



### Lesson 5: The Biggest Risk Reducer

### Lesson Summary:

Students review cancer risk factors and breast cancer risk factors. Students then read profiles of the Biggest Risk Reducer Players and learn about cancer risk reduction. Students compete in a Physical Challenge to win clues that will help them develop effective risk reduction strategies. Students develop and present risk reduction strategies for their Players at the end of the lesson.

Lesson Duration: One 45-60-minute class period

### How to Use This Guide

This lesson plan was created to aid instructors in planning their lesson. It provides slide-by-slide details so educators will be prepared to engage, explain, discuss, and analyze every part of the lesson. The lesson is designed to be one 45–60-minute class period, but it is flexible, depending on the students' needs and time available. All handouts are included in this guide, as well as additional resources for more learning activity ideas.

### Objectives

Upon completion of this lesson, students will be able to:

- Identify common risk factors for cancer
- Discuss the risk factors for breast cancer
- Evaluate the short- and long-term consequences of health practices
- Predict diseases and health conditions that may occur during one's lifespan
- Develop a strategy for reducing cancer risk

#### Materials:

- Handout: Cancer Risk Factors
- Handout: Breast Cancer Risk Factors
- Handout: Biggest Risk Reducer Player Cards
- Handout: Biggest Risk Reducer Score Sheet
- Handouts: Risk Reduction Strategy Worksheet
- Handout: Chance Cards
- Handouts: Physical Challenge Questions
- Handouts: Physical Challenge Answers
- Handout: What Determines Health?
- Handout: Behavior Change Clues
- Handout: Rubrics for Judging Risk Reduction Strategies
- Lesson 5 Quiz
- Answer Keys
- Interactive whiteboard (optional)
- Flip chart paper and markers
- Computer with Internet access/LCD projector





### Subjects:

- Health
- Language Arts and Literacy
- Science

### Vocabulary:

alcohol, atypical hyperplasia, behavior, body mass index (BMI), BRCA 1, BRCA2, diethylstilbestrol (DES), environment, environmental tobacco smoke (ETS), Epstein-Barr virus (EBV), exercise, helicobacter pylori, hepatitis, human herpes virus 8 (HHV8), human immunodeficiency virus (HIV), human papilloma virus (HPV), human T-cell leukemia/lymphoma virus (HTLV-1), ionizing radiation, Kaposi's sarcoma, nutrition, obesity, overweight, prevention, radioactive fallout, radon, risk factor, risk reduction, screening, smoking cessation, sun protection factor (SPF), sun safety, sunscreen, tobacco, ultraviolet (UV) radiation

### Advance Preparation:

### The Biggest Risk Reducer

### Real-World Scenario – Steve and Nikki

- Review Steve and Nikki's real-world scenarios throughout the lesson so that you can effectively use their story in the classroom.
- Review the learning activity Small Group Brainstorm.
- Review information from the National Cancer Institute (NCI) at the following website: http://www.cancer.gov/about-cancer/causes-prevention/genetics

### Talk About It!

• Review the question and follow-up questions to foster a robust class discussion.

### **Cancer Risk Factors**

- Review the learning activity **Think-Pair-Share** and prepare the SMART Board.
- Make one copy per student of *Cancer Risk Factors* (page 14–19).
- Review slides 5-16.

### Talk About It!

• Review the question and follow-up questions to foster a robust class discussion.

## The Biggest Risk Reducer

- Review slides 22-39.
- Review the learning activity Group Discussion.
- Make one copy per group (for four to six groups) of <u>*Biggest Risk Reducer Player Cards*</u> (pages 20–22) and cut so each group receives one Player card.
- Make one copy perstudent of *Breast Cancer Risk Factors* (pages 23–24).
- Make one copy per group of *Biggest Risk Reducer Score Sheet* (pages 25–33).
- Make one copy per student of *<u>Risk Reduction Strategy</u>* (pages 34–38).
- Make copies of the <u>Chance Cards</u> (pages 39–40) and cut. Each group will receive one Chance Card specific to their target behavior.
- Make one copy per group of <u>*Physical Challenge Questions*</u> (pages 41–50). (Each group will write their answers on their copy of <u>*Physical Challenge Questions*</u>.)
- Decide whether you will have students take the Physical Challenge using stations or having students work at tables.
- Make one copy per student of <u>What Determines Health?</u> (page 51).





- Make one copy perstudent of *Behavior Change Clues* (pages 52–56) and cut.
- Make one copy per group of <u>*Rubrics for Judging Risk Reduction Strategies*</u> (pages 57–61) for the group's target behavior.
- Review the learning activity **Presenting Risk Reduction Strategy**.

### Homework Assignment

- Review the writing activity Email to Steve and Nikki.
- Review the homework assignment **Personal Risk Reduction Plan**.

### **Career Connection**

- Dietitian
- Health Educator

### A Note about Cancer

Cancer is a disease that unfortunately touches many people. You may have students with a parent, guardian, or loved one affected by cancer. Adolescents affected by cancer cope in their own ways, depending on their stage of life. Some students may want to share their personal experiences, while others may not. Reassure students that you want them to be comfortable in the classroom and will not ask them to share experiences unless they want to.

You may learn a student is personally affected prior to or while implementing the curriculum. If you discover a student is affected by cancer, talk with him privately and make sure he is comfortable with participating in the learning activities, discussions, and explorations.

If you know a student is affected by cancer prior to starting the curriculum:

• Give the student a brief summary of the lessons, and ask how he feels about it. Tell the student it may not bother him now, but he should let you know if it does.

If you learn a student is affected by cancer while implementing the curriculum:

• Ask who he has spoken to about the cancer. If the answer is no one, ask if he would like to talk to someone, such as a guidance counselor or other trusted adult.

Connect students with support. Possible sources include the following:

- guidance counselors
- family friends
- family doctors or pediatricians
- faith-based counselors

Look for warning signs. Keep an eye out for signs of distress, such as

- changes in academic performance,
- changes in behavior with other students,
- evidence of alcohol or drug use, or
- evidence of anxiety or depression.





Lesson 5 Plan — The Biggest Risk Reducer

### ENGAGE

### Real-World Scenario – Steve and Nikki

- [Slides 2-3] Update the class about Steve and Nikki, whose mom is now undergoing hormone therapy. Discuss how Steve and Nikki are less anxious now that they know a lot more about breast cancer and treatments. They are interested in learning about how they can reduce their own cancer risk now that they know they're both at risk.
- [Slide 3] Learning Activity: Small Group Brainstorm. Tell the class they will develop a response to Nikki's question, What can we do to reduce risk? Information about cancer prevention is available from the National Cancer Institute (NCI) at http://www.cancer.gov/about-cancer/causes-prevention/genetics. Tell students to select the Patient versions. Divide the class into small groups and have students brainstorm what people can do to reduce their risk for cancer. Then ask students to share any questions they have about pathology reports and make a list for the class. Use the SMART Board and write student responses to this question in the box provided. You can then save the notes the students make to each question by saving via one of the following methods:
  - Press the Print Screen button on the keyboard and paste the screen image into a Word document.
  - Use the screen capture feature of the Notebook software that comes with the SMART Board to add the screen to a set of class notes to be shared with the class later.
  - $\circ$  Use PowerPoint's annotate pen and save the notes to the slide.

### Talk About It!

- [Slide 4] Ask students to consider the question on the slide: Will a person with one or more known risk factors always develop cancer?
  - Learning Activity: Class Discussion. Ask students to discuss the question: Will a
    person with one or more known risk factors always develop cancer? What are some
    examples from students' personal lives that support their answers? Answer: No!
    Most people have risk factors and never develop cancer.

### **EXPLORE**

### **Cancer Risk Factors**

- [Slide 5] Before showing the bullets on the slide, explain to students that doctors often cannot explain why one person develops cancer and another does not. However, research has shown that people with certain risk factors are more likely to develop cancer. Risk factors are characteristics or behaviors that increase the possibility of developing a disease.
  - Learning Activity: Think-Pair-Share. Ask students to think about cancer risk factors, allowing one to two minutes for them to think quietly to themselves. After a few minutes, ask students to pair up with one or two other students to discuss their thoughts and make a list. After four or five minutes, go around the room and ask each group to share their list of cancer risk factors, creating one large list on the SMART Board. Once the list is made, reveal the list on this slide.
- [Slides 6-16] Distribute <u>Cancer Risk Factors</u> (pages 14-19) and <u>Breast Cancer Risk Factors</u> (pages 23-24) for students to refer to during Slides 7-16. Explain that breast cancer, like all cancers, has a specific set of risk factors that are linked to it. No one knows why some people develop breast





- cancer and others do not. However, research has shown that women with certain risk factors are more likely to develop breast cancer. Risk factors are characteristics or behaviors that increase the possibility of developing a disease.
- Use the following slides to explain some general cancer risk factors.
  - o [Slide 6] Age
    - The most significant risk factor for cancer is age.
    - Risk of cancer steadily increases with age.
  - o [Slide 7] Tobacco use
    - Tobacco use is the most preventable cause of death.
    - Each year, more than 180,000 Americans die from cancer that is related to tobacco use.
    - Using tobacco products or regularly being around tobacco smoke increases the risk of cancer.
    - Smokers are more likely than nonsmokers to develop cancer of the lung, larynx, mouth, esophagus, bladder, kidney, throat, stomach, pancreas, and cervix, as well as cancer that starts in the blood cells.
  - o [Slides 8-9] Exposure to UV radiation
    - Ultraviolet (UV) radiation comes from the sun, sunlamps, and tanning booths.
    - UV rays cause early aging of the skin and damage that can lead to skin cancer.
    - People of all ages should avoid exposure
      - Stay out of the midday sun
      - Use sunscreen
      - Wear long sleeves and sunglasses with UV protection
      - Do not use sunlamps or tanning booths they are no safer than sunlight
    - Explain to students that there are other approaches to prevention. The Community Preventive Services Task Force recommends education and policy interventions for the prevention of skin cancer. These interventions combine community-based communications with policy and regulation to increase preventive behaviors (such as covering up, using shade, or avoiding the sun during peak UV hours) among populations in specific settings, including primary school and outdoor recreational settings. The U.S. FDA has information to help guide patients and clinicians on the use and effectiveness of broad-spectrum sunscreens (www.fda.gov/sunscreen). It has determined that, if used as directed, broad-spectrum sunscreens with a sun-protection factor of 15 or greater protect against both UV A and UV B radiation and reduce the risk for skin cancer and early skin aging. The agency also has consumer education materials on the dangers of indoor tanning.
  - [Slide 10] Exposure to ionizing radiation
    - Sources include:
      - Medical procedures such as X-rays and radiation therapy
      - Radioactive fallout
      - Radon gas
    - Additional information on this slide:





- The risk of cancer from low-dose X-rays is extremely small. Body parts not being X-rayed are shielded to limit exposure. There is a slightly higher risk for radiation therapy. This therapy is only used if the benefits outweigh the risks.
- Radioactive fallout is from accidents at nuclear power plants or from production, testing, or use of atomic weapons. People exposed to fallout have increased risk of cancers, especially leukemia and cancer of the thyroid, breast, lung, and stomach.
- Radon gas forms in soil and rocks. It cannot be seen, smelled, or tasted. It's found in homes in certain parts of the U.S. and in mines. People exposed to radon gas are at increased risk of lung cancer.
- o [Slide 11] Bacteria
  - Some viruses and bacteria increase the risk of developing cancer.
  - Helicobacter pylori
    - A bacterium which can cause stomach ulcers, stomach cancer, or lymphoma in the stomach lining
- o [Slides 12-14] Viruses
  - Being infected with certain viruses of bacteria may increase the risk of developing cancer:
    - Hepatitis B and C
      - $\circ~$  Liver cancer can develop after many years of infection with hepatitis B or C.
    - Human papillomaviruses (HPVs)
      - Main cause of cervical cancer has been linked to risk factor for other types of cancer
    - Human T-cell leukemia/lymphoma virus (HTLV-1)
      - Increases risk of lymphoma and leukemia
    - Human herpes virus 8 (HHV8)
      - o Risk factor for Kaposi's sarcoma, a rare cancer
    - Epstein-Barr virus (EBV)
      - Linked to increased risk of lymphoma
    - Human immunodeficiency virus (HIV)
      - $\circ$  HIV doesn't cause cancer but enables cancer formation.
      - Individuals with HIV infection are at greater risk of cancers such as lymphoma or Kaposi's sarcoma.
  - Explain to students that there are effective ways to manage the risk due to viruses and bacteria.
    - Do not have unprotected sex or share needles. This puts you at risk for contracting HPV, hepatitis B and C, and HIV.
    - Talk to your doctor about getting vaccinated for hepatitis B and HPV.
    - If you think you are at risk for HIV or hepatitis, ask about being tested. These infections may not cause symptoms but can be diagnosed by a blood test.
    - If you have stomach problems, talk to your doctor. Infection with H. pylori can be detected and treated.





- o [Slide 15] Hormones
  - Doctors may prescribe hormones (estrogen or estrogen plus progestin) to women undergoing menopause.
  - Hormones can relieve problems such as hot flashes, vaginal dryness, and thinning bones.
  - However, menopausal hormone therapy can cause serious side effects.
  - May increase the risk of breast cancer
- o [Slide 16] Alcohol Use
  - Having more than two drinks per day for many years may increase the chance of developing cancers of the mouth, throat, esophagus, larynx, liver, and breast.
  - Risk increases with the amount of alcohol a person drinks.
  - Risk increases for drinkers who also use tobacco.
  - Doctors counsel drinkers to consume alcohol in moderation.
    - No more than one drink per day for women
      - No more than two drinks per day for men
- [Slide 17-18] Positive Choices to Reduce Cancer Risk
  - [Slide 17] Diet
    - A healthy diet includes foods high in fiber, vitamins, and minerals.
      - Whole-grain breads and cereals, five to nine servings of fruits and vegetables
      - Limit fatty foods such as butter, whole milk, fried food, and red meat.
    - Poor diet, lack of physical activity, or being overweight puts a person at increased risk for several types of cancer. Individuals with high-fat diets have an increased risk of cancers of the colon, uterus, and prostate.
    - Optional Learning Activity: Divide students into groups of 2 or 3 and tell them they will work together to create a "healthy plate" by researching <u>http://www.choosemyplate.gov/MyPlate.</u> Students will need Internet access, and they should focus on a meal (breakfast, lunch, or dinner). Ask student volunteers to present their meals to the class.
  - o [Slide 18] Exercise
    - Be active and maintain a healthy body weight.
      - Children and adolescents should do 60 minutes (one hour) or more of physical activity each day.
      - Adults should have moderate physical activity (such as brisk walking) for at least 30 minutes on five or more days per week.
    - Optional Learning Activity: Ask for student volunteers to track their steps with a
      FitBit or other technology that registers steps for a period of time. Ask these
      students to track their steps at certain intervals in the day to determine most
      active times versus lower activity times. Ask students to share their data, and
      use the information to start a discussion with the rest of the class.





### **EXPLAIN**

### How Do You Get Cancer?

• [Slide 19] Explain to students that cancer is not caused by an injury nor is it contagious. You cannot "catch" cancer from another person, even though certain viruses or bacteria may increase the risk of some types of cancer.

### Talk About It!

- [Slide 20] Ask students to consider the question on the slide: Do all risk factors play a role in breast cancer risk?
  - Learning Activity: Class Discussion. Ask students to discuss the question: Do all risk factors play a role in breast cancer risk? Answer: No. Some risk factors for cancer do not play a role in breast cancer risk.
- [Slide 21] Homework assignment: Reflect on your own behaviors and develop a personal risk reduction plan to avoid or reduce cancer risk factors for yourself. Write a letter to yourself in the future as an adult. Describe what you are doing now to reduce your risk of cancer, and include what some consequences of behavior could be, as well as predictable diseases or conditions based on certain behaviors.

### **ELABORATE**

### The Biggest Risk Reducer

- [Slide 22] Tell students they will be playing The Biggest Risk Reducer, a learning activity that will help them understand more about cancer risk factors. Slides 22-39 pertain to this game. Ask students if they are familiar with *The Biggest Loser*, a reality TV show in which participants compete to lose weight. Tell students they will be playing a variation called The Biggest Risk Reducer that focuses on cancer risk reduction.
- [Slide 23] Learning Activity: Group Discussion. Ask students if they or someone they know has ever tried to change a behavior to be healthier (e.g., quitting smoking, starting an exercise program, eating healthy).
  - Discuss the experiences of changing a behavior to be healthier with these questions:
    - Was the process of changing the behavior easy?
    - What obstacles were encountered?
    - Was the process successful?
    - Was there anything that helped the person to change the behavior (rewards, family support, etc.)?
- [Slide 24] Step 1: Pick a Player.
  - Divide the class into small groups of four to six students. Assign each group a <u>Biggest</u> <u>Risk Reducer Player Card</u> (pages 20-22) or have them randomly pick a Player card. Allow time for groups to review their Player's information.
- [Slide 25] Step 2: Establish Baseline Risk Score
  - Ask students to refer to their copies of <u>Breast Cancer Risk Factors</u> (pages 23-24) and <u>Cancer Risk Factors</u> and to take a few minutes to review the information.
  - [Slide 26] Distribute copies of <u>Biggest Risk Reducer Score Sheet</u> (pages 25-33) to each group. Have students review the information about cancer risk factors and complete the Score Sheet to determine their Player's Baseline Risk Score.

The Val Skinner Foundation, and Rutgers, The State University of New Jersey.

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- TEACHER NOTE: The numbers used on the Score Sheet are only used for purposes of playing the game; they do not represent actual extent of risk. One of the questions requires students to calculate their Player's BMI. BMI is a number calculated based on weight and height. It is used to measure overweight and obesity status. A calculator is available online at <a href="http://www.cdc.gov/nccdphp/dnpa/bmi/">http://www.cdc.gov/nccdphp/dnpa/bmi/</a>. There are separate calculators for adults and children/teenagers. Students may calculate BMI using the following formula: BMI = [(weight in pounds)/(height in inches)<sup>2</sup>] × 703. An individual with a BMI >25 is considered overweight, while >30 is considered obese.
- [Slide 27] Step 3: Develop a Risk Reduction Strategy
  - Tell the class they will be developing a strategy to reduce their Player's cancer risk. Distribute <u>Risk Reduction Strategy</u> (pages 34-38). Ask each group to select one unhealthy behavior their Player engages in (this will be their Target Behavior) and develop a preliminary plan for how their Player can change this unhealthy behavior based on their own personal knowledge and experiences. Their goal is to de velop a realistic and manageable strategy for helping their Player reduce their cancer risk. The group that helps their Player lower their Risk Score the most will be the Biggest Risk Reducer.
- [Slide 28] Step 4: Select a Target Behavior
  - $\circ$  ~ Tell students that these are some examples of target behaviors.
    - Unhealthy eating
    - Inadequate physical activity
    - Irregular or no cancer screenings
    - Irresponsible alcohol use
    - Tobacco use (smoking)
- [Slide 29] Step 5: Develop a Preliminary Plan.
  - Select one unhealthy behavior your Player engages in and develop a plan to change that behavior.
  - After each group completes a preliminary plan, distribute one <u>Chance Card</u> (pages 39-40) specific to their Target Behavior. For example, a group that chose inadequate physical activity as their Target Behavior would receive one Exercise Chance Card. Allow students to review their Chance Card and update their Score Sheet.
- [Slide 30] Step 6: Account for Chance
  - Based on their target behavior change from the preliminary plan, distribute one chance card specific to their target behavior.
- [Slides 31-36] Step 7: Take the Physical Challenge
  - Tell the class that research has provided some insight into how to help people change a behavior. Tell students that in order to gain clues about how to help Players change a behavior, they must compete in a Physical Challenge, just like in a reality show such as *The Biggest Loser*. Groups must use their knowledge about breast cancer and their physical endurance to win clues about how to write a more effective risk reduction strategy.
  - [Slides 32-33] Physical Challenge Rules





- 1. The teacher is the Judge.
- 2. Each group will rotate among different Stations. At each Station, groups must answer as many questions about breast cancer correctly as they can in two minutes.
- 3. While a Team is at a Station, one group member (the Mover) must remain in motion at ALL times.
- 4. If any Mover stops, their Team must step away from their Station, regardless of whether they have completed their questions.
- 5. After two minutes, the Judge calls time. The Judge collects the completed Question sheets and the Teams move to the next Station.
- 6. At each new Station, another group member should be the Mover so that each student is the Mover at least once.
- [Slide 34] Get Moving! Have each group select their first Mover and Station. Distribute the first Question sheet to each Station. Call, "Start!" and begin timing for two minutes. Circulate among groups to make sure they are answering the questions and Movers are constantly moving. After two minutes, tell the class time is up. Teams turn in their completed Question sheets and move to the next Station. The role of Mover should rotate to the next group member. Continue playing until each group has visited all Stations.
  - Activities for the Movers:
    - Running
    - Marching in place
    - Walking around the classroom
    - Jumping jacks
    - Dancing to music
  - TEACHER NOTE: If you do not have enough space for students to rotate around stations, you can modify the activity. Have students sit in groups and designate a place in the classroom for the Movers. Give each group the same set of Questions and time them. After the allotted time, collect the Questions, distribute the next set of Questions, and have the Mover for each group rotate to the next member until all Questions are completed.
- o [Slide 35] The Biggest Winner
  - Review the answers with the class and determine which group is the winner of the Physical Challenge (the group with the most correct answers wins). The winning group may subtract an additional six points from their Player's Baseline Risk Score; all other teams may subtract two points if they made an effort in the Physical Challenge.
- o [Slide 36] The Winnings
  - Distribute <u>What Determines Health?</u> (page 51) to each student and <u>Behavior</u> <u>Change Clues</u> (pages 52-56) to each group based on their Target Behavior and their performance in the Physical Challenge, using the process on this slide. The clues for each group may be randomly selected.
    - Winner of the Physical Challenge receives 15 clues for their Target Behavior.
    - Second place receives 10 clues for their Target Behavior.





- Third place receives eight clues for their Target Behavior.
- Fourth place and below receive five clues for their Target Behavior.
- [Slide 37] Step 8: Risk Reduction Presentations
  - Tell students they should use their clues to revise and refine their risk reduction strategy for their Player. Strategies should be realistic. Allow groups enough time to discuss their strategy and complete or revise their *Risk Reduction Strategy* (pages 34-38) handout.
    - Learning Activity: Presenting Risk Reduction Strategy. Have each group introduce their Player and present their risk reduction strategy to the class. Use <u>Rubrics for Judging Risk Reduction Strategies</u> (pages 57-61) to score each group's strategy. Strategies are scored based on how well the strategy conforms with behavior change science. Points are assessed based on each strategy's potential to reduce cancer risk.
- [Slide 38] Step 9: Update Score Sheet
  - Have students update their Score Sheet with the results of the assessment of their risk reduction strategy and calculate the percentage they reduced their Player's risk score from the Baseline Risk Score to the Final Risk Score. The group with the Player who reduces their cancer risk the most is the Biggest Risk Reducer.
- [Slide 39] Step 10: Judging Risk Reduction Strategy
  - Have students assess themselves, their peers, and their group on the strategies.

### **EVALUATE**

### **Homework Assignment**

- Writing Activity: Email to Steve and Nikki. Ask the class to write an email to Steve and Nikki with suggestions on how to answer their question, What can we do to lower our cancer risk? This email should detail what students have learned and offer advice on how to reduce cancer risk factors.
- Homework Assignment: Personal Risk Reduction Plan. For homework, have each student write a personal risk reduction plan.
  - Alternate activity: Have students research and give a brief oral or written report on different types of cancer, including causes, treatment, and prevention. See Appendix D for factsheets on some of these cancers. Some examples are:
    - Cervical cancer
    - Colorectal cancer
    - Leukemia
    - Liver cancer
    - Lung cancer
    - Lymphoma
    - Oral cancer
    - Ovarian cancer
    - Prostate cancer
    - Skin cancer
  - Lesson 5 Quiz





### **Additional Resources**

- National Cancer Institute, Cancer Causes and Prevention http://www.cancer.gov/about-cancer/causes-prevention
- National Cancer Institute, Cancer-Causing Substances in the Environment http://www.cancer.gov/about-cancer/causes-prevention/risk/substances
- Centers for Disease Control and Prevention, Body Mass Index (BMI) http://www.cdc.gov/nccdphp/dnpa/bmi/
- The University of Colorado at Boulder. (2009). Eating & Exercise—Interactive Simulations http://phet.colorado.edu/en/simulation/eating-and-exercise Students may use this site in conjunction with the Biggest Risk Reducer Activity.





### Next Generation Science Standards

### Performance Indicators

HS-LS1 From Molecules to Organisms: Structures and Processes

• HS-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS-LS3 Heredity: Inheritance and Variation of Traits

• HS-LS3-2. Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.

### Science and Engineering Practices

Constructing Explanations and Designing Solutions

• Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (HS-LS1-1)

Asking Questions and Defining Problems

• Ask questions that arise from examining models or a theory to clarify relationships. (HS-LS3-1) Engaging in Argument from Evidence

• Make and defend a claim based on evidence about the natural world that reflects scientific knowledge, and student-generated evidence. (HS-LS3-2)

### **Disciplinary Core Ideas**

LS1.A: Structure and Function

• Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

### LS3.B: Variation of Traits

Environmental factors also affect expression of traits, and hence affect the probability of occurrences of traits in a population. Thus the variation and distribution of traits observed depends on both genetic and environmental factors. (HS-LS3-2),(HS-LS3-3)

### **Crosscutting Concepts**

Structure and Function

• Investigating or designing new systems or structures requires a detailed examination of the properties of different materials, the structures of different components, and connections of components to reveal its function and/or solve a problem. (HS-LS1-1)

**Cause and Effect** 

• Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects. (HS-LS3-1),(HS-LS3-2)





Cancer risk reduction is action taken by an individual to lower their chance of getting cancer. By reducing cancer risk, the number of new cases of cancer in a group or population may be lowered.

Anything that increases your risk of developing cancer is a risk factor. Some risk factors for cancer can be controlled, such as smoking, but others cannot, such as genes. Some risk factors are the same for different cancers and some are specific for a particular cancer. Avoiding or reducing risk factors may lower a person's cancer risk but it does not mean they will be cancer-free. Scientists are learning about cancer risk factors everyday. Below are the risk factors known today for five common cancers.

#### Breast Cancer

- Being older (over age 50)
- Having menarche (menstruation) at an earlier age (younger than 12)
- Never having a child or having a child when older
- Having a personal history of breast cancer or benign (noncancer) breast disease
- · Having a family member with breast cancer
- Having a BRCA1 or BRCA2 mutation
- Receiving treatment with radiation therapy to the breast/chest
- Taking hormones, such as estrogen or progesterone
- Being overweight or obese
- Drinking alcoholic beverages
- Not getting adequate exercise

#### Colorectal Cancer

- Being older (over age 50)
- Having a personal history of colorectal cancer
- Having a family history of colorectal cancer
- Being overweight or obese
- Not getting adequate exercise
- Smoking
- Drinking alcoholic beverages

#### Lung Cancer

- Being older (over age 50)
- Smoking
- · Having a lung disease such as tuberculosis
- Having a personal history of lung cancer
- Being exposed to environmental tobacco smoke
- Being exposed to cancer-causing chemicals, such as radon or asbestos
- Drinking alcoholic beverages
- Not getting adequate exercise
- · Not eating adequate fruits and vegetables

#### **Prostate Cancer**

- Being older (over age 50)
- · Have a family history of prostate cancer
- Eating lots of high-fat foods
- Being exposed to testosterone over a long time

#### Skin Cancer

- Being exposed to ultraviolet radiation (UV)
  rays
- · Having a family history of skin cancer
- · Having a personal history of skin cancer
- · Being exposed to arsenic





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Doctors often cannot explain why one person develops cancer and another does not. But research shows that certain risk factors increase the chance that a person will develop cancer. These are the most common risk factors for cancer:

- Growing older
- Tobacco
- Sunlight
- Ionizing radiation
- Certain chemicals and other substances
- Some viruses and bacteria
- Certain hormones
- · Family history of cancer
- Alcohol
- Poor diet, lack of physical activity, or being overweight

Many of these risk factors can be avoided. Others, such as family history, cannot be avoided. People can help protect themselves by staying away from known risk factors whenever possible.

If you think you may be at risk for cancer, you should discuss this concern with your doctor. You may want to ask about reducing your risk and about a schedule for checkups.

Over time, several factors may act together to cause normal cells to become cancerous. When thinking about your risk of getting cancer, these are some things to keep in mind:

- Not everything causes cancer.
- Cancer is not caused by an injury, such as a bump or bruise.
- Cancer is not contagious. Although being infected with certain viruses or bacteria may increase the risk of some types of cancer, no one can "catch" cancer from another person.
- Having one or more risk factors does not mean that you will get cancer. Most people who have risk factors never develop cancer.
- Some people are more sensitive than others to the known risk factors.

#### **Growing Older**

• The most important risk factor for cancer is growing older. Most cancers occur in people over the age of 65. But people of all ages, including children, can get cancer, too.

#### Tobacco

Tobacco use is the most preventable cause of death. Each year, more than 180,000 Americans die from cancer that is related to tobacco use.





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Using tobacco products or regularly being around tobacco smoke (environmental or secondhand smoke) increases the risk of cancer.

Smokers are more likely than nonsmokers to develop cancer of the lung, larynx (voice box), mouth, esophagus, bladder, kidney, throat, stomach, pancreas, or cervix. They also are more likely to develop cancer that starts in blood cells.

People who use smokeless tobacco (snuff or chewing tobacco) are at increased risk of cancer of the mouth.

#### Sunlight

Ultraviolet (UV) radiation comes from the sun, sunlamps, and tanning booths. It causes early aging of the skin and skin damage that can lead to skin cancer. Doctors encourage people of all ages to limit their time in the sun and to avoid other sources of UV radiation:

- It is best to avoid the midday sun (from mid-morning to late afternoon) whenever possible. You also should protect yourself from UV radiation reflected by sand, water, snow, and ice. UV radiation can penetrate light clothing, windshields, and windows.
- Wear long sleeves, long pants, a hat with a wide brim, and sunglasses with lenses that absorb UV.
- Use sunscreen. Sunscreen may help prevent skin cancer, especially sunscreen with a sun protection factor (SPF) of at least 15. But sunscreens cannot replace avoiding the sun and wearing clothing to protect the skin.
- Stay away from sunlamps and tanning booths. They are no safer than sunlight.

#### **Ionizing Radiation**

lonizing radiation can cause cell damage that leads to cancer. This kind of radiation comes from rays that enter the Earth's atmosphere from outer space, radioactive fallout, radon gas, x-rays, and other sources.

Radioactive fallout can come from accidents at nuclear power plants or from the production, testing, or use of atomic weapons. People exposed to fallout may have an increased risk of cancer, especially leukemia and cancers of the thyroid, breast, lung, and stomach.

Radon is a radioactive gas that you cannot see, smell, or taste. It forms in soil and rocks. People who work in mines may be exposed to radon. In some parts of the country, radon is found in houses. People exposed to radon are at increased risk of lung cancer.





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Medical procedures are a common source of radiation:

- Doctors use radiation (low-dose x-rays) to take pictures of the inside of the body. These pictures help to diagnose broken bones and other problems.
- Doctors use radiation therapy (high-dose radiation from large machines or from radioactive substances) to treat cancer.

The risk of cancer from low-dose x-rays is extremely small. The risk from radiation therapy is slightly higher. For both, the benefit nearly always outweighs the small risk.

You should talk with your doctor if you are concerned that you may be at risk for cancer due to radiation.

If you live in a part of the country that has radon, you may wish to test your home for high levels of the gas. The home radon test is easy to use and inexpensive. Most hardware stores sell the test kit.

You should talk with your doctor or dentist about the need for each x-ray. You should also ask about shields to protect parts of the body that are not in the picture.

Cancer patients may want to talk with their doctor about how radiation treatment could increase their risk of a second cancer later on.

#### **Certain Chemicals and Other Substances**

People who have certain jobs (such as painters, construction workers, and those in the chemical industry) have an increased risk of cancer. Many studies have shown that exposure to asbestos, benzene, benzidine, cadmium, nickel, or vinyl chloride in the workplace can cause cancer.

Follow instructions and safety tips to avoid or reduce contact with harmful substances both at work and at home. Although the risk is highest for workers with years of exposure, it makes sense to be careful at home when handling pesticides, used engine oil, paint, solvents, and other chemicals.

#### **Some Viruses and Bacteria**

Being infected with certain viruses or bacteria may increase the risk of developing cancer:

- Human papillomaviruses (HPVs): HPV infection is the main cause of cervical cancer. It also may be a risk factor for other types of cancer.
- Hepatitis B and hepatitis C viruses: Liver cancer can develop after many years of infection with hepatitis B or hepatitis C.





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- Human T-cell leukemia/lymphoma virus (HTLV-1): Infection with HTLV-1 increases a person's risk of lymphoma and leukemia.
- Human immunodeficiency virus (HIV): HIV is the virus that causes AIDS. People who have HIV infection are at greater risk of cancer, such as lymphoma and a rare cancer called Kaposi's sarcoma.
- Epstein-Barr virus (EBV): Infection with EBV has been linked to an increased risk of lymphoma.
- Human herpesvirus 8 (HHV8): This virus is a risk factor for Kaposi's sarcoma.
- Helicobacter pylori : This bacterium can cause stomach ulcers. It also can cause stomach cancer and lymphoma in the stomach lining.

Do not have unprotected sex or share needles. You can get an HPV infection by having sex with someone who is infected. You can get hepatitis B, hepatitis C, or HIV infection from having unprotected sex or sharing needles with someone who is infected.

You may want to consider getting the vaccine that prevents hepatitis B infection. Health care workers and others who come into contact with other people's blood should ask their doctor about this vaccine.

If you think you may be at risk for HIV or hepatitis infection, ask your doctor about being tested. These infections may not cause symptoms, but blood tests can show whether the virus is present. If so, the doctor may suggest treatment. Also, the doctor can tell you how to avoid infecting other people.

If you have stomach problems, see a doctor. Infection with H. pylori can be detected and treated.

#### **Certain Hormones**

Doctors may recommend hormones (estrogen alone or estrogen along with progestin) to help control problems (such as hot flashes, vaginal dryness, and thinning bones) that may occur during menopause. However, studies show that menopausal hormone therapy can cause serious side effects. Hormones may increase the risk of breast cancer, heart attack, stroke, or blood clots.

#### **Family History of Cancer**

Most cancers develop because of mutations in genes. A normal cell may become a cancer cell after a series of gene changes occur. Tobacco use, certain viruses, or other factors in a person's lifestyle or environment can cause such changes in certain types of cells.

Some gene changes that increase the risk of cancer are passed from parent to child. These changes are present at birth in all cells of the body.





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It is uncommon for cancer to run in a family. However, certain types of cancer do occur more often in some families than in the rest of the population. For example, melanoma and cancers of the breast, ovary, prostate, and colon sometimes run in families. Several cases of the same cancer type in a family may be linked to inherited gene changes, which may increase the chance of developing cancers. However, environmental factors may also be involved. Most of the time, multiple cases of cancer in a family are just a matter of chance.

#### Alcohol

Having more than two drinks each day for many years may increase the chance of developing cancers of the mouth, throat, esophagus, larynx, liver, and breast. The risk increases with the amount of alcohol that a person drinks. For most of these cancers, the risk is higher for a drinker who uses tobacco.

Doctors advise people who drink to do so in moderation. Drinking in moderation means no more than one drink per day for women and no more than two drinks per day for men.

#### Poor Diet, Lack of Physical Activity, or Being Overweight

People who have a poor diet, do not have enough physical activity, or are overweight may be at increased risk of several types of cancer. For example, studies suggest that people whose diet is high in fat have an increased risk of cancers of the colon, uterus, and prostate. Lack of physical activity and being overweight are risk factors for cancers of the breast, colon, esophagus, kidney, and uterus.

Having a healthy diet, being physically active, and maintaining a healthy weight may help reduce cancer risk. Doctors suggest the following:

- Eat well: A healthy diet includes plenty of foods that are high in fiber, vitamins, and minerals. This includes whole-grain breads and cereals and 5 to 9 servings of fruits and vegetables every day. Also, a healthy diet means limiting foods high in fat (such as butter, whole milk, fried foods, and red meat).
- Be active and maintain a healthy weight: Physical activity can help control your weight and reduce body fat. Most scientists agree that it is a good idea for an adult to have moderate physical activity (such as brisk walking) for at least 30 minutes on 5 or more days each week.

Source: U.S. Department of Health and Senior Services, National Institutes of Health, National Cancer Institute. What You Need To Know About™ Breast Cancer





### **Biggest Risk Reducer Player Cards**

#### Marjory Hill

Age: 56 Height: 5'5" Weight: 195 lbs Marital Status: Married with three children Occupation: Surgical Nurse

Marjory has always taken care of others, but knows she also needs to take care of herself. Her father, a heavy smoker, died of lung cancer. Marjory has a hectic work schedule and does not have the time to exercise. She eats a lot of fast food because she is always on the go and has a glass of wine with dinner every night. Marjory has gained weight since she went through menopause. She does not smoke and has not had a mammogram or any other cancer screening in six years. She has not been diagnosed with cancer.

#### **Bob Wells**

Age: 37 Height: 5'9" Weight: 180 lbs Marital Status: Divorced with two children Occupation: Electrician

Bob is a smoker. He has tried to quit in the past, but was never successful. After his divorce, Bob began drinking alcohol more frequently and drinks at least two to three beers every day. Bob's family has a history of cancer. His mother died of ovarian cancer when she was 42. His sister recently found out she has a BRCA 2 mutation. Bob is very busy and eats out a lot during the week and is only active on the weekend when he sees his children. He only goes to the doctor when he is sick and has not been diagnosed with cancer. Since his sister learned about her BRCA 2 mutation, Bob is more motivated to learn how to reduce his cancer risk status.

#### **Eva Murray**

Age: 25 Height: 5'2" Weight: 115 lbs Marital Status: Single Occupation: Graphic Designer

Eva tries to lead a healthy lifestyle. Eva eats healthy and takes a vitamin every day. She does not smoke and goes to the doctor every year for her annual examination and screenings. By the time she gets home from work, she is too tired to exercise. She has two glasses of wine each night and drinks more heavily on the weekend with her friends. When she was a teenager, Eva had radiation therapy to treat Hodgkin's disease. Since then she has tried to lead a healthy lifestyle. Eva's grandmother also had Hodgkin's disease.





### **Biggest Risk Reducer Player Cards**

### Scott Morgan

Age: 42 Height: 6'0" Weight: 185 lbs Marital Status: Married with one child Occupation: Accountant

Scott quit smoking five years ago but his wife still smokes around the home. He is on medication for high blood pressure. He usually skips breakfast and has fast food for lunch. Scott was an athlete in high school and college, but isn't as athletic as he used to be. His office has a gym which he tries to use two to three times per week. He plays golf every Saturday and then goes out for a beer with his friends. Scott sees his doctor each year. His doctor told him there are some screening tests he will need in a few years, but that he is healthy now. Scott's father had prostate cancer.

#### Vanessa Ling

Age: 15 Height: 5'1" Weight: 135 lbs Marital Status: Single Occupation: High School Student

Vanessa has always struggled with her weight and feels like she is always trying a new diet. She has lost a few pounds, but would like to lose more. She eats healthy because she knows it will help her lose weight. Vanessa started smoking a year ago but does not drink alcohol. She loves her part-time job at the local tanning salon because she gets a great employee discount. She used to play softball, but doesn't have time anymore because of all her homework. On weekends, Vanessa likes to hang out at the mall and watch movies with her friends. Neither Vanessa nor anyone in her family has been diagnosed with cancer.

### Alejandro Focell

Age: 17 Height: 5'11″ Weight: 165 lbs Marital Status: Single Occupation: High School Student

Alejandro's mom tells him he needs to go outside and be active more often. However, Alejandro does not like to go outside because he always gets a sunburn. Alejandro has a part-time job at the local movie theater and likes to hang out with his friends and play video games. He likes to snack on the food at the theater and eat fast food. Alejandro does not play sports, smoke or drink alcohol. Alejandro has not been diagnosed with cancer, but his grandmother and father had skin cancer.





# **Biggest Risk Reducer Player Cards**

#### Wendy Otis

Age: 47 Height: 5'4" Weight: 140 lbs Marital Status: Married with two children Occupation: Teacher

Wendy is a breast cancer survivor who just completed treatment. She was the first person in her family to be diagnosed with cancer. She was diagnosed with breast cancer over a year ago. She had a mastectomy of her left breast, but her oncologist warned Wendy that she is at increased risk of cancer in her other breast and ovaries. Wendy is supposed to make appointments for more screening tests, such as annual mammograms and MRIs, but she is tired of doctors; appointments. Wendy does not have the energy to exercise, but she figures her running around the classroom counts. She does not smoke and drinks alcohol only occasionally (less than one drink per week). She tries to eat healthy by making sure she has whole grains and the recommended number of servings of fruits and vegetables per day.

#### **Mike Stough**

Age: 67 Height: 5'11" Weight: 190 lbs Marital Status: Married with five children Occupation: Retired

Mike started smoking when he was 15 but quit ten years ago when he found out he had diabetes. Mike's wife keeps telling him he needs to eat better, but Mike doesn't want to give up all of his favorite foods. He likes to eat a lot of steak and other meats and does not like fruits and vegetables. He drinks alcohol only occasionally (less than one drink per week). Mike used to enjoy taking long walks with his dog, but now he is out of breath after walking around the block. Mike's doctor told him to get screened for prostate and colorectal cancer, but Mike feels fine and doesn't like going to the doctor. Neither Mike or any one in his family has been diagnosed with cancer.





### **Breast Cancer Risk Factors**

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No one knows the exact causes of breast cancer. Doctors often cannot explain why one person develops breast cancer and another does not. They do know that bumping, bruising, or touching the breast does not cause cancer, and breast cancer is not contagious. You cannot "catch" it from another person.

Research has shown that women with certain risk factors are more likely than others to develop breast cancer. A risk factor is something that may increase the chance of developing a disease.

Studies have found the following risk factors for breast cancer:

- Age: The chance of getting breast cancer goes up as a woman gets older. Most cases of breast cancer occur in women over 60. This disease is not common before menopause.
- Personal history of breast cancer: A person who had breast cancer in one breast has an increased risk of getting cancer in the other breast.
- Family history: A person's risk of breast cancer is higher if their mother, sister, or daughter had breast cancer. The risk is higher if the family member got breast cancer before age 40. Having other relatives with breast cancer (in either her mother's or father's family) may also increase a someone's risk.
- Certain breast changes: Some women have cells in the breast that look abnormal under a microscope. Having certain types of abnormal cells (atypical hyperplasia and lobular carcinoma in situ [LCIS]) increases the risk of breast cancer.
- Gene changes: Changes in certain genes increase the risk of breast cancer. These genes include BRCA1, BRCA2, and others. Tests can sometimes show the presence of specific gene changes in families with many women who have had breast cancer. Health care providers may suggest ways to try to reduce the risk of breast cancer, or to improve the detection of this disease in women who have these changes in their genes.
- Reproductive and menstrual history:
  - The older a woman is when she has her first child, the greater her chance of breast cancer
  - Women who had their first menstrual period before age 12 are at an increased risk of breast cancer.
  - Women who went through menopause after age 55 are at an increased risk of breast cancer.
  - Women who never had children are at an increased risk of breast cancer.
  - Women who take menopausal hormone therapy with estrogen plus progestin after menopause also appear to have an increased risk of breast cancer.
  - Large, well-designed studies have shown no link between abortion or miscarriage and breast cancer.
- Race: Breast cancer is diagnosed more often in white women than Latina, Asian, or African American women.





### **Breast Cancer Risk Factors**

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- Radiation therapy to the chest: Women who had radiation therapy to the chest (including breasts) before age 30 are at an increased risk of breast cancer. This includes women treated with radiation for Hodgkin's lymphoma. Studies show that the younger a woman was when she received radiation treatment, the higher her risk of breast cancer later in life.
- Breast density: Breast tissue may be dense or fatty. Older women whose mammograms (breast x-rays) show more dense tissue are at increased risk of breast cancer.
- Taking DES (diethylstilbestrol): DES was given to some pregnant women in the United States between about 1940 and 1971. (It is no longer given to pregnant women.) Women who took DES during pregnancy may have a slightly increased risk of breast cancer. The possible effects on their daughters are under study.
- Being overweight or obese after menopause: The chance of getting breast cancer after menopause is higher in women who are overweight or obese.
- Lack of physical activity: Women who are physically inactive throughout life may have an increased risk of breast cancer. Being active may help reduce risk by preventing weight gain and obesity.
- Drinking alcohol: Studies suggest that the more alcohol a woman drinks, the greater her risk of breast cancer.

Other possible risk factors are under study. Researchers are studying the effect of diet, physical activity, and genetics on breast cancer risk. They are also studying whether certain substances in the environment can increase the risk of breast cancer.

Many risk factors can be avoided. Others, such as family history, cannot be avoided. Women can help protect themselves by staying away from known risk factors whenever possible.

But it is also important to keep in mind that most women who have known risk factors do not get breast cancer. Also, most women with breast cancer do not have a family history of the disease. In fact, except for growing older, most women with breast cancer have no clear risk factors.

Source: U.S. Department of Health and Senior Services, National Institutes of Health, National Cancer Institute. What You Need To Know About™ Breast Cancer





### Biggest Risk Reducer Score Sheet

Name:	Date:	
Player Name:		
Group Members:		
Calculate your Pla	yer's Risk Score.	
Cancer Risk Factor	Risk Score Calculation	Risk Score*
	Starting Risk Score (does not represent actual risk)	150
	If your Player:	(+/-)
Age	Is over age 50, add 10 points.	
Personal History of Cancer	Has been diagnosed with cancer before, add 9 points.	
Ferreile History of	Has a blood relative with cancer, add 8 points.	
Cancer	<ul> <li>Has a blood relative with a BRCA mutation but not cancer, add 3 points.</li> </ul>	
Smoking	<ul> <li>Is exposed to cigarette smoke or other tobacco products (including smoking), add 15 points.</li> </ul>	
Overweight or	Has a BMI between 18.5 and 25, subtract 10 points.	
Obese	Has a BMI over 25, add 10 points.	
Unhealthy Diet	Eats healthy, subtract 10 points.	
	Eats lots of fast food or red meats, add 10 points.	
Inadequate Exercise	Exercises regularly, subtract 8 points.	
Excreise	Does not exercise regularly, add 8 points.	
Alcohol Use	Has at least five - seven drinks of alcohol per week, add 5 points.	
Lack of Regular Screening	<ul> <li>Does not get the recommended cancer screenings, add 4 points.</li> </ul>	
	BASELINE RISK SCORE	
	Add/subtract points based on your Chance Card	
	Subtract points earned from the Physical Challenge	
	Subtract points earned regarding the potential effectiveness of your Risk Reduction Strategy to change your Player's risky behavior (based on points assigned by your teacher)	
	FINAL RISK SCORE	
	Calculate the percentage of points your Player's risk score was	

\*The Risk Score and numbers used are for purposes of playing the game; they do not represent actual risk.





Player Name: Mar	jory Hill	
Group Members:		
Calculate your Pla	yer's Risk Score.	
Cancer Risk Factor	Risk Score Calculation	Risk Score*
	Starting Risk Score (does not represent actual risk)	150
	If your Player:	(+/-)
Age	Is over age 50, add 10 points.	+10
Personal History of Cancer	• Has been diagnosed with cancer before, add 9 points.	
Fourity Listowy of	Has a blood relative with cancer, add 8 points.	
Cancer	<ul> <li>Has a blood relative with a BRCA mutation but not cancer, add 3 points.</li> </ul>	+8
Smoking	<ul> <li>Is exposed to cigarette smoke or other tobacco products (including smoking), add 15 points.</li> </ul>	
Overweight or	Has a BMI between 18.5 and 25, subtract 10 points.	10
Obese	Has a BMI over 25, add 10 points.	+70
Unhealthy Diet	Eats healthy, subtract 10 points.	+10
	Eats lots of fast food or red meats, add 10 points.	170
Inadequate	Exercises regularly, subtract 8 points.	1.0
Exercise	Does not exercise regularly, add 8 points.	τo
Alcohol Use	<ul> <li>Has at least five - seven drinks of alcohol per week, add 5 points.</li> </ul>	+5
Lack of Regular Screening	<ul> <li>Does not get the recommended cancer screenings, add 4 points.</li> </ul>	+4
	BASELINE RISK SCORE	205
	Add/subtract points based on your Chance Card	
	Subtract points earned from the Physical Challenge	
	Subtract points earned regarding the potential effectiveness of your Risk Reduction Strategy to change your Player's risky behavior (based on points assigned by your teacher)	
	FINAL RISK SCORE	Answers will vary
	Calculate the percentage of points your Player's risk score was reduced (From Baseline to Final)	

\*The Risk Score and numbers used are for purposes of playing the game; they do not represent actual risk.





Player Name: Bob	Wells	
Group Members:		
Calculate your Pla	yer's Risk Score.	
Cancer Risk Factor	Risk Score Calculation	Risk Score*
	Starting Risk Score (does not represent actual risk)	150
	If your Player:	(+/-)
Age	Is over age 50, add 10 points.	
Personal History of Cancer	• Has been diagnosed with cancer before, add 9 points.	
Family History of	Has a blood relative with cancer, add 8 points.	+8
Cancer	<ul> <li>Has a blood relative with a BRCA mutation but not cancer, add 3 points.</li> </ul>	+3
Smoking	<ul> <li>Is exposed to cigarette smoke or other tobacco products (including smoking), add 15 points.</li> </ul>	+15
Overweight or	Has a BMI between 18.5 and 25, subtract 10 points.	+10
Obese	Has a BMI over 25, add 10 points.	+70
Unhealthy Diet	Eats healthy, subtract 10 points.	+10
Officeating Diet	Eats lots of fast food or red meats, add 10 points.	170
Inadequate	Exercises regularly, subtract 8 points.	
Exercise	Does not exercise regularly, add 8 points.	+8
Alcohol Use	<ul> <li>Has at least five - seven drinks of alcohol per week, add 5 points.</li> </ul>	+5
Lack of Regular Screening	Does not get the recommended cancer screenings, add 4 points.	+4
	BASELINE RISK SCORE	213
	Add/subtract points based on your Chance Card	
	Subtract points earned from the Physical Challenge	
	Subtract points earned regarding the potential effectiveness of your Risk Reduction Strategy to change your Player's risky behavior (based on points assigned by your teacher)	
	FINAL RISK SCORE	Answers will vary
	Calculate the percentage of points your Player's risk score was reduced (From Baseline to Final)	

\*The Risk Score and numbers used are for purposes of playing the game; they do not represent actual risk.





Player Name: Eva	Murray	
Group Members:		
Calculate your Pla	yer's Risk Score.	
Cancer Risk Factor	Risk Score Calculation	Risk Score*
	Starting Risk Score (does not represent actual risk)	150
	If your Player:	(+/-)
Age	Is over age 50, add 10 points.	
Personal History of Cancer	Has been diagnosed with cancer before, add 9 points.	+9
	Has a blood relative with cancer, add 8 points.	
Family History of Cancer	<ul> <li>Has a blood relative with a BRCA mutation but not cancer, add 3 points.</li> </ul>	+8
Smoking	<ul> <li>Is exposed to cigarette smoke or other tobacco products (including smoking), add 15 points.</li> </ul>	
Overweight or	Has a BMI between 18.5 and 25, subtract 10 points.	
Obese	Has a BMI over 25, add 10 points.	-10
	Eats healthy, subtract 10 points.	
Unhealthy Diet	Eats lots of fast food or red meats, add 10 points.	-10
Inadequate	Exercises regularly, subtract 8 points.	
Exercise	Does not exercise regularly, add 8 points.	+8
Alcohol Use	Has at least five - seven drinks of alcohol per week, add 5 points.	+5
Lack of Regular Screening	Does not get the recommended cancer screenings, add 4 points.	
	BASELINE RISK SCORE	160
	Add/subtract points based on your Chance Card	
	Subtract points earned from the Physical Challenge	
	Subtract points earned regarding the potential effectiveness of your Risk Reduction Strategy to change your Player's risky behavior (based on points assigned by your teacher)	
	FINAL RISK SCORE	Answers will vary
	Calculate the percentage of points your Player's risk score was reduced (From Baseline to Final)	

\*The Risk Score and numbers used are for purposes of playing the game; they do not represent actual risk.





Player Name: Scot	tt Morgan	
Group Members:		
Calculate your Pla	yer's Risk Score.	
Cancer Risk Factor	Risk Score Calculation	Risk Score*
	Starting Risk Score (does not represent actual risk)	150
	If your Player:	(+/-)
Age	Is over age 50, add 10 points.	
Personal History of Cancer	Has been diagnosed with cancer before, add 9 points.	
	Has a blood relative with cancer, add 8 points.	
Family History of Cancer	<ul> <li>Has a blood relative with a BRCA mutation but not cancer, add 3 points.</li> </ul>	+8
Smoking	<ul> <li>Is exposed to cigarette smoke or other tobacco products (including smoking), add 15 points.</li> </ul>	+15
Overweight or	Has a BMI between 18.5 and 25, subtract 10 points.	
Obese	<ul> <li>Has a BMI over 25, add 10 points.</li> </ul>	+10
	Eats healthy, subtract 10 points.	
Unhealthy Diet	Eats lots of fast food or red meats, add 10 points.	+10
Inadeguate	Exercises regularly, subtract 8 points.	
Exercise	Does not exercise regularly, add 8 points.	+8
Alcohol Use	Has at least five - seven drinks of alcohol per week, add 5 points.	
Lack of Regular Screening	Does not get the recommended cancer screenings, add 4 points.	
	BASELINE RISK SCORE	201
	Add/subtract points based on your Chance Card	
	Subtract points earned from the Physical Challenge	
	Subtract points earned regarding the potential effectiveness of your Risk Reduction Strategy to change your Player's risky behavior (based on points assigned by your teacher)	
	FINAL RISK SCORE	Answers will vary
	Calculate the percentage of points your Player's risk score was reduced (From Baseline to Final)	

\*The Risk Score and numbers used are for purposes of playing the game; they do not represent actual risk.





Player Name: Van	essa Ling	
Group Members:		
Calculate your Pla	yer's Risk Score.	
Cancer Risk Factor	Risk Score Calculation	Risk Score*
	Starting Risk Score (does not represent actual risk)	150
	If your Player:	(+/-)
Age	Is over age 50, add 10 points.	
Personal History of Cancer	Has been diagnosed with cancer before, add 9 points.	
	Has a blood relative with cancer, add 8 points.	
Cancer	<ul> <li>Has a blood relative with a BRCA mutation but not cancer, add 3 points.</li> </ul>	
Smoking	<ul> <li>Is exposed to cigarette smoke or other tobacco products (including smoking), add 15 points.</li> </ul>	+15
Overweight or	Has a BMI between 18.5 and 25, subtract 10 points.	
Obese	Has a BMI over 25, add 10 points.	+10
	Eats healthy, subtract 10 points.	
Unhealthy Diet	Eats lots of fast food or red meats, add 10 points.	-10
Inadequate	Exercises regularly, subtract 8 points.	
Exercise	<ul> <li>Does not exercise regularly, add 8 points.</li> </ul>	+8
Alcohol Use	Has at least five - seven drinks of alcohol per week, add 5 points.	
Lack of Regular Screening	Does not get the recommended cancer screenings, add 4 points.	
	BASELINE RISK SCORE	173
	Add/subtract points based on your Chance Card	
	Subtract points earned from the Physical Challenge	
	Subtract points earned regarding the potential effectiveness of your Risk Reduction Strategy to change your Player's risky behavior (based on points assigned by your teacher)	
	FINAL RISK SCORE	Answers will vary
	Calculate the percentage of points your Player's risk score was reduced (From Baseline to Final)	

\*The Risk Score and numbers used are for purposes of playing the game; they do not represent actual risk.





Player Name: Alej	andro Focell	
Group Members:		
Calculate your Pla	yer's Risk Score.	
Cancer Risk Factor	Risk Score Calculation	Risk Score*
	Starting Risk Score (does not represent actual risk)	150
	If your Player:	(+/-)
Age	Is over age 50, add 10 points.	
Personal History of Cancer	Has been diagnosed with cancer before, add 9 points.	
	Has a blood relative with cancer, add 8 points.	
Family History of Cancer	• Has a blood relative with a BRCA mutation but not cancer, add 3 points.	+8
Smoking	Is exposed to cigarette smoke or other tobacco products     (including smoking), add 15 points.	
Overweight or	Has a BMI between 18.5 and 25, subtract 10 points.	10
Obese	Has a BMI over 25, add 10 points.	-10
	Eats healthy, subtract 10 points.	
Unhealthy Diet	Eats lots of fast food or red meats, add 10 points.	+10
Inadequate	Exercises regularly, subtract 8 points.	_
Exercise	Does not exercise regularly, add 8 points.	+8
Alcohol Use	Has at least five - seven drinks of alcohol per week, add 5 points.	
Lack of Regular Screening	Does not get the recommended cancer screenings, add 4 points.	
	BASELINE RISK SCORE	166
	Add/subtract points based on your Chance Card	
	Subtract points earned from the Physical Challenge	
	Subtract points earned regarding the potential effectiveness of your Risk Reduction Strategy to change your Player's risky behavior (based on points assigned by your teacher)	
	FINAL RISK SCORE	Answers will vary
	Calculate the percentage of points your Player's risk score was reduced (From Baseline to Final)	

\*The Risk Score and numbers used are for purposes of playing the game; they do not represent actual risk.





Player Name: Wer	ndy Otis	
Group Members:		
Calculate your Pla	yer's Risk Score.	
Cancer Risk Factor	Risk Score Calculation	Risk Score*
	Starting Risk Score (does not represent actual risk)	150
	If your Player:	(+/-)
Age	Is over age 50, add 10 points.	
Personal History of Cancer	Has been diagnosed with cancer before, add 9 points.	+9
Family History of	Has a blood relative with cancer, add 8 points.	
Cancer	<ul> <li>Has a blood relative with a BRCA mutation but not cancer, add 3 points.</li> </ul>	L
Smoking	<ul> <li>Is exposed to cigarette smoke or other tobacco products (including smoking), add 15 points.</li> </ul>	
Overweight or	Has a BMI between 18.5 and 25, subtract 10 points.	-10
Obese	Has a BMI over 25, add 10 points.	
Unhealthy Diet	Eats healthy, subtract 10 points.	-10
,	Eats lots of fast food or red meats, add 10 points.	
Inadequate	Exercises regularly, subtract 8 points.	+8
Exercise	Does not exercise regularly, add 8 points.	
Alcohol Use	<ul> <li>Has at least five - seven drinks of alcohol per week, add 5 points.</li> </ul>	
Lack of Regular Screening	<ul> <li>Does not get the recommended cancer screenings, add 4 points.</li> </ul>	+4
	BASELINE RISK SCORE	151
	Add/subtract points based on your Chance Card	
	Subtract points earned from the Physical Challenge	
	Subtract points earned regarding the potential effectiveness of your Risk Reduction Strategy to change your Player's risky behavior (based on points assigned by your teacher)	
	FINAL RISK SCORE	Answers will vary
	Calculate the percentage of points your Player's risk score was reduced (From Baseline to Final)	

\*The Risk Score and numbers used are for purposes of playing the game; they do not represent actual risk.





Player Name: Mike	e Stough	
Group Members:		
Calculate your Pla	yer's Risk Score.	
Cancer Risk Factor	Risk Score Calculation	Risk Score*
	Starting Risk Score (does not represent actual risk)	150
	If your Player:	(+/-)
Age	Is over age 50, add 10 points.	+10
Personal History of Cancer	• Has been diagnosed with cancer before, add 9 points.	
	Has a blood relative with cancer, add 8 points.	
Family History of Cancer	<ul> <li>Has a blood relative with a BRCA mutation but not cancer, add 3 points.</li> </ul>	
Smoking	Is exposed to cigarette smoke or other tobacco products     (including smoking), add 15 points.	
Overweight or	Has a BMI between 18.5 and 25, subtract 10 points.	
Obese	Has a BMI over 25, add 10 points.	+10
	Eats healthy, subtract 10 points.	
Unhealthy Diet	Eats lots of fast food or red meats, add 10 points.	+10
Inadequate	Exercises regularly, subtract 8 points.	
Exercise	Does not exercise regularly, add 8 points.	+8
Alcohol Use	Has at least five - seven drinks of alcohol per week, add 5 points.	
Lack of Regular Screening	Does not get the recommended cancer screenings, add 4 points.	+4
	BASELINE RISK SCORE	192
	Add/subtract points based on your Chance Card	
	Subtract points earned from the Physical Challenge	
	Subtract points earned regarding the potential effectiveness of your Risk Reduction Strategy to change your Player's risky behavior (based on points assigned by your teacher)	
	FINAL RISK SCORE	Answers will vary
	Calculate the percentage of points your Player's risk score was reduced (From Baseline to Final)	

\*The Risk Score and numbers used are for purposes of playing the game; they do not represent actual risk.

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Risk Reduction Strategy			
Name:	Date:		
Player Name:			
What is your Player's BMI? Formula for calculating Body Mass Index: (wei inches) <sup>2</sup>	ight in lbs x 703) ÷ (height in		
What are your Player's risk factors?			
Which risk factors can be controlled?			
Which risk factors cannot be controlled?			
What cancer(s) is your Player at risk for?			
Are there any other diseases your Player could be at risk for? For exampl they could be at greater risk for obesity or diabetes.	e, if someone has a high BMI,		
As a group, choose one behavior your Player needs to change to reduce choice below.	their cancer risk. Write your		

Why did you pick that behavior?





### **Risk Reduction Strategy**

Based on your personal knowledge and experiences, develop a preliminary plan to change your Player's behavior. What can they do to reduce their cancer risk? Write your plan in the space below.

After completing the Physical Challenge and reading your team's Clues, revise your plan. Write your new plan in the space below.





#### Risk Reduction Strategy Answer

Note: Answers will vary. Look for students to suggest realistic changes each player can make to reduce his or her risk.

### **Marjory Hill**

#### BMI = 32.4 (obese)

Unhealthy Eating – Marjory could try to limit the amount of fast food she eats. Since she is very busy during the day, she could pack healthy meals at night for the following day. Or if she must eat out, try to make more healthful choices.

Inadequate Physical Activity – Marjory could increase her physical activity by taking a 30 minute walk before or after going to work. She could also try talking a walk with a co-worker during her lunch break or taking the stairs rather than the elevator.

Irregular or No Cancer Screenings – Marjory should be getting regular mammograms.

Irresponsible Alcohol Use – Marjory can reduce her risk by skipping the glass of wine at dinner a few nights each week.

### **Bob Wells**

BMI = 26.6 (overweight)

Unhealthy Eating – If Bob is going to eat out most of the time, he could find places where he can order healthy foods.

Inadequate Physical Activity – Bob is only active when he is with his children on the weekend. He could try to see his children a couple evenings during the week to increase his physical activity.

Irregular or No cancer Screenings – Currently, Bob only goes to the doctor after he becomes ill. He should be visiting his doctor for regular checkups and to receive information about when to begin screening for disease.

Irresponsible Alcohol Use – Bob can take steps to limit his alcohol intake. He can avoid drinking as much by visiting his children more, or by finding a hobby to take up some of his time in the evenings.

Tobacco Use – Bob should talk to his doctor about receiving help to stop smoking. He may want to consider using a patch or nicotine gum to wean himself off the drug.





### **Eva Murray**

#### BMI = 21.0

Inadequate Physical Activity – Since Eva is too tired to exercise after work, she could try to start working out in the morning. If she gave herself an extra 30 to 45 minutes in the morning to work out, she might experience less fatigue in the evening.

Irresponsible Alcohol Use – Drinking two glasses of wine every night may be contributing to Eva's fatigue, as well as increasing her risk for cancer. She can start to reduce her intake on weeknights to one glass of wine. When she is out with her friends, she can try alternating between alcoholic and non-alcoholic drinks.

#### Scott Morgan

#### BMI =25.1 (overweight)

Unhealthy Eating – Scott can improve his eating habits by eating breakfast in the morning. He can avoid getting fast food for lunch by preparing food to take with him.

Inadequate Physical Activity – Although Scott tries to use the gym a couple times each week, he can work out more frequently by establishing a routine. Since the gym is located at his office, he can increase his physical activity by exercising for 30 minutes before or after work.

Tobacco Use – Although Scott is not a smoker, he is still exposed to cigarette smoke from his wife. He could encourage his wife to stop smoking for her and her family's health. If she is unable or unwilling to do so, she can at least limit her smoking to outside the house.

#### **Vanessa Ling**

#### BMI = 25.5 (overweight)

Inadequate Physical Activity – In order to achieve a healthy weight and reduce her risk for cancer, Vanessa can make a commitment to exercise. If she cannot commit to playing softball on a team, she could find another way to be more active. Instead of going to the mall and watching movies with friends, she could suggest that they play sports or take a walk in the park.

Tobacco Use – Smoking puts Vanessa at a much greater risk of developing cancer. Vanessa can talk to her doctor about help quitting.

Students may note that Vanessa's frequent use of the tanning salon is also increasing her risk for cancer.





### **Alejandro Focell**

#### BMI = 23.0

Unhealthy Eating Habits – Alejandro could try to avoid eating fast food and unhealthy snacks at work. He can bring healthy snacks to work in order to limit the amount of junk food he eats.

Inadequate Physical Activity – Alejandro's mom is right – he can be more active. If he burns easily, he can try applying sunscreen before leaving the house. If he does not like playing sports, he could try some other type of exercise like martial arts or walking.

#### **Wendy Otis**

#### BMI = 24.0

Inadequate Physical Activity - Although Wendy is active at work, she can still benefit from more strenuous exercise. By incorporating a daily walk into her routine, Wendy can reduce her risk of a recurrent cancer.

Irregular or No Cancer Screenings – Wendy needs to make a commitment to her health by following her doctor's screening recommendations. Although it can be draining of her time and energy, it is important that she be proactive about screening for cancer. Wendy might try to schedule her mammogram on the same day as a friend so that they can keep each other company.

### **Mike Stough**

#### BMI = 26.5 (Overweight)

Unhealthy Eating Habits – Mike Stough can find a better balance between eating the foods he enjoys and reducing his body weight and risk for cancer. Mike could reduce the amount of red meat he eats. Instead of eating meat at every meal, he can begin to use other sources of protein like eggs, beans, and fish. Although he does not like vegetables, he can try new recipes to incorporate them into his diet.

Inadequate Physical Activity – Mike can begin to improve his stamina. He can walk the dog more frequently and gradually increase how far he walks.

Irregular or No Cancer Screenings – Even though Mike feels healthy, he should adhere to his doctor's screening recommendations as some diseases may be asymptomatic.





### **Chance Cards**

#### **NUTRITION CHANCE**

Your Player has been trying to eat healthier. They have been bringing their lunch from home instead of eating fast food every day. Their risk score decreases by 10 points.

#### **NUTRITION CHANCE**

Your Player wants to eat healthier, but doesn't have the time to prepare healthy foods. Their risk score increases by 10 points.

### **EXERCISE CHANCE**

Your Player has been exercising more. They take walks on their lunch breaks. Their risk score decreases by 8 points.

### **EXERCISE CHANCE**

Your Player wants to exercise more, but is too tired when they get home in the evenings. Their risk score increases by 8 points.

#### **SCREENING CHANCE**

Your Player called their doctor and asked what cancer screenings they need to have and then got the appropriate screenings. Their risk score decreases by 4 points.

### SCREENING CHANCE

Your Player throws away the doctor's note that recommends a cancer screening test and then does not get the appropriate screenings. Their risk score increases by 4 points.





### **Chance Cards**

#### ALCOHOL CHANCE

Your Player has been drinking less alcoholic beverages. Their risk score decreases by 5 points.

### ALCOHOL CHANCE

Your Player wants to drink less alcoholic beverages, but drinks more when they are out with their friends. Their risk score increases by 5 points.

### TOBACCO CHANCE

Your Player looked up information on how to quit smoking and set a date to quit. Their risk score decreases by 10 points.

### **TOBACCO CHANCE**

Your Player tried quitting smoking in the past and it didn't work. Your Player thinks it is too hard to quit. Their risk score increases by 10 points.





Physical Challenge Cell Biology and Cancer		Questions	
Name: Date:		Date:	
1.	BRCA1 and BRCA2 are what types of genes?		
2.	List two ways that cancerous and healthy cells differ.		
3.	Which organelle makes proteins?		
4.	At what phase of mitosis do chromosomes line up in the cell?		
5.	When does the nuclear envelope reappear?		
6.	What is an oncogene called before it mutates?		
7.	What is programmed cell death?		
8.	What happens at cell checkpoints?		
9.	What is the normal function of tumor suppressor genes?		
10.	Cancer develops because of		





Physic	cal Challenge Cell Biology and Cancer	Answers
1.	BRCA 1 and BRCA 2 are what types of genes?	
	Tumor suppressor	
2.	List two ways that cancerous and healthy cells differ.	
	There are more cancer cells; cancer cells have an irregular shape, more nuclei and	less cytoplasm
3.	Which organelle makes proteins?	
	Ribosomes	
4.	At what phase of mitosis do chromosomes line up in the cell?	
	Metaphase	
5.	When does the nuclear envelope reappear?	
	Telophase	
6.	What is an oncogene called before it mutates?	
	Proto-oncogene	
7.	What is programmed cell death?	
	Apoptosis	
8.	What happens at cell checkpoints?	
	The cell checkpoints make sure that each phase of the cell cycle have been correct completed.	tly
9.	What is the normal function of tumor suppressor genes?	
	Tumor suppressor genes normally prevent cells from growing out of control	
10.	Cancer develops because of	
	Abnormal gene function	





Physic	al Challenge	Diagnosis	C	Questions
Name	2:	-	Date:	
1.	Which diagnostic tool is used for h	igh-risk patients?		
2.	Which diagnostic test use X-rays?			
3.	Which type of needle biopsy remo	oves more tissue?		
4.	Name one hormone that is tested	and reported on in a breast o	ancer pathology	report.
5.	What do pathologists study?			
6.	What tumor marker tells you if a ca	ancer is aggressive?		
7.	What body system includes lymph	nodes?		
8.	Why is cancer screening important	t?		
9.	When should a woman with an ave	erage risk of breast cancer ha	ive her first mamr	nogram?
10.	Why is it important to know what s	stage a cancer is in?		





Physi	ical Challenge Diagnosis	Answers
1.	Which diagnostic tool is used for high-risk patients?	
	MRI	
2.	Which diagnostic test use X-rays?	
	Mammogram	
3.	Which type of needle biopsy removes more tissue?	
	Stereotactic or core needle biopsy	
4.	Name one hormone that is tested and reported on in a breast cancer pathology	report.
	Estrogen or progesterone	
5.	What do pathologists study?	
	Diseases	
6.	What tumor marker tells you if a cancer is aggressive?	
	HER2/neu	
7.	What body system includes lymph nodes?	
	Lymphatic system	
8.	Why is cancer screening important?	
	Screening detects cancer early when it is easier to treat.	
9.	When should a woman with an average risk of breast cancer have her first mam	mogram?
	40	
10.	Why is it important to know what stage a cancer is in?	
	To plan treatment	





Physical Challenge Genetics			Questions
Name: Da		Date:	
1.	When was the structure of the double helix discovered?		
2.	Who discovered the structure of DNA?		
3.	BRCA1 is on which chromosome?		
4.	Compare genotype and phenotype:		
5.	How many amino acids are there?		
6.	Translate the following DNA sequence into mRNA: GAT ACA CAG ATC CCA		
7.	List three different types of mutations.		
8.	What effect can mutations have on protein synthesis?		
9.	What percentage of cancer is inherited?		
10.	When was the BRCA1 gene cloned?		





Physi	cal Challenge Genetics	Answers
1.	When was the structure of the double helix discovered?	
	1953	
2.	Who discovered the structure of DNA?	
	Watson, Crick and Franklin	
3.	BRCA 1 is on which chromosome?	
	17	
4.	Compare genotype and phenotype:	
	Genotype is a person's genetic makeup while phenotype is the physical expression genotype.	of that
5.	How many amino acids are there?	
	20	
6.	Translate the following DNA sequence into mRNA:	
	GAT ACA CAG ATC CCA	
	CUA UGU GUC UAG GGU	
7.	List three different types of mutations.	
	Insertion, Deletion and Frameshift	
8.	What effect can mutations have on protein synthesis?	
	No effect, missense or deleterious effect	
9.	What percentage of cancer is inherited?	
	5-10%	
10.	When was the BRCA 1 gene cloned?	
	1994	





Physic	cal Challenge Genetic Counseling and Testing	Questions
Name	e: Date:	
1.	A family with many cases of breast and cervical cancer would be good candid genetic testing for a BRCA mutation. True or False?	ates for
2.	If one parent is heterozygous for a BRCA mutation, what percentage does the of inheriting the mutation?	ir child have
3.	Why is completing a pedigree important for genetic counseling?	
4.	DNA fragments travel further down the gel in gel electrophoresis	
5.	On a pedigree, what is the symbol for a female who died of breast cancer?	
6.	A person who has a genetic predisposition for a trait, but does not have it is a	<u> </u>
7.	What electrical charge does DNA have?	
8.	List two roles of a genetic counselor.	
9.	Draw the symbol for twin boys on a pedigree.	
10.	List two factors that suggest a person is a good candidate for genetic testing f cancer.	or breast





Physic	al Challenge Answers Genetic Counseling and Testing
1.	A family with many cases of breast and cervical cancer would be good candidates for genetic testing for a BRCA mutation. True or False?
	False. A family with many cases of breast and ovarian cancer would be good candidates for genetic testing for a BRCA mutation.
2.	If one parent is heterozygous for a BRCA mutation, what percentage does their child have of inheriting the mutation?
	50%
3.	Why is completing a pedigree important for genetic counseling?
	Genetic counselors can see how many and what kinds of cancer cases there are in a family.
4.	DNA fragments travel further down the gel in gel electrophoresis.
	Smaller
5.	On a pedigree, what is the symbol for a female who died of breast cancer?
6.	A person who has a genetic predisposition for a trait, but does not have it is a
	Carrier
7.	What charge does DNA have?
	Negative
8.	List two roles of a genetic counselor.
	Discuss a patient's family health history, draw a pedigree, interpret a pedigree, educate patients, write letter to patients.

9. Draw the symbol for twin boys on a pedigree.



10. List two factors that suggest a person is a good candidate for genetic testing for breast cancer.

Multiple generations are affected, men in the pedigree have breast cancer, majority of breast cancer cases are diagnosed at a younger age (before age 50), women may have ovarian cancer or both breast and ovarian cancers.





Physical Challenge		hallenge	Treatment		Questions
Na	me:			Date:	
1.	Name t	wo treatment types that use drugs	5.		
2.	Metasta	atic cancer is classified as what stag	ge?		
3.	What is	the difference between local and s	systemic therapies?		
4.	Why do	o side effects occur?			
5.	Compa	re and contrast a lumpectomy and	l mastectomy.		
6.	lf a brea	ast cancer patient is HER2/neu posi	itive, what does this mean?		
7.	Hair los	is can be a side effect of which brea	ast cancer treatment?		
8.	Is chem	notherapy a local or systemic treatn	nent?		
9.	ltchy or	r sensitive skin can be a side effect o	of which breast cancer treatm	nent?	
10.	lf a brea treatme	ast cancer patient has a small, horn ents would you recommend?	none positive tumor that has	not spread, the	en what





Physi	cal Challenge Treatment	Answers
1.	Name two treatment types that use drugs.	
	Chemotherapy, Biological therapy and Hormone therapy	
2.	Metastatic cancer is classified as what stage?	
	IV	
3.	What is the difference between local and systemic therapies?	
	Local therapy is targeted to a specific part of the body while systemic therapy affe body	ects the entire
4.	Why do side effects occur?	
	Treatment may affect healthy cells	
5.	Compare and contrast a lumpectomy and mastectomy.	
	Both remove breast cancer tissue. A lumpectomy removes a small piece of tissue, the tumor and surrounding tissue. A mastectomy removes the entire breast.	including
6.	If a breast cancer patient is HER2/neu positive, what does this mean?	
	It means there is an overexpression of the HER2/neu (Human Epidermal Growth I 2) protein.	Factor Receptor
7.	Hair loss can be a side effect of which breast cancer treatment?	
	Chemotherapy	
8.	Is chemotherapy a local or systemic treatment?	
	Systemic	
9.	Itchy or sensitive skin can be a side effect of which breast cancer treatment?	
	Radiation therapy	
10.	If a breast cancer patient has a small, hormone positive tumor that has not spi treatments would you recommend?	ead, then what
	Lumpectomy, radiation and hormone therapies.	





### What Determines Health?

Your health is affected by several types of factors, including genetic, behavior, social and environment. These factors work together to affect an individual's health, as well as the health of communities and the nation.

What you do (individual behavior), where you live and work, the state of the environment, genetics, income and education level, and your relationships with friends and family all impact your health. Surprisingly, factors such as access to and use of health care services, have less impact on your health.

- Individual behavior healthy eating, keeping active, not smoking, responsible drinking, and managing stress and challenges well maintain good health.
- Environment safe water and clean air, healthy workplaces, safe houses, communities and roads all contribute to good health.
- Genetics inheritance plays a part in determining lifespan, healthiness and the likelihood of developing certain illnesses.
- Education low education levels are linked with poor health, more stress and lower self-confidence.
- Income higher income and social status are linked to better health.
- Family and friends greater support from families, friends and communities is linked to better health.

Health professionals are working to better understand the interactions between health and these factors to develop health promotion programs that are effective in improving health and modifying risky behaviors. More and more research suggests that to be effective, health promotion programs should be multifaceted and target more than just the individual. Outlined below are examples of variables that may be targeted to help individuals improve health or prevent diseases and illnesses.

- Individual: The thoughts and ideas inside a person's mind have significant influence on an individual's health behaviors, and include their knowledge, skills, beliefs, attitudes and values.
- Interpersonal: Family, friends and co-workers can impact an individual's health behaviors by their own behaviors and how they support an individual.
- Community: Schools, workplaces, and neighborhoods can influence the choices individuals make, provide resources to individuals to make those choices, and ensure safe and healthy living and working conditions.
- Society: Social and cultural norms, laws and policies, and economic factors are associated with health and disease. Many laws are designed to promote our nation's health and to prevent injury and disease (e.g., seat belt laws).

Sources: World Health Organization.(2008). Health Impact Assessment: The determinants of health at http://www. who.int/hia/evidence/doh/en/index.html and Institute of Medicine. (2001). Health and behavior. Washington, DC: National Academies Press.





# Behavior Change Clues • Unhealthy Eating

Unhealthy EatingINDIVIDUALPeople who know more about nutritionmay be more likely to eat healthier foodsrather than unhealthy foods. (Knowledge)	Unhealthy Eating INDIVIDUAL People who do not know about health problems related to poor nutrition are more likely to eat unhealthy foods. (Knowledge)
Unhealthy EatingINDIVIDUALPeople who do not know what the servingsize should be for food may be more likelyto eat more. (Knowledge)	Unhealthy EatingINDIVIDUALPeople may believe it is healthy to eat redmeat and are not aware of the health risksof eating red meat. (Belief)
Unhealthy EatingINDIVIDUALPeople who eat unhealthy foods maynot believe that they are at risk for healthproblems. (Belief)	<b>Unhealthy Eating</b> INDIVIDUAL People may eat unhealthy foods to manage stress. (Belief)
Unhealthy EatingINDIVIDUALPeople may not believe that they are able to eat healthy. (Attitude)	Unhealthy EatingINDIVIDUALPeople eat different cultural foods,regardless of the foods' nutritional contentbecause it is part of their culture. (Values)
Unhealthy EatingINDIVIDUALPeople may believe that they should cleantheir plates even if they are full. (Values)	Unhealthy Eating INDIVIDUAL People who can read and understand nutrition labels may eat healthier. (Skill)
Unhealthy Eating INDIVIDUAL People who can substitute food ingredients and make recipes healthier may eat healthier. (Skill)	Unhealthy Eating INTERPERSONAL People (e.g., children) who are rewarded for eating their fruits and vegetables may eat healthier.
<b>Unhealthy Eating</b> INTERPERSONAL People who attend parties where unhealthy foods are served may eat unhealthy.	<b>Unhealthy Eating</b> INTERPERSONAL People may eat in a similar way as someone who they look up to (a role model).
<b>Unhealthy Eating</b> INTERPERSONAL People who live in households with greater disposable income may eat healthier.	<b>Unhealthy Eating</b> INTERPERSONAL People may eat healthier foods if their friends and family do.
Unhealthy Eating COMMUNITY People may buy junk foods before buying healthy foods because of their lower cost.	Unhealthy Eating COMMUNITY The availability of many fast food restaurants in a community may make it easier for people to eat unhealthy foods.
Unhealthy Eating COMMUNITY People who have limited to no access to a grocery store that sells fresh fruits and vegetables may not eat healthy	Unhealthy Eating COMMUNITY Foods advertised in the media (healthy or unhealthy) may influence people to purchase these foods





# Behavior Change Clues • Inadequate Physical Activity

INDIVIDUAL People who know more about how to exercise may engage in physical activity more. (Knowledge)	Inadequate Physical Activity INDIVIDUAL People who do not know about health problems related to physical inactivity may be more likely to not exercise. (Knowledge)
Inadequate Physical ActivityINDIVIDUALPeople who do not know what type of exercises they should do may be more likely to not exercise. (Knowledge)	Inadequate Physical Activity INDIVIDUAL People who know how calories are expended may exercise more. (Knowledge)
Inadequate Physical ActivityINDIVIDUALPeople who are slender may believe theyare healthy and do not need to exercise.(Belief)	Inadequate Physical Activity INDIVIDUAL People may believe that exercising is boring. (Belief)
Inadequate Physical ActivityINDIVIDUALPeople may believe there are little to nobenefits from exercise. (Belief)	Inadequate Physical Activity INDIVIDUAL People may believe that they do not have the time to exercise. (Belief)
Inadequate Physical Activity INDIVIDUAL People who believe that exercising relieves stress may exercise more.	Inadequate Physical ActivityINDIVIDUALPeople may prefer to spend their leisuretime doing sedentary activities, such aswatching television. (Values)
Inadequate Physical Activity INDIVIDUAL People who can exercise (e.g., plan an exercise session) may exercise more. (Skill)	Inadequate Physical Activity INTERPERSONAL People may lack exercise programs and/or equipment with which to exercise.
Inadequate Physical Activity INTERPERSONAL People who live in households with greater disposable income may exercise more.	Inadequate Physical Activity INTERPERSONAL People may exercise if their friends do.
Inadequate Physical Activity INTERPERSONAL People who work in a setting where exercise is encouraged (e.g., walking during lunch break) may exercise more.	Inadequate Physical Activity INTERPERSONAL People may exercise if their family does.
Inadequate Physical Activity COMMUNITY People who live in a community with adequate sidewalks and crosswalks may engage in more physical activity.	Inadequate Physical Activity COMMUNITY People who live in a community with parks and trails may exercise more.
Inadequate Physical Activity COMMUNITY The media may influence people's opinion about exercising.	Inadequate Physical Activity COMMUNITY People who do not feel safe exercising outdoors may not exercise.





# Behavior Change Clues • Irregular or No Cancer Screenings

Irregular or No Cancer Screenings INDIVIDUAL People who know which cancer screenings are appropriate for them may make sure they get their screenings. (Knowledge)	Irregular or No Cancer Screenings INDIVIDUAL People who do not know how cancer screenings can save lives may not get their cancer screenings. (Knowledge)
Irregular or No Cancer Screenings INDIVIDUAL People who do not understand the causes and risks associated with cancer may not get their cancer screenings. (Knowledge)	Irregular or No Cancer Screenings INDIVIDUAL People may believe they are not at risk for cancer. (Belief)
Inregular or No Cancer Screenings INDIVIDUAL People may believe that cancer screenings are painful or uncomfortable. (Belief)	INDIVIDUAL People may think they only need to go to the doctor when they are sick. (Belief)
Irregular or No Cancer Screenings INDIVIDUAL People may not want to know the outcome of cancer screenings and then avoid being screened. (Attitude)	Irregular or No Cancer Screenings INDIVIDUAL People may not trust their health care professional. (Values)
Integration of the insurance of the pay for cancer screenings.	Irregular or No Cancer Screenings INDIVIDUAL People may have difficulty making appointments with doctors for cancer screenings.
Irregular or No Cancer Screenings INTERPERSONAL	Irregular or No Cancer Screenings INTERPERSONAL
gets screened.	ecopie who have significant others who encourage them to get screened may be more likely to get screened.
gets screened. Irregular or No Cancer Screenings INTERPERSONAL People who receive reminders about when to get cancer screenings may get their screenings on-time.	People who have significant others who encourage them to get screened may be more likely to get screened.         Irregular or No Cancer Screenings       INTERPERSONAL         People may get screened if their friends also get screened.
Irregular or No Cancer Screenings       INTERPERSONAL         People who receive reminders about when to get cancer screenings may get their screenings on-time.       Interpendent of the workplace and co-workers encourage screening.	reopie who have significant others who encourage them to get screened may be more likely to get screened.         Irregular or No Cancer Screenings       INTERPERSONAL         People may get screened if their friends also get screened.       Interpersonal         Irregular or No Cancer Screenings       INTERPERSONAL         People may get screened if their church or other social groups encourage screening.       INTERPERSONAL
Irregular or No Cancer Screenings       INTERPERSONAL         People who receive reminders about when to get cancer screenings may get their screenings on-time.       Irregular or No Cancer Screenings         Irregular or No Cancer Screenings       INTERPERSONAL         People may get screened if the workplace and co-workers encourage screening.       Interpender or No Cancer Screenings         Irregular or No Cancer Screenings       COMMUNITY         People may get screened if free cancer screenings are available in their community.	reopie who have significant others who encourage them to get screened may be more likely to get screened.         Irregular or No Cancer Screenings       INTERPERSONAL         People may get screened if their friends also get screened.       INTERPERSONAL         Irregular or No Cancer Screenings       INTERPERSONAL         People may get screened if their church or other social groups encourage screening.       INTERPERSONAL         Irregular or No Cancer Screenings       COMMUNITY         People may get screened if the media promotes screening.       COMMUNITY





# Behavior Change Clues • Irresponsible Alcohol Use

Intersponsible Alcohol Use INDIVIDUAL	Irresponsible Alcohol Use INDIVIDUAL
People who know more about the	People who do not know about health
consequences of alcohol use may not use	problems related to alcohol use may be
alcohol or limit their intake. (Knowledge)	more likely to drink alcohol. (Knowledge)
Irresponsible Alcohol Use INDIVIDUAL	Irresponsible Alcohol Use INDIVIDUAL
People who do not know what a serving	People who know their family history
size is for alcohol may be more likely to	regarding alcoholism may not use alcohol
drink more. (Knowledge)	or limit their intake. (Knowledge)
Irresponsible Alcohol Use INDIVIDUAL People who believe that drinking alcohol relieves stress may drink alcohol. (Belief)	Irresponsible Alcohol Use INDIVIDUAL People who believe that drinking alcohol makes them the "life of the party" may drink alcohol. (Belief)
Irresponsible Alcohol Use INDIVIDUAL People who believe that everyone is drinking alcohol may drink alcohol to fit in. (Belief)	Irresponsible Alcohol Use INDIVIDUAL People may believe they cannot quit drinking alcohol. (Belief)
Irresponsible Alcohol Use INDIVIDUAL	Irresponsible Alcohol Use INDIVIDUAL
People may drink alcohol if they believe	People who are part of a culture where
alcohol reduces their risk for heart disease.	alcohol is more accepted may drink alcohol.
(Belief)	(Values)
Irresponsible Alcohol Use INTERPERSONAL People who attend social events where alcohol is served may be more likely to drink alcohol.	Irresponsible Alcohol Use INTERPERSONAL People with family members who drink may be more likely to drink alcohol.
Irresponsible Alcohol Use INTERPERSONAL	Irresponsible Alcohol Use COMMUNITY
People with friends who drink may be more	Advertisements for alcohol may encourage
likely to drink alcohol.	alcohol use.
Irresponsible Alcohol Use COMMUNITY Restrictions on the days and time of the day to purchase alcohol may decrease alcohol use.	Irresponsible Alcohol Use COMMUNITY Age restrictions for purchasing and drinking alcohol may decrease alcohol use.
Irresponsible Alcohol Use COMMUNITY	Irresponsible Alcohol Use COMMUNITY
Increasing the price of alcohol may reduce	Alcohol use in movies and on television
alcohol use.	shows may encourage alcohol use.
Irresponsible Alcohol Use COMMUNITY	Irresponsible Alcohol Use COMMUNITY
People may live in a community where	People may live in a community where
alcohol is easily accessible.	alcohol is sold in many stores.





# Behavior Change Clues • Tobacco Use

Tobacco UseINDIVIDUALPeople who know how to quit smoking or using tobacco may quit. (Knowledge)	Tobacco Use         INDIVIDUAL           People who do not know about health risks         related to tobacco use may be more likely           to use tobacco. (Knowledge)         to use tobacco.
Tobacco UseINDIVIDUALPeople who believe that everyone issmoking may smoke to fit in. (Belief)	Tobacco UseINDIVIDUALPeople who believe that smoking relievesstress may smoke more. (Belief)
Tobacco UseINDIVIDUALPeople may believe that quitting smoking istoo hard. (Belief)	Tobacco UseINDIVIDUALPeople may believe that they will gainweight if they quit smoking. (Belief)
Tobacco UseINDIVIDUALPeople who drink alcohol may be morelikely to smoke.	Tobacco Use INDIVIDUAL People may believe that they can not quit smoking. (Belief)
Tobacco UseINDIVIDUALPeople who know the steps to quitting may be more likely to quit smoking. (Skill)	Tobacco UseINDIVIDUALPeople who know how to cope with thewithdrawal symptoms may be more likelyto quit smoking. (Skill)
Tobacco UseINTERPERSONALPeople who attend social events wherepeople are smoking may smoke more.	Tobacco UseINTERPERSONALPeople with family members who smokemay be more likely to smoke or use tobacco.
Tobacco UseINTERPERSONALPeople with friends who smoke may bemore likely to smoke or use tobacco.	Tobacco Use         INTERPERSONAL           People with family members who believe           that smoking is bad may be more likely to           not smoke.
Tobacco UseINTERPERSONALPeople with friends who believe thatsmoking is bad may be more likely to notsmoke.	<b>Tobacco Use</b> COMMUNITY Communities with indoor smoking bans may reduce tobacco use.
Tobacco UseCOMMUNITYIncreasing the price of tobacco (cigarettes)may reduce tobacco use.	Tobacco Use         COMMUNITY           Smoking in movies and on television shows           may encourage tobacco use.
Tobacco UseCOMMUNITYAge restrictions for purchasing and usingtobacco (cigarettes) may decrease tobaccouse.	Tobacco Use         COMMUNITY           People may live in a community where           smoking cessation programs are not           available.





Name:

Date:

# Unhealthy Eating

Play	er Name:	
Grou	up Members:	
Ide Rec Poi Rec	ntify which of the following behavior change clues are addressed in the group's Risk Juction Strategy. For those clues that are addressed, circle the Risk Points. Add the circled Risk nts this is the number of points earned regarding the potential effectiveness of the Risk Juction Strategy (for the Score Sheet).	Risk Points
IVIDUAL	People who know more about nutrition may be more likely to eat healthier foods rather than unhealthy foods. (Knowledge)	1
	People who do not know about health problems related to poor nutrition may be more likely to eat unhealthy foods. (Knowledge)	1
	People who do not know what the serving size should be for food may be more likely to eat more. (Knowledge)	1
	People may believe it is healthy to eat red meat and are not aware of the health risks of eating red meat. (Belief)	1
	People who eat unhealthy foods may not believe that they are at risk for health problems. (Belief)	1
ž	People may eat unhealthy foods to manage stress. (Belief)	1
	People may not believe that they are able to eat healthy. (Attitude)	1
	People eat different cultural foods, regardless of the foods' nutritional content because it is part of their culture. (Values)	1
	People may believe that they should clean their plates even if they are full. (Values)	1
	People who can read and understand nutrition labels may eat healthier. (Skill)	1
	People who can substitute food ingredients and make recipes healthier may eat healthier. (Skill)	1
AL	People (e.g., children) who are rewarded for eating their fruits and vegetables may eat healthier.	1
RSOI	People who attend parties where unhealthy foods are served may eat unhealthy.	1
RPE	People may eat in a similar way as someone who they look up to (a role model).	2
Ē	People who live in households with greater disposable income may eat healthier.	2
	People may eat healthier foods if their friends and family do.	2
COMMUNITY	People may buy junk foods before buying healthy foods because of their lower cost.	2
	The availability of many fast food restaurants in a community may make it easier for people to eat unhealthy foods.	3
	People who have limited to no access to a grocery store that sells fresh fruits and vegetables may not eat healthy.	3
	Foods advertised in the media (healthy or unhealthy) may influence people to purchase these foods.	3
	TOTAL POINTS EARNED	





Name: \_\_\_\_\_

Date:

### Inadequate Physical Activity

Play	er Name:	]
Grou	p Members:	
lder Red Risk Risk	ntify which of the following behavior change clues are addressed in the group's Risk uction Strategy. For those clues that are addressed, circle the Risk Points. Add the circled Points – this is the number of points earned regarding the potential effectiveness of the Reduction Strategy (for the Score Sheet).	Risk Points
	People who know more about how to exercise may engage in physical activity more. (Knowledge)	1
	People who do not know about health problems related to physical inactivity may be more likely to not exercise. (Knowledge)	1
	People who do not know what types of exercise they should do may be more likely to not exercise. (Knowledge)	1
Β	People who know how calories are expended may exercise more. (Knowledge)	1
NDI	People who are slender may believe they are healthy and do not need to exercise. (Belief)	1
QN	People may believe that exercising is boring. (Belief)	1
	People may believe there are little to no benefits from exercise. (Belief)	1
	People may believe that they do not have the time to exercise. (Belief)	1
	People who believe that exercising relieves stress may exercise more. (Belief)	1
	People may prefer to spend their leisure time doing sedentary activities, such as watching television. (Values)	1
	People who can exercise (e.g., plan an exercise session) may exercise more. (Skill)	1
	People may lack exercise programs and/or exercise equipment.	1
NAL	People who live in households with greater disposable income may exercise more.	2
ERSC	People may exercise if their friends do.	2
INTERP	People who work in a setting where exercise is encouraged (e.g., walking during lunch break) may exercise more.	2
	People may exercise if their family does.	2
Δ	People who live in a community with adequate sidewalks and crosswalks may engage in more physical activity.	3
MUN	People who live in a community with parks and trails may exercise more.	3
COM	The media may influence people's opinion about exercising.	3
	People who do not feel safe exercising outdoors may not exercise.	3

TOTAL POINTS EARNED





Name: \_\_\_\_\_

Date:

### Irregular or No Cancer Screenings

Pla	yer Name:	
Gro	oup Members:	
Ide Rec Poir Rec	ntify which of the following behavior change clues are addressed in the group's Risk luction Strategy. For those clues that are addressed, circle the Risk Points. Add the circled Risk nts this is the number of points earned regarding the potential effectiveness of the Risk luction Strategy (for the Score Sheet).	Risk Points
	People who know which cancer screenings are appropriate for them may make sure they get their screenings. (Knowledge)	1
	People who do not know how cancer screenings can save lives may not get their cancer screenings. (Knowledge)	1
	People who do not understand the causes and risks associated with cancer may not get their cancer screenings. (Knowledge)	1
DUAL	People may believe they are not at risk for cancer. (Belief)	1
INDIVID	People may believe that cancer screenings are painful or uncomfortable. (Belief)	1
	People may think they only need to go to the doctor when they are sick. (Belief)	1
	People may not want to know the outcome of cancer screenings and then avoid being screened. (Attitude)	1
	People may not trust their health care professional. (Values)	1
	People may lack the insurance or money to pay for screenings. (Resources)	1
	People may have difficulty making appointments with doctors for screenings. (Skills)	1
	People may get screened if their family also gets screened.	2
<b>IAL</b>	People who have significant others who encourage them to get screened may be more likely to get screened.	2
RPERSO	People who receive reminders about when to get screenings may get their screenings on- time.	1
NTE	People may get screened if their friends also get screened.	2
	People may get screened if the workplace and co-workers encourage screening.	1
	People may get screened if their church or other social groups encourage screening.	2
COMMUNITY	People may get screened if free cancer screenings are available in their community.	3
	People may get screened if the media promotes screening.	3
	People may be unable to get to a screening location because transportation is unavailable.	3
	People may live in a community where inexpensive cancer screening facilities may not be available.	3
	TOTAL POINTS EARNED	





Name: \_\_\_\_\_

Date:

### Irresponsible Alcohol Use

Play	/er Name:	]
Gro	up Members:	1
lder Red Risk Risk	itify which of the following behavior change clues are addressed in the group's Risk uction Strategy. For those clues that are addressed, circle the Risk Points. Add the circled Points this is the number of points earned regarding the potential effectiveness of the Reduction Strategy (for the Score Sheet).	Risk Points
AL	People who know more about the consequences of alcohol use may not use alcohol or limit their intake. (Knowledge)	1
	People who do not know about health problems related to alcohol may be are more likely to drink alcohol. (Knowledge)	1
	People who do not know what a serving size is for alcohol may be more likely to drink more. (Knowledge)	1
	People who know their family history regarding alcoholism may not use alcohol or limit their intake. (Knowledge)	1
VID	People who believe that drinking alcohol relieves stress may drink alcohol. (Belief)	1
IND	People who believe that drinking alcohol makes them the "life of the party" may drink alcohol. (Belief)	1
	People who believe that everyone is drinking alcohol may drink alcohol to fit in. (Belief)	1
	People may believe they cannot quit drinking alcohol. (Belief)	1
	People may drink alcohol if they believe alcohol reduces their risk for heart disease. (Belief)	1
	People who are part of a culture where alcohol is more accepted may drink alcohol. (Values)	1
SONAL	People who attend social events where alcohol is served may be more likely to drink alcohol.	2
RPER	People with family members who drink may be more likely to drink alcohol.	2
INTE	People with friends who drink may be more likely to drink alcohol.	2
	Advertisements for alcohol may encourage alcohol use.	3
<b>_</b>	Restrictions on the days and time of the day to purchase alcohol may decrease alcohol use.	3
COMMUNITY	Age restrictions for purchasing and drinking alcohol may decrease alcohol use.	3
	Increasing the price of alcohol may reduce alcohol use.	3
	Alcohol use in movies and on television shows may encourage alcohol use.	3
	People may live in a community where alcohol is easily accessible.	3
	People may live in a community where alcohol is sold in many stores.	3

TOTAL POINTS EARNED





Name: \_

Date: \_

Tobacco Use

Pla	yer Name:	
Gro	oup Members:	
lde Rec Poir Rec	ntify which of the following behavior change clues are addressed in the group's Risk luction Strategy. For those clues that are addressed, circle the Risk Points. Add the circled Risk nts this is the number of points earned regarding the potential effectiveness of the Risk luction Strategy (for the Score Sheet).	Risk Points
	People who know how to quit smoking or using tobacco may quit. (Knowledge)	1
	People who do not know about health risks related to tobacco use may be more likely to use tobacco. (Knowledge)	1
	People who believe that everyone is smoking may smoke to fit in. (Belief)	1
_	People who believe that smoking relieves stress may smoke more. (Belief)	1
DUA	People may believe that quitting smoking is too hard. (Belief)	1
DIV	People may believe that they will gain weight if they quit smoking. (Belief)	1
<b>≤</b>	People who drink alcohol may be more likely to smoke. (Values)	1
	People may believe that they can not quit smoking. (Belief)	1
	People who know the steps to quitting may be more likely to quit smoking. (Skill)	1
	People who know how to cope with the withdrawal symptoms may be more likely to quit smoking. (Skill)	1
-	People who attend social events where people are smoking may smoke more.	1
NOS	People with family members who smoke may be more likely to smoke or use tobacco.	1
PERS	People with friends who smoke may be more likely to smoke or use tobacco.	2
IER	People with family members who believe that smoking is bad are more likely to not smoke.	2
≤	People with friends who believe that smoking is bad may be more likely to not smoke.	2
MUNITY	Communities with indoor smoking bans may reduce tobacco use.	3
	Increasing the price of tobacco (cigarettes) may reduce tobacco use.	3
	Smoking in movies and on television shows may encourage tobacco use.	3
NO S	Age restrictions for purchasing and using tobacco (cigarettes) may decrease tobacco use.	3
	People may live in a community where smoking cessations programs are not available.	3
	TOTAL POINTS FARNED	





Lesson 5 Quiz

1. Match the definition on the right with the term it corresponds to on the left.

Environmental Tobacco Smoke	a. A measure of someone's weight in relation to height
Overweight	b. Also known as second hand smoke
Risk Factor	c. Action taken by an individual to lower their chance of getting cancer
Body Mass Index (BMI)	d. Anything that increases a person's chance of getting cancer
Risk Reduction	e. A condition in which an individual

3. Explain risk factors and risk reduction.

4. What risk factors for cancer can an individual control? What factors cannot be changed?

5. Pat is 18 years old and a senior in high school. Pat is the valedictorian of the class and spends a lot of time studying or working with the school debate team. Pat doesn't have time for sports or exercise. Pat eats a lot of junk food throughout the day because Pat rarely has time to eat meals. Pat has never smoked or consumed alcohol. Pat's grandmother had ovarian cancer and Pat's aunt died of breast cancer.

Based on Pat's lifestyle, create a risk reduction strategy that will help Pat prevent breast cancer.





#### **Lesson 5 Quiz Answers**

1. Match the definition on the right with the term it corresponds to on the left.

b. Also known as second hand smoke
e. A condition in which an individual exceeds their expected BMI (BMI > 25)
d. Anything that increases a person's chance of getting cancer
a. A measure of someone's weight in relation to height
c. Action taken by an individual to lower their chance of getting cancer Tobacco Smoke Environmental Overweight Risk Factor Body Mass Index (BMI) Risk Factor

3. Explain risk factors and risk reduction.

Risk factors are characteristics, conditions, or behaviors that increase the possibility of disease or injury. Risk reduction is action taken to lower the risk of disease. Changing lifestyle or eating habits, avoiding things known to cause cancer, such as smoking, taking medicines to treat a precancerous condition, or to keep cancer from starting are all ways to reduce risk of cancer.

4. What risk factors for cancer can an individual control? What factors cannot be changed?

Controllable risk factors, such as alcohol consumption, smoking, diet, and exercise, the individual can alter. Other factors such as age, gender, and family history, cannot be changed.

5. Pat is 18 years old and a senior in high school. Pat is the valedictorian of the class and spends a lot of time studying or working with the school debate team. Pat doesn't have time for sports or exercise. Pat eats a lot of junk food throughout the day because Pat rarely has time to eat meals. Pat has never smoked or consumed alcohol. Pat's grandmother had ovarian cancer and Pat's a unt died of breast cancer.

Based on Pat's lifestyle, create a risk reduction strategy that will help Pat prevent breast cancer.

Answers will vary. Responses should address exercise, diet and family history of cancer.