

Taking a Break from Electronics: The Benefits of Physical Activity

Grades 4-7

Physical and Health Education, Arts Education & Social Studies

Purpose of the Lesson

In this day and age of technology, it is hard to encourage our children to take a break from their devices. Video games are increasingly popular and one study has shown that frequent players can get “video game brain.” This means key parts of their frontal lobe become underused, which can alter moods. Overall, too much screen time can affect the following areas: psychosocial risks, physical health, language delays, impediments with life skills, advertising concerns, and poor sleep quality (more details in the graphics on the last page). It is well known that physical activity not only has benefits for our physical health but also our mental health. Exercise is a natural anti-depressant and helps produce endorphins, which makes us feel good! The purpose of this lesson is to inform students of the risks of overusing technology and the impact on their brain, physical and mental health.

Curriculum Competencies:

Physical and Health Education

- ◇ Identify and describe factors that influence healthy choices (Grade 4)
- ◇ Describe the impacts of personal choices on health and well-being (Grade 5/6)
- ◇ Identify factors that influence healthy choices and explain their potential health effects (Grade 7)
- ◇ Describe and assess strategies for promoting mental well-being, for self and others (Grade 4/5/6/7)
- ◇ Describe factors that positively influence mental well-being and self-identity (Grade 4)
- ◇ Explore and describe how personal identities adapt and change in different settings and situations (Grade 5/6)
- ◇ Analyze and describe the connections/relationships between eating, physical activity, and mental well-being (Grade 4/5)

Arts Education

- ◇ Express, feelings, ideas, and experiences in creative ways, through the arts

Social Studies

- ◇ Use Social Studies inquiry processes and skills to — ask questions; gather, interpret, and analyze ideas; and communicate findings

First Peoples Principles of Learning:

- ◇ Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors
- ◇ Learning requires the exploration of one's identity

Step-by-Step Lesson Plan

1. Lesson Hook: Ask students: “How many hours do you spend on technology per day?” (This includes: cell phones, computers, video games, iPads or tablets, etc.)

Have students put their heads down on their desk. Start with 1 hour a day and put a tally on the board of the number of students. Next ask 2 hours, then 3 hours or more a day on technology. At the end, the visual tally on the board will speak for itself that students spend far too much time on their devices. Guidelines [HERE](#) indicate that children 5 years old and up should spend no longer than 2 hours a day or less on technology.

2. Follow-up Question: “How much time per day do students spend doing physical activity?”

Follow the same process as above and tally the results on the board. Start at 30 minutes, then 1 hour, and finally more than 1 hour a day. Discuss with the class how much time they think is ideal to spend doing some sort of physical activity. (Answer: 60 minutes or more of physical activity each day. Most of the 60 minutes should be either moderate or vigorous intensity aerobic physical activity). See full explanation [HERE](#).

3. Display the below “Neurology of Gaming” graphic and “How too Much Screen Time Affects Children” graphic for your students. Use the below guiding questions to spark discussion:

- Do you think violent video games have the potential to make youth more aggressive? Why or why not?
- What are some positives of playing video games? (Possible answers: some are good for memory recall, or logical thinking areas of the brain that contribute to decision making.)
- What are some negatives of playing video games? (Possible answers: emotional response gets suppressed when playing violent video games, decreased frontal lobe activity which could lead to altered moods and aggressive behaviour, lower activation of the left interior frontal lobe during emotional tasks, lower activation of the anterior cingulate cortex in numerical tasks, those that play highly aggressive games are significantly more anxious than those that don't.)

- How does screen time affect your sleep? What about your eating habits and overall health? (Answer: negatively impacts sleep and increases behaviour, advertising on devices increasing snacking behaviours, and more screen time can lead to obesity and diabetes.)

4. Follow-up Activity:

Have students create their own poster of technology guidelines by researching other Canadian websites and resources. For example, there is some great information on Fraser Health's website [HERE](#) and Healthy Families BC [HERE](#). Alternatively, have students create a skit to act out for the class after researching the benefits of exercise on mental health.

- 5. Lesson closure:** Have students look at the Activity Generator on the Student Mental Health Toolkit Youth Activities page for suggestions of things to do other than time spent on devices. You can find the Activity Generator [HERE](#).

The Neurology of Gaming

Video games have both positive and negative effects on the human brain. They can be used to educate through repetition and feedback, but they also have some less-positive side effects.

The parts of the brain impacted by games

Different gaming scenarios and situations affect different areas of the brain by provoking certain reactions.



Game play involves repeated actions that strengthen the brain cell connections underlying memory and learning.



PREMOTOR & PARIETAL CORTEX
Games that require real-time action, like 'Space Invader,' activate these areas, which control sensory movement.



PREFRONTAL CORTEX
Games that require logical thinking, like 'Othello' and 'Tetris,' activate this area, which controls decision making.



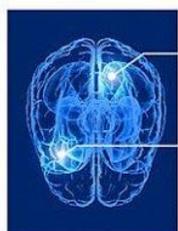
DOPAMINE
Dopamine, which is involved in learning and feelings of reward, is released in the brain's striatum during video game play.

DORSAL ANTERIOR CINGULATE CORTEX
Immediately after firing a weapon in a video game, players show greater activity in this area, which controls cognition and planning.



ROSTRAL ANTERIOR CINGULATE CORTEX & AMYGDALA
Areas that resolve emotional conflict showed less activity while players fired a weapon and soon afterward. Studies say players may suppress their emotional response to cope with their violent actions.

The effects of violent video games



When gamers play frequently, there's a decrease in prefrontal lobe activity. This can lead to altered moods and aggressive behavior, which can last even after the game is turned off.

One week of violent game play can lead to lower activation of the left inferior frontal lobe during emotional tasks and also in the anterior cingulate cortex during nonemotional tasks.

Those who play high-aggression games are significantly more anxious than those who don't.

Playing violent games increases aggressive thoughts, feelings and behaviors in the short and long-term.

The positive and negative effects of video game

Depending on what area of the brain is being tested, studies can produce very different results.



Games that require teamwork help develop collaboration skills.



Games designed to help children manage health problems like asthma are more effective than doctors' pamphlets.



Violent content in games increases aggressive responses.



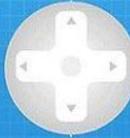
Violent game play increases active suppression of emotional responses.



Improves ability to reason and solve new problems independently of previously acquired knowledge.



Can improve peripheral vision, way finding skills, hand-eye coordination and mental rotation.



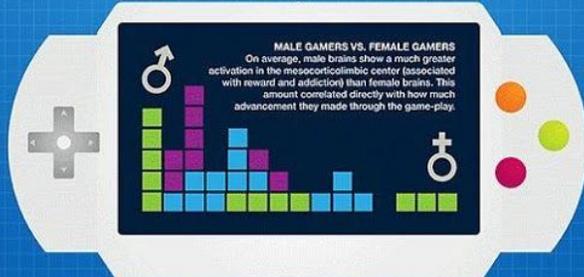
Long-term playing can lead to obesity, attention problems, and poor school performance.



Increased risk of seizures in players with epilepsy or photosensitivity disorder.

MALE GAMERS VS. FEMALE GAMERS

On average, male brains show a much greater activation in the mesolimbic center (responsible with reward and addiction) than female brains. This amount correlated directly with how much advancement they made through the game-play.



How too Much Screen Time Affects Children



Psychosocial Risks

There is a lack of social interaction and engagement with family and peers.



Language Delays

There are fewer vocalizations and less babbling from infants. Significant expressive and receptive language delays in preschool children.



Physical Health

There are increases in childhood health disorders such as obesity and diabetes.



Impediments with Life Skills

Children are experiencing an inability to tie shoes, swim, ride a bike, or build blocks when exposed to too much screen time.



Advertising Concerns

On TV, there are food related advertisements that lead to more snacking and higher rates of being overweight in young children.



Poor Sleep Quality

Children have decreased quality and quantity of sleep resulting in increased behavioral concerns at home and school.