

*What developmental issues derive from excessive screen time use?*

## **Lesson Plan**

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### **Objectives:**

- 1) Students will examine the alteration in white matter integrity in the brain and observe screen use effects.
- 2) Students will assess the effects of screen use on children's brain development and performance.
- 3) Students will describe how addiction and overuse can hurt children's brains.

### **Lesson:**

A) The Brain Itself (Hook) - 1 min

- Show picture of brain
- Explain how screens alter brain chemistry

B) White Matter (Introduction); Source: **(Basu)** - 2 min

- Explain what white matter is, nerves in the brain
- More time in front of screens lower white matter integrity (photo)
- White matter is the brain's communication network
- Show study from children's hospital

Q: *How many hours have you been awake today?*

*How many times do you think you have checked your phone today?*

C) Brain Development and Performance (Lecture); Source: **(LaMotte)** - 4 mins

- Introduce with study linking children's inability to pay attention with excessive TV viewing
- Scans:
  - MRI results show the 90% of kids are using screens by age one and those exceeding recommended use had more disorganized and underdeveloped white matter
  - Scans of 3 to 5 year old brains who exceed recommended use had lower development levels of white matter, affecting language, literacy, and cognitive skills.
  - With MRI results, excessive screen time was also linked to testing lower on

the ability to rapidly name objects on cognitive tests

D) Recommended Use (Activity); Source; (**Citroner**) - 3 mins

- Show [video](#) from Thinkstock (1 min)
- Study from Journal American Medical Association found greater amounts of screen time associated with significantly poorer performance
- Children 1 to 2 years old should not exceed one hour of play a day.
- Parents should manage their child's use

E) The Addiction of Screens (Lecture); Source: (**McDuling**) - 3 mins

Q: *Have you ever heard of gaming addiction?*

- Science has trouble deciphering whether screen addiction exists
- Gaming addiction was declared as a mental health disorder last year
- Example of *Fortnite* addiction from same article
- Improvements from limiting:
  - Children become creators rather than users
  - Improvements in wellbeing, happiness, life satisfaction, depression and anxiety

F) Knowledge of Lesson (Activity) - 5 mins

- Play Kahoot for students, quiz them on information that was taught

### **Materials**

- Video clip
- Graph from study
- Photos of white matter
- Photos of children and screens
- Kahoot

## Annotated Bibliography

Basu, Tanya. "Screen Time Might Be Physically Changing Kids' Brains." *MIT Technology Review*, MIT, 5 Nov. 2019, [www.technologyreview.com/f/614672/screen-time-might-be-physically-changing-kids-brains/](http://www.technologyreview.com/f/614672/screen-time-might-be-physically-changing-kids-brains/).

This source discusses the effects of screen time on white matter integrity in the brain. Brain development is analyzed and how excessive screen use affects it. The brain has lower white matter integrity with more screen use and could be further affected.

Citroner, George. "Children Developmental Delays Caused by Screen Time." *Healthline*, Healthline Media, 4 Feb. 2019, [www.healthline.com/health-news/does-screen-time-cause-developmental-delays-in-young-children](http://www.healthline.com/health-news/does-screen-time-cause-developmental-delays-in-young-children).

How many hours of screen time that is recommended for children along with limitations for screen time are discussed. Parents should limit their children's use. Studies also found links between higher screen use and poorer test performance.

LaMotte, Sandee. "MRIs Show Screen Time Linked to Lower Brain Development in Preschoolers." *CNN Health*, Cable News Network, 4 Nov. 2019, [www.cnn.com/2019/11/04/health/screen-time-lower-brain-development-preschoolers-wellness/index.html](http://www.cnn.com/2019/11/04/health/screen-time-lower-brain-development-preschoolers-wellness/index.html).

Most children start using screens by the age of one, which immediately begins to affect development. Children who use screens over the recommended time become impacted in reading, but some uses may be beneficial for learning. MRI results also show proof of developmental issues.

McDuling, John. "Why Technologists Are Limiting Their Families' Screen Time." *The Sydney Morning Herald*, 1 Mar. 2019, [www.smh.com.au/technology/why-technologists-are-limiting-their-families-screen-time-20190226-p510bh.html](http://www.smh.com.au/technology/why-technologists-are-limiting-their-families-screen-time-20190226-p510bh.html).

Consumers are spending billions on new technology. The industry continues to grow and social media industry leaders are beginning to become corrupt, multi billion dollar companies. Scientists are beginning to debate whether excessive screen use is an addiction, even though video game addiction has been declared a mental health disorder.

