that we are perceiving. Every sound, color, and smell around us would be noticeable. That would make it harder for us to focus on something in particular. As dopamine and noradrenaline are also needed to regulate emotions and inhibiting actions, a lack of those messengers makes it likely that we will be constantly on the move and act impulsively. This is one of the explanations of what is happening inside the brain of people with ADHD.

Part II:

Now the second part of the workshop starts: Two tests will simulate this overstimulation or hyperactivity state. For both of them participants of the workshop are asked to fill in a (math) test individually. Participants should try to answer as many questions correctly as possible. The test can be found in the annex.

Overstimulation Activity:

For the overstimulation activity the workshop leader disturbs the participants by stimulating their senses:

- Eyes: Light can be switched on and off constantly. Participants can also be disturbed by pointing a headlamp or torch at them. One can also wave at them to gesture.
- Ears: Loud music can be played while at the same time someone is speaking or arguing. Lots of unexpected and disturbing noise is helpful. On the contrary, playing only ONE song could even be motivating to some people that are used to studying while they listen to music.
- Nose: Spraying some room refresheners, strong perfume or even stinky spray can be used.

After 3 minutes you will end the test and ask them to form groups of 4-5 people to discuss how they felt during this activity, how they experienced it and what challenges they saw.

Hyperfocus Activity:

For the hyperfocus activity, you will again distribute a test and let them answer it without any disturbances. On the contrary, you will give them earplugs or the possibility to put on their own headphones. Again, end the test after 3 minutes and let them discuss.

⁴ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3277258/>

⁵ <https://www.sciencedirect.com/science/article/pii/S0012160617306887>

⁶ <https://www.sciencedirect.com/science/article/pii/S0006322311002605>

Conclusion:

When people with ADHD are really interested in something, they have the ability to hyperfocus. This is the exact opposite of the situation we experienced before. They are able to shut down every little noise, light, and smell that is outside this interesting thing they are doing. It's not clear yet, what exactly happens in the brain during this state. One explanation might be that the general lack of dopamine makes it hard to "shift gears" to take up tasks that are less interesting or boring. People with ADHD might also respond more strongly to anything interesting that causes a burst in dopamine. This burst could temporarily normalize their attention mechanisms, resulting in intense concentration. It is as if they are in a dark room with a lighter pointing to the thing they care about and it's the only thing they perceive.

You can end the workshop with a summary of the take-aways and what this means: It is important to understand that the brain of people with ADHD works differently than neurotypically developed brains, which can have its positive and negative aspects. We must support them and not pressure them when they are having difficulties. We should also promote an inclusive environment that allows them to contribute their unique perspectives and talents to our society.

If you'd like to end on a positive note you can show the famous people with ADHD again: Many scientists, writers, and artists with ADHD have had very successful careers, in large part because of their ability to focus on what they're doing for hours on end. The ability to hyperfocus could be regarded as the superpower of people with ADHD.

A pink speech bubble containing the text 'FAQ' in white capital letters.

FAQ

Why are so many people diagnosed with ADHD lately? Is it just a trend?

No, it's not a trend. It's a condition with a long history. People are more aware of ADHD and speaking more openly about mental problems nowadays, which might lead to a *perceived* increase of ADHD diagnosis.

Are boys more often diagnosed with ADHD?

Around 2/3 of people diagnosed with ADHD are male. It's not clear yet, why this is the case. It might be that girls are underdiagnosed, as they more often show a dreamer type and less hyperactivity.

Are adults also diagnosed with ADHD?

Yes, some people only learn that they have ADHD as adults.

What kind of therapies are offered for people with ADHD?

A multimodal approach is best to treat ADHD. Medication may be one way to alleviate the symptoms of ADHD. It helps by increasing the level of important chemicals in the brain. In the context of behavioral therapy, therapists can also help individuals develop the social, emotional, and planning skills that are lagging with ADHD. Although medication is not always needed, it may help in the beginning of therapy to alleviate the symptoms and thus make patients receptive for therapy.

Other resources:

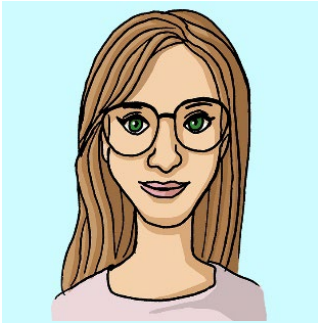
“[Why so distracted?](#)” science comic from the [LUX:plorations](#) series

[RTL Interview](#) (12 minutes, in Luxembourgish) with Cathy Mangen, Director of SCAP, speaking about the symptoms of ADHD and its treatment

[SCAP](#) = Service de Consultation et d'Aide pour troubles de l'Attention

[ADHD comics](#) and infographics made by Dani Donovan, a person affected by ADHD

The creators:



Félicia Jeannelle

Doctoral candidate at the [Laboratoire National de Santé](#) (LNS)

I'm 26 years old and come from France. After high school/lycée, I studied biology in Nancy and started to get interested in neurosciences. Now I'm working to better understand Alzheimer's and Parkinson's diseases.



Angélica Mendes

Doctoral candidate at the [Faculty of Humanities, Education and Social Sciences](#) (FHSE) from the University of Luxembourg

I am 28 years old and coming from Venezuela. I did my master's in neuropsychology and currently I am doing a Ph.D. in motivation and decision making in children. During my studies, I worked as a clinical psychologist where I had the opportunity to work with kids diagnosed with ADHD, from which I learned a lot about this disorder.

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This workshop was developed by Félicia Jeannelle and Angélica Mendes under supervision of Nadia Battello in the context of a DESCOM science communication training. This guideline and the associated presentation was written by Nicole Paschek, Project Manager of DESCOM, based on material shared by Félicia Jeannelle and Angélica Mendes.

This workshop is inspired by the science comic “[Why so distracted?](#)” from the [LUX:plorations](#) series. The comic’s artist is [Nadine Scholtes](#). Portraits have been drawn by [Andy Genen](#).

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APPENDIX: Math Test

Question 1.

$19 + \dots = 42$

- A. 23
- B. 61
- C. 0
- D. 42

Question 2.

What is the symbol of pi?

- A. €
- B. π
- C. Ω
- D. ∞

Question 3.

Arrange the numbers in ascending order: 36, 12, 29, 21, 7.

- A. 36, 29, 21, 12, 7
- B. 36, 29, 7, 21, 12
- C. 7, 12, 21, 29, 36
- D. None of these

Question 4.

What is the greatest two-digit number?

- A. 10
- B. 90
- C. 11
- D. 99

Question 5.

How much is $90 - 19$?

- A. 71
- B. 109
- C. 89
- D. None of these

Question 6.

20 is divisible by ...

- A. 1
- B. 3
- C. 7
- D. None of these

Question 7.

Find the value of x; if $x = (2 \times 3) + 11$.

- A. 55
- B. 192
- C. 17
- D. 66

Question 8.

What is the smallest three-digit number?

- A. 100
- B. 999
- C. 111
- D. 101

Question 9.

How much is $190 - 87 + 16$?

- A. 103
- B. 261
- C. 87
- D. 119

Question 10.

What is 1000×1 equal to?

- A. 1
- B. 1000
- C. 0
- D. None of these

Math test 2

Question 1.

How many digits are there in 1000?

- A. One digit
- B. Two digits
- C. Three digits
- D. Four digits

Question 2.

Complete the sequence 13, 16,, 22.

- A. 17
- B. 18
- C. 19
- D. 20

Question 3.

What is the largest two digits prime number?

- A. 96
- B. 97
- C. 98
- D. 99

Question 4.

50 times 5 is equal to

- A. 2500
- B. 505
- C. 500
- D. None of these

Question 5.

How many surfaces are there in a cube?

- A. 3
- B. 4
- C. 5
- D. None of these.

Question 6.

Which is the largest number in $15/17$, $15/18$, $15/19$, $15/21$?

- A. $15/17$
- B. $15/18$
- C. $15/19$
- D. $15/21$

Question 7.

What is the average value of 25, 20, 23 and 22?

- A. 20
- B. 21.5
- C. 22.5
- D. 24

Question 8.

2 is a number.

- A. Odd
- B. Prime
- C. composite
- D. None of these.

Question 9.

What is the sum of one-digit prime numbers?

- A. 11
- B. 13
- C. 15
- D. 17

Question 10.

How many hours in 90 minutes?

- A. 1.5 hours
- B. 1.30 hours
- C. 1 hour
- D. None of these.