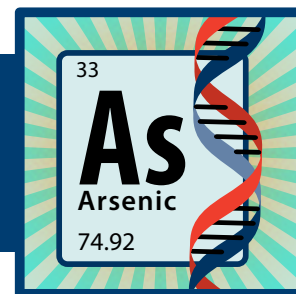


Teacher Directions

UNIT: DNA

LESSON 1: ARSENIC AND EPIGENETICS: A DNA STORY

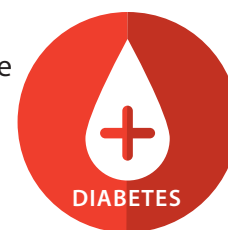
Activity 1D: Walking in the Steps of an Epigeneticist



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Rationale

In this activity, students will evaluate and present Type 2 Diabetes using data from the Centers for Disease Control (CDC). These data are gathered from all states in the US. There are multiple ways to implement this activity. Each category, Health Burden, Economic Burden, and Mortality, have multiple data sets to evaluate. The values provided in the Teacher and Student Backgrounds are from national, not state, data. This activity provides multiple opportunities for students to practice graphing, comparing, and evaluating data.



This activity is divided into two parts. Each part can be a stand-alone activity or done in sequence.

Materials

- › Computers for students to access CDC website.
- › Graphing paper (wall post-it graph paper – optional)
- › Markers or colored pencils
- › Rulers (optional)

Directions

Using data from the CDC (<https://nccd.cdc.gov/Toolkit/DiabetesBurden/Home/Index>), students will graph, evaluate, compare, and present their data to the class.

Part 1: Graphing T2D Data

- › Students can work individually or as a class.
- › As a class, evaluate your state's T2D data, graphing:
 - Health Burden: Diabetes Prevalence
 - Economic Burden: Total Costs
 - Mortality: Number of Diabetes-Attributed-Deaths

Suggested stand-alone activity: As there are multiple data tables within the three separate categories, members of each group can be assigned a different data table to graph within a category.

MIDDLE & HIGH SCHOOL LEVEL

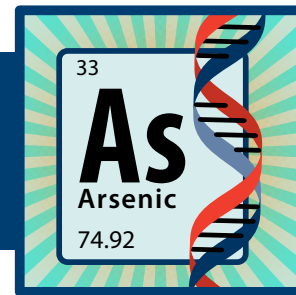
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Part 2: Epigenetic and T2D Trends

Review the transformed article, *Arsenic – The Silent Toxin That Keeps On Giving*. This study focused on the indigenous peoples in the Western states: North Dakota, South Dakota, Oklahoma, and Arizona. The study sought to evaluate the epigenetic impact of arsenic, an identified toxin in the drinking water, on offspring. What the scientists found is a correlation between the incident of T2D in adult offspring whose mothers were exposed to arsenic during their pregnancies.

Assign each group one of the states from the original study. Within each group, assign specific categories: Health Burden, Economic Burden, or Mortality. If there are more groups than categories, assign each group specific sub-categories to graph. If multiple groups are working on the same state and category, but different sub-categories, the groups need to come together and evaluate their final graphs. Within each group, students need to generate claims regarding the impact of T2D. Each claim must be supported by data evidence. Students are to present their claim/reasoning with their graphs to the class.

Example:

- › If Group A is graphing subcategories within Health Burden, they are to make a claim as to the impact of T2D on the health care industry.
- › If Group B is graphing subcategories within Economic Burden, they are to make a claim as to the impact of T2D on the state's economy.
- › If Group C is graphing Mortality, they are to create a claim as to the impact of T2D on the state population.

Extensions:

- › Post the groupings of graphs in the room and do a class discussion about the findings.
- › Post individual graphs and conduct a gallery walk. Students are to take notes as they make observations about each graph in preparation for a class discussion.
- › Conduct a discussion as to how each category impacts the other categories.
- › Compare each state's data to the national data.