



Lesson 2: Getting the Results

Lesson Summary:

In this lesson, students investigate early detection plans and explore the various diagnostic tools used in breast cancer detection and tracking by building an online directory using wiki technology.

Lesson Duration: One or two 45-60-minute class periods

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 or two 45-60-minute class periods, but it is flexible, depending on the students' needs and time available. Note there are several activities that are optional and can be deleted or modified for specific classroom needs. All handouts are included in this guide.

Objectives:

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

- Identify different diagnostic procedures for breast cancer screening
- Describe different diagnostic procedures for breast cancer screening
- Compare different diagnostic procedures for breast cancer screening

Materials:

- Handout: Blank Diagnostic Tools Summary graphic organizer
- Handout: Wiki Resource List
- Handout: Diagnostic Tool Cards
- Website: National Cancer Institute's Visuals Online

 <u>http://visualsonline.cancer.gov/</u>
- Lesson 2 Quiz
- Answer Keys
- Wiki Instruction Manual for Teachers
- Interactive white board (optional)
- Computer with Internet access/LCD projector

Subjects:

- Health
- Language Arts and Literacy
- Science

Vocabulary:

biopsy, calcification, cell, core biopsy, diagnosis, excisional biopsy, false negative, false positive, fine needle aspiration, incisional biopsy, mammogram, microcalcification, microscope, MRI, mutation, radiology, stereotactic biopsy, tissue, transducer, ultrasound, x-ray





Advance Preparation:

- Review the *Wiki Instruction Manual for Teachers* (and possibly set up a sample Wiki with your platform of choice to be prepared to answer student questions)
- Review online resources provided in lesson
- Consider strategies for ELL, struggling, and accelerated students

Career Connection

- Registered Nurse
- Mammogram Technician
- Ultrasound Technician
- Nurse Practitioner
- Radiologist

A Note for the Teacher 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. 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 require them to share any personal or private experiences.

You may learn a student is personally affected prior to or while implementing the curriculum. If you discover a student is affected by cancer, speak with them privately and make sure they are 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 they feel about it. Tell the student it may not bother them now, but they should let you know if it does.

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

• Ask whom they have spoken with about the cancer. If the answer is no one, ask if they 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
- Evidence of anxiety or depression





Lesson 2 Plan: Getting the Results

ENGAGE

Real-World Scenario - Nikki: All These Tests

- [Slide 3] Revisit fictional characters Steve and Nikki. Begin by reviewing essential concepts from Lesson 1, discussing both what cancer is and the relationship between the cell cycle and cancer development. Next, have students read a first-hand excerpt from Nikki: "All These Tests." Tell students they will be learning about the various diagnostic tests during this lesson.
 - Learning Activity: Paired Brainstorm. Pair students off to brainstorm why Nikki and Steve's mom might have to undergo so many tests at the outset of her treatment. Students should make predictions about what the doctors are trying to determine and share their ideas with the class. If an interactive white board is available, write students' responses in the box provided. You can save the notes the students make 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 interactive white board to add the screen to a set of class notes to be shared with the class later.
 - Use PowerPoint's annotate pen, and save the notes to the slide.

EXPLORE

Diagnostic Tests and Cancer

- [Slide 4] Introduce the concept of diagnostic imaging to the class covering the following points:
 - Discussing the general purpose of diagnostic imaging and common uses when these technologies are used (both specific to and apart from cancer contexts).
 - Diagnostic testing are procedures that help doctors diagnose an illness or condition or to evaluate its severity.
 - Some diagnostic tests are image based: healthcare professionals use technology to develop pictures of organs or specific areas within the human body. Radiologists interpret these images for clues about an illness.
 - Some diagnostic tests involve analyzing samples of fluid or tissue from patients in laboratories.
- [Slide 5] Learning Activity: Talk About It! Ask one or two students to share their experiences with personal diagnostic imaging (if they are comfortable sharing this information). This activity should get students talking about their or their family members' broken bones, visits to the dentist, pregnancies, and other common experiences that would necessitate the use of diagnostic imaging. Connect these tools of diagnosis to similar tools used to diagnose and treat cancer.
- [Slide 6] Emphasize that diagnostic tests are used during the information gathering stage of a doctor's treatment. It is important to have information collected from diagnostic testing so everyone involved is able to make the most informed and effective decisions about care. Furthermore, while diagnostic imaging tools may help detect and diagnose cancer, the only way to diagnose cancer definitively is to evaluate tissue under a





microscope. Note that the tests themselves do not treat the disease, but provide critical information about it. Explain that people also often undergo medical testing in health screenings — regular testing of individuals in specific demographics or who meet certain criteria, such as age or family history.

- [Slide 7] Introduce the four main tests students will investigate and ensure they know how to pronounce them. Explain that mammograms, ultrasounds, and MRIs are all different types of imaging procedures and that they each have different strengths and purposes that students will research on their own. Check prior knowledge by asking if anyone knows what a biopsy is. If necessary, explain that biopsies are tissue samples that are taken from patients and analyzed by specialists for clues about a disease.
 - Learning Activity: Diagnostic Tools Summary. Distribute the Blank Diagnostic Tools handout. Instruct students to take notes using the graphic organizer while you present the information on the subsequent slides. Note that the content on the subsequent slides is intentionally left at a very general level. More detail is provided in the Instructor Notes section. You can include additional detail as desired during this portion of the lesson; students will be researching and investigating this content on their own later in the lesson. This particular activity is meant to provide some background knowledge for students to use before they start their research. If you do not cover all the detail while introducing the four diagnostic tools over the next slides, encourage students to fill in gaps in their Diagnostic Tools graphic organizer throughout the remainder of the lesson.
- [Slide 8] Provide an overview of mammograms, and emphasize that it is the only diagnostic test that is also used in routine health screenings. Note that different medical groups have different guidelines for when women should start receiving mammograms. Research is ongoing about the most effective schedule for catching and treating cancer. In general, women over 40 are advised to receive a mammogram every 1 to 2 years depending on their family history and other individual circumstances. Also, it is important to know that women in their 20s and 30s can get breast cancer and men can get breast cancer, as well; however, it is much less common than in women over 40.
 - Breast cancer tissue often appears as having a jagged outline and an irregular shape. Radiologists look for places where calcifications, which appear as small white spots on a mammogram, are grouped together in a certain way. On a mammogram, a benign growth often looks smooth and round with a clear, defined edge. Breast cancer often has a jagged outline and an irregular shape.
 - Radiologist: Radiologists are medical doctors or doctors of osteopathic medicine (DOs) who specialize in diagnosing and treating diseases and injuries using medical imaging techniques, such as x-rays, computed tomography (CT), magnetic resonance imaging (MRI), nuclear medicine, positron emission tomography (PET) and ultrasound.
- [Slide 9] Provide an overview of MRI. Unlike mammograms, MRI is not part of the regular screening process for breast cancer, but this tool is used in various specific circumstances.
 - To create an MRI of the breast, a patient lies face down on a table and the breast hangs through a hole. Then the patient is moved into a tube-like machine. An MRI session takes about one hour to collect the necessary images.
 - Note that MRI is still being researched in terms of how it can most effectively be used to understand and treat breast cancer in patients.





- MRI shows differences that allow the radiologist to determine how likely the abnormality represents cancer. It can be used to investigate abnormal areas seen on a mammogram. MRI can also be used after diagnosis to evaluate the extent to which a cancerous growth has spread. MRI is effective at evaluating dense breast tissue.
- [Slides 10-11] Provide an overview of biopsies. Explain that biopsies are the only way to find out if cells are cancerous. Also stress that biopsies are the most invasive of these four procedures (it is the only one involving the collection of tissue or fluid from beneath the surface of the skin or the skin itself). The other three tools are imaging tools. You can also underscore, however, that these procedures do not usually require hospitalization. Patients come in, have the procedure, and generally can go home the same day.
 - Some common types of biopsies include fine needle aspiration, core biopsy, and surgical biopsy.
 - Doctors and nurses collect samples for analysis. These samples are sent to pathology labs where specialists investigate the samples for information about the patient's health. Doctors use the pathologist's analysis to determine the best course of care and to keep patients informed about their illness.
 - [Slide 11] Optional Learning Activity: Small Group Research Project. Have students work in pairs or small groups to research what pathologists do using the questions below as a guide. Have students share their findings.
 - Optional resource: What is Pathology? Retrieved from http://www.newsmedical.net/health/What-is-Pathology.aspx
 - Are pathologists doctors?
 - Where do they work?
 - Do pathologists work exclusively with cancer patients?
 - What do pathologists do?
 - How do pathologists help patient-care teams?
- [Slide 12] Provide an overview of Ultrasounds. Note that ultrasounds are sometimes used to help guide biopsy needles to targeted areas within the breast tissue. You may also want to make the connection that this technology is the same method that is used to get early images of a developing fetus within a pregnant woman. The wand that emits the ultrasonic waves is called a transducer.
 - To conduct an ultrasound, a medical professional will cover the skin with a lubricating gel and then use a wand to direct the sound waves.
 - Ultrasounds are not part of regular screenings; they are an additional diagnostic tool.

EXPLORE

Comparing Diagnostic Tests

• [Slides 13-21] Learning Activity: Review Questions. Consider the following review questions about the four main types of diagnostic tests for breast cancer. Allow students some time to review the notes they took in their graphic organizers. Then, lead them through the following review exercises as a form of guided practice for the independent practice they will perform for the class's writing assignments. For each of the following slides, present the slide to the class, invite volunteers to share an answer, and then reveal the correct answer.





Following is all of the detail from these slides and this activity.

- [Slide 14] Statement 1: This is an image created by taking an x-ray of breast tissue. Correct answer: Mammogram.
- [Slide 15] Statement 2: For this diagnostic test, patients lie on a table inside a large tube-like machine that creates hundreds of images of the breast. Correct answer: MRI.
- [Slide 16] Statement 3: This tool is used in routine screenings for breast cancer. Correct answer: Mammogram.
- [Slide 17] Statement 4: This procedure is the most conclusive for doctors to diagnose breast cancer. Correct answer: Biopsy.
- [Slide 18] Statement 5: This procedure helps physicians determine whether a growth in a woman's breast is a solid lesion or a fluid-filled cyst. Correct answer: Ultrasound.
- [Slide 19] Statement 6: The purpose of a biopsy is to remove a tumorous growth. Correct answer: False. An excisional surgical biopsy may have the objective of removing an entire lump or area, but other types of biopsies, including incisional biopsies or fine needle aspirations extract only a small amount of a particular area.
- [Slide 20] Statement 7: Pathologists interpret MRI results. Correct answer: False. Pathologists analyze biopsies. Radiologists interpret X-rays and MRI results.
- [Slide 20] Statement 8: Some biopsy procedures also require the use of ultrasound equipment. Correct answer: True. Ultrasound technology can be helped to guide a needle to a lump in a breast that is difficult to palpate, or feel, or when lumps are difficult to identify on a mammogram.

ELLABORATE

Group Project

- [Slide 22] Learning Activity: Building a Wiki. Divide the class into small groups (one for each diagnostic procedure: mammogram, ultrasound, MRI, and biopsy). If necessary, assign diagnostic tools to more than one group.
 - Optional modification of assignment: This activity could be modified by asking students to create a multimedia presentation instead of a wiki. Students can use online slide makers or video tools and create a voiceover narration to accompany the visuals they find. To incorporate the writing aspect, students could write about their findings. For example, they could write an article for Breast Cancer Awareness month or create an informative poster.
- [Slide 23] Assign, or ask groups to select, a leader, recorder, typist, etc.
- [Slide 24] Go over the project requirements with students, answering questions and clarifying expectations as needed. Explain that they will create a list of 3–4 open-ended questions for their classmates as a kind of "knowledge check." These questions will be placed at the end of the wiki page. If students have trouble generating questions on their own, encourage them to consult frequently-asked-questions pages for some of the resources on the *Wiki Resources List.* Examples of open-ended questions:
 - Why is this test important?
 - o How much discomfort do patients experience while undergoing this test?
 - Are there downsides or negative side effects to this test?





- [Slide 25] Go over the project overview with students and explain that you will be providing additional detail for each step of the process.
- [Slide 26] Ask each group to list questions about their assigned procedure. Have each group share their list with the class once they are finalized. Encourage students to expand their lists to incorporate questions shared by the other groups.
- [Slide 27] Distribute one copy per group of the *Wiki Resource List,* which provides several websites that students may use to gather information for their wikis. Tell students they are to prepare the content for their wiki using information from the online sources in the *Wiki Resource List.* Tell students they will have to cite their sources and to be sure to record where they obtain each piece of information.
- [Slide 28] Distribute the *Diagnostic Tool Cards* as a reference for each group. The Biopsy group should get the Biopsy card and so on. Allow students time to read and discuss the content of the card. Students should compare the content of the card to the list of questions they brainstormed to see if the card contains some of the answers that they need for their wiki. They should also note what information they still need to research. Allow time for students to research their procedure more fully and to find any relevant information for their wiki. Remind students to note their sources. They will have to cite their sources in their wiki.
- [Slide 29] Students should prepare a "hard copy" version of their wikis before they are allowed to create the online version. If possible, students should use word processors. Otherwise, they can compile the wiki using pencil and paper or sticky notes/index cards and poster board. Once again, remind students that they must cite their research in their wikis. The finished wiki should feature a works cited section where students should list consulted resources using the proper format.
 - Review all group work before students create their online wiki. After the content is approved, students will create their wiki page using the online wiki tool you selected. (Use the *Wiki Instruction Manual for Teachers* document included below to become familiar with the process.). Students can search for images at the National Cancer Institute's Visuals Online, a searchable database. Visuals Online is located at http://visualsonline.cancer.gov/.
- [Slide 30] If necessary, review the Project Requirements with students. Circulate to offer students assistance and guidance as needed.

EVALUATE

- *Homework Assignment:* Recall Nikki's question at the beginning of the lesson. Ask students to write a response to Nikki's question about why her mom needs to undergo so many different tests. If an interactive white board is available, write students' responses to this question in the box provided. You can then save the notes the students make 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 interactive white board to add the screen to a set of class notes to be shared with the class later.
 - Use PowerPoint's annotate pen, and save the notes to the slide.





• *Homework Assignment:* Students demonstrate their understanding of the four different diagnostic tests. To assess student learning, assign students to review the wiki pages created by their classmates and answer the open-ended questions created for each wiki.

Students may use the Blank or Incomplete *Diagnostic Tools Summary worksheet* as well as the *Diagnostic Tools worksheet*. Students should submit their responses to the wiki designers for review.

- If it was necessary to assign a diagnostic tool to more than one group, ensure that 1) every student answers questions about the three diagnostic tools they did not research, but answers only one of the wiki's questions for each tool, and 2) every group's wiki has a set of students responding to their questions.
- Lesson 2 Quiz

Additional Resources

- National Cancer Institute
 <u>http://www.cancer.gov/types/breast</u>
- The University of Texas M.D. Anderson Cancer Center <u>http://www2.mdanderson.org/app/snb/mainmenu.htm</u>
- How Stuff Works
 <u>http://health.howstuffworks.com/mri6.htm</u>
- The University of Colorado at Boulder
 <u>http://phet.colorado.edu/simulations/sims.php?sim=Simplified_MRI</u>





Next Generation Science Standards

Performance Indicators

HS-PS4 Waves and Their Applications in Technologies for Information Transfer.

• HS-PS4-5. Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.

Science and Engineering Practices

Obtaining, Evaluating, and Communicating Information

• Communicate technical information or ideas (e.g. about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (including orally, graphically, textually, and mathematically). (HS-PS4-5)

Disciplinary Core I deas

PS4.C: Information Technologies and Instrumentation

- Multiple technologies based on the understanding of waves and their interactions with matter are part of everyday experiences in the modern world (e.g., medical imaging, communications, scanners) and in scientific research. They are essential tools for producing, transmitting, and capturing signals and for storing and interpreting the information contained in them. (HS-PS4-5)
- PS4.B: Electromagnetic Radiation: Photoelectric materials emit electrons when they absorb light of a high-enough frequency. (HS-PS4-5)

Crosscutting Concepts

Interdependence of Science, Engineering, and Technology

- Science and engineering complement each other in the cycle known as research and development (R&D). (HSPS4-5)
- Influence of Engineering, Technology, and Science on Society and the Natural World: Modern civilization depends on major technological systems. (HS-PS4-2), (HSPS4-5)





Diagnostic Tool: MAMMOGRAM

A mammogram is an imaging test that uses x-rays. Mammograms can be used for screening and diagnosis. During a mammogram, a technician places the breast between two x-ray panels. The panels press the breast to make it flat, which may be uncomfortable for a few seconds. However, this compression is needed to get a clear picture. An x-ray is taken of each breast.

A screening mammogram detects breast changes in women who have no signs or symptoms of breast cancer. Women age 40 and older should have screening mammograms every 1 to 2 years. A diagnostic mammogram is used to check for breast cancer after a lump or other sign or symptom of breast cancer has been found. The size, shape, and edges of a lump sometimes can give doctors information about whether or not it may be cancer. On a mammogram, a benign growth often looks smooth and round with a clear, defined edge. Breast cancer often has a jagged outline and an irregular shape. A calcification is a deposit of calcium in the breast tissue and appears as small white spots on a mammogram. If calcifications are grouped together in a certain way, it may be a sign of cancer.

Getting a high-quality mammogram and having a clinical breast exam (done by a health care provider) on a regular basis on the most effective ways to detect breast cancer early.

Diagnostic Tool: MAGNETIC RESONANCE IMAGING (MRI)

Magnetic resonance imaging (MRI), uses a magnet, radio waves and a computer to make a series of detailed pictures of areas inside the body without the use of radiation. Each MRI produces hundreds of images of the breast from side-to-side, top-to-bottom, and front-to-back. The images are then interpreted by a radiologist.

During an MRI of the breast, the patient lies on their stomach on the scanning table. The breast hangs into a depression or hollow in the table, which contains coils that detect the magnetic signal. The table is moved into a tube-like machine that contains the magnet. The entire imaging session takes about 1 hour.

Breast MRI is not used for routine breast cancer screening, but clinical trials are being performed to determine if MRI is valuable for screening certain women, such as young women at high risk for breast cancer. MRI cannot always accurately distinguish between cancer and benign breast conditions. Like ultrasound, MRI cannot detect microcalcifications.

MRI is used to assess abnormal areas that are seen on a mammogram or are felt after breast surgery or radiation therapy. It can be used after breast cancer is diagnosed to determine the extent of the tumor in the breast. MRI is also sometimes useful in imaging dense breast tissue, which is often found in younger women, and in viewing breast abnormalities that can be felt but are not visible with conventional mammography or ultrasound.





Diagnostic Tool: BIOPSY

In most cases, doctors need to do a biopsy to diagnose cancer. During a biopsy, fluid or tissue is removed from the breast. The tissue is sent to a lab where a pathologist looks at the cells and checks for cancer or other diseases. Biopsies are usually done on an outpatient basis, meaning patients can go home the same day as. Biopsies are the only way to find out if cells are cancerous.

Doctors can remove tissue from the breast in different ways:

- Fine Needle Aspiration: The doctor uses a thin needle to remove fluid from a breast lump.
- Core Biopsy: The doctor uses a thick needle through a small cut in the skin to remove a core of breast tissue. This test may cause a bruise but rarely leaves a scar. Sometimes the doctor uses other methods to guide the core needle, including:
 - Ultrasound-guided needle biopsy. Doctors use ultrasound to guide the needle during the biopsy. This method is used when lumps are hard to feel on a breast exam or see on a mammogram.
 - Stereotactic core needle biopsy localization. A 3-D x-ray guides a biopsy needle to a lump or other change that cannot be felt on a breast exam. The patient lies face down on an exam table with a hole in it. The hole allows the breast to hang below the table, where the x-ray machine and needle are.
- Surgical Biopsy: The surgeon removes a sample of tissue. An incisional biopsy takes a sample of a lump or abnormal area, while an excisional biopsy takes the entire lump or area.

Diagnostic Tool: ULTRASOUND

Ultrasound, also called sonography, is an imaging technique in which high-frequency sound waves that cannot be heard by humans are bounced off tissues and internal organs. Their echoes produce a picture called a sonogram. Ultrasound imaging of the breast is used to distinguish between solid tumors and fluid-filled cysts. Ultrasound can also be used to evaluate lumps that are hard to see on a mammogram. Sometimes, ultrasound is used as part of other diagnostic procedures, such as one type of core biopsy.

During an ultrasound examination, the clinician spreads a thin coating of lubricating jelly over the area to improve conduction of the sound waves. A hand-held device called a transducer directs the sound waves through the skin toward specific tissues. As the sound waves are reflected back from the tissues within the breast, the patterns formed by the waves create a two-dimensional image of the breast on a computer.

Ultrasound is not used for routine screenings because it does not consistently detect certain early signs of cancer such as microcalcifications (tiny deposits of calcium in the breast that cannot be felt but can be seen on a conventional mammogram).





Wiki Resource List

Website addresses are subject to change. Current as of December 2015.

American Cancer Society http://www.cancer.org (Search for "breast cancer")

Rutgers Cancer Institute of New Jersey http://cinj.org/

Centers for Disease Control and Prevention http://www.cdc.gov/cancer/breast/

Health Line http://www.healthline.com/channel/breast-cancer

Mayo Clinic http://www.mayoclinic.org/diseases-conditions/breast-cancer/basics/definition/con-20029275

MD Anderson Cancer Center http://www.mdanderson.org/diseases/BreastCancer/

National Breast Cancer Foundation http://www.nationalbreastcancer.org/

National Cancer Institute http://www.cancer.gov/cancertopics/types/breast

National Human Genome Research Institute http://www.genome.gov/10000507

Susan G. Komen for the Cure Foundation http://ww5.komen.org/

The Cure Magazine http://www.curetoday.com/

Cancer.Net http://www.cancer.net/breast



What can it show us? Take notes using this graphic while your class discusses these diagnostic tools. When should it be used? Date: **Materials/Technology** used? Mammogram Ultrasound Biopsy Tool MR

Name:

Blank Diagnostic Tools Summary

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Lesson 2 Quiz

- 1. How is a definite diagnosis of breast cancer established?
- a. Mammogram
- b. Ultrasound
- c. Biopsy
- d. MRI
- 2. Explain the significance of microcalcifications.
- 3. Explain the different types of biopsies used to diagnose breast cancer.
- 4. Which diagnostic tool may be used for screening young women at high risk for breast cancer?
- a. Mammogram
- b. Ultrasound
- c. Biopsy
- d. MRI

5. The image on the right of a breast tumor was most likely produced using which diagnostic tool?

- a. Mammogram
- b. Ultrasound
- c. Biopsy
- d. MRI



6. Select two diagnostic tools and compare and contrast them.





Lesson 2 Quiz Answers

- 1. How is a definite diagnosis of breast cancer established?
- c. Biopsy
- 2. Explain the significance of microcalcifications.

Microcalcifications are tiny deposits of calcium in the breast that cannot be felt. If calcifications are grouped together, it may be an indication of cancer. Microcalcifications can only be detected on a mammogram.

3. Explain the different types of biopsies used to diagnose breast cancer.

Fine-needle aspiration biopsies use a thin needle to remove fluid from a breast lump. Core biopsies use a thick needle to remove a core of breast tissue. Surgical biopsies remove breast tissue.

4. What is the most effective way to detect breast cancer early?

Getting regular mammograms and a clinical breast exam by a health care provider.

5. The image on the right of a breast tumor was most likely produced using which diagnostic tool?

b. Ultrasound



6. Select two diagnostic tools and compare and contrast them.

Answers will vary. Refer to Diagnostic Tools Summary Answers sheet below for key points of difference among the diagnostic tools.



Diagnostic Tools Summary

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Tool	Materials/Technology used?	When should it be used?	What can it show us?
Mammogram	X-rays, panels.	For screening or diagnosis .	Whether a lump is benign or cancerous.
MRI	Radio waves, magnets computer, scanning table.	To assess abnormal areas on a mammogram, or that are felt after breast surgery or treatment. Also useful for imaging dense breast tissue.	Shows the extent of a tumor.
Ultrasound	Sound waves, transducer computer.	To clarify a mammogram or make a diagnosis.	Used to evaluate lumps that are hard to see on a mammogram. Also used to distinguish between tumors and fluid-filled cysts.
Biopsy	Needles, scalpels, etc.	To diagnose cancer.	Whether or a not a tissue sample contains cancer cells.







Wiki Instruction Manual for Teachers

for http://pbworks.com/

How Do I Create a pbwiki Account?

- 1. Go to http://pbworks.com/.
- 2. Select "Get Started" in the upper right hand corner and then select EduHub. One the next page, select the Basic (free) level.
- 3. Complete the required fields using an email account that you can access from the computer on which you are currently working. Choose a name for your wiki that you and your students will easily remember. The URL for your page incorporates this name as "https://pagename.pbworks. com." For example, if a wiki page name is "fhsbio," the wiki page address is www.fhsbio.pbworks. com.
- 4. Log on to your email and read the message from the wiki team. Click the link as advised. This will redirect you to a user agreement screen.
- 5. Select who would like to be able to view the wiki; "Only People I Invite or Approve," is the safest option and reduces the chances that your students pages will be edited by those not in your class.
- 6. Click terms of service box and select "Take me to my workspace."
- 7. The next page will be the homepage of your wiki, the page that everyone sees when they log on.

How Do I Share the Wiki With My Students?

As the administrator of your page, there are three ways you can allow students on your wiki:

- 1. Students type in the wiki URL to reach the log in page. They then "Request Access." You will receive this request by email. Once you grant access, they will be asked to sign up with an email address and password. They will be able to access the wiki with these at any future date.
- 2. You may invite students to join your wiki by choosing "Users" then "Add more users." Type in the email address of the person you wish to invite and assign a security clearance to them. They will receive an email as above.
- 3. If students do not have email, you can create user IDs and passwords for them by choosing the option "create accounts for your students" in the manage users screen. Follow the directions given.

You can invite people using the "Invite more people" feature in the side toolbar also. Only administrators can invite new users.

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How Can I Best Deliver Instructions to My Students?

The FrontPage is a place where students can meet and get instructions or links to other pages on the wiki; either their own or ones you created. Fhsbio.pbwiki.com FrontPage is a sample front page that has assignments and links to student work.:

fhsbio	FrontPag	te			Search with search here
Home	Edit page New	page Comme	nts Files		• Add features • Settings • He
1784 W.C	lcome to your	Biology Wik	11		
	Imal exam - bolog Cancer Trea	trans	S Derived 5	Period 8	
	Period 1	Panog 3	Penod 5	Penod 8	
	thecapy 1	therapy 2	therapy 5	therapy R	

How Do I Create Pages?

Creating a FrontPage

Back on the FrontPage of your wiki, go to the "Edit" screen by choosing the "Edit" tab. A format and editing toolbar will appear that allows you to change the page as you wish. Delete the default contents of the page and type in your page title. You can adjust the format any way you wish using the editing tools. Choose "Save." This will take you back to the "View" screen.

umdnjdemo1		Car Car	Blanchard@optonline.net eccount_tign ex
FrontPage	•	Create a page	Frunkfrege Nevr all pages Settings
last edited by B de 25 ninutes apo	Page history	Next Horiz the faster Search	icadro editor moriana)
Demo.page.1 Demo.page.2		 Put this page in a folder Add Tags Page Security (default) 	
		Sidebar	
C Cannents (8)		This is your Sidebar, which will page. This Sidebar appears even to I whatever you like a your favorite web sites, or	h you can edit like any other synthese on your will. Add rangetion section, a link to rangeting alos.
		Edit the sidebar	





Creating a New Page

Choose "Create a Page" in the tool section to the right of the screen. The next screen allows you to name your page.

You have now created a second page that can be edited in the same manner as your FrontPage. To activate this page, you must make a change to it in some way; give it a title, write your name, etc, then hit save. Your wiki now has two pages, your FrontPage and Page 1.

How Do I Create Links Between Other Pages?

Linking the FrontPage to Other Pages in Your Wiki

Note in the sample wiki at fhsbiowiki.com, most of the text on the screen is in the form of links, providing a starting point for me and my students. To add a link, do the following:

- 1. Navigate back to your FrontPage by clicking the "FrontPage" link in the side toolbar.
- 2. Choose the "Edit" tab. In the side toolbar, under the "Insert Links" section, choose the new page you have created. A link will appear on your page.
- 3. Choose "Save."
- 4. Click the link you have just inserted; you should now be looking at the page you linked.

How Do I Insert Images On a Page?

- 1. On your page 1, go to edit mode and choose "images and files" under the insert links section. Here, you may insert a file you have stored on your wiki that you upload or a file from an existing URL.
- 2. Choose "Browse" and navigate your computer to find a picture you would like to insert. When you have selected a picture and opened the file, it will automatically upload to your wiki and be stored for future use. You will be able to see the file under "images and files" in the side toolbar in edit mode.

Editing Images

- 1. Right click on the image to change the properties of the image; size, name, etc.
- 2. Use the Alignment feature to place the image on the page where you want it.





How Do I Monitor Activity on the Wiki Pages My Students Create?

The wiki stores very useful information that allows you to keep track of who has accessed and edited pages you or your students have created. It is a record of how much time and what changes have been made to each page. To monitor activity, do the following:

- 1. On the FrontPage side toolbar, choose "Options" next to the "Pages" and "Files" buttons. You will see a list of the pages showing their name, last edited information, etc. You have two options:
- 2. Choose a page to view and open it. In the top right of the page you will see the "page history" button. Choosing this allows you to see a full history of the page.
- 3. In the page list screen you can also click the "More" dropdown menu and click on the number of revisions made for the highlighted page.

Revision history can be seen by comparing two versions in the list. Choose two versions of one of your pages to see how and when they were changed. The screen is illustrated below.

fhsb	io FindPage			
Home	The			
Tip: use qui	tes to group terms, - to exclude terms, and + to include them/ [more] Search			
Revisio	ns of FrontPage (85):			
Compar	u			
00	August 9, 2009 at 2:14:27 pm by cb	Celete	(Current Revision)	
00	August 9, 2009 at 2:13:46 pm by cb	Celete		
00	August 9, 2008 at 2:11:20 pm by cb	Celete		
00	June 15, 2008 at 10:39:05 am by chlanchard@frankinboe.org	Celete		
00	June 15, 2008 at 10:38-32 am by chlanchard@frankinboe.org	Celete		
00	May 8, 2008 at 3:25:17 pm by jennifer	Celete		
00	April 6, 2008 at 8:16:30 am by chlanchard@franklinboe.org	Celete		
00	April 6, 2008 at 7:37:21 am by chlanchard@franklinboe.org	Delete		
00	April 3, 2008 at 7:35:28 pm by chlanchard@thanklinboe.org	Delete		
00	March 31, 2008 at 7:51:43 pm by cblanchard@franklinboe.org	Colete		
0.0		· · · · ·		

How Do I Access an Older Version of a Page?

Sometimes, you or your students may accidently change and save a page but wish undo this change. To do this, when in page history, just delete the version you have most recently created. The next youngest version of this page in the revision list will be the one that is seen on your wiki. Only text changes can be seen using this tool, not image changes.





How Do I Organize Information in Outline Format and Insert Table of Contents?

Most of the features in the format and editing toolbar are similar to those on Office products. There are, however, a couple of features that are a little different:

Creating a Page in Outline Format

- 1. Go to the edit screen of page 1 of your wiki. Type in the example below about turtles, (or think up your own.)
- 2. Select the first heading of your piece, and from the toolbar, choose "format" and "heading 1." Select a sub-heading and assign it with "heading 2." Repeat with headings and sub-headings using up to 6 levels. Leave regular text as "normal."

Turtles

Turtles are Cool

Pictures

Here is a picture of a cool turtle.

(insert pic)

Just How Cool Are Turtles?

Especially cool if you can hold them.

Creating Table of Contents

- 1. Using the page with formatted headings, place the cursor at the top of the page, or under your heading and click on the dropdown menu labeled "Insert" and then select "Table of Contents."
- 2. Select the depth of headings you want to catch in your table of contents (up to 6 levels of heading).
- 3. Save your changes and view your table of contents.

Note: Only the plugin ICON is visible in the edit screen, the actual table of contents is visible only in the view screen once you have saved your changes.





Here is a marked up version of the page in edit mode that shows headings:

venito page i s				
BUIME E E (# # #	프 프 미	B 10 8	🗖 🗄 🥥 🌸 Insett Ph	igin
Tgs - Ogs - Format Heading 1 + Font		Size	Source	
	14	rtles		
<toc> Table Of Contents (4 level)</toc>				
furties are Cool				
Pictures				
fare is a nicture of a cool turtle				
tere to a presure of a cool future				
		1		
Just How Cool Are Turtles?				

Here's how it looks in view mode. Note the table of contents in blue.



How Do I Keep My Students' Work Organized and Easy to Access?

If you have multiple pages, for example, projects for different students in a number of classes, you can have them organize their work by folder.

- 1. In the side toolbar of the page you want to classify, choose "Put this page in a folder," select "Create a new folder," and give your folder a name, say "Class 1."
- 2. To see and edit the contents of a folder, just click on the folder name in the sidebar.





How Can I Grade My Students' Projects?

Every page you and your students create can receive comments from anyone who has access to the wiki. This can be used by you to effectively grade and provide feedback for a group project. Students seem to enjoy reading comments on their wikis. Here is a sample of a comment and grade I provided for a group's wiki page:



To add a comment, just choose the "add comment" button at the bottom of the page you are viewing. Use this feature with caution; some students may not want comments about their work in the public domain.