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The National Association of State Boards of Education

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Dear Kristen Amundson,

We are writing to share information about an important children's environmental issue impacting schools: wireless radiation. Wireless radiation is radio frequency radiation, which encompasses the radiation from cell phones, cordless phones, WIFI routers and wireless enabled devices.

Current exposure standard for radio frequency radiation were established around 30 years ago. The United States has come under sharp criticism by the [GAO](#), the [American Academy of Pediatrics](#), the [US Department of the Interior](#), and research scientists around the world. The FCC is currently reviewing exposure standards and has received hundreds of submissions detailing public health concerns with the current regulations ([Proceeding 13-84](#), 2013).

Israel, with help from the Israeli Health Ministry and the Ministry of Education, has recommended teachers have wired computers and that students exposures to WiFi in classes are minimized. Other countries, such as Russia, India, France and Belgium recommend that children's exposures be minimized and that citizens take specific precautions with children, cell phones and wireless devices.

There is a significant emerging body of evidence indicating that wireless radiation can have effects on the body with respect to cancer, genotoxicity, immune function, gene and protein expression, cell signaling, oxidative stress, cell death, blood-brain barrier and brain activity. Although the low level microwaves from Wi-Fi meet FCC regulations, this does not ensure they are safe.

"Children are not little adults and are disproportionately impacted by all environmental exposures, including cell phone radiation. Current FCC standards do not account for the unique vulnerability and use patterns specific to pregnant women and children." stated the American Academy of Pediatrics in a 2013 Submission to the FCC on Radio Frequency exposure standards.

Biological effects have been shown to occur at radiation levels below the FCC public exposure guideline level. Please consider this recently published scientific information.

- 2011: The World Health Organization's International Agency for the Research on Cancer (IARC) [classified](#) Radio Frequency Radiation as a Class 2 B Carcinogen, a possible human carcinogen and the IARC issued their [Monograph](#) in April 2013 detailing the basis of the classification.
- 2011: Environment and Human Health Inc. released "[Cell Phones: Technology, Exposures, Health Effects](#)" calling for reduced exposures and protective standards.
- Several studies are showing impacts on both male and female reproductive systems: Adams J., (2014), Avendaño C. et al. (2012), De Iulii et al., 2009 (2002), Fejes et al. (2005), Agawar et al. (2008), Wdowiak et al. (2007), Gul A et al. (2009), Atasoy H. et al., (2013), Nazıroğlu M et al., (2013), Panagopoulos DJ, (2012) and Gutschi et al (2011).
- Several studies are showing changed brain activity and neurotoxic effects: Aldad et al., (2012), Cetin H, et al (2014), Júnior C. et al., (2014) Odaci, E., et al, (2008), Qiao S, et al, (2014), Bas, O. et al (2009), Nazıroğlu M. and Gumral. (2009), Megha, K, et al., (2012), Bin L. et al, (2013), Jing J et al, (2012), Razavinasab M. et al, (2014), Volkow N, et al (2011) İkinci et al (2013).
- A [new study](#) by breast cancer surgeons found a link to unusual breast tumors in young women who keep cell phones in their bras and have no genetic markers for the disease.

Administrators, staff and students are not aware of the health and safety issues wireless devices present. For example, iPads and tablets have at least 4 antennas emitting digital pulsed radiation 900 times an hour. They have [fine print warnings](#) recommending that the cellular antennas be directed "away from the body and other objects." As another example, laptops are tested at 20 cm (about 8 inches) from the body and use on laps could result in exposures over the FCC limits. Such important information is buried in the fine print of manuals.

Children are more vulnerable to this radiation due to their rapidly developing bodies and brains. In light of accumulating research that such devices can have biological effects, we believe precautionary approaches are necessary. The US history with lead, cigarettes and asbestos demonstrates that regulations and "proof" could take decades. Waiting these decades could have serious health implications for our children's future.

Attached is a document detailing current precautionary actions by governments and authorities around the world. We are open to assisting your organization in any way we can in order to support more protective policy and practices in schools and to raise awareness with the families you serve.

Based on growing evidence of biological effects and policies devised by other nations, we recommend that educational policy makers raise community awareness on this issue so that schools, students and their families can take simple precautionary steps. It is important to teach children how to use technology safely and more responsibly to protect their health and wellbeing.

Solutions exist to reduce exposures to wireless and mitigate risk. Best Practices have been developed to reduce exposures in schools and homes. Schools have a unique opportunity to maintain low radiation environments through prudent technology choices and Low-EMF Best Practices, thus significantly reducing the overall exposures on children.

We would like to schedule a call at your convenience to discuss this important emerging health concern. We would like to present multimedia information to your leadership (or your annual meeting) on the latest scientific evidence on this issue and specific mitigation strategies that are being adopted around the world.

A 21st century classroom must bridge the digital divide so that students have equal access to technology. Low EMF Best Practices are the solution that allows for full technological access in the classroom while minimizing health risk.

Sincerely,

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Bibliography

Adams J, Galloway T, Mondal D, Esteves S, Mathews F. (2014). [Effect of mobile telephones on sperm quality: A systematic review and meta-analysis](#). *Environment International*. 80, 106-112.

Aldad T, Gan G, Gao X, Taylor H. (2012). [Fetal Radiofrequency Radiation Exposure From 800-1900 Mhz-Rated Cellular Telephones Affects Neurodevelopment and Behavior in Mice](#). *Scientific Reports*.

Agarwal A, Deepinder F, Sharma R, Ranga G. (2008). [Effect of cell phone usage on semen analysis in men attending infertility clinic: an observational study](#). *Fertil Steril*. 89(1), 124-8.

Atasoy H, Gunal M, Atasoy P, Elgun S, Bugdayci G. (2013). [Immunohistopathologic demonstration of deleterious effects on growing rat testes of radiofrequency waves emitted from conventional Wi-Fi devices](#). *Journal of Pediatric Urology*. 9(2), 223-9.

Avendaño C, Mata A, Sanchez C, Doncel G. (2012). [Use of laptop computers connected to internet through Wi-Fi decreases human sperm motility and increases sperm DNA fragmentation](#). *Fertility and Sterility*. 97(1), 39-45.

Bas O, Odaci E, Mollaoglu H, Uçok K, Kaplan S. (2009). [Chronic prenatal exposure to the 900 megahertz electromagnetic field induces pyramidal cell loss in the hippocampus of newborn rats](#). *Toxicol. Ind. Health*. 25, 377-384.

Cetin H, Nazıroğlu M, Celik O, Yüksel M, Pastacı N, Ozkaya MO. (2014). [Liver antioxidant stores protect the brain from electromagnetic radiation \(900 and 1800 MHz\)-induced oxidative stress in rats during pregnancy and the development of offspring](#). *J Matern Fetal Neonatal Med*.

De Iuliis G, Newey R, King B, Aitken R. (2009). [Mobile phone radiation induces reactive oxygen species production and DNA damage in human spermatozoa in vitro](#). *PLoS One*. 4(7)

Fejes I, Zavaczki Z, Sollosi J, Koloszar S, Daru J, Kovacs L, Pal A. (2005). [Is there a relationship between cell phone use and semen quality?](#) *Arch Androl*. 51(5), 385-93.

Gul A1, Celebi H, Uğraş S. (2009). [The effects of microwave emitted by cellular phones on ovarian follicles in rats](#). *Arch Gynecol Obstet*. 280(5), 729-33.

Gutsch T, Mohamad Al-Ali B, Shamloul R, Pummer K, Trummer H. (2011). [Impact of cell phone use on men's semen parameters](#). *Andrologia*. 43(5), 312-6.

- Ikinci A, Odaci E, Kaya H, Akca M, Hanci H, Alsan A. (2013). [The Effects of Prenatal Exposure to a 900 Megahertz Electromagnetic Field on Hippocampus Morphology and Learning Behavior in Rat Pups.](#) *NeuroQuantology*. 11(4), 582-590.
- Jing J, Yuhua Z, Rongping J, Xiao-qian Y, Dong-mei G, Xi C. (2012). [The influence of microwave radiation from cellular phone on fetal rat brain.](#) *Electromagn Biol Med*.31(1), 57-66.
- Lv B, Chen Z, Wu T, Shao Q, Yan D, Ma L, Lu K, Xie Y. (2013). [The alteration of spontaneous low frequency oscillations caused by acute electromagnetic fields exposure.](#) *Clinical Neurophysiology*.
- Nazıroğlu M, Yüksel M, Köse SA, Özkaya MO. (2013). [Recent reports of Wi-Fi and mobile phone-induced radiation on oxidative stress and reproductive signaling pathways in females and males.](#) *J Membr Biol*. 246(12), 869-75.
- Odaci E, Bas O, Kaplan S. (2008). [Effects of prenatal exposure to a 900 megahertz electromagnetic field on the dentate gyrus of rats: a stereological and histopathological study.](#) *Brain Res*. 1238, 224–229.
- Panagopoulos DJ. (2012). [Effect of microwave exposure on the ovarian development of Drosophila melanogaster.](#) *Cell Biochem Biophys*. 63(2), 121-32
- Qiao S, Peng R, Yan H, Gao Y, Wang C, Wang S, Zou Y, Xu X, Zhao L, Dong J, Su Z, Feng X, Wang L, Hu X. [Reduction of Phosphorylated Synapsin I \(Ser-553\) Leads to Spatial Memory Impairment by Attenuating GABA Release after Microwave Exposure in Wistar Rats.](#) *PLoS One*. 17, 9(4).
- Razavinasab M1, Moazzami K, Shabani M. (2014). [Maternal mobile phone exposure alters intrinsic electrophysiological properties of CA1 pyramidal neurons in rat offspring.](#) *Toxicol Ind Health*.
- Volkow ND, Tomasi D, Wang GJ, Vaska P, Fowler JS, Telang F, Alexoff D, Logan J, Wong C. (2011). [Effects of cell phone radiofrequency signal exposure on brain glucose metabolism.](#) *JAMA*. 305(8), 808-13.
- Wdowiak A, Wdowiak L, Wiktor H. (2007). [Evaluation of the effect of using mobile phones on male fertility.](#) *Ann Agric Environ Med*. 14(1), 169-72.