

# **How to Change the World**

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In collaboration with the Centers for Disease Control and Prevention's  
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Fetal alcohol syndrome (FAS) is one of the leading known preventable causes of mental retardation and birth defects. In this unit students will learn about fetal alcohol spectrum disorders (FASDs), including FAS. Students will also use the Behavioral Risk Factor Surveillance System (BRFSS) to create a plan to help decrease the incidence of alcohol exposed pregnancies, resulting in the prevention of new FASD cases. Students can then share their plans with a government official of their choice.

*Disclaimer: The findings and conclusions in this report are those of the author(s) and do not necessarily represent the views of the Centers for Disease Control and Prevention.*

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### **Summary**

Fetal alcohol syndrome (FAS) is one of the leading known preventable causes of mental retardation and birth defects. In this unit students will learn about fetal alcohol spectrum disorders (FASDs), including FAS. Students will also use the Behavioral Risk Factor Surveillance System (BRFSS) to create a plan to help decrease the incidence of alcohol exposed pregnancies, resulting in the prevention of new FASD cases. Students can then share their plan with a government official of their choice.

### **Learning Outcomes**

- Students will be able to define what an FASD is and what causes an FASD.
- Students will be able to create a graph from the BRFSS data about alcohol.
- Using these data, students will be able to write a letter to policy makers about concerns they might have regarding alcohol use.

### **Materials**

1. Computers with Internet access
2. Excel or other graphing program (optional)

### **Total Duration**

2 hours, 20 minutes

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## **Procedures**

### **Teacher Preparation**

Teachers should be familiar with the Behavioral Risk Factor Surveillance System (BRFSS) Web site, included in the “Web Resources” section. Teachers also should review some of the Web sites with information about FASDs. To save time, teachers should have the BRFSS page used in Step 4 (<http://www.cdc.gov/brfss/>) bookmarked on the computers that students will use, and should make copies of the graphing rubric used in Step 4 and the letter-writing rubric used in the conclusion for the students. If a teacher would like to create a rubric specific to his or her state standards or situation, the Rubistar Web site listed below is a free online rubric maker. Teachers should note that fetal alcohol spectrum disorders (FASD) is an umbrella term used to refer to the range of effects of prenatal exposure to alcohol. FASDs include fetal alcohol syndrome (FAS), which is a specific medical diagnosis, other alcohol-related birth defects, and other conditions related to prenatal alcohol exposure.

### **Web Resources**

Title: BRFSS- CDC's Behavioral Risk Factor Surveillance System Home Page

URL: [http:// www.cdc.gov/brfss/](http://www.cdc.gov/brfss/)

Description: This CDC Web site contains general information and links about the BRFSS program.

Title: BRFSS Overview

URL: [http://www2.cdc.gov/nccdphp/brfss2/training\\_ov/default.htm](http://www2.cdc.gov/nccdphp/brfss2/training_ov/default.htm)

Description: This CDC Web site describes the history and use of the BRFSS.

Title: BRFSS Data Systems Prevalence Training

URL: <http://apps.nccd.cdc.gov/brfssdatasystems>

Description: This Web site from CDC explains the basic statistics used in the BRFSS and how to find the information contained in the Web site. Macromedia Flash player will need to be installed to get the most from the Web pages. Directions on how to do this are supplied at the Web page.

Title: BRFSS Data Systems Prevalence Training

URL: <http://www.cdc.gov/ncbddd/fas/>

Description: This Web site from CDC provides information on FAS and FASDs.

Title: Tips for Elementary School Teachers

URL: <http://www.fascenter.samhsa.gov/pdf/WYNKTeachersTips2.pdf>

Description: This document from the FAS Center for Excellence gives a very brief description of FASDs and how it might affect students and teachers.

Title: Fetal Alcohol Syndrome and Birth Defects at NOFAS

URL: <http://www.nofas.org/>

Description: This Web site was created by the National Organization on Fetal Alcohol Syndrome and includes basic information about FASDs as well as an entire section for educators.

Title: FASDs 5-Minute Classroom Presentation

URL: <http://www.come-over.to/FAS/Classroom5minute.htm>

Description: This Web site was created by the FAS Community Resource Center and has many quick activities to use with students of all ages. There are also some good handouts and posters.

Title: RubiStar Home

URL: <http://rubistar.4teachers.org/index.php>

Description: This Web site allows users to create their own rubrics on-line for free and then print them out. This Web site is a useful tool for teachers who use a lot of rubrics in their classroom.

## **Introduction**

**Duration: 10 minutes**

Tell students that they are going to become advocates for change in their government. The topic that they are going to work on is FASDs. Begin by reading the "Secret Agent Monologue" located in the Web resources. The teacher then should tell the students he or she is going to read a short informational document on a dangerous chemical agent. During the reading there should be no talking or comments. After reading the "Secret Agent Monologue", the teacher should instruct students to write down everything they know about FASDs. Again, there is to be no talking during this time. The teacher should collect and save these papers because they will serve as pre-assessments of what students know about FASDs.

## **Web Resource**

Title: Secret Agent Monologue

URL: <http://come-over.to/FAS/SecretAgent.doc>

Description: This short Word document from the FAS Community Resource Center in Tucson, Arizona, is the introductory reading to introduce this unit.

## **Step 2**

**Duration: 15 minutes**

Using the “Improving Health” PowerPoint presentation, the teacher will discuss with the class some policies that have been created to promote public health. The teacher might want to have a school nurse or someone from the local public health agency participate in this discussion. The teacher should begin the discussion with the following question: “How do scientists or public health workers show something is a problem and that it needs to be changed?” This is a good activity to do at the end of a class period. Step 3 could then begin the next day, thus breaking up the PowerPoint presentations.

### **Supplemental Document**

Title: Improving Health

File Name: Improving Health.ppt

Description: This file is a short PowerPoint presentation explaining how the public health system works to improve the health of the public. This presentation should help students learn more about how policies and other public health initiatives can promote health.

## **Step 3**

**Duration: 40 minutes**

The teacher will introduce the topic of FASDs to students using the PowerPoint presentation found on “Fetal Alcohol Spectrum Disorders (The Basics)”. This Web site is included in the “Web Resources” section. This is a long PowerPoint presentation created for a wide range of people. The following sections and subsections will meet the needs of most middle school students: “Understanding Fetal Alcohol Spectrum Disorders (FASDs)”, “Symptoms and Difficulties Of FASDs”, and “Economic Cost” (subsection under “Treatment”) and the “Strengths of Persons With FASDs” (subsection under “Outcomes”). Teachers should review the entire presentation and choose the sections and subsections that best address the needs of students. Because of the prevalence of FASDs, it is possible that some students in their classrooms might have some level of an FASD or have a sibling or relative affected by an FASD. It is important to treat this topic in a sensitive manner and avoid criticizing parents of children with FASDs. Depending on the class, teachers also may want to read the message from someone with FAS. The teacher can then play the “Knowledge is Money” game (see Web resources for Internet link to download).

### **Web Resources**

Title: Fetal Alcohol Spectrum Disorders (The Basics)

URL: <http://www.fascenter.samhsa.gov/whatsnew/FASDTheBasic.cfm>

Description: An introductory PowerPoint created for a wide range of audiences. The following sections will be useful in introducing FASDs to students:

“Understanding Fetal Alcohol Spectrum Disorders”

“Symptoms and difficulties of FASDs”

“Treatment” (“Economic Cost” subsection)

“Outcomes” (“Strengths of Persons With FASDs” subsection)

Title: Message from someone with FAS

URL:<http://www.niaaa.nih.gov/publications/Science/PdfFiles/Message%20Someone%20with%20FAS.pdf> This link didn't work for me - MA

Description: This NIH Web site provides a letter written by a young man with FAS. The page-long letter describes how he will never be independent from his mother.

Title: The Knowledge is Money Game

URL: <http://pubs.niaaa.nih.gov/publications/Science/PdfFiles/MoneyGame.pdf>

Description: This NIH Web site features a fun game that reviews facts of FASDs.

#### **Step 4**

**Duration: 40-60 minutes**

Tell students that they are going to help develop a policy for their community/state/nation to decrease alcohol use during pregnancy. A short brainstorming session can help remind students that policy changes can extend beyond laws that punish people for an action, and can include proclamations, warning labels, funding for studies and educational campaigns including brochures and public service announcements. Remind students that policy change is rarely made without data to support it, so whatever they decide they must show proof that alcohol use during pregnancy is a problem. One way to get the numbers is by using the BRFSS Web site. Take the students through the Web site so they know how to find information. The ideal way to do this is using a projector system and going through the Web site with them. A PowerPoint with screen shots is included. The teacher can use the PowerPoint notes as lecture notes if they have access to a projector system. The teacher guide to the BRFSS can be also be used . Then explain to students that they must create a graph showing numbers that would relate to FAS. Encourage students to use questions from the "Alcohol Consumption" section of the survey. Questions pertaining to frequency of heavy drinking and binge drinking will be most useful. Students can group results by gender and report, for example, the percentage of women surveyed who reported drinking more than one drink per day. Please note that this Web site allows users to group results by gender or age, but does not allow users to group results by gender and age at the same time. The ability to view results for women of childbearing age would provide a more precise estimate of alcohol consumption of women of childbearing age. Additionally, please note surveys like BRFSS do not calculate rates of FAS, but rather estimate the prevalence of alcohol-exposed pregnancies. For more information on women of childbearing age and alcohol consumption, a *Morbidity and Mortality Weekly Reports* article is available free of charge on the Internet (see Web Resources).

#### **Supplemental Documents**

Title: It's All Greek To Me: Accessing BRFSS Data

File Name: brfss.ppt

Description: This PowerPoint presentation provides instructions on using the BRFSS Web site for the graphing activity in Step 4 and includes screen shots of the BRFSS Web site.

Title: Graph Rubric

File Name: graphrubric.xls

Description: This Excel file provides a detailed rubric to guide students in presenting their data in graph form.

#### **Web Resources**

Title: BRFSS Prevalence Data – Start Page

URL: <http://apps.nccd.cdc.gov/brfss/>

Description: This BRFSS Web page contains an interactive database that contains information from the BRFSS about health related behaviors in the U.S.

Title: Alcohol Consumption Among Women Who Are Pregnant or Who Might Become Pregnant – United States

URL: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5350a4.htm>

Description: This article used BRFSS data to estimate rates of alcohol use and binge drinking among women who were pregnant or could become pregnant. Estimates gathered from the BRFSS Web site in the class activity may be compared to rates in this article. Teachers should note that the article calculated rates in women who were pregnant or of child-bearing age, producing more precise estimates than the numbers available on the BRFSS Web site. Surveys like BRFSS do not calculate rates of FAS, but rather can be used to estimate the prevalence of alcohol-exposed pregnancies.)

### **Conclusion**

**Duration: 40 minutes**

Students will then use their created graph and policy change idea and write a letter to a policy maker of their choice about their proposal using the supporting data they have found. Hand out the letter rubric so students know how they will be graded.

### **Supplemental Document**

Title: Letter Rubric

File Name: letterrubric.xls

Description: This file contains a detailed rubric to guide students in writing their letter to policy makers.

### **Assessment**

In Step 4, students are asked to create a graph of data that supports their proposed policy change. In Step 5, students will write a letter to policy makers detailing their proposed policy change. Detailed rubrics for graphs (Graph Rubric) and letters (Letter Rubric) are found in Steps 4 and 5, respectively..

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### **Modifications**

#### **Extension(s)**

The class (or classes) could present the policy changes to each other and decide on one or two that they want to seriously develop. Representatives from the local health district could come in and help them refine their ideas. Then, they could develop a presentation or do a letter writing campaign to promote the policy change.

#### **Other Modifications**

Students who are at a lower level can use the attached directions to get specific numbers from the BRFSS website that will be easy to put into a graph. Questions are included to help them think of specific policy changes. The teacher may want to give some students an outline of a business letter for the student to fill in.

## **Supplemental Document**

Title: Modification

File Name: modification.doc

Description: This Word document contains a worksheet can be used by students who need more detailed help to find information.

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### **Education Standards**

#### **National Science Education Standards**

SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVES, CONTENT STANDARD F:

As a result of activities in grades 5-8, all students should develop an understanding of

- **Personal health**
- **Populations, resources, and environments**
- Natural hazards
- **Risks and benefits**
- **Science and technology in society**

SCIENCE AND TECHNOLOGY, CONTENT STANDARD E:

As a result of activities in grades 5-8, all students should develop

- Abilities of technological design
- **Understandings about science and technology**

#### **State Standards—Ohio**

**Science:** By the end of the 6-8<sup>th</sup> grade program students will be able to:

##### **Scientific Inquiry**

- A. Explain that there are differing sets of procedures for guiding scientific investigations and procedures are determined by the nature of the investigation, safety considerations and appropriate tools.
- B. Analyze and interpret data from scientific investigations using appropriate mathematical skills to draw valid conclusions.

##### **Science and Technology**

- A. Give examples of how technological advances, influenced by scientific knowledge, affect the quality of life.

#### **Language Arts:**

##### **Reading Applications: Informational, Technical and Persuasive Text**

- A. Use text features and graphics to organize, analyze and draw inferences from content and to gain additional information.

##### **Communication: Oral and Visual**

- A. Select an organizational structure appropriate to the topic, audience, setting and purpose.
- B. Present ideas in a logical sequence and use effective introductions and conclusions that guide and inform a listener of key ideas.

## **Mathematics:**

### **Data Analysis and Probability**

- A. Read, create and use line graphs, histograms, circle graphs, box-and-whisker plots, stem-and-leaf plots, and other representations when appropriate.
- B. Interpret data by looking for patterns and relationships, draw and justify conclusions, and answer related questions.
- C. Evaluate interpretations and conclusions as additional data are collected, modify conclusions and predictions, and justify new findings.
- D. Compare increasingly complex displays of data, such as multiple sets of data on the same graph.
- E. Collect, organize, display and interpret data for a specific purpose or need.
- F. Determine and use the range, mean, median and mode to analyze and compare data, and explain what each indicates about the data.
- G. Evaluate conjectures and predictions based upon data presented in tables and graphs, and identify misuses of statistical data and displays

## BRFSS Graphing Rubric

How to Change the World

Beth MacLehose, CDC's 2005 Science Ambassador Program

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Teacher Name:

Student Name:

CATEGORY	4	3	2	1
Neatness and Attractiveness	Exceptionally well designed, neat, and attractive. Colors that go well together are used to make the graph more readable. A ruler and graph paper (or graphing computer program) are used.	Neat and relatively attractive. A ruler and graph paper (or graphing computer program) are used to make the graph more readable.	Lines are neatly drawn but the graph appears quite plain.	Appears messy and "thrown together" in a hurry. Lines are visibly crooked.
Accuracy of Plot	All points are plotted correctly and are easy to see. A ruler is used to neatly connect the points or make the bars, if not using a computerized graphing program.	All points are plotted correctly and are easy to see.	All points are plotted correctly.	Points are not plotted correctly OR extra points were included.
Labeling of X axis	The X axis has a clear, neat label that describes the units used for the independent variable (e.g, days, months, participants' names).	The X axis has a clear label that describes the units used for the independent variable.	The X axis has a label.	The X axis is not labeled.
Labeling of Y axis	The Y axis has a clear, neat label that describes the units and the dependent variable (e.g, % of dogfood eaten; degree of satisfaction).	The Y axis has a clear label that describes the units and the dependent variable (e.g, % of dogfood eaten; degree of satisfaction).	The Y axis has a label.	The Y axis is not labeled.
Type of Graph Chosen	Graph fits the data well and makes it easy to interpret.	Graph is adequate and does not distort the data, but interpretation of the data is somewhat difficult.	Graph distorts the data somewhat and interpretation of the data is somewhat difficult.	Graph seriously distorts the data making interpretation almost impossible.

## Letter-writing Rubric

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Teacher Name:

Student Name:

CATEGORY	4	3	2	1
Salutation and Closing	Salutation and closing have no errors in capitalization and punctuation.	Salutation and closing have 1-2 errors in capitalization and punctuation.	Salutation and closing have 3 or more errors in capitalization and punctuation.	Salutation and/or closing are missing.
Format	Complies with all the requirements for a business letter.	Complies with almost all the requirements for a business letter.	Complies with several of the requirements for a business letter.	Complies with less than 75% of the requirements for a business letter.
Sentences and Paragraphs	Sentences and paragraphs are complete, well-constructed and of varied structure.	All sentences are complete and well-constructed (no fragments, no run-ons). Paragraphing is generally done well.	Most sentences are complete and well-constructed. Paragraphing needs some work.	Many sentence fragments or run-on sentences OR paragraphing needs lots of work.
Ideas	Ideas were expressed in a clear and organized fashion. It was easy to figure out what the letter was about.	Ideas were expressed in a pretty clear manner, but the organization could have been better.	Ideas were somewhat organized, but were not very clear. It took more than one reading to figure out what the letter was about.	The letter seemed to be a collection of unrelated sentences. It was very difficult to figure out what the letter was about.
Grammar & Spelling	Writer makes no errors in grammar or spelling.	Writer makes 1-2 errors in grammar and/or spelling.	Writer makes 3-4 errors in grammar and/or spelling	Writer makes more than 4 errors in grammar and/or spelling.
Data	Writer makes good use of data to support their ideas. Graph is clear and legible.	Writer uses to data to support ideas but the organization could have been better. Graph is clear and legible with only minor formatting mistakes.	Writer includes data but does not connect it to their ideas. Graph is present, but not easily understandable.	Writer fails to include either the data or the graph.

## Modification – Graphing Using BRFSS Data

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Choose any state: \_\_\_\_\_

Choose the year **2004**

Choose the category of **Alcohol**

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Choose the question: **Risk Factor for heavy drinking**

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Group the answers by **age** (remember to click on **go**)

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	At Risk	Not At Risk
18-24	_____	_____
25-34	_____	_____
35-44	_____	_____
45-54	_____	_____
55-64	_____	_____
65+	_____	_____

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What age group(s) are women in when they get pregnant? \_\_\_\_\_

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What age group is most likely to be heavy drinkers? \_\_\_\_\_

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