Risk Continuum

Abstract
A whole-class kinesthetic demonstration of what it means to be in a “risk group” for developing heart disease based on family history/genetics.

Logistics

Class Time: 15 minutes
Prep Time: 10 minutes

Materials
Paper

Prior Knowledge Needed
None

Appropriate For:
Primary Intermediate Secondary College

Learning Objectives
- People can be assigned to a risk group for developing heart, and other diseases based on family history/genetics.
- Lifestyle choices can positively or negatively influence the risk of developing heart disease.
- A higher risk means a greater chance of developing heart disease, not an inevitability of developing it.
- Though a lower risk means there is a reduced chance, it is still possible for members of this risk group to develop heart disease.

Special Features You’ll Find Inside
- Diagrams to help set up the demonstration.
**Classroom Implementation**

***Activity instructions***:

**Teacher Action**

1. Line your students up standing in a single row, shoulder to shoulder, and facing the same direction.
2. Mark off two spots so that the line of students are roughly divided into thirds.
3. Explain that the students now represent a continuum ranging from those at the left who are genetically most at risk for developing heart disease, and those at the right who are least at risk. The “thirds” represent the broader categories of high, medium, and low risk groups.
4. Explain that each risk group correlates with a certain probability of developing heart disease based on family history. Lifestyle choices involving diet, exercise and smoking can influence this risk.

**Quantities**

<table>
<thead>
<tr>
<th>Per Group of 30</th>
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<tbody>
<tr>
<td>10 copies of Lifestyle Choice Cards, cut to form individual cards, (30 total). Shuffle them and place them in a bag or other container.</td>
</tr>
</tbody>
</table>

**Student Action**

1. Starting with the student most at risk (left) have each student choose a Lifestyle Choice card without looking.
Student Action (cont.)

2. Adjust the continuum to reflect lifestyle choices:

   A. Complete the following calculation:
      \[ \text{Total # of students} = \text{# of spaces to move} \]
      \[ 6 \]

   B. Ask the first student to read his or her Lifestyle Choice card and move the designated number of spaces (calculated above) in the following manner:
      - **Healthy** = move the # spaces to the right
      - **Neutral** = remain where you are
      - **Negative** = move the # spaces to the left

3. Have each student repeat the above process until all students are arranged into the newly formed continuum.

4. Have the students reform into the divisions outlined in teacher action steps 1-3 and note how their risk has changed after factoring in lifestyle choices.

5. Within each of the thirds, the students will count off 1 to 4.

6. In the “high-risk” group on the left, those who counted a 1 will be asked to sit down.

7. In the “medium-risk” group, those who counted a 1 or 2 will be asked to sit down.

8. In the “low-risk” group on the right, those who counted a 1, 2, or 3 will be asked to sit down.

9. Those standing represent the people that developed the disease.
Discuss the following:

- People in all risk groups develop heart disease with the largest percentage being from the “high” risk group.

- Not all people in the high risk group develop heart disease.

- Making positive or neutral lifestyle choices can influence your risk enough to prevent developing heart disease. (Ask students for which this was true to raise their hands).

- Sometimes, people who make positive or neutral lifestyle choices still develop heart disease (Ask students for which this was true to raise their hands).

- Some people who make negative lifestyle choices do not develop heart disease, even though their risk is increased.

Adaptations

You can create a risk continuum for other diseases such as: Diabetes, Cancer, Blood Pressure and Cholesterol. Visit the online components of this module for information about these diseases as well as heart disease.

Standards

U.S. National Science Education Standards

Grades 5-8:
Content Standard C: Life Science
- Reproduction and Heredity
  » Some traits are inherited and others result from interactions with the environment.

Content Standard F: Science in Personal and Social Perspectives
- Risks and Benefits
  » Risk analysis considers the type of hazard and estimates the number of people that might be exposed and the number likely to suffer consequences. The results are used to determine the options for reducing or eliminating risks.
- Personal Health
  » Individuals have some responsibility for their own health. Students should engage in personal care–dental hygiene, cleanliness, and exercise—that will maintain and improve health.

Grades 9-12:
Content Standard F: Science in Personal and Social Perspectives

Extensions

Log in as a teacher on our website to download and print the Exploring Family History to Improve Your Health web quest. Have students complete the webquest while exploring the Using Family History to Improve Your Health module.

Additional Resources

Visit the Genetic Science Learning Center website to get more great resources like this one!
Many diseases can be prevented, controlled or cured. Personal choice concerning fitness and health involves multiple factors. Understanding of biological consequences can influence decisions about health practices.

**U.S. National Health Education Standards**

Grades 5-8:
Standard 1: Students will comprehend concepts related to health promotion and disease prevention to enhance health.
- Describe how family history can impact personal health.

Grades 9-12:
Standard 1: Students will comprehend concepts related to health promotion and disease prevention to enhance health.
- Analyze how genetics and family history can impact personal health.

**B. AAAS Benchmarks for Science Literacy:**

Grades 9-12
The Human Organism
- Physical Health
  - New medical techniques, efficient health care delivery systems, improved sanitation, and a fuller understanding of the nature of disease give today’s human beings a better chance of staying healthy than their forebears had.

**Credits**

Molly Malone, Kevin Pompei, Louisa Stark, Harmony Starr, Genetic Science Learning Center
Brendan Nicholson, Genetic Science Learning Center (Illustrations)

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Lifestyle Choice Cards

Very active
Healthy diet
Positive

Moderate activity
Balanced diet
Neutral

Inactive
Smoking
Negative

Print-and-Go™

This activity was downloaded from: http://teach.genetics.utah.edu

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ESTILO DE VIDA

Negativo

Dieta Saludable

Actividad Moderada

Mucha Actividad

Dieta Balanceada

Inactividad Negativa

ESTILO DE VIDA

Neutral

ESTILO DE VIDA

Positivo

ESTILO DE VIDA

Negativo