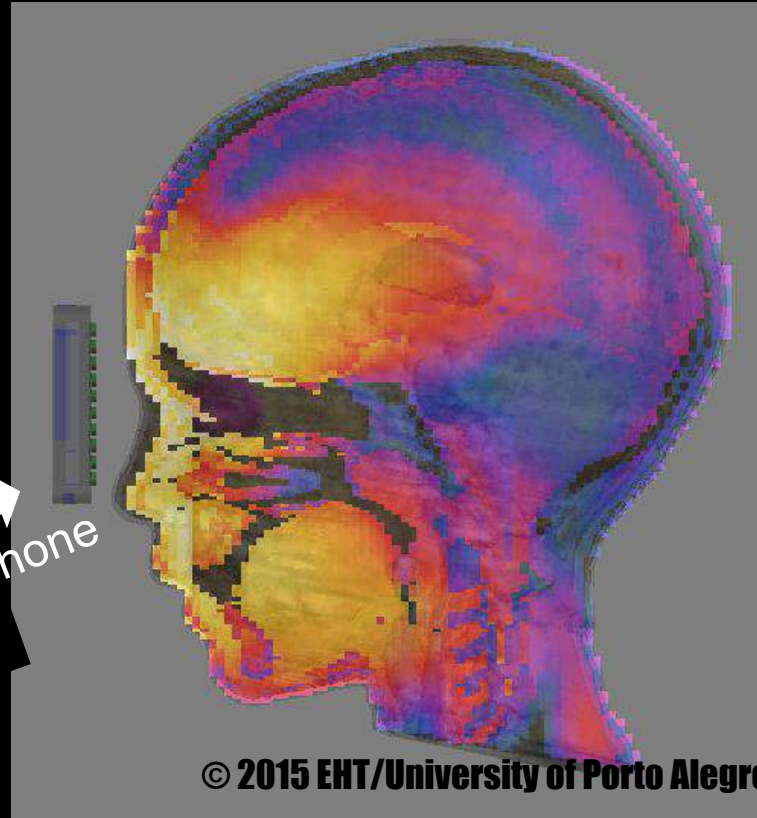


Radiofrequency Exposure at Eye Plane of 6 Year Old Child Smartphone Placed In Cardboard Simulation Position



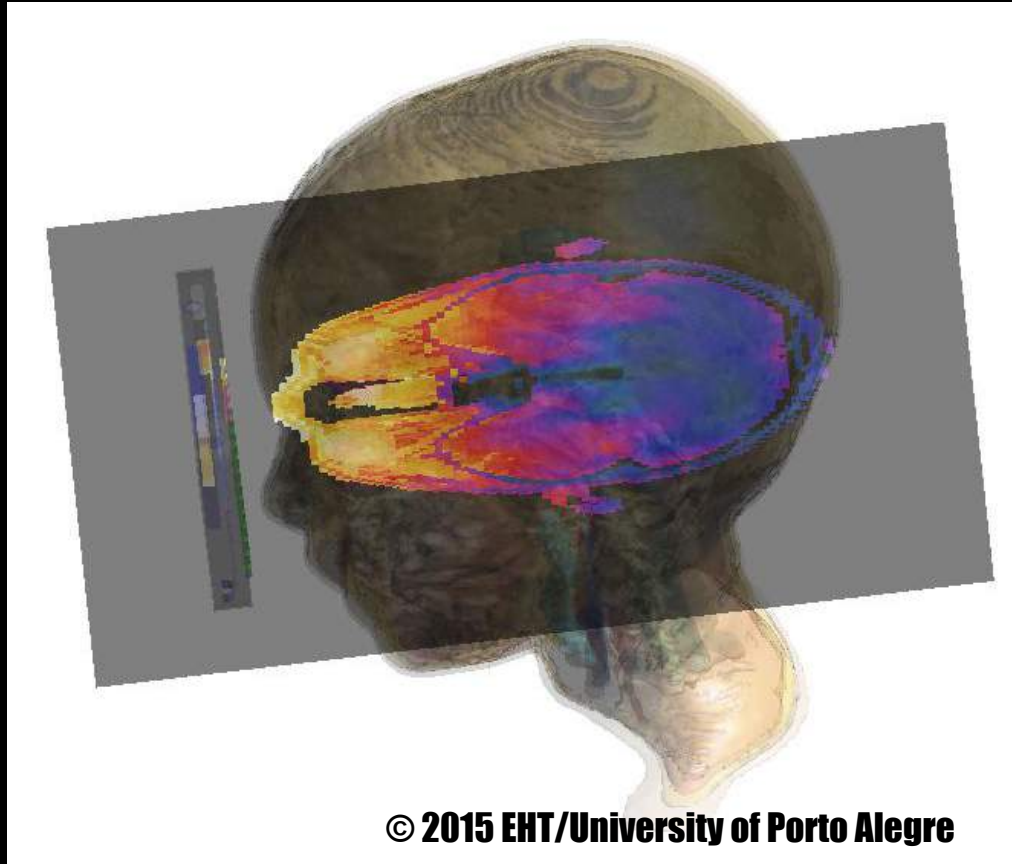
Smartphone



Smartphone placed in a position to the eyes as it would be placed using the cardboard virtual reality holder.



Dose (SAR) in an Horizontal (axial) Slice at the Eyes 6 Year Old Boy Model



1g-psSAR = 1.08 W/kg over
the entire head
1g-psSAR = 0.86 W/kg in the
eyes

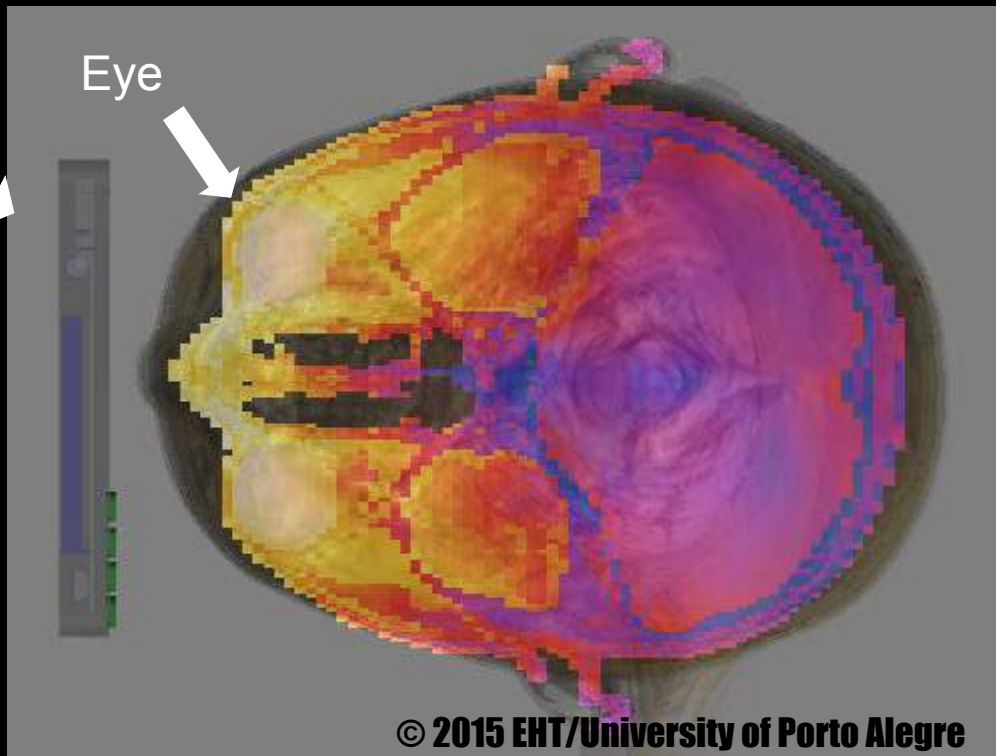
White and yellow are the
highest doses. Smartphone
Placed In Cardboard
Simulation Position



Radiofrequency Dose into Eyes of 6 Year Old Child Model Smartphone Placed In Cardboard Simulation Position

Smartphone

Eye



1g-psSAR (peak value axial slice) in Thelonious (6 year old male) anatomically correct model, 0dB=2mW/g, 50 db scale. for smartphone placed in a position to the eyes as it would be placed using the cardboard virtual reality holder.



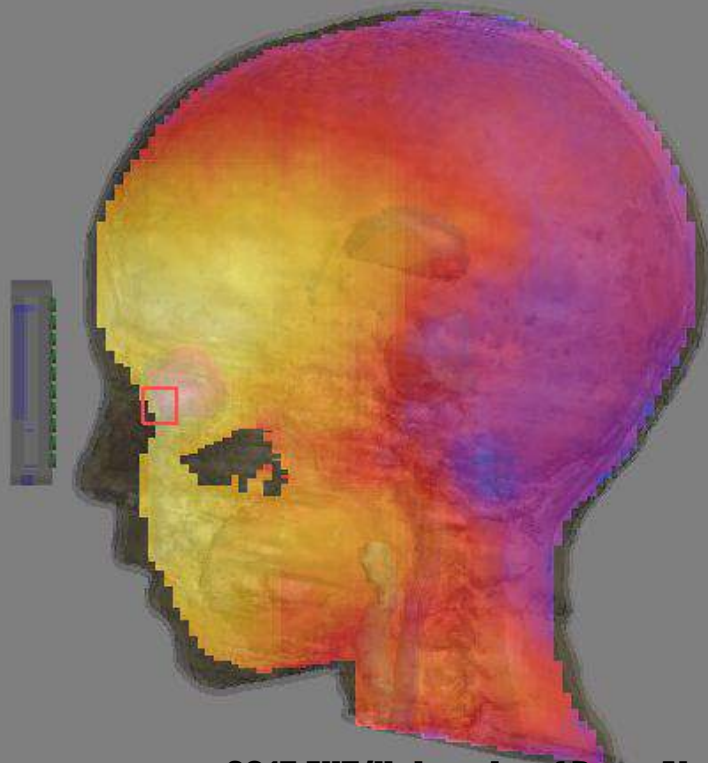
White and yellow are the highest doses.

Exposure (SAR) in Vertical (sagittal) Slice at the Eye 6 Year Old Boy Model

1g-psSAR = 1.08 W/kg over the
entire head and
1g-psSAR = 0.86 W/kg in the
eyes.

The red cube is the location of the peak
dose.

White and yellow are the highest doses.



© 2015 EHT/University of Porto Alegre



Smartphone Placed In
Cardboard Simulation
Position

Dielectric Properties of the Three Models - SAM, Duke and Thelonius.

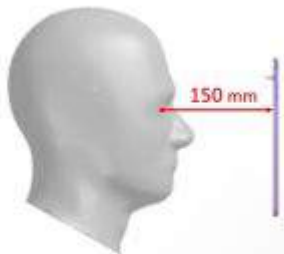
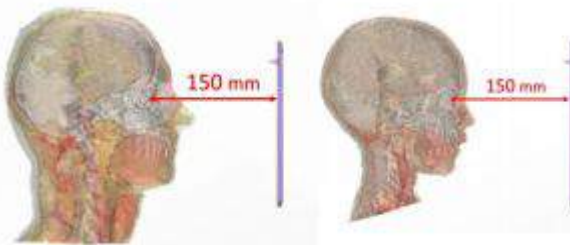


Fig 3. SAM phantom (homogeneous model) with Tablet.

TABLE III. Dielectric Properties of the SAM Phantom following the IEEE 1528 Recommended Practice @ 2.45 GHz

Material	σ [S/m]	ϵ_r
SAM shell	0.0016	5
SAM liquid	1.8	39.2

Homogenous liquid inside skull does not realistically represent brain and skull.



(a) 34 years old adult man (DUKE)

(b) 6 years old child (THELONIOUS)

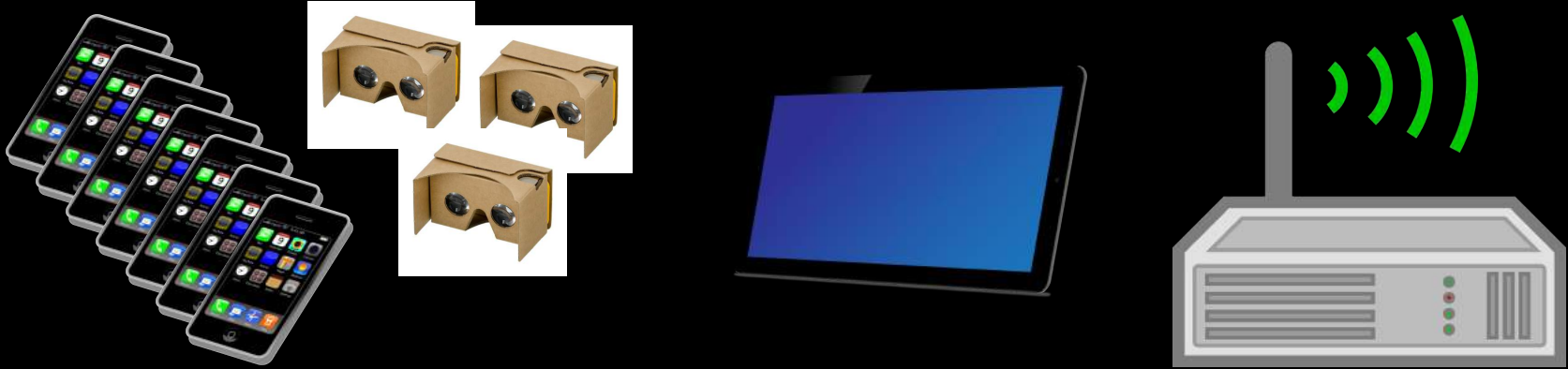
TABLE IV. Dielectric Properties of the Heterogeneous Models Tissues @ 2.45 GHz.

Tissue	ϵ_r	σ [S/m]
Fat	0.104	5.280
Bone	0.394	11.381
Grey matter	1.807	48.911
White matter	1.215	36.167
Liquid Brain	66.243	3.457
Muscle	52.729	1.738
Aqueous Humor	68.208	2.478
Skin	38.007	1.464
Crystalline	44.625	1.504
Sclera	52.628	2.033
Vitreous Humor	68.208	2.478
Cerebellum	30.145	1.088
Nerve	30.145	1.088

With Anatomical Models Different Properties of Different Body Tissues are considered.



The Google Expeditions Kit



“kits included **ASUS smartphones** and **a tablet** for the teacher, plus **a router** to connect all the devices and run the Expeditions app offline.”

TechCrunch.com



ASUS Zen Phone 2



RF Exposure Information (SAR)

“To reduce exposure to RF energy, use a hands-free accessory or other similar option to keep this device away from your head and body.”

“Carry this device at least 10 mm away from your body to ensure exposure levels remain at or below the as-tested levels. Choose the belt clips, holsters, or other similar body-worn accessories which do not contain metallic components to support operation in this manner. Cases with metal parts may change the RF performance of the device, including its compliance with RF exposure guidelines, in a manner that has not been tested or certified, and use of such accessories should be avoided.”

“Canada, Industry Canada (IC) Notices Radio Frequency (RF) Exposure Information
The radiated output power of the Wireless Device is below the Industry Canada (IC) radio frequency exposure limits.
The Wireless Device should be used in such a manner such that the potential for human contact during normal operation is minimized.”:

from http://dlcdnet.asus.com/pub/ASUS/ZenFone/ZE550ML/e10509_ze550ml_ze551ml_em_0601.pdf

Children Are Wearing Metal Glasses Despite Warnings That Metal so Close to Brain and Phone Could Intensify Radiation



Youtube video <https://www.youtube.com/watch?v=0vj3D3spkxc>

Metal can increase radiation exposure by refocusing radiation. The end result can be higher than tested levels to specific tissues.



from Youtube video <https://www.youtube.com/watch?v=mKrbDKO5f08>



The **ASUS Zen Phone 2 Manual** states: Cases with metal parts may change the RF performance of the device, including its compliance with RF exposure guidelines, in a manner that has not been tested or certified, and use of such accessories should be avoided. http://dlcdnet.asus.com/pub/ASUS/ZenFone/ZE550ML/e10509_ze550ml_ze551ml_em_0601.pdf



Wireless Routers Placed Near Children in Classroom



From 11/2016 CBS News Report.



Information Provided to Schools by Google

GOOGLE CARDBOARD

PRODUCT SAFETY INFORMATION

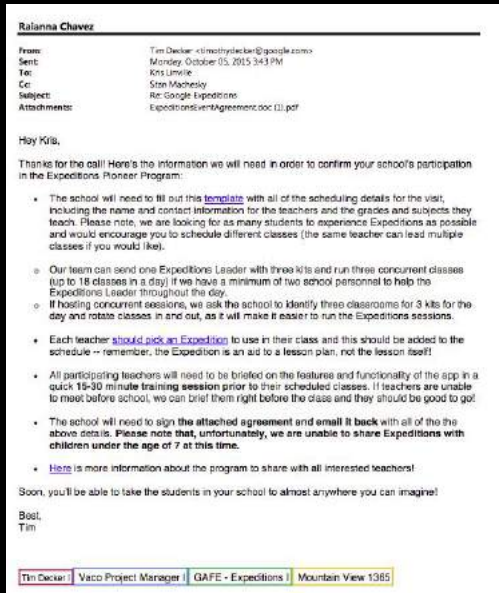
- Take frequent breaks while using Cardboard. If you experience nausea, discomfort, eye strain, or disorientation, immediately discontinue using Cardboard.
- Cardboard is not for use by children without adult supervision.
- Do not use Cardboard while driving, walking, or otherwise by being distracted from real world situations that prevent you from obeying traffic or safety laws. Do not drive or operate heavy machinery immediately after using Cardboard if you feel impaired or disoriented.
- If you have had or could be prone to seizures, consult a doctor before using Cardboard.

Schools That Host Google Expeditions Agree To Terms

“The school will need to sign the attached agreement and email it back with all of the the above details.

Please note that, unfortunately, we are unable to share Expeditions with children under the age of 7 at this time.”

-From emails obtained by public information request RE: Google Expeditions staff to Irvine Unified School District.



GOOGLE EXPEDITIONS EVENT AGREEMENT

“School will conduct the event in accordance with all current product safety information...”

“School will supervise children participating in the Event and will not allow children under seven years of age to participate in the event ...”

“Waivers and Release: ...School hereby waives, releases and forever discharges Google and its agents... of and from any and all claims, demands, debts, contracts, expenses causes of action, lawsuits, damages and liabilities of every kind and nature, whether known or in law and equity, that School had or may have, arising from or in any way related to the Event or Cardboard , including claims for property damages, personal injuries and death, whether caused by the ordinary negligence of Google or any other party...”

GOOGLE EXPEDITIONS EVENT AGREEMENT

This Google Expeditions Event Agreement (the "Agreement") is entered into by and between Google Inc. ("Google") and the school or other institution indicated below ("School"), requesting School's participation in a Google Expeditions event (the "Event") at School's facilities. This Agreement is effective as of the date School accepts this Agreement by signing below.

1. **Signatory.** The Signatory below is entering into this Agreement on behalf of School. The Signatory represents and warrants that: (i) he or she has full legal authority to bind School to this Agreement; (ii) he or she has read and understands this Agreement; and (iii) he or she agrees, on behalf of School, to this Agreement.

2. **Access.** School permits Google (through its affiliates, employees, agents, and contractors) to enter School's facilities in connection with the Event. Google will make any facilities access plans available in writing to School. Google must have suitable insurance coverage or self-insure for all of Google's activities at the facilities during the Event.

3. Event.

(A) School will conduct the Event in accordance with all Google Cardboard ("Cardboard") product safety information (currently available at <https://www.google.com/cardboard/index.html>) and any other guidelines made available by Google (the "Event Guidelines"). School will ensure that all its employees, agents, and contractors who participate in the Event have reviewed and understood the Event Guidelines.

(B) School will supervise all individually partial participants for the Event.

(C) School will supervise all children participating in the Event, and will not allow any children under seven (7) years of age to participate in the Event.

(D) School and Google will each be responsible for their respective costs in connection with the Event.

4. **Waiver and Release.** On behalf of itself and its employees, agents, and contractors, School hereby waives, releases, and forever discharges Google and its agents, providers, officials, participants, employees, officers, directors, affiliates, successors, representatives, agents, and assigns, of and from any and all claims, demands, debts, contracts, expenses, causes of action, lawsuits, damages and liabilities, of every kind and nature, whether known or unknown, in law or equity, that School (or any of its employees, agents, or contractors) had or may have, arising from or in any way related to the Event (including claims for property damages, personal injuries, and death, whether caused by the ordinary negligence of Google or any other party, except that this waiver does not apply to any acts of gross negligence or intentional misconduct).

5. **Limitation of Liability.** EXCEPT FOR ANY MATTERS FOR WHICH LIABILITY CANNOT BE EXCLUDED OR LIMITED UNDER APPLICABLE LAW, IN NEITHER PARTY SHALL BE LIABLE UNDER THIS AGREEMENT FOR DIRECT, INDIRECT, CONSEQUENTIAL, EXEMPLARY, OR PUNITIVE DAMAGES, EVEN IF THE PARTY KNEW OR SHOULD HAVE KNOWN THAT SUCH DAMAGES WERE POSSIBLE AND EVEN IF DIRECT DAMAGES DO NOT SATISFY A REMEDY, AND IN NEITHER PARTY MAY BE HELD LIABLE UNDER THIS AGREEMENT FOR MORE THAN ONE THOUSAND U.S. DOLLARS.

6. **Miscellaneous.** All legal notices must be in English, in writing, and addressed to the other party's primary contact, which for Google is legal@google.com. Any amendment must be in writing and signed by both parties. This Agreement constitutes the entire agreement between the parties and supersedes all other agreements between the parties relating to its subject matter. If School is in any country or state government entity, then the parties agree to remain bound regarding governing law and venue. If School is not one of those entities, then the following applies: This Agreement is governed by California law, excluding that state's choice of law rules, FOR ALL PURPOSES, AND TO THIS AGREEMENT, THE PARTIES CONSENT TO PERSONAL JURISDICTION IN, AND THE EXCLUSIVE VENUE OF, THE COURTS IN SANTA CLARA COUNTY, CALIFORNIA.

Date: _____

Signature of signatory: _____

Name of signatory: _____

Title of signatory: _____

School (or other institution) name and address: _____

GOOGLE EXPEDITIONS EVENT AGREEMENT

5. Limitation of Liability: EXCEPT FOR ANY MATTERS FOR WHICH LIABILITY CANNOT BE EXCLUDED FROM OR LIMITED UNDER APPLICABLE LAW: (A) NEITHER PARTY WILL BE LIABLE UNDER THIS AGREEMENT FOR LOST REVENUES OR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, OR PUNITIVE DAMAGES, **EVEN IF THE PARTY KNEW OR SHOULD HAVE KNOWN THAT SUCH DAMAGES WERE POSSIBLE** AND EVEN IF DIRECT DAMAGES DO NOT SATISFY A REMEDYING (B) NEITHER PARTY MAY BE HELD LIABLE UNDER THIS AGREEMENT FOR MORE THAN ONE THOUSAND US DOLLARS.

GOOGLE EXPEDITIONS EVENT AGREEMENT

This Google Expeditions Event Agreement (the "Agreement") is entered into by and between Google Inc. ("Google") and the school or other institution (collectively "School") regarding School's participation in a Google Expeditions event (the "Event") at School's facilities. This Agreement is effective as of the date School accepts this Agreement by signing below.

1. **Agreement.** The signatory below is entering into this Agreement on behalf of School. This signatory represents and warrants that (i) he or she has full legal authority to bind School to this Agreement; (ii) he or she has read and understands this Agreement; and (iii) he or she agrees, on behalf of School, to this Agreement.

2. **Access.** School permits Google through its affiliates, employees, agents, and contractors (i) to enter School's facilities in connection with the Event; Google will attend any field trips unless noted otherwise in writing by School; Google may have visitors (including members of the press) at Google's facilities at the location during the Event.

3. Event.

(A) School will attend the Event in accordance with all Google Guidelines ("Guidelines") product safety information (available at <https://www.google.com/edu/expeditions/>) and any other guidelines made available by Google (the "Event Guidelines"). School will ensure that all its employees, agents, and contractors who participate in the Event have reviewed and understood the Event Guidelines.

(B) School will secure all necessary parental permissions for the Event.

(C) School will supervise all children participating in the Event, and will not allow any children under seven (7) years of age to participate in the Event.

(D) School and Google will each be responsible for their respective costs in connection with the Event.

4. **Warrant and Release.** On behalf of itself and its employees, agents, and contractors, School hereby warrants, releases, and agrees to indemnify Google and its agents, contractors, employees, officers, directors, officers, business successors, successors, agents, and assigns, of and from any and all claims, demands, suits, demands, expenses, costs of action, damages, charges, and costs, attorneys' fees and costs, whether known or unknown, in law or equity, that School or any of its employees, agents, or contractors had or may have, arising from or in any way related to the Event or Guidelines, including claims for property damage, personal injury, and death, whether caused by the ordinary negligence of Google or any other party, or that had this Event directly apply to any party's gross negligence or intentional misconduct.

5. **Limitation of Liability.** EXCEPT FOR ANY MATTERS FOR WHICH LIABILITY CANNOT BE EXCLUDED OR LIMITED UNDER APPLICABLE LAW, NEITHER PARTY WILL BE LIABLE UNDER THIS AGREEMENT FOR LOST REVENUES OR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, OR PUNITIVE DAMAGES, EVEN IF THE PARTY SHOULD HAVE KNOWN THAT SUCH DAMAGES WERE POSSIBLE AND EVEN IF DIRECT DAMAGES DO NOT SATISFY A REMEDYING AND NEITHER PARTY MAY BE HELD LIABLE UNDER THIS AGREEMENT FOR MORE THAN ONE THOUSAND US DOLLARS.

6. **Entire Agreement.** All legal notices must be in English, in writing, and addressed to the other party's primary contact, which for Google is expeditions@google.com. Any agreement must be in writing and signed by both parties. This Agreement lists out all agreed-upon terms; the parties are advised and release all other agreements (except the parties' release to the extent that if School is a city, county, or other governmental entity, then the parties agree to remain silent regarding governing law and venue, if School will not sue or be sued within the state of California, then the following applies: this Agreement is governed by California law, including but not limited to the law of the state of California, and the venue for any dispute arising from this Agreement shall be the courts of the state of California, JUDICIAL DISTRICT NO. 1, PERSONAL JURISDICTION IN AND THE EXCLUSIVE VENUE OF, THE COURTS IN SANTA CLARA COUNTY, CALIFORNIA.

7. **Force Majeure.** This Agreement shall be null and void if either party is unable to perform its obligations under this Agreement due to an act of God, war, terrorism, or other event beyond the control of either party.

8. **Assignment.** This Agreement shall be null and void if either party assigns its obligations under this Agreement to a third party without the written consent of the other party.

9. **Severability.** If any provision of this Agreement is held to be unenforceable, the remainder of this Agreement shall remain in full force and effect.

10. **Counterparts.** This Agreement may be executed in counterparts, each of which shall be deemed to represent the entire agreement between the parties, and all of which when taken together shall be deemed to represent the entire agreement between the parties.

11. **Signature.** The signature of the signatory below shall constitute the signatory's agreement to the terms and conditions of this Agreement.

12. **Witness.** This Agreement shall be null and void unless signed by two witnesses in addition to the signatory.

13. **Notarization.** This Agreement shall be null and void unless notarized by a notary public in the state of California.

14. **Amendment.** This Agreement may be amended only in writing and signed by both parties.

15. **Construction.** This Agreement shall be construed according to the intent of the parties at the time of execution.

16. **Interpretation.** This Agreement shall be interpreted according to the intent of the parties at the time of execution.

17. **Binding Effect.** This Agreement shall be binding on the parties and their heirs, assigns, and successors.

18. **Entire Agreement.** This Agreement shall constitute the entire agreement between the parties.

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22. **Signature.** The signature of the signatory below shall constitute the signatory's agreement to the terms and conditions of this Agreement.

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24. **Notarization.** This Agreement shall be null and void unless notarized by a notary public in the state of California.

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46. **Notarization.** This Agreement shall be null and void unless notarized by a notary public in the state of California.

What Do Manufacturers State
On the Safety of
Other Virtual Reality Systems?

Health and Safety Information **SAMSUNG GEAR VR**

Seizures

Some people (about 1 in 4000) may have severe dizziness, seizures, epileptic seizures or blackouts triggered by light flashes or patterns, and this may occur while they are watching TV, playing video games or experiencing virtual reality, even if they have never had a seizure or blackout before or have no history of seizures or epilepsy. Such seizures are more common in children and young people under the age of 20. Anyone who has had a seizure, loss of awareness, or other symptom linked to an epileptic condition should consult with a doctor before using the Gear VR.

The Gear VR headset should not be used by children under the age of 13, as these children may be at increased health and safety risk.

- A comfortable virtual reality experience requires an unimpaired sense of motion and balance. Do not use the Gear VR when you are tired, need sleep, are under the influence of alcohol or drugs, are hung-over, have digestive problems, are under emotional stress or anxiety, or when suffering from cold, flu, headaches, migraines, or earaches, as this can increase your susceptibility to adverse symptoms.

OCULUS Virtual Reality

Health and Safety Brochure



WARNING Seizures: Some people (about 1 in 4000) may have severe dizziness, seizures, epileptic seizures or blackouts triggered by light flashes or patterns, and this may occur while they are watching TV, playing video games or experiencing virtual reality, even if they have never had a seizure or blackout before or have no history of seizures or epilepsy. Such seizures are more common in children and young people under the age of 20. Anyone who has had a seizure, loss of awareness, or other symptom linked to an epileptic condition should consult a doctor before using the Gear VR.



WARNING Children: The Gear VR should not be used by children under the age of 13. Adults should monitor children (age 13 and older) who are using or have used the Gear VR for any of the symptoms described below, and should limit the time children spend

Gotan: Virtual Reality

Health and Safety Brochure



Seizures:

Some people (about 1 in 4000) may have severe dizziness, seizures, epileptic seizures or blackouts triggered by light flashes or patterns, and this may occur while they are watching TV, playing video games or experiencing virtual reality, even if they have never had a seizure or blackout before or have no history of seizures or epilepsy. Such seizures are more common in children and young people under the age of 20. Anyone who has had a seizure, loss of awareness, or other symptom linked to an epileptic condition should see a doctor before using the headset.



Children:

This product should not be used by children under the age of 13. Adults should monitor children (age 13 and older) who are using or have used the Headset for any of the symptoms described below,