

**PORT TOWNSEND SCHOOL DISTRICT NO. 50**

**Work/Study School Board Meeting, 6:00 p.m.**

**April 13, 2015**

***"Discover the Power of Learning"***

**Mission:**

In partnership with home and community, Port Townsend School District provides a learning environment where each student develops the knowledge and skills to become a creative, successful and engaged citizen.

**01. Location/Time**

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01.01 Gael Stuart Building, Room S-11, 1610 Blaine St., 6:00 p.m.

**02. Call to Order**

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- 02.01 Roll Call
- 02.02 Pledge of Allegiance

**03. Agenda**

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03.01 Agenda Approval

**04. Recognition**

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- 04.01 Board
- 04.02 Superintendent – Shining Star Awards

**05. Public Comments**

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**06. Board Correspondence**

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- 06.01 Email from L. Wright regarding music classes at Blue Heron
- 06.02 Email from M. Frederickson regarding music classes at Blue Heron
- 06.03 Email from K. Kolff regarding Blue Heron bike shelter and bike ed training at Blue Heron
- 06.04 Email from S. Story following up on wi-fi and cell phone radiation issue
  - 06.040 Attachment A
  - 06.041 Attachment B
  - 06.042 Attachment C
- 06.05 Letter from High School GSA (Gay-Straight Alliance) regarding gowns worn at graduation

**07. Reports**

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- 07.01 High School ASB Report
  - 07.02 Visit History Trip-2015 – Gina McMather and Tom Gambill
  - 07.03 Next Generation Science Standards – Lois Sherwood
  - 07.04 Superintendent
    - 07.040 Curriculum Review
- World History: Patterns of Interaction, Houghton Mifflin Harcourt Publishing, 2012

**08. Unfinished Business**

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**09. New Business**

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**10. Policy Review**

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- 10.01 Policy 4215 – Use of Tobacco and Nicotine Products and Delivery Devices – 1<sup>st</sup> Review
- 10.02 Policy 5011 – Sexual Harassment – 2<sup>nd</sup> Review

**11. Board Member Announcements/Suggestions for Future Meetings**

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**12. Next Meeting**

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12.01 April 27, 2015 Regular Board Meeting, 6:00 p.m., 1610 Blaine St., Room S-11

**13. Executive Session – (if necessary)**

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**14. Adjournment**

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## School Board

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**From:** Lelah Wright <divinedanceoflife@gmail.com>  
**Sent:** Thursday, March 26, 2015 12:25 AM  
**To:** School Board  
**Cc:** Holley Carlson; Keith White; Nathanael O'Hara; Jennifer James-Wilson; Pam Daly  
**Subject:** Thank you. And concern for 6th period

Hello Board members. Thank you for your time and commitment in sitting on the Board for our Port Townsend School district. My family and I truly appreciate the energy you all invest in the support of our community's children.

I have a 4th grader at Blue Heron. I also own a business who's prime time is evening hours, so I was not able to attend the last Board Meeting on the 26th...even though I really wanted to come and share my voice.

I would like to speak out in concern for the possibility of shifting to 6 periods in the middle school schedule. It is my understanding that if Blue Heron adopts a 6 period schedule the students will need to choose between tech/science classes and arts/ music classes. As a musician *and* an analytical thinker I find this unacceptable. We need to foster both the 'right brain' and 'left brain' learning in our young people. We need to have the space for our children to explore both their science and technological based interests as well as their musical interests. It is important that as they are developing they are allowed to tap into different interests and are given the opportunities to gain skills in what ever chord they strike in these fields. Especially at the Middle School age, they need this time to develop these skills. To explore these fields.

i would like to be clear that as a parent of a student of Blue Heron, I am not in favor of any action that causes my child to choose between science/technology and music/orchestra/band. Therefore I am not in favor of adding a 6th period to the middle school schedule. I plan to attend the next meeting, but felt it important to share my voice here.

Again, Thank you for your time.  
Sincerely,  
Lelah Wright

## School Board

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**From:** Mia Frederickson <fabfred4@gmail.com>  
**Sent:** Wednesday, March 25, 2015 11:26 AM  
**To:** School Board; Diane Lashinsky; Daniel Ferland  
**Subject:** Transcript of comments made at March 23rd board meeting by Mia Frederickson  
**Attachments:** Board Comments March 2015.docx

I am enclosing a copy of the transcript for my comments made to the board at the March 23rd meeting. I ran out of time and wish to have the full transcript available to any who may be interested.

Thank You,  
Mia Frederickson

Transcript of comments to the School Board from March 23, 2015

Good Evening Ladies and Gentlemen of the Board,

My name is Mia Frederickson and I am a classical cellist and music teacher. I am the current Pres. of the PT Music Boosters and I volunteer close to 100 hours every year in our school orchestra programs as a strings specialist. Some days I get to introduce a student to the cello for the very first time and other days I talk to the high school string quartet about their interpretation of Beethoven's earliest chamber works. A lot of what I do is make sure instruments are in tune with four functioning strings and a bow. My own husband (who is also a cellist) began his musical career in this very district in the fourth grade string program. My son is in 5<sup>th</sup> grade orchestra class this year. To say that I am invested in this program would be an understatement.

I'm really proud of the accomplishments that our music department has made this year. Tonight I understand that you will get to hear a few of our award-winning students play for you.

The program is making great strides. We want to do everything we can to enable them to continue.

We have recently become aware of a potential scheduling issue that has the power to derail their progress

Middle School is considering going from a 7 period to a 6 period day.

The 7 period day means that in addition to 5 slots for core curriculum there are two elective slots. Having a 7 period day enables 2 key things:

- 1) Provides Choir and World Music classes as an alternative for kids who are not interested in learning to play an instrument. With these classes, more students get exposure to music in the schools than would be served with Band or Orchestra offerings alone.
- 2) Enables students in music classes to take both music AND technology offerings. Our STEAM classes.

Without careful thought to the schedule, kids will lose access to music.

Allow me to paint a picture for you:

12 out of 30 members of Festival orchestra are currently enrolled in tech classes.

16 in Band.

Almost half.

Next year they may have to choose one or the other. That is almost half of the current 7/8<sup>th</sup> band/orchestra program gone.

But that's not all!!!

The current class of 6<sup>th</sup> graders will also be asked to choose between music and tech classes.

Last year due to cuts in instruction time to music programs our current 6<sup>th</sup> grade class received 50% less class time this year than last. This year's 5<sup>th</sup> graders lost 20% of their instruction time. Our K-3 music program was cut in half the year before.

As a direct result of these cuts the kids coming in to the 7<sup>th</sup>/8<sup>th</sup> grade festival group next year will be less prepared, less advanced and perhaps even less invested because they have spent less time learning how to play. This kind of change to the program will be evident next fall where there is the potential to lose half the orchestra/band program at the middle school level. That change filters up to the High school the year after that. Currently HS and Band programs are majority freshman. Within 2 short years this small change has the potential to cripple the music department.

There is a tipping point at which you can no longer maintain a quality HS program. It takes years for students to build the musical skills that are required to play at the HS level. Proposed changes to the schedule PLUS the steady loss of hours of instruction means that we are swiftly reaching that tipping point.

Our music program is a resource. It provides VALUE to the students, the school and the community. Our music program is also fragile and could be greatly impacted by scheduling changes. We will need to work together to preserve and protect this resource. I am here to respectfully request that you to look into every possibility for scheduling at the middle school to make sure our kids don't have to choose between music and technology.

Thank you for listening.

## Mary Colton

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**From:** kkolff <kkolff@olympus.net>  
**Sent:** Thursday, April 02, 2015 8:45 AM  
**To:** Mary Colton  
**Subject:** Re: letter to board

Dear PT School Board,

We are making great progress in our plans for April bike ed training AND the Blue Heron Bike Shelter. Below is a summary I sent to Diane Lashinsky and others providing an update of the plans. Please note that there are many people and businesses in the community that are donating materials and labor to this exciting project.

Please mark your calendars for a great ribbon-cutting ceremony on Friday, May 1st, at 2:30. We hope that you will be able to join us and help thank all of those who are making this new school asset possible.

I will come to your April 27th meeting and give you a further update on our progress, but would like to be on the schedule after 7PM. Thanks.

Cheers, Kees

Begin forwarded message:

**From:** kkolff <[kkolff@olympus.net](mailto:kkolff@olympus.net)>  
**Subject:** Blue Heron Bike Shelter & Bike Ed Classes  
**Date:** March 24, 2015 at 9:02:20 AM PDT  
**Cc:** Mark Tallarico <[mtallarico@ptschools.org](mailto:mtallarico@ptschools.org)>, David Engle <[dengle@ptschools.org](mailto:dengle@ptschools.org)>, Chauncey Tudhope-Locklear <[chauncey@ptrecyclery.org](mailto:chauncey@ptrecyclery.org)>, Kees Kolff <[kkolff@olympus.net](mailto:kkolff@olympus.net)>, Douglas Milholland <[douglasmilholland@waypt.com](mailto:douglasmilholland@waypt.com)>, Charles Landau <[charlesl@olympus.net](mailto:charlesl@olympus.net)>, Greg Barron <[glbarron@olympus.net](mailto:glbarron@olympus.net)>  
**To:** Brad Taylor <[btaylor@ptschools.org](mailto:btaylor@ptschools.org)>, Diane Lashinsky <[dlashinsky@ptschools.org](mailto:dlashinsky@ptschools.org)>

Hi Brad and Diane.

1. Shelter

We are making good progress on lining up the work crews for building the shelter. Here is the tentative schedule:

- a. The steel posts will arrive on Thursday, April 16, and perhaps be laid behind the racks on the grass.
- b. Concrete cutting will occur on Thursday or Friday, April 16 or 17.
- c. Excavation of the holes, with a backhoe and dump truck, will start after school lets out on Friday the 17th. I assume that is about 3PM unless it is an early release day.
- d. Concrete will be poured on Saturday the 18th.
- e. All the lumber will arrive on Monday morning, April 20, and placed right next to the racks.
- f. The posts and the lumber will be assembled on Monday, April 27th.
- g. The roof materials will arrive and be placed on Wednesday the 29th.
- h. The decorative panels painted by 6th graders will be attached on Thursday the 30th or on May 1st.
- i. Outdoor assembly, ribbon-cutting, bikathon kick-off and celebration on May first. Time TBD.

NOTE: As a show of support for this great project, Blue Heron Construction is donating labor for concrete work, Moving Earth is donating excavation services, Cotton Redi Mix is donating concrete, Charles Landau and

a crew are donating timber work, Edensaw Woods is donating plywood panels for artwork, Henery's Hardware and Peninsula Paints may donate paint, Carl's Building Supply may donate some lumber, Taylor Roofing may donate the metal roof and Hope Roofing may donate putting on the roof. Great community generosity! Great reason for a giant celebration May 1st!

## 2. Bike moving

Brad and Mike will hopefully be able to:

- a. Have the trailers there for bike ed before Monday, April 6th.
- b. Get temporary bike parking up by the 16th.
- c. Have the chain link fence up around the current bike rack area by the 16th.
- c. Move both bike trailers to Chimacum on Friday the 17th, any time of day.
- e. Move both trailers back to Blue Heron on Friday morning, May 1st.

The new trailer with yellow bikes can be moved anytime early.

The old trailer can only be moved after 10AM since it will be used for an early class in

Chimacum.

All bikes will be needed for the shelter dedication ceremony and bikathon kick-off - time TBD.

That's all for now.

Please let me know if you have any thoughts on this plan.

Cheers, Kees

# Responding to Wi-Fi Safety Concerns in Our Schools

January 2014

Revised September 2014



DOH 320-100 January 2014





# Responding to Wi-Fi Safety Concerns in Our Schools

January 2014

Revised September 2014

For more information or additional copies of this report contact:

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Division of Disease Control and Health Statistics  
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## **Executive Summary**

In 2013, a concerned Washington resident contacted the state Office of Superintendent of Public Instruction (OSPI) and the Department of Health (Health) about the safety of Wireless Fidelity (Wi-Fi) in schools. The state agreed to evaluate comprehensive reviews of the literature on the health effects of radiofrequency (RF) radiation. This report summarizes the findings of those reviews, but does not present state policy or recommendations on the use of Wi-Fi in schools.

A draft report was posted to the Department of Health website on January 31, 2014, and public comments were collected until March 3, 2014. The state received public comments from 58 individuals. Many of them included documents or references that were not evaluated in this report. The draft report was modified based on public comments, and responses to comments submitted by Washington residents are included in an appendix at the end of this report.

The Health-OSPI work group found 15 documents that satisfied the evaluation criteria. Each document was a comprehensive literature review of the health impact of human exposure to RF fields, and was published in English between January, 2000 and March, 2014 by a national or international health agency.

Among the 15 documents that were evaluated, 11 concluded there is no clear and consistent evidence that low levels of RF have any adverse health effects. The other four concluded there is limited and uncertain evidence that cell phone use can cause brain tumors; however, these four documents also concluded there is no evidence that RF field exposure at levels much lower than cell phones (which would include Wi-Fi) has any adverse health effect.

## **Introduction**

Washington has 295 school districts with more than 2,200 buildings and more than one million students. School staff, parents, and students all expect schools to provide a healthy and comfortable environment conducive to learning and teaching.

In today's classroom, devices using Wi-Fi are commonly used for both administrative and instructional purposes. In 2012-13, more than 90 percent of Washington schools reported providing wireless access in one or more classrooms, and more than two-thirds of buildings provided wireless access throughout the building. Devices—such as tablets, smart phones, and wireless laptops—are used in many Washington schools by educators and students for tasks ranging from taking attendance to accessing online instructional materials.

A concerned Washington resident questioned the safety of Wi-Fi in schools. In response to this concern, the Washington State Office of Superintendent of Public Instruction and Department of Health have evaluated studies conducted by national or international health agencies that had already carried out comprehensive reviews of the literature on the health effects of radiofrequency (RF) radiation. This report presents the findings of these reviews.

## Background

The fields generated by Wi-Fi devices are in the RF part of the electromagnetic spectrum. Cell phones, cell towers, radar, microwaves, and radio and TV broadcasts also generate RF fields. Most studies regarding the health effects of RF fields have evaluated cell phones because the level of exposure from cell phones is far greater than that from other devices, including Wi-Fi. Therefore, cell phones can be used as an indicator for health risks from other RF devices, at least if no evidence of risk is found; if there is no evidence of risk associated with cell phone use, then there is also no evidence of risk from other RF devices.

The International Commission on Non-Ionizing Radiation Protection (international commission, ICNIRP), which is associated with the World Health Organization (WHO), sets guidelines for exposure to RF fields. At high levels, RF can cause dangerous thermal (heat) effects, such as those caused inside microwave ovens. The international commission sets RF exposure levels so that thermal effects will not occur. The commission's review of the science found that thermal effects do not occur below a power density limit of 4 watts per kilogram (W/kg), and after incorporating a 50-fold safety factor, they have established a safety limit of 0.08 W/kg for public RF exposure for the whole body, and 2 W/kg for localized exposure (Appendix A, document 5). Among RF devices to which the public is commonly exposed, cell phones provide by far the highest exposure, with some models providing an exposure of 1 W/kg or more to the head. Wi-Fi, cell towers, and Bluetooth devices all provide roughly similar levels of exposure, about 100 to 1,000 times lower than exposure from cell phones (Appendix A, documents 5 and 6).

## Documents Review Process

An enormous amount of research has been conducted into the possible health effects of RF fields. The WHO maintains a catalog of this research that includes more than [3,000 scientific articles](#). The Health-OSPI work group determined that conducting a comprehensive review of this research was not feasible within current staffing resources. Because it wasn't possible to review all individual reports, and selecting a subset of reports might lead to inaccurate or biased conclusions, the work group decided to evaluate existing comprehensive reviews that have already been conducted, and to summarize the findings of those reviews.

To be certain of not selecting only particular viewpoints, the work group established objective criteria and conducted a search to find all reviews meeting those criteria. The criteria the reviews had to satisfy included that they were:

- Conducted by a national or international health agency.
- Published in English or had an official summary published in English.
- Published between 2000 and March, 2014.

- A comprehensive review of the scientific literature on some aspect of the health impact of human exposure to RF fields.

Some agencies published updated versions of previous reviews during this time period. When this was the case, the work group included only the most recent version of the review. Some agencies published separate reviews of different health impacts of RF field exposure. In these cases, the work group included each of the reviews. The work group found 15 documents satisfying the criteria and reviewed them for this report. The documents came from eight national health agencies and six international health agencies (one agency had two reports included in the review) Appendix A lists the 15 documents.

For each document, the Health-OSPI work group determined:

- The exposure and health outcome categories to be evaluated. The work group looked for exposure categories of RF fields, RF fields in children, Wi-Fi, Wi-Fi in schools, Wi-Fi in other settings, mobile phones, cell towers, and other. Health outcome categories included cancer (meningioma, glioma, acoustic neuroma, other or unspecified brain tumors, or other cancers), non-cancer health effects (cognitive, behavioral, immune system, hearing, brain development, nerve conduction, endocrine system or other), and electrosensitivity.
- The findings for each health outcome category.
- Whether each document provided an overall conclusion regarding health risks from RF field exposure in general and Wi-Fi exposure specifically.
- If the document discussed how or whether the precautionary principle applies.

For each document, the work group summarized the overall scientific findings, including uncertainties. These are summarized in Table 1, and the [accompanying Excel spreadsheet](#) provides the entire set of data for each document.



**TABLE 1: Overall scientific findings regarding RF field exposure and conclusion of 15 documents reviewed**

<b>Country/Entity</b>	<b>Year Published</b>	<b>Overall scientific findings/conclusions</b> (Text in quotes represents a direct quote from the document; otherwise, text is a summary of the document's conclusion):
Canada <sup>1</sup>	2014	(p. 10) "Therefore, the Panel has concluded that the balance of evidence at this time does not indicate negative health effects from exposure to RF energy below the limits recommended in the Safety Code. However, research on many of these health effects is ongoing and it is possible that the findings of future studies may alter this balance of evidence."
France <sup>2</sup>	2013	(p. 23) Biological effects below the exposure limits can be observed, but a causal relationship with adverse health effects has not been established. There is no rationale for proposing new exposure limits for the general population. There is limited evidence that there may be an increase in risk of glioma among intensive mobile phone users, but the evidence indicates that if there is an increased risk, it is low.
The Netherlands <sup>3</sup>	2013	(p. 121) "Based on the available epidemiological evidence described in this report and taking into account the quality of the different studies and their strengths and weaknesses, the final conclusion from this systematic analysis is then, that there is no clear and consistent evidence for an increased risk of tumours in the brain and other regions in the head in association with up to approximately 13 years use of a mobile telephone. For longer term use, for which no data are available, such risk cannot be excluded at present."
Sweden <sup>4</sup>	2013	(p. 9-10) There is no good evidence of adverse health effects of RF field exposure, but there is still uncertainty regarding the effects of long-term (more than 15 years) exposure to cell phones.
WHO <sup>5</sup>	2013	(p. 419) "There is limited evidence in humans for the carcinogenicity of radiofrequency radiation. Positive associations have been observed between exposure to radiofrequency radiation from wireless phones and glioma, and acoustic neuroma." (p. 419) "Radiofrequency electromagnetic fields are possibly carcinogenic to humans (Group 2B)." There was no evidence that environmental exposure [i.e. RF from cell towers and radio/TV transmitters] causes cancer.
England <sup>6</sup>	2012	(p. 4) "...in summary, although a substantial amount of research has been conducted in this area, there is no convincing evidence that RF field exposure below guideline levels causes health effects in adults or children."
European Union <sup>7</sup>	2012	(p. 41-44) There is limited evidence that long-term cell phone exposure causes brain tumors in adults, evidence that RF does not cause symptoms in electrosensitive people, and inadequate evidence for all other associations that were considered.

Norway <sup>8</sup>	2012	(p. 38) "The large total number of studies provides no evidence that exposure to weak RF fields causes adverse health effects. Some measurable biological / physiological effects cannot be ruled out." (p. 38) "This uncertainty [regarding mobile phone use] is considered to be low. There is negligible uncertainty in the risk assessment associated with other sources, such as base stations, wireless networks, ..."
The Netherlands <sup>9</sup>	2011	(p. 33-34) Based on currently available knowledge, there is not an increased risk of harmful health effects in children from RF exposure from cell phones, cell towers, or Wi-Fi, but more research is needed.
European Union <sup>10</sup>	2010	(p. 29) "...the environmental levels of RF due to anthropogenic sources are not sufficient to produce observable health effects." But there is still scientific uncertainty, especially regarding long-term exposure.
European Union <sup>11</sup>	2009	(p. 60-61) Exposure to RF fields is unlikely to cause cancer in humans, according to epidemiological, animal, and in vitro studies, but there is still some uncertainty regarding the effects of long-term exposure. There is some evidence RF exposure can influence EEG patterns but the health relevance of this is uncertain. Studies on functions of the nervous system, including cognitive and sensory functions, and studies on human reproduction and development show no or no consistent effects. Information on the possible effects of RF fields in children is limited.
ICNIRP <sup>12</sup>	2009	(p. 260-261) The plausibility of the mechanisms that have been proposed for non-thermal effects is very low. Recent studies suggest that genotoxicity effects are unlikely. There may be effects on other endpoints, such as cell signaling and EEG, but there is no evidence of adverse health effects associated with them. There is no consistent evidence of increased cancer risk, but there is still uncertainty regarding long-term effects. The data do not suggest that children are more susceptible than adults to the effects of RF radiation, but there have been few studies.
Ireland <sup>13</sup>	2007	(p. 3) "So far no adverse short or long-term health effects have been found from exposure to the RF signals produced by mobile phones and base station transmitters. RF signals have not been found to cause cancer. However research is underway to investigate whether there are likely to be any subtle, noncancer effects on children and adolescents."
Australia <sup>14</sup>	2002	(p. 76) No adverse health effects have been consistently observed when exposures are within the current standards. There is no need to revise the standards to lower exposure levels.
New Zealand <sup>15</sup>	2000	(p. 2) "The Ministry of Health considers there are no established adverse effects from exposures to radiofrequency fields which comply with the ICNIRP guidelines and the New Zealand Standard."

## Summary/Results

Among the 15 documents the work group included in the review, 14 reported on the health effects of RF fields in general, and one reported solely on the health effects of cell phones (See Table 2.) Twelve of the documents commented on health effects of RF field exposure in children. Only four of the documents commented specifically on the health effects of Wi-Fi. Fourteen documents reviewed evidence about the relationship between RF field exposure and cancer. Two of these documents were concerned only with cancer; the others also included a review of at least some other health conditions, but the specific conditions varied among the documents. Nine of the documents were published in 2011 or more recently, and as a whole, the documents include a review of the most recent research in the field.

The documents generally described their conclusions in terms of there being ‘no evidence’ or ‘no clear and consistent evidence’ that RF field exposure causes a particular health effect (except for the few times they concluded there was limited evidence of an effect). It is usually very difficult for health studies to show that a harmful effect does not exist, so a conclusion of ‘no evidence’ of a harmful effect may cover a wide range of possibilities—it may mean that numerous high-quality studies found no harmful effect, or it may mean that few studies evaluated the effect. For this reason, the work group also tabulated the uncertainty in the estimates of effect, when that was reported.

Among the 15 comprehensive review documents that were evaluated, 11 concluded there is no clear and consistent evidence that low levels of RF field exposures have any adverse health effects. Four of the 15 documents concluded there is limited and uncertain evidence that cell phone use can cause brain tumors; however, these four documents also concluded there is no evidence that RF exposure at levels much lower than cell phones, such as those obtained from Wi-Fi, has any adverse health effect.

Many of the documents noted that cell phones have been used for a shorter period of time than the latency period for slow-growing brain tumors, such as meningioma and acoustic neuroma. Therefore, epidemiological studies have not properly evaluated the health effects of long-term use. Most of these documents also noted that since cell phone prevalence was very high (approaching 100 percent) in many countries by 2000, some effects on national trends should have been seen by now unless the increased risk due to cell phone use is small.

Nine of the documents specifically stated that the long-term effects of cell phone use are still uncertain, or that long-term studies are needed. Two of the documents concluded that there was little uncertainty in their assessment that RF field exposure has no adverse health effects. Among the nine documents that concluded there is uncertainty regarding cell phone use, none of the documents concluded that there is uncertainty regarding low-level RF exposure.

Eight of the documents addressed the possible cognitive effects of RF exposure. All eight of these documents concluded that there is no clear and consistent evidence that RF exposure has adverse cognitive effects. Three of the documents addressed behavioral effects. All three

concluded there is no clear and consistent evidence that RF exposure has adverse behavioral effects.

Several other health effects were addressed by one or more of the documents, including effects on the immune system, hearing, brain development and function, nerve conduction, the endocrine system, the cardiovascular system, and the reproductive system. No clear and consistent evidence for adverse health effects was found for any of these. Although RF field exposure was found to possibly affect nerve conduction, this was not associated with adverse health effects.

Eight of the documents commented on the phenomenon of electrosensitivity—the phenomenon in which people exhibit symptoms that they attribute to RF or other electromagnetic field (EMF) exposure. Several documents stated that it is well-established that the symptoms exhibited by electrosensitive people are real, and can be severe, to the point that some people are disabled or have their lives disrupted by their symptoms. The documents were unanimous though in concluding that there is good evidence from numerous, well-controlled studies that these symptoms are not actually caused by RF or EMF exposure. Further, there is no evidence that anyone can detect the presence of EMF at the levels to which people are commonly exposed.

Six of the documents mentioned the precautionary principle in some way, although there was a wide range of how that principle was interpreted. This ranged from limiting unnecessary exposure to recommending that children should minimize cell phone use. None of the documents that mentioned the precautionary principle advocated eliminating the use of Wi-Fi.

One report (Appendix A, document 6) measured the magnitude of exposure to RF fields in school settings, and concluded that levels were far below the international commission threshold.

## **Conclusion**

The work group evaluated studies conducted by national or international health agencies that have carried out comprehensive reviews of the literature on the health effects of exposure to RF radiation, and that have been published in English between 2000 and March, 2014. The consensus conclusion of these 15 documents was that there is no clear and consistent evidence that low levels of RF fields, such as produced by Wi-Fi equipment, have any adverse health effects in people. Although there is some uncertainty regarding the possible effects of cell phones, which expose users to RF fields with much higher power density than Wi-Fi, the documents assert there is little uncertainty regarding health effects of the low levels of RF field exposures produced by Wi-Fi equipment.

**TABLE 2: Characteristics and conclusions of the 15 reviewed documents**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Reported on RF fields in general	X	X		X	X	X	X	X	X	X	X	X	X	X	X
Reported on cell phones only			X												
Reported on RF in children	X	X		X		X	X	X	X	X	X	X	X	X	
Reported on health effects of Wi-Fi					X		X	X					X		
Concluded there is no evidence RF has adverse health effects	X	X	X		X	X		X		X	X	X	X		X
Concluded there is limited evidence cell phones cause brain tumors				X			X		X					X	
Concluded long-term effects of cell phone use are still uncertain	X	X	X	X	X		X			X	X	X			
Concluded there is little uncertainty in conclusion of no adverse effects					X		X								
Reported on cognitive effects	X	X		X		X			X	X	X	X			
Reported on behavioral effects						X		X	X						
Reported on electrosensitivity	X			X		X	X	X			X	X	X		

## Appendix A: Documents Reviewed

Text in parentheses at the end of each citation refers to the corresponding tab in the accompanying spreadsheet.

1. The Royal Society of Canada. A Review of Safety Code 6 (2013): Health Canada's Safety Limits for Exposure to Radiofrequency Fields. The Royal Society of Canada, 2014. [http://rsc-src.ca/sites/default/files/pdf/SC6\\_Report\\_Formatted\\_1.pdf](http://rsc-src.ca/sites/default/files/pdf/SC6_Report_Formatted_1.pdf), accessed on April 1, 2014. (Canada14)
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## APPENDIX B: Glossary

<b>Terminology</b>	<b>Definition</b>
acoustic neuroma	An acoustic neuroma is a rare, usually slow-growing tumor of the inner ear, specifically of the nerve that connects the ear to the brain (the hearing nerve). This type of brain tumor develops in the eighth cranial nerve, which controls hearing and balance and is located in the inner ear near the back of the skull.
behavioral effects	In RF studies, this may refer to many aspects of animal and human behavior; in this review, it refers to general behavior in people, especially children, such as the ability to concentrate on tasks or follow directions.
cognitive effects	These include effects on conscious mental activities such as thinking, understanding, learning, and remembering.
electrosensitivity	A common name for the phenomenon in which some people are sensitive to the presence of electromagnetic fields, either to RF fields, or to other parts of the EMF spectrum. Electrosensitivity is associated with a very wide range of symptoms, including some which are clinically observable, such as skin rashes and heart rate variability. Some medical organizations have termed this phenomenon "idiopathic environmental intolerance attributed to electromagnetic fields" (IEI-EMF) to reflect the fact that the actual cause of the symptoms is unknown.
EMF	EMF is an acronym for electromagnetic fields.
glioma	A glioma is a type of tumor that starts in the brain or spine.
meningioma	Meningiomas are a diverse set of tumors arising from the meninges, the membranous layers surrounding the central nervous system.
nerve conduction	The electrical conduction of nerve cells in either the peripheral or central nervous systems. Usually measured with an electroencephalogram (EEG) or a test of event-related potential (ERP).
power density	The rate at which energy from an electromagnetic field is absorbed by human tissue.
precautionary principle	There are many definitions of this concept; all of them express the idea that when there is evidence that a particular exposure is harmful, people or governments need not wait for proof of harm before taking steps to limit exposure.
RF	RF stands for <i>radiofrequency</i> , part of the electromagnetic spectrum.
SAR	SAR stands for <i>specific absorption rate</i> , a measure of the intensity of the radiofrequency field produced by a device.
Wi-Fi	Wi-Fi stands for <i>wireless fidelity</i> ; Wi-Fi is a popular technology that allows an electronic device to exchange data or connect to the Internet wirelessly using radio waves.



## APPENDIX C: Public Comments

<ul style="list-style-type: none"> <li>• Comments included in this document are from Washington residents only.</li> <li>• To protect privacy, commenter's street addresses, email addresses and telephone numbers have been redacted.</li> <li>• Multiple comments from the same person are combined in one PDF file.</li> <li>• Click on each name below to read comments.</li> </ul>	Advocated no Wi-Fi in schools.	Advocated use of precautionary principle.	Expressed concern about possible bias of documents reviewed or omission of other documents, studies, or expert testimony.	Asserted that other countries have banned Wi-Fi in schools.	Mentioned electrosensitivity or stated personal effect of RF on themselves.	Expressed concern that DOH/OSPI only summarized the documents reviewed, or details from documents reviewed were not included in the report.	Expressed concern that current safety standards are out of date and are not based on all possible health outcomes.	Expressed concern that research is biased by industry funding.
<a href="#">Ace Swerling</a>	X				X			
<a href="#">Ann Marie Fischer</a>	X		X		X			
<a href="#">Audrey Adams</a>	X	X						
<a href="#">Avantika Nirupama</a>	X	X	X	X				
<a href="#">Brigitta Erhard</a>	X	X			X			
<a href="#">Cynthia Franklin</a>		X	X					
<a href="#">David Morrison</a>	X		X	X				X
<a href="#">Erica Swedberg</a>	X		X					
<a href="#">Erin Honeycutt</a>	X	X	X					X
<a href="#">Evelyn Savarin</a>	X		X					X
<a href="#">Faith de Coeur</a>	X		X					
<a href="#">Gert Gustedt</a>	X							
<a href="#">Jeffri D Smith</a>			X					
<a href="#">Jordan Van Voast</a>	X	X	X				X	
<a href="#">Judi Hangartner</a>	X							
<a href="#">Julienne Battalia</a>			X					X
<a href="#">Kaitlin Losansky</a>	X	X	X					X
<a href="#">Karen Nold</a>	X	X	X			X		X
<a href="#">Kulany Hanson (Roeksbutr)</a>	X				X			
<a href="#">Laura Legere</a>	X	X	X			X		X
<a href="#">Martin Pall</a>	X		X				X	
<a href="#">Michael Meek</a>	X	X	X					
<a href="#">Miranda Taylor</a>	X		X					
<a href="#">Nancy Morris</a>	X	X	X		X	X		X
<a href="#">Olemara Peters</a>	X		X				X	
<a href="#">Rose Miller</a>	X							

<a href="#">Sandra Storwick</a>	X	X	X		X	X		
<a href="#">Shirleann Nold</a>	X		X					
<a href="#">Sonia M. Hoglander</a>	X	X	X			X		X
<a href="#">Stephanie Lecovin</a>	X	X						
<a href="#">Stephen F. Ludwig</a>	X	X	X			X		X
<a href="#">Terry Losansky</a>	X	X	X			X		X

## **APPENDIX D: Response to Comments**

### **Report changes based upon comments**

The typographical error identifying the Health Council of the Netherlands report (formerly Document 1) as the sole document that measured the exposure to RF field exposures in school has been corrected to Health England (now Document 6).

The final report has been modified to include discussion of the precautionary principle. Other minor changes were made to clarify the report.

The French 2013 report “Opinion of the French Agency for Food, Environmental and Occupational Health & Safety concerning the update of the ‘Radiofrequency electromagnetic fields and health’ expert appraisal” met our criteria and was added to the report with its accompanying spreadsheet (new Document 2). As a result, we have removed the 2005 French report from the final document (formerly Document 13).

Two documents in the draft report were determined not to meet the criteria for inclusion, and were removed from the final report. They were the 2011 document from Spain (formerly Document 8), which was sponsored by a university (Fundación General of the Complutense University of Madrid), not by a health agency; and the 2003 report from the USA National Council on Radiation Protection and Measurements (formerly Document 14), because that body accepts corporate sponsorship.

Another document that meets the criteria for inclusion was published after the comment period ended, and has also been added. This document is “A Review of Safety Code 6 (2013): Health Canada’s Safety Limits for Exposure to Radiofrequency Fields,” published in March, 2014 (new Document 1).

### **Responses to specific comments submitted by Washington residents**

*See Appendix C: Public Comments – page 12*

#### **Comment: Advocated no Wi-Fi in schools.**

The decision to use Wi-Fi in schools is a policy decision that this report does not address. This report only reviews the evidence concerning the safety and potential health effects of Wi-Fi in schools.

#### **Comment: Advocated use of precautionary principle.**

The final report has been modified to include discussion of the precautionary principle. The decision to use the precautionary principle is a policy decision that this report does not address.

#### **Comment: Expressed concern about possible bias of documents reviewed or omission of other documents, studies, or expert testimony.**

As noted above, two documents were removed from the final report.

Several comments recommended additional studies, expert opinion, or other documents to include in this report. We did not include these suggested studies, as they did not meet our stated criteria (e.g., they were not conducted by a national or international health agency, or they did not include a comprehensive review of the scientific literature).

**Comment: Asserted that other countries have banned Wi-Fi in schools.**

The Health-OSPI work group have not found any evidence to support the assertion that other countries have banned Wi-Fi in schools.

**Comment: Mentioned electrosensitivity or stated personal effect of RF fields on themselves.**

As noted in the report, several documents stated that it is well-established that the symptoms exhibited by electrosensitive people are real, and can be severe, to the point that some people are disabled or have their lives disrupted by their symptoms. However, the eight documents that addressed electrosensitivity were unanimous in concluding that there is good evidence from numerous, well-controlled studies that these symptoms are not actually caused by RF or EMF exposure. Further, there is no evidence that anyone can detect the presence of EMF at the levels to which people are commonly exposed.

**Comment: Expressed concern that Health-OSPI work group only summarized the documents reviewed, or details from documents reviewed were not included in the report.**

As described in the Documents Review Process section, the goal was to “summarize the overall scientific findings, including uncertainties,” which was generally provided in the executive summary of each document reviewed. The report includes links to the complete documents, so those who are interested can read the complete details provided in those documents.

**Comment: Expressed concern that current safety standards are out of date and are not based on all possible health outcomes.**

The International Commission on Nonionizing Radiation Protection (ICNIRP) sets recommended standards for RF exposure limits, and the limits are based upon a review of the scientific literature. The most recent review of the standards are included in Document 12, one of the reviews evaluated in this report. The ICNIRP standards are based on thermal effects; however, the ICNIRP evaluates all other known outcomes when setting or reviewing standards.

**Comment: Expressed concern that research is biased by industry funding.**

None of the reviews that were evaluated were funded by industry; however, the Health-OSPI work group acknowledge that some of the authors of these reviews may be associated with industry in other contexts.

Specific concerns were expressed that a document prepared by the ICNIRP was included, and that individuals associated with the ICNIRP served as authors on other included documents. The ICNIRP is publicly funded, and does not accept industry funding.

## **Greetings Dr. Engle and Port Townsend School Board Members,**

Thank you for your continued service to our community.

I am writing to address Dr. Engle's email communication on February 25, 2015 shown below, that was in response to the health concerns about WiFi radiation exposure that I voiced during public comment at the February 23, 2015 School Board Meeting. At this meeting, I requested that the WiFi radiation exposure issue be added as an agenda item for the School Board to discuss since the health of our children, teachers and staff is at stake.

I have thoroughly read the report document titled, "Responding to Wi-Fi Safety Concerns in Our Schools" sent to me by Dr. Engle and attached to this communication. The main conclusion of the report, which was a summary of various scientific reviews about wireless radiation from International health agencies, is:

"that there is no clear and consistent evidence that low levels of RF fields, such as produced by Wi-Fi equipment, have any adverse health effects in people."

However as I mentioned in my public comments at the March 23rd, 2015 School Board meeting:

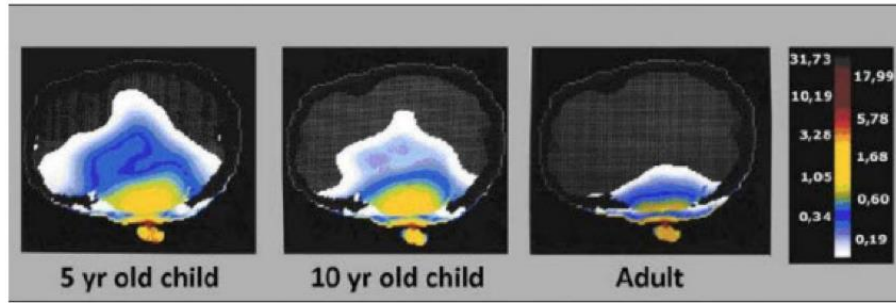
While it is true that the evidence is not 'clear and consistent' that does not mean there is no evidence.

There is a great deal of evidence of harmful biological effects spanning many decades that have been reported in peer reviewed, published, scientific journals. Some of these harmful biological effects are: sleep disruption, headaches, disruption of cell membrane channels, DNA damage, disruptions to heart functioning, leakage of the blood-brain barrier, increased risk of cancer, oxidative stress, anxiety, behavioral disruptions, memory loss, and decreased fertility. There are also anecdotal reports of fatigue, feelings of pressure in the head, nosebleeds, hair loss, ringing in the ears, nausea and 'brain fog' after exposure to wireless radiation. At the same time, there is also research showing no harmful biological effects. This lack of clarity and consistency is not a reason to dismiss the subject, but it is a reason to acknowledge that the subject is highly complex and it requires a much more thoughtful and precautionary approach.

It is very important to understand that radiation exposure guidelines have been declared inadequate by numerous scientists and medical doctors, especially because they were written with adults in mind and not for children.

See below the photos using brain scan thermography to show the 'Children's Unique Vulnerabilities to Wireless Radiation'

## Children's Unique Vulnerabilities to Wireless Radiation



(Om P. Gandhi et al., 2012)

The image above demonstrates the increased absorption of wireless radiation within the brains of children compared to adults. WiFi radiation has *never* been evaluated for its long term impact on the developing brain. Recent research is linking wireless with serious potential health effects.

The above Image Accessed on April 7, 2015 from Environmental Health Trust website and can be view at:

<http://ehtrust.org/wp-content/uploads/2015/02/SchoolsWirelessShortBriefingFeb2015.pdf>  
(entire article)

The ones who write the "Responding to Wi-Fi Safety Concerns in Our Schools" report that Dr. Engle sent, expressly state the purpose of the document is to address safety concerns about WiFi radiation. But they also state that the document is NOT for the purpose of making policy decisions.

Consider this: Why go through all of the trouble to review WiFi radiation health and safety issues if you are not going to use the review for policy decisions?

While the review is ostensibly written to address the concerns voiced by parents and citizens, what needs to be brought out in the open is that PRIOR to the review, a policy decision has ALREADY BEEN MADE. The decision to allow WiFi radiation in schools was already in place and the so called 'review', without saying it outright, serves to support the existing policy of exposing children to WiFi radiation.

Our children are being exposed to unprecedented, unevaluated, unregulated levels of microwave radiation without complete study, without proper discussion, and without informed consent.

The very limited review summarized in the "Responding to Wi-Fi Safety Concerns in Our Schools" report is nowhere near a complete and accurate accounting of the full scope of this issue. But even if it was, what is in the report itself is enough to give us pause. Here are quotes from some of the summaries given:

1. Norway 2012 "Some measurable biological/physiological effects cannot be ruled out."
2. The Netherlands 2011 "... more research is needed."
3. European Union 2010 "... there is still scientific uncertainty, especially regarding long-term exposure."
4. European Union 2009 "Information on the possible effects of RF fields in children is limited."

There are three important points below that have a bearing on how we, as a community, can understand the magnitude of this issue and how together we can deal with the WiFi question in ways that are most thoughtful and wise.

### 1. Complexity of the Issue

Measuring the effects of WiFi radiation is complex and this accounts for the discrepancies and apparent contradictions we see in the research about whether or not there are harmful effects of WiFi radiation. As one of the primary research scientists on this subject, Dr. Henry Lai of the University of Washington's Bioelectromagnetics Research Lab states: "... the main barrier in understanding the biological effects of radio frequency radiation [such as WiFi] is caused by the complex interaction of different exposure parameters in causing an effect. An independent variable of such complexity is unprecedented in any other field of biological research." In simple terms, there are so many factors involved that even valid scientific studies can come to opposite conclusions. Because the safety of our children, teachers and staff is at stake, we must look at the evidence in total.

There is more than enough evidence of harmful biological effects of WiFi radiation—see references\*. It is our duty to provide a safe, healthy environment for children, teachers and staff.

Internet access for students, teachers and staff should only be through safe, wired, ethernet and adaptor connections (such as D-Link adaptors <http://us.dlink.com>). This technology is not only safe but inexpensive, more reliable, faster and more secure than wireless internet connection.

\*For references see:

"Best Practices with Wireless Radiation for Schools—a Review of Global Advisories" from the Environmental Health Trust website  
(Preliminary Report updated 2/5/2015)

<http://ehtrust.org/wp-content/uploads/2015/02/SchoolsWirelessShortBriefingFeb2015.pdf>  
And

<http://www.electronicssilent.spring.com/wp-content/uploads/2014/01/Dr-Erica-Mallery-Blythe-EHS-A-Summary-Working-Draft-Version-1-Dec-2014-for-EESC-Brussels.pdf>

### 2. The Burden of Proof

Ones who object to the current policy of allowing WiFi in schools, on the grounds that there are serious health and safety issues involved, are told that there is no proof of 'causation' or in this case, "no clear and consistent evidence" that any harmful effects are coming from exposure to WiFi radiation.

Causation is challenging to prove especially when the variables are complex and when effects of the radiation damage can occur days, weeks, months or years after exposure.

Again, because a policy decision has already been made, the burden of proof is placed in such a way that serves to uphold the existing policy.

But this is a mistake of enormous magnitude because the burden of proof has been switched from its rightful place.

In reality, the burden of proof lies with those who promote the technology. Rather than asking concerned citizens to prove that WiFi radiation is harmful, the ones who promote the technology, and those who benefit financially from the technology, need to prove WiFi radiation

is safe.

At this time no medical or scientific individual or organization states that low level microwaves in WiFi radiation are “safe”.

Not one.

Therefore, the most wise course of action is to leave the whole debate aside, take precaution, and use the safer alternative that already exists—wired internet connection.

3. WiFi technology is being rejected in schools, by teachers, by teachers unions, by librarians and by government agencies in the US and throughout the world. Insurance companies are seeing WiFi health damage claims as a significant emerging risk.

Go to the link here to see a list of global initiatives to remove or limit exposure to wireless radiation in schools, libraries, public places and as public health policy, see pages 7-13:

<http://ehtrust.org/wp-content/uploads/2015/02/SchoolsWirelessShortBriefingFeb2015.pdf>

More information here:

<http://ehtrust.org/schools-and-safe-technology/>

For insurance reference see:

[http://media.swissre.com/documents/SONAR\\_+Emerging\\_risk\\_insights\\_from\\_Swiss\\_Re.pdf](http://media.swissre.com/documents/SONAR_+Emerging_risk_insights_from_Swiss_Re.pdf)

A final point: Do we need more research before we take action?

Here is the answer from Martin Blank, PhD, who joined a panel of Children’s Health Experts to discuss the health effects of wireless radiation on children, fetuses and fertility:

"No more research is needed in order to say with certainty that these effects are real, and there is sufficient cause to take action now to protect adults and children. While more research will always be desirable, . . . all members of the panel agreed there is sufficient scientific evidence today on which to take precautionary steps to minimize this radiation in our lives."

To see the full report go to:

<http://electromagnetichealth.org/electromagnetic-health-blog/summary-and-audio/>

Dr. Engle and School Board Members, I respectfully request that you read the evidence here and take steps to ensure our children and school staff can switch to safe wired internet access. I trust there are many parents, teachers and community members who will come forward to volunteer their time to make this transition smooth and successful. At the very least adding the WiFi radiation exposure issue to your agenda at the earliest opportunity is requested and expected given the serious nature of this issue.

I have in writing the following about how the agenda items are administered:

From the Port Townsend School District Calendar:

"To address the board collectively, you may send email to [aboard@ptschools.org](mailto:aboard@ptschools.org). Email sent to this address will be included on the agenda of the next board meeting. In order to appear on an agenda, all written communication (via letter or email) must be in the district office by noon on the Wednesday before the Monday meeting."

Please consider the above to be my formal request for hearing this issue as an agenda item at the



April 27th, 2015 school board meeting.

Again thank you for your service to our community and I look forward to working together to solve this important issue.

Sincerely,

Sonia Story  
Parent

On Feb 25, 2015, at 1:18 PM, David Engle <[dengle@ptschools.org](mailto:dengle@ptschools.org)> wrote:

Hello Mrs. Story,

I wanted to be sure and get back to you regarding your public comments at our most recent Board meeting. I appreciated your willingness to present your concerns to the Board of Directors. I know that they are always appreciative of public comment. As part of our regular meeting process, we reviewed our work-study calendar for the remainder of the school year. We have a very full slate through the end of this school year. This precludes adding any further agenda items at this time.

In order to let you know that I've considered your concerns, I'm attaching a document that speaks directly to the focus of your public comments. Also, I've included the URL below that connects you to the State of Washington agency most directly concerned with this issue.

Please know that we are actively considering how to most effectively support our instructional program with digital technology. As you may or may not know, we are building a district instructional program that emphasizes active learning in the community. This bias towards placed-based, active and community-connected learning means that we will use digital tools to augment, not substitute for, a more hands-on approach to learning. I worry as much about the risks of our students sitting too much and using digital technology as a replacement for actual social engagement as much as the concerns you raised. Inactivity and alienation are known risk factors for everyone! Again, thank you for your public comments Monday, February 23rd.

Best regards,  
David

<http://www.doh.wa.gov/CommunityandEnvironment/Schools/EnvironmentalHealth/WiFiSafety>

This communication is for the sole use of the intended recipient(s) and may contain information that is confidential or legally protected. Any unauthorized review, disclosure, dissemination, distribution or use of this communication is prohibited and may be a violation of the Family Educational Records Privacy Act (FERPA) or other privacy protection laws and regulations. If you received this communication in error, please notify me immediately by phone at 360-379-4503, and delete the original message.

<320-100-WiFiSafetyInSchoolsSept2014Final.pdf>  
<320-100-WiFiSafetyInSchoolsSept2014Final.pdf>

reviewed & approved by  
David Engle  
4/9/15

March 26, 2015

Dear Port Townsend School Board,

My name is [REDACTED] and I am a senior this year at PTHS. My life has become really busy lately preparing for graduation. One of the things I've had to do is to get my cap and gown all squared away for when I walk at graduation. It was here that I hit a roadblock. It is my understanding that it has been traditional for women to wear white gowns at graduation and for men to wear red. This was I'm sure once upon a time a very ordinary, and appropriately conservative rule at the beginning of Port Townsend High Schools riveting history. Today I feel that it is a tad outdated.

My main issue with this policy is that it leaves no wiggle room for students who identify outside of the gender binary. With this policy gender nonconforming, or transgender students at PTHS will feel uncomfortable (to say the least) in their own skin at graduation. If these students are forced to wear the color that doesn't represent who they are, they may instead opt out of graduation, missing out on what is arguably the biggest day of their lives thus far. There are many schools in our region and throughout the United States that have recently changed similar policies to reflect the changing times. For example there was Seattle's Franklin High school who changed their policy of gender segregated seating at graduation, in February, and Kennett High School in North Dakota that had a policy identical to our own about graduation gown colors, which was changed just this month.

I want to wear red at graduation. **I am writing to you today to ask that you change the rule, so that any student, of any gender, can wear a gown of either red or white at graduation.** I do not want an exception the rule to be made in my case, I respectfully request that the rule be revisited and changed for all students.

Sincerely [REDACTED] and the Port Townsend High School GSA.

Received by C. Ehrhardt, Principal on 3-27-15.  
Verified approval by C. Ehrhardt on 4-7-15  
Approved at GSA meeting on 4-8-15, verified by advisor Ben Dow.  
Forwarded to District office by C. Ehrhardt on 4-8-15.

Physical Science Progression

INCREASING SOPHISTICATION OF STUDENT THINKING

	K-2	3-5	6-8	9-12
PS1.A Structure of matter (includes PS1.C Nuclear processes)	Matter exists as different substances that have observable different properties. Different properties are suited to different purposes. Objects can be built up from smaller parts.	Because matter exists as particles that are too small to see, matter is always conserved even if it seems to disappear. Measurements of a variety of observable properties can be used to identify particular materials.	The fact that matter is composed of atoms and molecules can be used to explain the properties of substances, diversity of materials, states of matter, phase changes, and conservation of matter.	The sub-atomic structural model and interactions between electric charges at the atomic scale can be used to explain the structure and interactions of matter, including chemical reactions and nuclear processes. Repeating patterns of the periodic table reflect patterns of outer electrons. A stable molecule has less energy than the same set of atoms separated; one must provide at least this energy to take the molecule apart.
PS1.B Chemical reactions	Heating and cooling substances cause changes that are sometimes reversible and sometimes not.	Chemical reactions that occur when substances are mixed can be identified by the emergence of substances with different properties; the total mass remains the same.	Reacting substances rearrange to form different molecules, but the number of atoms is conserved. Some reactions release energy and others absorb energy.	Chemical processes are understood in terms of collisions of molecules, rearrangement of atoms, and changes in energy as determined by properties of elements involved.
PS2.A Forces and motion	Pushes and pulls can have different strengths and directions, and can change the speed or direction of its motion or start or stop it.	The effect of unbalanced forces on an object results in a change of motion. Patterns of motion can be used to predict future motion. Some forces act through contact, some forces act even when the objects are not in contact. The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center.	The role of the mass of an object must be qualitatively accounted for in any change of motion due to the application of a force.	Newton's 2 <sup>nd</sup> law ( $F=ma$ ) and the conservation of momentum can be used to predict changes in the motion of macroscopic objects.
PS2.B Types of interactions			Forces that act at a distance involve fields that can be mapped by their relative strength and effect on an object.	Forces at a distance are explained by fields that can transfer energy and can be described in terms of the arrangement and properties of the interacting objects and the distance between them. These forces can be used to describe the relationship between electrical and magnetic fields.
PS2.C Stability & instability in physical systems	N/A	N/A	N/A	N/A
PS3.A Definitions of energy	N/A	Moving objects contain energy. The faster the object moves, the more energy it has. Energy can be moved from place to place by moving objects, or through sound, light, or electrical currents. Energy can be converted from one form to another form.	Kinetic energy can be distinguished from the various forms of potential energy. Energy changes to and from each type can be tracked through physical or chemical interactions. The relationship between the temperature and the total energy of a system depends on the types, states, and amounts of matter.	The total energy within a system is conserved. Energy transfer within and between systems can be described and predicted in terms of energy associated with the motion or configuration of particles (objects). ----- Systems move toward stable states.
PS3.B Conservation of energy and energy transfer	[Content found in PS3.D]			

# NGSS Performance Expectation Analysis Placemat

Grade Level	DCI	Title of Standard
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**P.E.:**

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**AB/CS**

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**Connections to other DCIs at prior grade levels** \_\_\_\_\_

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**SEP**

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**DCI**

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**CC**

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**Connections to other DCIs at later grade levels** \_\_\_\_\_

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**Connections to other DCIs across grade level**

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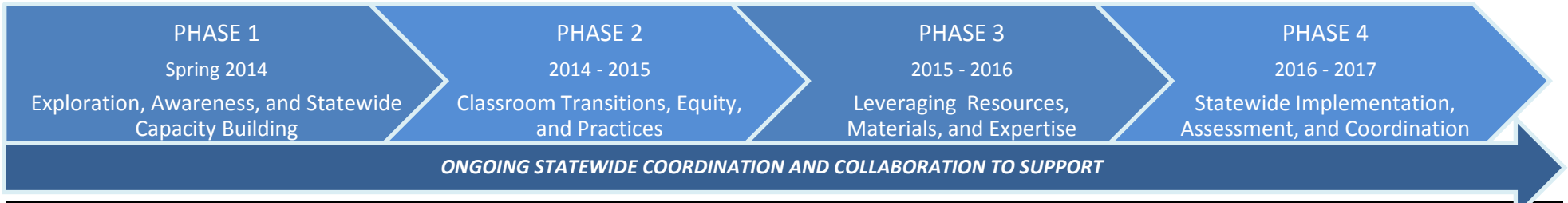
Reading CCSS	Writing CCSS	Speak/Listen CCSS	Mathematics CCSS
<hr/>	<hr/>	<hr/>	<hr/>
<hr/>	<hr/>	<hr/>	<hr/>
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Caption:





# Washington State Next Generation Science Standards Transition Planning Document



Elements, Leads, and Tasks	<b>Communication (OSPI, State Science Leadership Team, LASER)</b>			
	Develop messages	General outreach on shifts	Ongoing messaging	
	<b>Statewide Capacity/Network Building (OSPI Programs; State Science Leadership Team)</b>			
	Identify existing expertise and gaps	Develop NGSS support networks	Ongoing support of leadership network	
	<b>Professional Learning (OSPI Programs, State Science Leadership Team, ESD Regional Science Coordinators, STEM teachers, Administrators, Informal/Community Educators)</b>			
	Identify Professional Learning needs (teachers, administrators, and community educators)	Professional Learning designed for all stakeholders	Professional Learning Implemented for teachers and administrators	Professional Learning Implemented for informal/community educators and ongoing adaptation of Professional Learning
	<b>Instructional Practices/Shifts (OSPI Programs, State Science Leadership Team, ESD Regional Science Coordinators, STEM teachers)</b>			
	Focus on equity and integrating Science and Engineering Practices	Continued focus on equity and integrating SEPs and Cross Cutting Concepts	Integration of three dimensions (SEPs, CCCs, and DCIs)	Instructional shifts in place
	<b>Instructional Materials and Curriculum (OSPI Programs, State Science Leadership Team, ESD Regional Science Coordinators, LASER)</b>			
	Evaluate existing materials	Adapt existing materials and explore (e) Innovations	Evaluate placement of instructional materials and leverage materials and curriculum	Develop/evaluate new materials
	<b>Assessment System (OSPI)</b>			
	Review Board on Testing and Assessment Report (NRC)	Study assessment system opportunities with NGSS adopted states	Develop new assessments and resources	Field test new assessments
	<b>Data Collection (OSPI)</b>			
	Determine metrics to be tracked (e.g., course taking, student achievement, STEM, etc.)	Develop data collection plan	Track and report science related data	
<b>Policy Shifts (OSPI, SBE, PESB, Legislature)</b>				
Identify policy changes necessary to implement NGSS (e.g. PESB teacher competencies, secondary pathways, assessment)				



## Critical Stakeholders in Washington State NGSS implementation

Implementation of NGSS requires the collaboration of various critical stakeholder groups, many of which are included here. (Please note that this is not an all-inclusive list of stakeholders.)

### OSPI Programs

- Teaching and Learning
- Assessment and Student Information
- CTE (STEM, Agriculture, Skilled and Technical Sciences, Family Consumer Science, Health, etc.)
- Migrant/Bilingual
- Special Education
- Indian Education
- Early Learning
- Communications

### State Science Leadership Team

- OSPI
- ESD Regional Science Coordinators
- Higher Ed Partners
- Business Partners
- Administrators
- Teachers

### Statewide Networks

- Leadership and Assistance for Science Education Reform (LASER)
- Educational Service Districts (ESD)

### Higher Education

- Colleges of Education
- Colleges of Science and Engineering
- Community and Technical Colleges
- Content Faculty

### Informal/Community Partners

- Various informal and community partners with connections to NGSS

### Business Industry Partners

- Various business/industry partners with connections to NGSS

### K-12 (Districts and Building Level) Schools

- Staff
- Students
- Administrators
- Community

### State Boards

- Professional Educators Standards Board (PESB)
- State Board of Education (SBE)

### State Associations

- Educator and Administrator Professional Organizations

### National (Science/STEM) Education Organizations

- Council of State Science Supervisors (CS3)
- Achieve
- National Educator Professional Organizations





# **Unpacking Washington State Standards in Science**

What does NGSS mean for our teachers?

# What would you say?

Take a minute to record your thoughts on the workshop Reflection Response Guide.....

*What would you tell someone at a WSSDA meeting if you were asked what Port Townsend Schools are doing to meet the new science standards?*

# NGSS - Conceptual Shift

“Facts are not science - as the dictionary is not literature”

- Martin H. Fischer (1944)

# Examining the Conceptual Shift

Expectation for tonight

- Engage in a science experience
- Learn new vocabulary of science instruction
- Discover three domains of science instruction
- Reflect on what NGSS means for PTSD

# The Classic Whirligig

- Decide how you can determine which whirligig flies the best.
- Decide what data you want to record to document which whirligigs flies the best.
- Start gathering data as soon as you have your plan!

# Now make a prediction

Consider the data that you gathered.....

- What would your data look like if the wings of the whirligig were even longer?
- Be sure you can support your prediction with mathematical and scientific reasoning as well as prior experience.

# Was this Next Generation Science?

- Look at the grade level progression for the performance expectation that could be applied to the whirligigs.
- Decide what grade level looks most appropriate for the task.
- [Progression](#) (find hard copy at back of powerpoint packet)

# **A Word About Vocabulary.....**

***Performance Expectations*** describe what a student should understand and be able to do at each grade level or band.



# A Word About Vocabulary.....

Each Performance Expectation (PE) has three dimensions:

- SEP - 8 Science and Engineering Practice
- Crosscutting Concepts - 7 Analysis skills that can be applied in all science domains
- DCI - 13 Disciplinary Core Idea (what we used to call content)

# Science and Engineering Practices

## Dimension 1: Practices

The practices describe behaviors that scientists engage in as they investigate and build models and theories about the natural world and the key set of engineering practices that engineers use as they design and build models and systems.

# Crosscutting Concepts

## Dimension 2: Crosscutting Concepts

Crosscutting concepts have application across all domains of science. They are a way of linking the different domains of science. They include:

Patterns, similarity, and diversity; Cause and effect; Scale, proportion and quantity; Systems and system models; Energy and matter; Structure and function; Stability and change.

# Disciplinary Core Ideas

## Dimension 3: Disciplinary Core Ideas

Disciplinary core ideas have the power to focus K–12 science curriculum, instruction and assessments on the most important aspects of science.

Disciplinary ideas are grouped in four domains: the physical sciences; the life sciences; the earth and space sciences; and engineering, technology and applications of science.

This is what we used to call Content!

# With your Mentor, open the NGSS application on your iPad

- Search DCI Arrangement.
  - Select the grade for the Whirligig investigation.
  - Select the topic of Forces and Motion, 3-PS2-2.
  - [Performance Expectation](#)

# What do you see?

Look at the standard page.

Share an observation of the standard page with your mentor (no inferences yet).

[Watch this short video](#)

# What do you see?

Look across the top of your placemat.

- Record the grade level
- Record the DCI code
- Record the title of the standard

# With your mentor....

Fill in the box that is outlined in black with

- Performance Expectation (PE)

Fill in the box what is outlined in red with

- Assessment Boundaries (AB)
- Clarifying Statements (CS)



# **With your mentor**

Check out the three color coded foundation boxes.

Record a key idea from each box.

Now click on

Connections across grade levels.

Common Core State Standards.

# What it means - Make inferences

On sticky notes record (one observation/note)

- What you notice,
- What it means for
  - District....
  - Instruction....
  - Curriculum....
  - Other....

# OSPI Transition Plan

## [Transition plan](#)

Look at Transition Plan matrix in handouts after the powerpoint slides in your packet.

On you Workshop Reflection Response Guide, *write your thoughts on where we are as a district right now.*

# On your Reflection Response Guide

- *Create an action statement describing possible next steps for our district for science.*
- Share your ideas with an elbow partner.
- Be ready to share ideas and questions with the group

# Works Cited

Brunsell E, Kneser D, Niemi K, *Introducing Teachers + Administrators to the NGSS*, NSTA Press, Arlington Virginia, 2014

Bybee R, *Evidence Based Science Curriculum and Transformational Professional Development*, BSCS, Colorado Springs CO, 2010

# Port Townsend School District

## NGSS Implementation Plan – DRAFT 3.5.2015

What?	Who?	When?	Time?
NGSS Presentation to School Board AND MDS Steering Committee	<i>Lead: Lois Sherwood</i> Brandi Hageman Diane Lashinsky Jennifer Manning Chris Neuman Peter Braden Jeanne Chao	School Board Work Study Session April 13, 2015 (All handouts to Mary Colton by April 9 for the packets.)	1 hour
Increasing Understanding of the structure of NGSS standards - Know/Think I Know/Want to Know	<i>Lead: Brandi Hageman</i> <i>Lead: Lois Sherwood</i> <i>Lead: Peter Braden</i> <b>ALL</b> K-5, OPEPO Jeanne Chao (Ocean) Jen Manning Roger Mills Tim Behrenfeld	June - August 2015 Day 1	1 hour
Science and Engineering Practices – Classroom Case Studies - Color, Symbol, Image SEPs	<i>Lead: Brandi Hageman</i> <i>Lead: Lois Sherwood</i> <i>Lead: Peter Braden</i> <b>ALL</b> K-5, OPEPO Jeanne Chao (Ocean) Jen Manning Roger Mills Tim Behrenfeld	June - August 2015 Day 1	2 hours
Cross Cutting Concepts - Themes through standards - Color Code a PE	<i>Lead: Brandi Hageman</i> <i>Lead: Lois Sherwood</i> <i>Lead: Peter Braden</i> <b>ALL</b> K-5, OPEPO Jeanne Chao (Ocean) Jen Manning Roger Mills Tim Behrenfeld	June - August 2015 Day 1	2 hours
Examining FOSS Kits - Use template	<i>Lead: Peter Braden</i> <i>Lead: Brandi Hageman</i> <b>ELEMENTARY</b> K-5, OPEPO, Ocean	June - August 2015 Day 2	3 hours

<b>What?</b>	<b>Who?</b>	<b>When?</b>	<b>Time?</b>
District Science Plan: FOSS Kit Rearrangement to Grade Levels	<i>Lead: Peter Braden</i> <i>Lead: Brandi Hageman</i> <b>ELEMENTARY</b> K-5, OPEPO, Ocean	June - August 2015 Day 3	6 hours
Engaging in Argument from Evidence Instructional Model – Activity to connect to ELA and Common Core State Standards	<i>Lead: Brandi Hageman</i> <b>SECONDARY</b> Jennifer Manning Roger Mills Tim Behrenfeld Lois Sherwood	June - August 2015	3 hours
District Science Plan: Model Course Maps Appendix K - front matter, Evaluation of options	<i>Lead: Brandi Hageman</i> <b>SECONDARY</b> Jennifer Manning Roger Mills Tim Behrenfeld Lois Sherwood	June 2015	6 hours
Ongoing Unit Planning  (Possibly OESD 114 FOSS Science Kit Jump Start!)	<b>ELEMENTARY</b> <i>Lead K: _____</i> <i>Lead 1-2: Peter Braden</i> <i>Lead 3: _____</i> <i>Lead 4: _____</i> <i>Lead 5: Chris Neuman</i> <i>Lead Ocean: Jeanne Chao</i>	Before starting each new FOSS kit	2 hours x 3
Ongoing Unit Planning	<b>SECONDARY</b> <i>Lead 6-7: Roger Mills</i> <i>Lead 7-8: Jennifer Manning</i>	Quarterly to plan next Unit	2 hours x 4
Ongoing Unit Planning	<b>SECONDARY</b> <i>Lead 9: Lois Sherwood</i> <i>Lead 10: Brandi Hageman</i> <i>Lead 11: Tim Behrenfeld</i>	Quarterly to plan next Unit	2 hours x 4
Science Leadership Team Meetings at OESD 114	Brandi Hageman Jennifer Manning or Roger Mills Chris Neuman Peter Braden	3 times 2015-2016 school year	

## COMMUNITY RELATIONS

### Use Of Tobacco And Nicotine Substances *Products and Delivery Devices*

The board of directors recognizes that to protect students from exposure to the addictive substance of nicotine, employees and officers of the school district, and all members of the community have an obligation as role models to refrain from ~~tobacco~~ ***use of tobacco products and delivery devices*** on school property and at school activities at all times. Tobacco ***products and delivery devices*** includes, but is ***are*** not limited to, cigarettes, cigars, snuff, smoking tobacco, smokeless tobacco, nicotine, ***electronic smoking/vapor devices, “vapor pens,” non-prescribed inhalers, nicotine-delivering delivery devices or, chemicals that are not FDA-approved to help people quit using tobacco, or devices that produce the same flavor or physical effect of nicotine substances; and any other smoking equipment, device, material*** or ~~tobacco~~ innovation.

Any use of such products ***and delivery devices*** by staff, students, visitors, and community members ~~shall~~ ***will*** be prohibited on school district property and at school activities. Possession ***by*** or distribution ***of tobacco products by to*** minors is prohibited. This ~~shall~~ ***will*** include all district buildings, grounds and district-owned vehicles.

The use of Federal Drug Administration (FDA) approved nicotine replacement therapy ***in the form of a nicotine patch, gum, or lozenge*** is permitted. However, students ***and employees*** must ~~have a physician’s prescription for the FDA approved nicotine replacement therapy and must follow applicable policies regarding use of medication at school. by students.~~

Notices advising students, district employees and community members of this policy ~~shall~~ ***will*** be posted in appropriate locations in all district buildings and at other district facilities as determined by the superintendent and ~~shall~~ ***will*** be included in the employee and student handbooks. Employees and students are subject to discipline for violations of this policy, and school district employees are responsible for the enforcement of the policy.

Cross Reference:	Policy 3200 <b><i>Policy 3416</i></b> <b><i>Policy 5201</i></b>	Student Rights and Responsibilities <b><i>Medication at School</i></b> <b><i>Drug-Free Schools, Community and Workplace</i></b>
Legal References:	Policy 5280 RCW 28A.210.310  <b><i>RCW 28A.210.260</i></b>  <b><i>RCW 28A.210.270</i></b>  RCW 70.155.080	Termination of Employment Prohibition on use of tobacco products on school property <b><i>Public and private schools-Administration of medication-conditions</i></b> <b><i>Public and private schools-Administration of Medication-Immunity from liability-Discontinuance, procedure.</i></b> Purchasing, obtaining or possessing tobacco by <del>minors</del> <b><i>persons under 18</i></b> – Civil infraction Electronic Cigarettes
Management Resources	<b><i>Policy and Legal News, February 2014</i></b> <b><i>Policy News, October 2010</i></b>	<b><i>Use of Tobacco and Nicotine Substances policy updated to address vapor devices</i></b> Electronic Cigarettes



*Policy News*, December  
2010

Addressing the use of “Electronic” Cigarettes

**Date: 4/20/89; 12/20/99; 1/13/03; 11/24/03; 1/23/06; 1/24/11\_\_\_\_\_**

**PORT TOWNSEND SCHOOL DISTRICT NO. 50**

## ~~MANAGEMENT SUPPORT PERSONNEL~~

### Risk Management

## ~~HARASSMENT POLICY SEXUAL HARASSMENT~~

The district is committed to a positive and productive education and working environment free from discrimination, including sexual harassment. The district prohibits sexual harassment of students, employees and others involved in school district activities.

Sexual harassment occurs when:

- A. Submitting to the harasser's sexual demands is a stated or implied condition of obtaining an education or work opportunity or other benefit;
- B. Submission to or rejection of sexual demands is a factor in an academic, work or other school-related decision affecting an individual; or
- C. Unwelcome sexual or gender-directed conduct or communication interferes with an individual's performance or creates an intimidating, hostile or offensive environment.

Sexual harassment can occur adult-to-student, student-to-adult, student-to-student, adult-to-adult, male-to-female, female-to-male, male-to-male, and female-to-female.

The district will take prompt, equitable, and remedial action within its authority on reports, complaints, and grievances alleging sexual harassment that come to the attention of the district, either formally or informally. Allegations of criminal misconduct will be reported to law enforcement and suspected child abuse will be reported to law enforcement or Child Protective Services. Persons found to have been subjected to sexual harassment will have appropriate school district services made reasonably available to them and adverse consequences of the harassment shall be reviewed and remedied, as appropriate.

Engaging in sexual harassment will result in appropriate discipline or other appropriate sanctions against offending students, staff, and contractors. Anyone else who engages in sexual harassment on school property or at school activities will have their access to school property and activities restricted, as appropriate.

Retaliation against any person who makes or is a witness in a sexual harassment complaint is prohibited and will result in appropriate discipline. The district will take appropriate actions to protect involved persons from retaliation.

It is a violation of this policy to knowingly report false allegations of sexual harassment. Persons found to knowingly report or corroborate false allegations will be subject to appropriate discipline.

The superintendent ~~shall~~ **will** develop and implement formal and informal procedures for receiving, investigating, and resolving complaints or reports of sexual harassment. The procedures will include reasonable and prompt time lines and delineate staff responsibilities under this policy. All staff are responsible for receiving informal complaints and reports of sexual harassment and informing appropriate district personnel of the complaint or report for investigation and resolution. All staff are also responsible for directing complainants to the

formal complaint process.

The superintendent ~~shall~~**will** develop procedures to provide age-appropriate information and education to district staff, students, parents, and volunteers regarding this policy and the recognition and prevention of sexual harassment. At a minimum, sexual harassment recognition and prevention and the elements of this policy will be included in staff, student, and regular volunteer orientation. This policy and the procedure, *which includes the complaint process*, ~~shall~~ **will** be posted in each district building in a place available to staff, students, parents, volunteers, and visitors. The policy *and procedure* ~~shall~~ **will** be reproduced in each student, staff, volunteer, and parent handbook.

The superintendent shall make an annual report to the board reviewing the use and efficacy of this policy and related procedures. Recommendations for changes to this policy, if applicable, shall be included in the report. The superintendent is encouraged to involve staff, students, and volunteers and parents in the review process.

Cross References:	Policy 3200 Policy 3207	Student Rights and Responsibilities Prohibition of Harassment, Intimidation and Bullying
	Policy 3210 Policy 3240 Policy 3421 Policy 5010 Policy 5281	Nondiscrimination Student Conduct Child Abuse and Neglect Nondiscrimination and Affirmative Action Disciplinary Action and Discharge
Legal References:	RCW 28A.640.020  WAC 392-190-056 Through 058	Regulations, guidelines to eliminate discrimination – Scope – Sexual harassment policies Sexual harassment
Management Resources	Policy News	October 2010 December 2014

**Date:** 6/17/93; 1/25/99; 2/12/01; 11/24/03; 1/24/11\_\_\_\_\_