



The 15 - 40 Connection meets ASSISTments: Can technology be used to build awareness and change behavior patterns in teens and young adults?

Interactive Qualifying Project Report
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Submitted to:

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Abstract

The mission of the 15-40 Connection is to create awareness that there have been close to no improvements in teen and young adult cancer survival rates since 1975, and to promote health awareness to provide the advantage of early detection. ASSISTments is a free web-based tutoring platform by WPI which provides teachers and students with immediate feedback from the use of problem sets containing flexible pre-built and custom content. A team of students is combining these missions by building custom cancer problem sets and conducting a study in order to identify successful messages that promote cancer awareness and behavior change. The study is currently underway.

Acknowledgements

I would like to thank Neil Heffernan for taking on this unique project and giving me the chance to participate in such a meaningful IQP, and I would like to thank Cristina Heffernan for being an invaluable source of knowledge about both ASSISTments and the world of education professionals. I would also like to thank Sandy Foster and Tricia Laursen for being such a wonderful source of guidance over the course of this project. They took the time out of their busy schedules to meet with this project group every week, keeping everyone on task and focused on the message of the 15 – 40 Connection. I would like to thank David Boroyan and Keleigh O'Neil for making this project fun and for being a part of one of the most flexible and supportive project groups I have had the opportunity to work with. A final thank you goes out to my family and friends for their advice and patience as well as their willingness to help generate preliminary data.

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Introduction

Cancer. Cancer is the name of a group of more than 100 different diseases in which cells grow out of control. Cancer also claims the lives of more young adults - ages 15 to 40 - than any other disease, and the survival rates of this age group have had close to zero percent improvement since 1975. A major contributing cause of this lack in improvement is delayed diagnosis - resulting in more advanced cancers which are more difficult to successfully treat. This makes early detection the key to improving survival rates for those between the ages of 15 and 40, and awareness and self-advocacy are the tools that make early detection possible (About the 15 - 40, 2012).

The 15-40 Connection is an organization whose mission is to promote health awareness, self-advocacy and action in order to provide the 15 to 40-year-old age group with the life-saving advantage of early detection. The 15-40 Connection provides this age group with the knowledge that subtle, persistent changes in one's health may very well be the early warning signs of cancer, and that being aware and acting on this knowledge can be the difference between life and death. Combining this mission with technology might just be the best way to educate today's young people and give them a fighting chance against cancer.

ASSISTments is an online platform that brings the education of young people into the twenty-first century. It allows teachers to make custom problem sets that assess students while providing immediate feedback and tutoring, so when a student answers incorrectly, they are guided through a step by step process leading them to the correct answer – they are actively involved in correcting their mistake. The mission of the ASSISTments platform is to elevate every student assessment from mundane regurgitation to an invaluable teaching moment.

This IQP is concerned with combining the missions of the 15-40 Connection and ASSISTments in order to promote an internalization and an understanding of the teen and young adult cancer issue and

to understand what messaging works best to educate, motivate behavior change and encourage individuals to “protect” their health. This combination might just be the best way to educate today’s youth - to help them help themselves - and give them a fighting chance against cancer.

Cancer

Cancer is a major issue in today’s society as the relatively high odds of developing this disease makes it a concern for everyone. One in two men and one in three women will develop invasive cancer during their lifetimes, and one in four men and one in five women will lose their lives battling this disease. The most concerning fact is that cancer is the number one disease related cause of death for teens and young adults, and the survival rates of this age group have had close to zero percent improvement since in the past 30 years (Learn about Cancer, 2012).

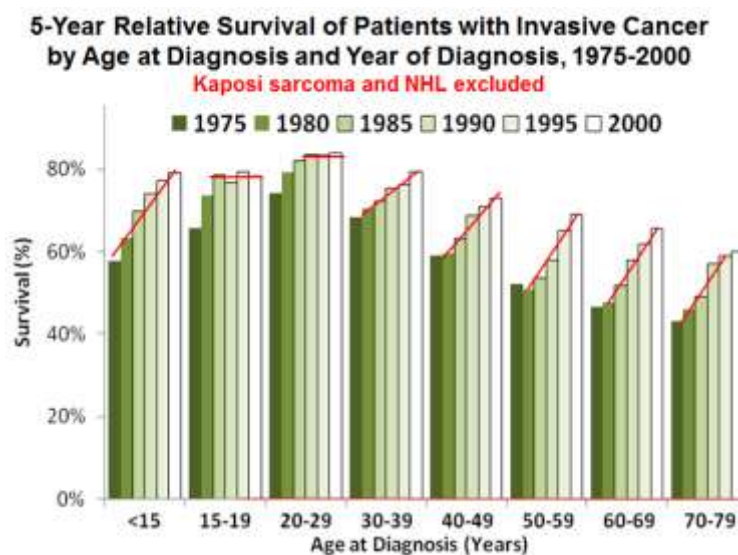


Figure 1. Survival rates of patients with invasive cancer 1975 – 2000. Notice how every age group except those of teens and young adults (15-19 and 20-29) have had significant increases in survival rates. (AYA AAPC, 2007)

During the past quarter century, overall cancer survival dramatically improved in young children while it remained essentially unchanged in older adolescents and young adults. This is especially concerning today with all of today’s medical technology. The 15 to 25 year-old age group has actually lagged behind all other age groups in survival prolongation since the 1980s and the incidence of cancer

in 15 to 40-year-olds is rising (2009 – 68,000 diagnosed, 2010 –70,000, 2011 - 72,000 diagnosed). This is extremely worrisome, and that is exactly what the 15 – 40 Connection is all about (AYA AAPC, 2007).

The 15 - 40 Connection

The 15 – 40 Connection wants to alert the world to the frighteningly low cancer survival rates for the vibrant teens and young adults who have so much life to live. They preach to *be aware* of your normal health, to *check yourself* – take action if your normal health changes, *act early* - see a medical provider and get checked. This is because they know that a significant number of teen and young adult cancers are diagnosed at more advanced stages, and that advanced cancers are more difficult to successfully treat. So delayed diagnosis is a major contributing cause of this lack in survival rate improvement. This makes early detection the key to improving survival rates for those between the ages of 15 and 40, and awareness and self-advocacy are the tools that make early detection possible. Empowering individuals with knowledge – such as the fact that cancer symptoms are often subtle but persistent changes in one’s health - will save and improve lives through early cancer detection (Mission of the 15 - 40, 2012).

ASSISTments

Technology provides information, builds awareness, and educates. It is a part of everyday life and is an essential element of 15 - 40 Connection communications. The use of ASSISTments is a fantastic way to use technology to build awareness and create behavior change. ASSISTments is a free, public online platform that brings the education of young people into the twenty-first century. It allows teachers to make custom problem sets that assess students while providing immediate feedback and tutoring, so when a student answers incorrectly, they are guided through a step by step process leading them to the correct answer – they are actively involved in correcting their mistake. The use of ASSISTments elevates every student assessment from mundane regurgitation to an invaluable teaching moment (What is ASSISTments, 2012).

ASSISTments are predominantly used by math teachers in middle and high schools to build skills and allow for instant tutoring and feedback during an online quizzing session or homework assignment. Teachers and students can then review either individual or class wide performance and target problem areas. This project aims to build cancer themed problem sets, which is a novel use of ASSISTments. Not only will this project allow for a study, it also will show education professionals how the ASSISTments platform can be molded to educate students in any subject.

Public Health Campaigns

Much research has been done to determine the success of many public health campaigns such as seatbelts, smoking and texting while driving. All of these dealt mainly with teaching awareness and what an individual can do to avoid the tragic consequences of these lifestyle choices. Public health campaigns dealing directly with the cancer awareness issue were few and far between.

A study called Project SAFETY (sun awareness for educating today's youth) predominantly dealt with awareness of the dangers of prolonged, unprotected exposure to sunlight. The study consisted of a 50 minute cancer prevention teaching module. During field testing, many students made comments concerning the need for information on appropriate sun behavior, before receiving so many blistering sunburns; especially since every sunburn before age 16 doubles one's chances of developing melanoma – the deadliest form of skin cancer (Kamen et al, 1993).

Another study focused on the development and implementation of a student-centered instructional module exploring the use of multimedia to enrich the learning of science, specifically the development of cancer. The interactive, virtual-lab-like module educated students about the complexities involved in the origins of cancer as well as providing some exposure to the research process. Technology was found to enhance the level of students' understanding of complex biological concepts (Bockholt, 2002).

Additionally, a 2010 anti-texting and driving study investigated the effectiveness of fear appeals on young adults. However, the study reported increased intensions of this risky behavior after exposure to fear appeals. This “boomerang effect” was unexpected, and was more prevalent in males than in females (Lennon, 2010).

All of these studies yielded useful information pertinent to this project. Repetition was the single most important factor in students absorbing and retaining information, while fear appeals and “statistical lecturing” resulted in a rejection of the information and increased participation in risky behaviors. This very much agreed with the book *Switch: How to Change Things When Change Is Hard*. The author writes about how an appeal for change must illicit both an emotional and rational response. He compared a successful change to an elephant and rider; the elephant being emotional and the rider being rational. If there is only an emotional appeal the elephant runs out of control, and if there is only a rational appeal the rider can only steer the elephant in circles getting nowhere. There must be a synergy of emotion and rational, so that the elephant lumbers forward under the guidance of the rider. All of these studies led to the construction of a problem set containing repetitive information and moderate emotional appeals (Chip, 2010).

Project goal

The overall goal for this Interactive Qualifying Project (IQP) was to combine the missions of the 15 – 40 Connection and ASSISTments and promote cancer awareness in teens and young adults. This was achieved by building custom cancer problem sets and conducting a study in order to identify successful messages that promote cancer awareness and behavior change. Currently, all supporting materials have been generated, study participants are being recruited and the study is slated to begin in mid-January. The study is expected to reveal what messages work best in order to promote cancer awareness in terms of gender differences –male versus female, age brackets – young teens versus older

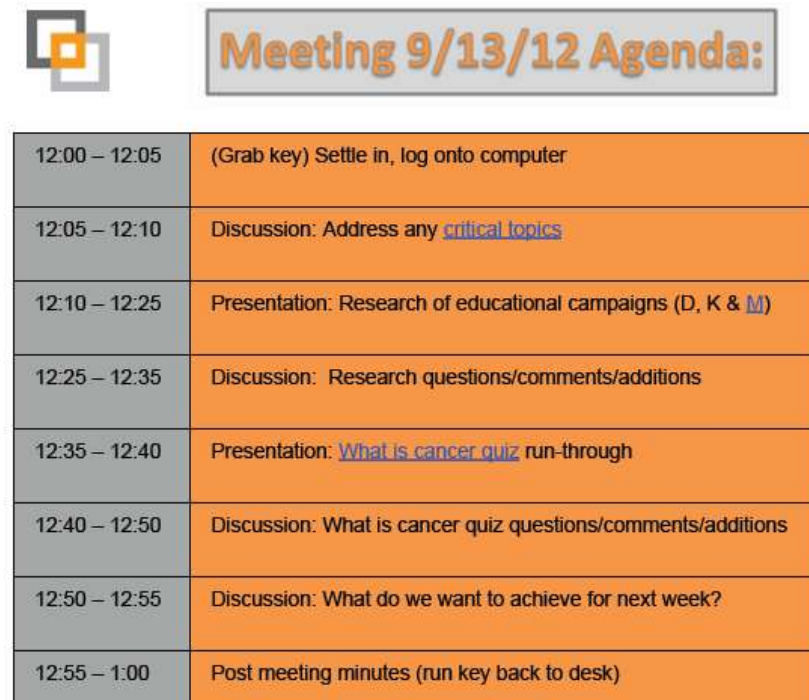
adolescents, and problem set format – being purely informative versus informative with frequent assessment.

Materials and Methods

Meetings

Weekly focus meetings took place over the course of this project in addition to student project meetings. Representatives from the 15 – 40 Connection , Sandy Foster and Tricia Laursen, met with the three student project members every week to discuss progress, future ventures and to keep current work focused and “branded” to the 15 – 40 Connection message. These professionals taught the group about how to generate materials and promote a public health campaign.

Meetings began with a student designed agenda, which listed the meeting’s topics and the allotted time for each in order for the meetings to remain efficient and focused. An example of the typical agenda can be seen in figure 2 below.



Meeting 9/13/12 Agenda:	
12:00 – 12:05	(Grab key) Settle in, log onto computer
12:05 – 12:10	Discussion: Address any critical topics
12:10 – 12:25	Presentation: Research of educational campaigns (D, K & M)
12:25 – 12:35	Discussion: Research questions/comments/additions
12:35 – 12:40	Presentation: What is cancer quiz run-through
12:40 – 12:50	Discussion: What is cancer quiz questions/comments/additions
12:50 – 12:55	Discussion: What do we want to achieve for next week?
12:55 – 1:00	Post meeting minutes (run key back to desk)

Figure 2. Generic focus meeting agenda. Each focus meeting began with an overview of the day’s topics listed on an agenda like the example above. Blue text is hyperlinked to topic materials such as scholarly research articles and PowerPoint presentations stored elsewhere on the Google Drive.

The agenda was designed using the project's shared 15 – 40 Connection Google Drive, and had hyperlinks to materials corresponding to each meeting topic. Topics usually included the presentation and discussion of research articles, ASSISTments construction and editing, and other organizational necessities. Meeting notes were always logged by a student in a weekly Google document on the Drive.

Google Drive

The project group created a 15 – 40 Connection Google Drive shared between Cristina Heffernan, the 15 – 40 Connection representatives and the three student project members. The Drive was used for many purposes; to post project progress, research materials, and cooperate on the development of project materials.

Meeting agendas were posted before each meeting, and meeting notes were posted at the conclusion of each meeting. Research articles and data were posted and shared between group members. Project materials such as ASSISTment problem set PDF files, writing drafts, and outreach contacts and materials were also posted and shared. The Google Drive provided for the organized, instantaneous storing and sharing of project resources.

ASSISTments

The project group collaborated on the construction of custom ASSISTments to be used in the study. Group member Meagan Sullender attended an ASSISTments summer training session which provided a crash course in the building and implementation of ASSISTments and problem sets. She later shared this knowledge with other group members. The group shared an ASSISTments account with the username mesullender@gmail.com and the password 1234; this account can be passed along if another IQP group wishes to pursue this project further. It is in this account where numerous ASSISTments were created and edited, and where various problem sets were assembled and tested.

Appendix II contains the preliminary problem set (problem set 56122) which was completed at the conclusion of A-Term. It was decided that the content was too complex (detailed DNA information about mutations and cancer), so another “simplified” problem set was developed. Table 1, below, contains a list of the ASSISTment numbers and titles in this preliminary problem set.

Table 1. Preliminary problem set. Problem set number 56122 contains informational slides with “bug message” style tutoring.

ASSISTment #	ASSISTment Title	Mode
342684	So what is cancer?	Tutor
342760	This is your body	Tutor
342762	This is a Cell	Tutor
345669	Number of Cells	Tutor
342765	Cancer Video	Tutor
345666	Cancer vs. Normal	Tutor
345670	X-men	Tutor
342763	Body with the wrong number of cells	Tutor
345667	"Normal" Division	Tutor
345668	Mutation Causes	Tutor
349982	For example...	Tutor
305164	What is cancer	Tutor
342782	Survival Rates I	Tutor
342796	When to See the Doctor Question	Tutor
342813	What Do You Do Once You're There Question	Tutor
342814	Taking Charge	Tutor
342807	Checklist	Tutor
339273	SpongeBob: Doctors are Horrible	Tutor
342424	"Solutions" to least favorite	Tutor
345618	Appointment	Tutor
345616	Waiting Room	Tutor
345619	Embarrassed	Tutor
345671	Know Your Normal (Step 1 of what you can do)	Tutor
345672	Two Weeks is Key (Step 2 of what you can do)	Tutor
342690	Dancer	Tutor

Appendix III contains the two versions of the “simplified” problem set (completed in mid-B-Term) which were to be used to create an AB study within ASSISTments. The problem sets share identical information; version 1(problem set 60575) contains casual, but informative ASSISTments with occasional, superficial quizzing, while version 2 (problem set 74394) contains the same informative ASSISTments, but with frequent (after every informative slide) “thinking” quiz questions. The problem set versions both also contain identical pre and post survey questions so as to provide demographic information as well as a method of determining which version prompted better cancer information retention during the study. Table 2 and 3, below, contain a list of the ASSISTment numbers, titles and tutoring in versions 1 and 2 of this preliminary problem set, respectively.

Table 2. Simplified problem set version 1. Problem set number 60575 contains informational slides with “bug message” style tutoring.

ASSISTment #	ASSISTment Title	Mode	Tutoring
346993	Pre Test - How old are you?	Test	No
346992	Pre Test - What is your gender?	Test	No
347091	Pre Test - How likely would you be to go to the doctor?	Test	No
382069	Test - What is cancer?	Test	No
382071	Test - Who gets cancer?	Test	No
382074	Test - Early warning signs?	Test	No
366888	Test - Go to the doctor?	Test	No
342684	Introduction: So What is Cancer?	Tutor	No
342760	This is your body	Tutor	---
342762	This is a Cell	Tutor	---
345669	Number of Cells	Tutor	---
345667	"Normal" Division	Tutor	---
350823	Cells Not Doing Their Jobs	Tutor	---
360053	"Cancer" Cell Division	Tutor	---
342765	Cancer Video	Tutor	---
342763	Body with the Wrong Number of Cells	Tutor	Bug
360068	Early Warning Signs I	Tutor	---
360070	CAUTION	Tutor	---
360069	Early Warning Signs II	Tutor	---

366759	Testimonials 2.0	Tutor	---
342782	Survival Rates I	Tutor	Bug
360076	Survival Rates II	Tutor	---
345671	Know Your Normal (Step 1 of what you can do)	Tutor	Bug
345672	Two Weeks is Key (Step 2 of what you can do)	Tutor	---
342796	When to See the Doctor Question	Tutor	Bug
342813	What Do You Do Once You're There Question	Tutor	Bug
342814	Taking Charge	Tutor	---
382147	Post Test - Go to the doctor II?	Test	No
382129	Test - What is cancer II?	Test	No
382127	Test - Who gets cancer II?	Test	No
382121	Test - Early warning signs II?	Test	No
366901	Post Test - What can you do?	Test	No
366862	Post Test - How likely are you to share what you learned?	Test	No
366908	Post Test - Do you think you learned?	Test	No
365451	Ending Video	Test	No

Table 3. Simplified problem set version 2. Problem set number 74394 contains quizzing ASSISTments and scaffold style tutoring in addition to informational slides with “bug message” style tutoring contained in version 1.

ASSISTment #	ASSISTment Title	Mode	Tutoring
346993	Pre Test - How old are you?	Test	No
346992	Pre Test - What is your gender?	Test	No
347091	Pre Test - How likely would you be to go to the doctor?	Test	No
382069	Test - What is cancer?	Test	No
382071	Test - Who gets cancer?	Test	No
382074	Test - Cancer warning signs?	Test	No
366888	Test - Go to the doctor?	Test	No
342684	Introduction: So What is Cancer?	Tutor	No
342760	This is your body	Tutor	---
342762	This is a Cell	Tutor	---
364201	This is a Cell Question	Tutor	Scaffold
345669	Number of Cells	Tutor	---
345667	"Normal" Division	Tutor	---
364171	"Normal" Division Question	Tutor	Scaffold

350823	Cells Not Doing Their Jobs	Tutor	---
364202	Cells Not Doing Their Jobs Question	Tutor	Scaffold
360053	"Cancer" Cell Division	Tutor	---
364188	"Cancer" Cell Division Question	Tutor	Scaffold
342765	Cancer Video	Tutor	---
342763	Body with the Wrong Number of Cells	Tutor	Bug
360068	Early Warning Signs I	Tutor	---
360070	CAUTION	Tutor	---
364377	CAUTION Question	Tutor	Scaffold
360069	Early Warning Signs II	Tutor	---
364380	Early Warning Signs II Question	Tutor	Scaffold
366759	Testimonials 2.0	Tutor	---
366760	Testimonials 2.0 Question	Tutor	Scaffold
342782	Survival Rates I	Tutor	Bug
360076	Survival Rates II	Tutor	---
364382	Survival Rates II Question	Tutor	Scaffold
345671	Know Your Normal (Step 1 of what you can do)	Tutor	Bug
345672	Two Weeks is Key (Step 2 of what you can do)	Tutor	---
342796	When to See the Doctor Question	Tutor	Bug
342813	What Do You Do Once You're There Question	Tutor	Bug
342814	Taking Charge	Tutor	---
364383	Taking Charge Question	Tutor	Scaffold
366888	Post Test - Go to the doctor?	Test	No
382069	Test - What is cancer?	Test	No
382071	Test - Who gets cancer?	Test	No
382074	Test - Cancer warning signs?	Test	No
366901	Post Test - What can you do?	Test	No
366862	Post Test - How likely are you to share what you learned?	Test	No
366908	Post Test - Do you think you learned?	Test	No
365451	Ending Video	Test	No

Appendix IV contains the final study which was built within ASSISTments as “15 – 40 and ASSISTments” (problem set 94249), completed at the conclusion of B-Term. It allows for the randomized distribution of versions 1 and 2 of the “simplified” problem set. This is the study which will

be distributed to education professionals (along with the recommendation to provide students with headphones), and will be the main source of data in this study. Table 4 below contains a list of the ASSISTment numbers, titles and tutoring in this problem set.

Table 4. 15 – 40 and ASSISTments. Problem set number 94249 contains introduction slides, pre and post questions and the randomly selected version 1 or 2 of the “simplified” problem set.

ASSISTment #	ASSISTment Title	Mode	Tutoring
382068	Intro to study	Test	No
346993	Pre Test - How old are you?	Test	No
346992	Pre Test - What is your gender?	Test	No
347091	Pre Test - How likely would you be to go to the doctor?	Test	No
382069	Test- What is cancer?	Test	No
382071	Test - Who gets cancer?	Test	No
382074	Test - Early warning signs?	Test	No
366888	Test - Go to the doctor?	Test	No
VI or V2	The Study Choose Condition	Tutor	Varies
382156	Intro to tutorial (Version 2 only)	Test	No
382145	Intro to Post test	Test	No
382129	Test- What is cancer II?	Test	No
382127	Test - Who gets cancer II	Test	No
382121	Test - Early warning signs II	Test	No
382147	Post Test - Go to the doctor II?	Test	No
366901	Post Test - What can you do?	Test	No
366862	Post Test - How likely are you to share what you learned?	Test	No
366908	Post Test - Do you think you learned?	Test	No
365451	Ending Video	Test	No

The study problem set is available for use on ASSISTments and can be found in the ASSISTments Certified Problem Sets under “Research Problem Sets” → “2012-13 Research Projects” → “15 – 40 Cancer Awareness”. The study allows for identical pre and post survey questions so as to provide demographic information as well as a method of determining which version prompted better

cancer information retention. Data gathering and analysis will allow for the identification of successful messages that promote cancer awareness and behavior change, and will occur once a minimum of five education professionals evaluate the problem sets and join the study.

Problem Set Timing

The study contained two versions of the “simplified” problem set, and each presented identical information about cancer and health awareness in a different format. It was crucial to generate a time approximation for the length of the study problem set so that education professionals could envision how they could incorporate the study into their class or homework curricula. The problem set versions were then tested by anonymous volunteers, providing both time data and feedback on the general flow of the problem sets.

Middle school and college-aged volunteers without biology backgrounds were provided a laptop and headphones in a quiet room and were asked to thoughtfully complete problem set version 1. Three days later each volunteer completed version 2 under the same conditions. The volunteers were observed by the problem set administrator during each session and were timed using stopwatches. Any questions and tester feedback were considered and appropriate changes were made to the problem sets in a case-by-case manner.

Reaching Out

The project group reached out to educational professionals familiar with ASSISTments, the 15 – 40 Connection or both. Table 7, found in Appendix V, contains a list of contacts fitting the criteria above, and those who are currently considering participating in the study are highlighted in yellow. Group members will begin corresponding with interested parties in C-Term through email, phone and in-person information sessions.

Appendix V also contains “marketing” materials which were used in order to pitch the study to the above contacts. There are a series of email template pairs for the recruitment of education professionals unfamiliar with ASSISTments, student leaders, and education professionals that are familiar with ASSISTments. The first “information” emails were sent out by Sandy Foster and Cristina Heffernan to their respective contacts on December 27, 2012 and then follow-up action emails were sent on January 3, 2013. There were two interested parties as of January 9, 2013.

Each “recruitment” email contained a hyperlink to a “marketing PowerPoint” on the Google Drive for target schools to distribute to interested parties. Figure 4 (in Appendix V) contains the three-slide PowerPoint which provided additional details about the importance and ease of adding the IQP study to existing curricula. Figure 4a) visually summarized the project, 4b) provided greater detail and 4c) showed the path to take in order to get involved.

Results

Combining the mission of the 15 – 40 Connection and the technology of ASSISTments allowed for the creation of an AB study in order to identify successful messages that promote cancer awareness and behavior change - the study is set to begin in mid-January 2013. Research and focus meetings lead to the development of various cancer ASSISTments which were then combined in order to create two versions of a problem set, each presenting identical information about cancer and health awareness in a different format. These problem set versions were then tested by anonymous volunteers, providing both time data and feedback on the general flow of the problem sets.

Middle school and college volunteers were provided a laptop in a quiet room and were asked to thoughtfully complete problem set version 1, then version 2 three days later. The problem set administrator only had access to middle school and college students to gather data, even though the target audience of the study is high school students. The volunteers were observed and timed using stopwatches. Table 5 (Appendix I) contains the raw data from the timing sessions. The tester feedback was considered and appropriate changes were made to the problem sets in a case-by-case manner.

Excel was used in order to calculate the average times and the standard deviation for middle school students, college students and the combined data sets. Version 1 took middle school students 11.2 ± 1.3 minutes and college students 9.8 ± 0.8 minutes. Version 2 took middle school students 20.2 ± 2.2 minutes and college students 16.6 ± 1.1 minutes. Table 6 (Appendix I) contains the calculated values which are also presented visually in figure 3 below.

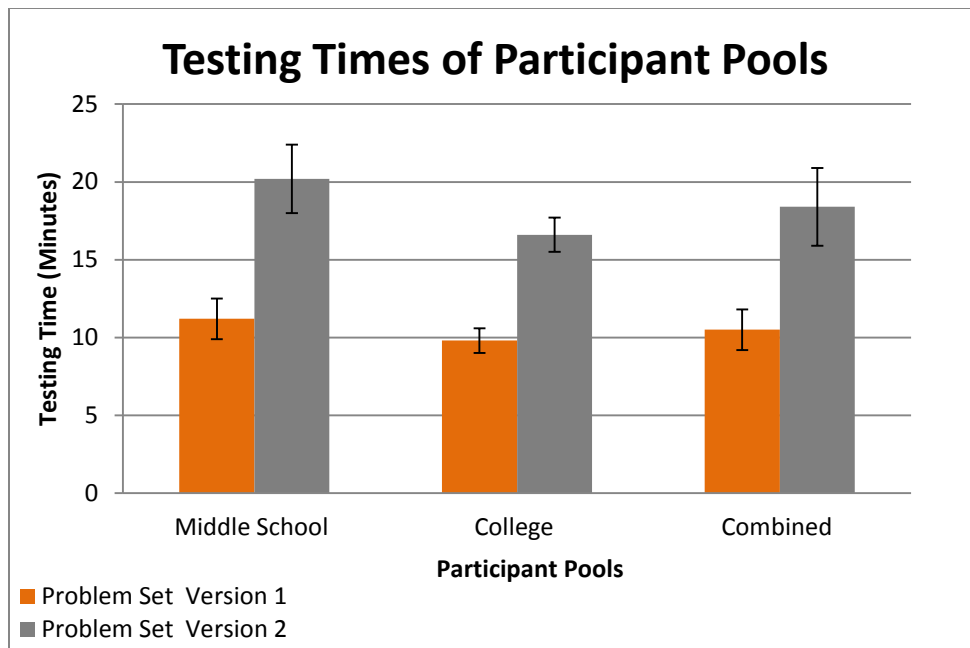


Figure 3. Analysis of testing times of middle school, college and combined student volunteer groups. The calculated average completion times for problem set versions 1 (orange) and 2 (gray) with standard deviation bars. The calculated values can be seen in table 6 and the raw data can be seen in table 5, both in appendix I.

The target audience of the study is high school students, so the average high school completion time was approximated by combining the data for both middle school and college students. Based on this, it is expected that the average high school student should be able to complete version 1 in 10.5 ± 1.3 minutes and version 2 in 18.4 ± 2.5 minutes.

Discussion

The overall goal for this Interactive Qualifying Project (IQP) was to combine the missions of the 15 – 40 Connection and ASSISTments by building custom cancer problem sets and conducting a study in order to identify successful messages that promote cancer awareness and behavior change. Currently, all supporting materials have been generated, study participants are being recruited and the study is slated to begin in mid-January. All supporting materials for the study have been generated; from “marketing” PowerPoints to recruitment emails to the ASSISTments study itself.

The PowerPoint, distributed to target schools, consists of three slides provided additional details about the importance and ease of adding the IQP study to existing curricula by visually summarizing the project, provided greater detail showing the path to take in order to get involved. The PowerPoint was distributed to target schools using hyperlinks in the various recruitment emails.

The ASSISTments study underwent dramatic remodeling twice and resulted in a dual version problem set, with both versions having identical informational content. The time approximation for version 2 was included in recruitment correspondence emails so that education professionals, with an interest in spreading cancer awareness to young adults, knew the longest expected completion time so they could envision how they could incorporate the study into their class or homework curricula.

Further data gathering and analysis, over the course of C-Term, will allow for the identification of successful messages that promote cancer awareness and behavior change, and will occur once a minimum of five education professionals evaluate the problem sets and join the study. Four parties are currently participating.

There are several things - both positive and negative - to consider when reflecting on this project. For example, working with the 15 – 40 Connection was a unique opportunity to learn how to work with an “outside” organization and to see how a real life public health campaign is run, while the study problem set seems to be too simplified for college and perhaps even high school aged participants.

Having the opportunity to work with the 15 – 40 Connection was both interesting and valuable. It was especially interesting after modeling a public health campaign in a scientific writing course. It seemed so simple in class and even at the beginning of this project, and then the group began diverging from the organization’s “brand”. Branding was a whole new concept, and something that proved to be a challenge when designing the study problem set. Cancer is such an enormous issue with so much information, and all three group members would agree that the experience was like trying to focus on math homework in the middle of a college basketball game. There were so many interesting factoids, but only those related to the 15 – 40 Connection’s cancer awareness and two-weeks-is-key messaging were appropriate to incorporate into this particular study.

This experience was also valuable because it taught the group how to organize and participate in a multi-organization project. There were many challenges such as deciding upon meeting times that were convenient to all 5-6 focus meeting participants – when2meet proved to be invaluable here – and how to share resources in an organized and efficient manner – Google Drive worked beautifully. This experience was invaluable being biology major, now pursuing a PhD for research. Think of the grant writing and the collaboration of multiple lab groups, institutions and organizations; this project was akin to a practice run in cooperation.

There is also the possibility that the study problem set will prove to be too simplified for college and perhaps even high school aged participants. Personally, when looking over the problem set, one notices a considerable amount of repetition (perhaps too much) and very simple concepts, language and visuals. It seems more appropriate for middle or junior high school-aged participants between 13 and 15-years old. The contact at Holy Cross confirmed this opinion as she believed that the study was “too redundant and too simplistic” and therefore inappropriate for college-aged young adults.

This IQP is ready to launch the 15-40 Connection/ASSISTments study, promoting an understanding of the teen and young adult cancer issue. Future data analysis will allow the group to

understand what messaging works best to educate, motivate behavior change and encourage individuals to “protect” their health. This project is just the beginning of a journey to discover the best way to educate today’s youth about cancer - to help them help themselves - and give them a fighting chance.

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Appendix I

Table 5. Testing times of middle school and college student volunteers one through six. This raw data consists of the times that it took each student to complete each version of the study problem set.

Participant	Problem Set Version 1 Time (Minutes)	Problem Set Version 2 Time (Minutes)
M1	10	18
M2	12	19
M3	11	23
M4	13	22
M5	10	19
C1	10	16
C2	11	17
C3	9	15
C4	10	18
C5	9	17

Table 6. Analysis of testing times of middle school, college and combined student volunteer groups. The calculated average completion times and standard deviation of each volunteer grouping for each version of the study problem set. These values were plotted into the graph in figure #.

	Problem Set Version 1 Time (Minutes)		Problem Set Version 2 Time (Minutes)	
	Average	Standard Deviation	Average	Standard Deviation
Middle School Sample	11.2	1.3	20.2	2.2
College Sample	9.8	0.8	16.6	1.1
Combined Samples	10.5	1.3	18.4	2.5

Appendix II: ASSISTments Preliminary Quiz

Assistment - Printing Content

<http://www.assistments.org/build/print/sequence/56122?mode=de...>

Problem Set "Preliminary Quiz" id:[56122]

1) Assistment #342684 "342684 - So What is Cancer?"

So....what IS cancer?

Well....

That's kind of a big question.

so let's start small

Multiple choice:

Let's do this!

2) Assistment #342760 "342760 - This is your body"

This is your body (if you look like a bad cartoon)

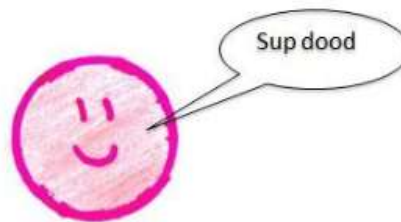


Multiple choice:

- ✓ Sir yes sir ✓ I'm a lady... ✓ Why Is my hair pointy?

3) Assistment #342762 "342762 - This is a Cell"

And **THIS** is a cell



Your **body** is made of water and trillions of **cells** like these

Each one of your **cells** has a specific job to do to keep you healthy

Multiple choice:

✓ Don't call me "dood." I'm a LADY ✓ Got it

4) Assistment #345669 "345669 - number of cells"

Your cells have lots of jobs to do...so many that your body is made up of somewhere between 60 and 90 TRILLION cells*, if you lined them up end to end they could encircle the earth 4.5 times!



*There are varying estimates of just how many cells make up the human body.

Multiple choice:

✓ Wow! ✓ Next ->

5) Assistment #342765 "342765 - cancer video"

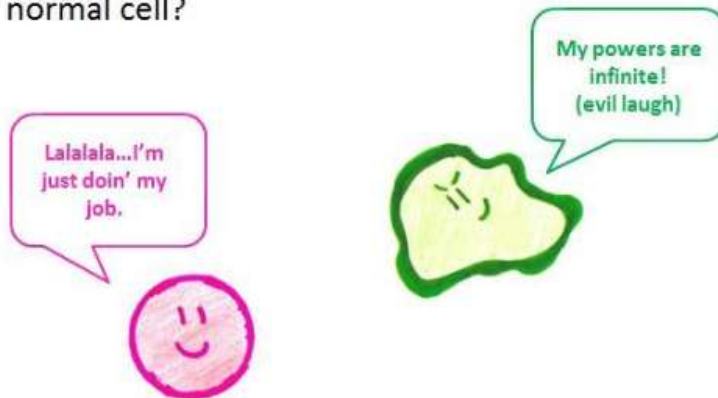
[Watch how uncontrolled cell growth causes cancer:](#)

Multiple choice:

✓ Next ->

6) Assistent #345666 "345666 - cancer vs normal"

So what is it that makes cancer cells able to continue to grow and divide uncontrolled when compared to a normal cell?



Multiple choice:

magic mutations physics

7) Assistent #345670 "345670 - x-men"

Right, mutations! DNA provides instructions for how a cell is supposed to function, and if there is a mutation that a cell can't repair on its own, the instructions will be wrong and the cell won't know what its job is. This can cause illnesses, including some types of cancer.

Multiple choice:

Next ->

8) Assistent #342763 "342763 - Body with the Wrong Number of Cells"

So, now you know **cancer is a group of diseases with a common trait - cells growing and spreading out of control...**



If these cells spread throughout your body, cancer becomes life-threatening because it takes over your healthy cells and your body can no longer do all the things needed to keep you healthy.

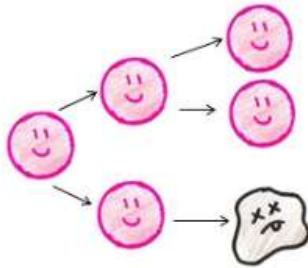
Multiple choice:

- I can definitely tell he has cancer He definitely does not have cancer Impossible to tell...

9) Assistment #345667 "345667 - "Normal" Division"

Normal body cells grow, divide, and die in a very **controlled** way. Cancer cells **grow and divide, uncontrolled**. They also outlive normal cells and continue to form new cancer cells. Your body creates cells to do specific jobs and when their jobs are done, they die. New cells take over.

Normal Growth:

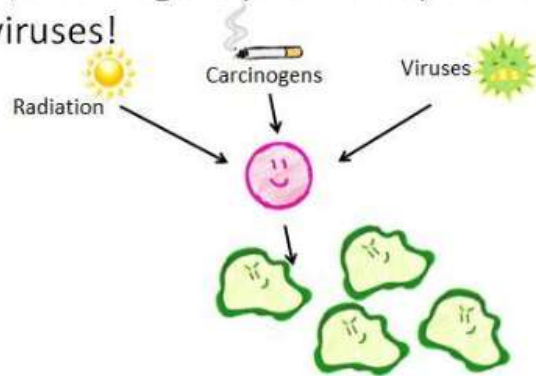


Multiple choice:

- Next ->

10) Assistment #345668 "345668 - mutation causes"

A genetic mutation can occur by mistake (when a cell is dividing), when it is exposed to certain substances or for unknown reasons. Some well known substances that can cause cancer are radiation, carcinogens (chemicals) and even certain viruses!



*Note that a few "special" viruses have the ability to potentially cause cancer **NOT** all viruses. **Cancer is NOT contagious!**

Multiple choice:

Next ->

11) Assistent #349982 "349982 - For example, a co..."

A common source of radiation is the sun and a common carcinogen is cigarette smoke. Any of these things can damage your DNA and potentially cause cancer no matter how strong or young or old you are.



*Note that a few "special" viruses have the ability to potentially cause cancer NOT all viruses. Cancer is NOT contagious!

Multiple choice:

✓ Next ->

12) Assistent #305164 "305164 - What is Cancer"

14) Assistment #342796 "342796 - When to See the Doctor Question"

So.....what can you do?



SPEAK UP!

You're in the driver's seat of your own health,
but your doc is the co-pilot!

Quick... when should you see your doc?

Multiple choice:

- Whenever you feel like having someone hit your knees Once a year When you need a physical for work, sports, etc. Once a year or whenever you think something's up ("abnormal" health for 14+ days)

15) Assistment #342813 "342813 - What Do You Do Once You're There Question"

Quick Quiz

So what should you do once you're actually
talking to your doctor?

Multiple choice:

- Let him/her decide and find whatever is wrong Voice your thoughts or concerns clearly Get in and out and on with your life

16) Assistment #342814 "342814 - Taking Charge"

Yes! Whenever you notice something strange happening with your body, make a note or take a picture on your phone with the date and a reminder to check again in two weeks. If it is still bothering you, get it checked. This is a great way to take charge of your health...your life!



Multiple choice:

✓ Next

17) Assistment #342807 "342807 - checklist"

Checklist for Going to the Doctor's

The image shows a yellow sticky note with handwritten text on a brown background. The text is organized into two sections: 'Have On Hand:' and 'Have On Your Phone:'. The 'Have On Hand' section lists 'ID (license, school ID, permit, etc)', 'Insurance Card', and 'Money'. The 'Have On Your Phone' section lists 'Any symptom that has lasted 2+ weeks' and 'Dates, pictures, etc.'.

Have On Hand:

- ID (license, school ID, permit, etc)
- Insurance Card
- Money

Have On Your Phone:

- Any symptom that has lasted 2+ weeks
- Dates, pictures, etc.

Multiple choice:

✓ Next ->

18) Assistment #339273 "339273 - Spongebob: Doctors are Horrible"

Going to the Doctor...

Here's what our resident doctor expert, Patrick Star, has to say on the topic:

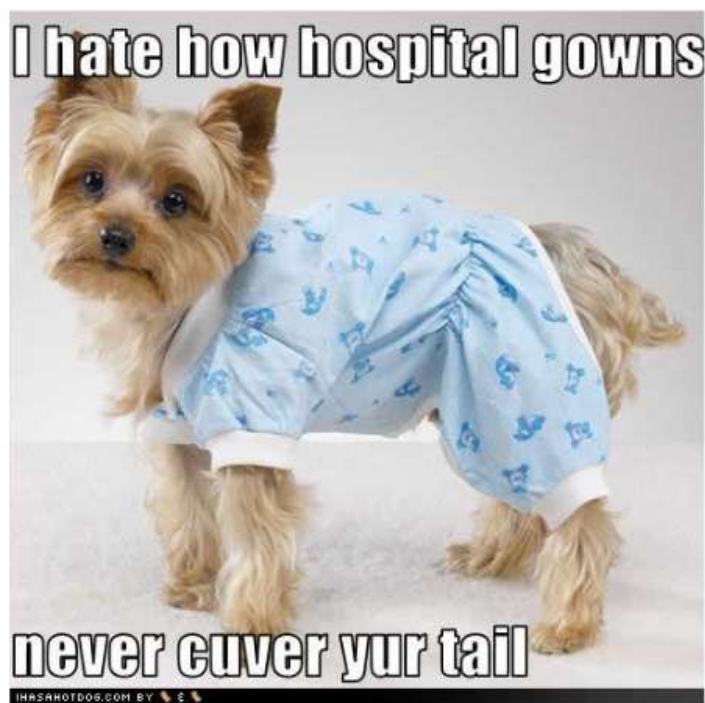
Don't let someone else's silly ideas stop you from going to the doctor. Going or not can potentially be lifechanging...

Multiple choice:

✓ Next ->

19) Assistment #342424 "342424 - "Solutions" to least favorite"

Yeah, but the "best" part is probably that paper smock thing that they make you wear...



Multiple choice:

✓ Next

20) Assistment #345618 "345618 - Appointment"

If making the appointment is your tough spot, then:

- **Ask your parents to help you schedule an appointment!**
- **Keep your doctor's office number in your cell phone so you always know the number.**

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"I'd like to make an appointment for a physical.
It's been seven years."

Multiple choice:

✓ Next ->

21) Assistment #345616 "345616 - waiting room"

If you get bored out of your mind, there isn't much we can do about that...

- **Download a couple games right before you go**
- **Bring your homework or a book**
- **Ask a sibling or friend to come along**



Multiple choice:

- ✓ Next ->

22) Assistment #345619 "345619 - embarrassed"

If you find it embarrassing that's fine (and perfectly normal):

- Don't be embarrassed! Try to get comfortable with talking about your body.
- Your doctor has seen everything, 7 days a week and twice on Sunday.



Embarrassed

Multiple choice:

- ✓ Next ->

23) Assistment #345671 "345671 - Know Your Normal (Step 1 of what you can do)"

Step 1:

Know Your “Normal”

Your “normal” is your regular body pattern. This is something you know better than anyone in the world!



What kinds of things do you think your “normal” includes?

Multiple choice:

- Your weight Your typical sleep patterns Your normal energy level The way your skin normally looks and feels (moles, freckles etc.) Strange, subtle pains (not because you slipped on a banana peel!) All of the above

24) Assistment #345672 "345672 - Two Weeks is Key (Step 2 of what you can do)"

Step2:

Right, but you have to pay attention to what your body tells you!

For example, if you notice any changes (remember CAUTION!) in your health that don't go away in **two weeks**, or that get a little worse every day, your body could be telling you that something is wrong. So go see your doctor and get yourself checked out.



Multiple choice:

- Sounds good

25) Assistent #342690 "342690 - Dancer"

Story of a Dancer

What do you think **she could have done** to save her dream of dancing?

Multiple choice:

- She should have gone to the doctor 14 days after her health changed and didn't return to her "normal"
- She should have eaten a more balanced diet of antioxidant rich fruits and veggies
- She should have discontinued her tanning bed usage...because ther is no such thing as a "healthy tan"

Appendix III: Test Versions One and Two

Version 1

Assistment - Printing Content

<http://www.assistments.org/build/print/sequence/60575?mode=de...>

Problem Set "Test Version 1" id:[60575]

1) Assistment #346993 "346993 - Pre Test - How old are you?"

How old are you?

Multiple choice:

13 14 15 16 17 18 Other

2) Assistment #346992 "346992 - Pre Test - What is your gender?"

What is your gender?

Multiple choice:

Female Male

3) Assistment #347091 "347091 - Pre Test - How likely would you be to go to the doctor?"

How likely would you be to go to the doctor after you noticed a change in your health (unusually tired, change in mole, lump etc.) had lasted for 2 weeks?

Multiple choice:

Very likely Likely Not sure Unlikely Very unlikely

4) Assistment #342684 "342684 - So What is Cancer?"

So...what IS cancer?

Well....

That's kind of a big question.

so let's start small

Multiple choice:

Let's do this!

5) Assistment #342760 "342760 - This is your body"

This is your body (if you look like a bad cartoon)

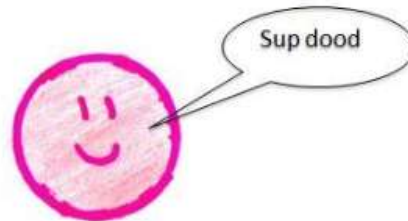


Multiple choice:

- ✓ Sir yes sir ✓ I'm a lady... ✓ Why Is my hair pointy?

6) Assistment #342762 "342762 - This is a Cell"

And **THIS** is a cell



Your **body** is made of water and trillions of **cells** like these

Each one of your **cells** has a specific job to do to keep you healthy

Multiple choice:

✓ Don't call me "dood." I'm a LADY ✓ Got it

7) Assistment #345669 "345669 - number of cells"

Your cells have lots of jobs to do...so many that your body is made up of somewhere between 60 and 90 TRILLION cells*, if you lined them up end to end they could encircle the earth 4.5 times!



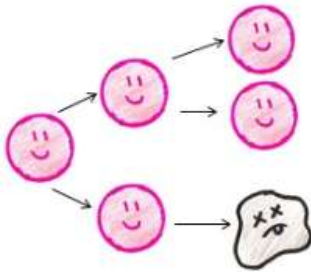
*There are varying estimates of just how many cells make up the human body.

Multiple choice:

✓ Wow! ✓ Next ->

8) Assistent #345667 "345667 - "Normal" Division"

Normal body cells grow, divide, and die in a very **controlled** way. Cancer cells grow and divide, **uncontrolled**. They also outlive normal cells and continue to form new cancer cells. Your body creates cells to do specific jobs and when their jobs are done, they die. New cells take over.

Normal Growth:**Multiple choice:**

✓ Next ->

9) Assistent #350823 "350823 - Cells Not Doing Their Jobs"

Sometimes cells stop doing the job they are supposed to do because the instructions they receive from your body are incomplete or inaccurate. These cells create new jobs for themselves.



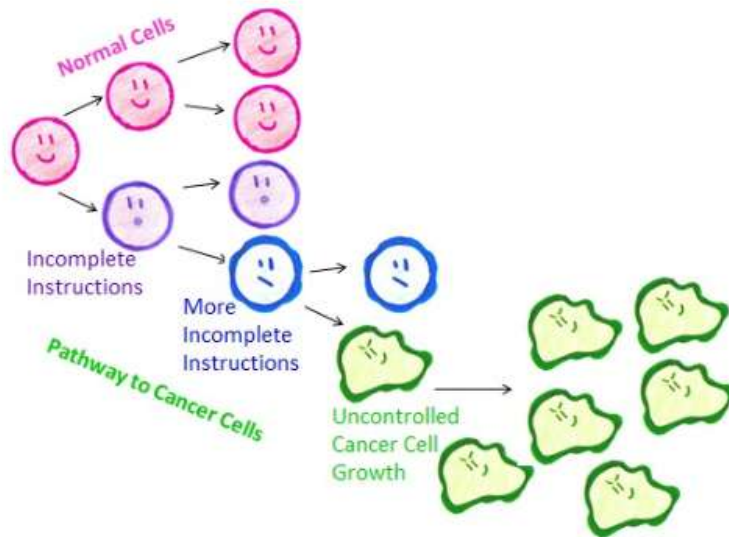
This typically results in disease, and one possible disease is cancer.

Multiple choice:

✓ Next ->

10) Assistent #360053 "360053 - "Cancer" Cell Division"

Take a look at this comparison. The pink cells show normal growth, while the bottom half depicts how cells can grow and divide in unplanned ways.



Multiple choice:

✓ Next ->

11) Assistent #342765 "342765 - cancer video"

Watch how uncontrolled cell growth causes cancer:

Multiple choice:

✓ Next ->

12) Assistment #342763 "342763 - Body with the Wrong Number of Cells"

So, now you know **cancer is a group of diseases with a common trait - cells growing and spreading out of control...**

This guy could have cancer, sometimes you just can't tell from the outside



If these cells spread throughout your body, cancer becomes life-threatening because it takes over your healthy cells and your body can no longer do all the things needed to keep you healthy.

Multiple choice:

I can definitely tell he has cancer He definitely does not have cancer Impossible to tell...

13) Assistment #360068 "360068 - Early Warning Signs I"

How might your body tell you something's not right?



Multiple choice:

CAUTION!!!

14) Assistment #360070 "360070 - CAUTION"

Change in mole or skin - A mole with irregular shapes, colors or borders. Skin that has a change in texture, itching or oozing.

Abnormal discharge from any external opening in your body.

Unilateral pain and swelling in one knee or shoulder but not the other

Tumor / bulge / bump / lump anywhere

Increasing lymph gland - Swollen lymph nodes may be felt in and around your head/neck area, groin, and armpit.

Obstinate fatigue, lethargy - Feeling tired most of the time and your energy does not seem to come back.

Neurologic deficit - A decrease in brain, spinal cord, muscle, or nerve function such as numbness or tingling, loss of balance, weakness, visual changes, or epic headache.

Multiple choice:

Next ->

15) Assistment #360069 "360069 - Early Warning Signs II "

Often, early warning signs **don't** land you in the Emergency Room. Early red flags of cancer can be subtle changes in your normal health.

Multiple choice:

Next ->

16) Assistment #366759 "366759 - Testimonials 2.0 "



Alex
Testicular Cancer

"I had a lump that didn't used to be there."



Stephanie
Thyroid Cancer

"I was getting so tired and was gaining weight."

"I had double visi

You know you better than anyone else. Pay attention!



Dav
Bra

"One of my moles looked weird."



Jen
Melanoma- Deadliest form of skin cancer



Laurel
Bone Cancer

"M out son

Multiple choice:
 Next ->

17) Assistment #342782 "342782 - Survival Rates I"

During the past 25-30 years cancer survival rates for teens to adults (up to age 40) have:



Multiple choice:

Increased 30% Basically stayed the same Increased 50% Decreased by 20%

18) Assistment #360076 "360076 - Survival Rates II"

One reason cancer survival rates for 15-40 year olds haven't gotten much better is delayed diagnosis. Some things that contribute to a delay in diagnosis are:

- Feeling invincible
- Believing that cancer only happens to other people
- Not knowing what early warning signs can look and feel like
- Ignoring subtle changes in your health that last up to 2 weeks
- Not speaking up to your doctor



Multiple choice:

Next ->

19) Assistment #345671 "345671 - Know Your Normal (Step 1 of what you can do)"

Step 1:

Know Your "Normal"

Your "normal" is your regular body pattern. This is something you know better than anyone in the world!



What kinds of things do you think your "normal" includes?

Multiple choice:

- Your weight Your typical sleep patterns Your normal energy level The way your skin normally looks and feels (moles, freckles etc.) Strange, subtle pains (not caused by slipping on a banana peel!) All of the above

20) Assistment #345672 "345672 - Two Weeks is Key (Step 2 of what you can do)"

Step 2:

Right, but you have to pay attention to what your body tells you!

For example, if you notice any changes (remember CAUTION!) in your health that don't go away in **two weeks**, or that get a little worse every day, your body could be telling you that something is wrong. So go see your doctor and get yourself checked out.



Multiple choice:
 Sounds good

21) Assistment #342796 "342796 - When to See the Doctor Question"

So.....what can you do?



SPEAK UP!

You're in the driver's seat of your own health,
but your doc is the co-pilot!

Quick... when should you see your doc?

Multiple choice:
 Whenever you feel like having someone hit your knees Once a year When you need a

physical for work, sports, etc. Once a year or whenever you think something's up ("abnormal" health for 14+ days)

22) Assistment #342813 "342813 - What Do You Do Once You're There Question"

Quick Quiz

So what should you do once you're actually talking to your doctor?

Multiple choice:

Let him/her decide and find whatever is wrong Voice your thoughts or concerns clearly Get in and out and on with your life

23) Assistment #342814 "342814 - Taking Charge"

Yes! Whenever you notice something strange happening with your body, make a note or take a picture on your phone with the date and a reminder to check again in two weeks. If it is still bothering you, get it checked. This is a great way to take charge of your health...your life!



Multiple choice:

Next

24) Assistment #365451 "365451 - Ending Video"

`<iframe width="560" height="315" src="http://www.youtube.com/embed/NSNGh_kXfBQ" frameborder="0" allowfullscreen></iframe>`

Multiple choice:

Done

25) Assistment #366888 "366888 - Post Test - Go to the doctor?"

What would you do if your left knee swelled up and didn't get better for 16 days?

Multiple choice:

Put ice on it Get it checked out Tough it out Take some pain meds Wear a knee

brace

26) Assistment #366901 "366901 - Post Test - What can you do?"

What can you do to increase cancer survival rates in your age group (15 to 40 year-old age group)?

Ungraded open response:

- ✓ Speak up to your doctor
 - ✓ Taking note of subtle changes in your health that last up to 2 weeks
 - ✓ Know what early warning signs can look and feel like
 - ✓ Realize that you aren't invincible – cancer can happen to anyone
-

27) Assistment #366862 "366862 - Post Test - How likely are you to share what you learned?"

How likely are you to share what you learned today about early detection with friends or family?

Multiple choice:

- ✓ Very likely
 - ✓ Likely
 - ✓ Not sure
 - ✓ Unlikely
 - ✓ Very unlikely
-

28) Assistment #366908 "366908 - Post Test - Do you think you learned?"

In three sentences, how would you explain to a friend what you have learned here?

Ungraded open response:

Problem Set "Test Version 2" id:[74394]

1) Assistent #346993 "346993 - Pre Test - How old are you?"

How old are you?

Multiple choice:

- 13 14 15 16 17 18 Other

2) Assistent #346992 "346992 - Pre Test - What is your gender?"

What is your gender?

Multiple choice:

- Female Male

3) Assistent #347091 "347091 - Pre Test - How likely would you be to go to the doctor?"

How likely would you be to go to the doctor after you noticed a change in your health (unusually tired, change in mole, lump etc.) had lasted for 2 weeks?

Multiple choice:

- Very likely Likely Not sure Unlikely Very unlikely

4) Assistent #342684 "342684 - So What is Cancer?"

So....what IS cancer?

Well....

That's kind of a big question.

so let's start small

Multiple choice:

- Let's do this!

5) Assistent #342760 "342760 - This is your body"

This is your body (if you look like a bad cartoon)

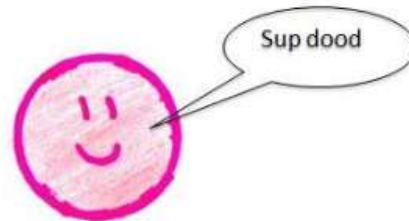


Multiple choice:

- ✓ Sir yes sir ✓ I'm a lady... ✓ Why Is my hair pointy?

6) Assistment #342762 "342762 - This is a Cell"

And **THIS** is a cell



Your **body** is made of water and trillions of **cells** like these

Each one of your **cells** has a specific job to do to keep you healthy

Multiple choice:

Don't call me "dood." I'm a LADY Got it

7) Assistment #364201 "364201 - This is a Cell Question"

[Here is a question for you.](#)

True or false.

Cells have to multi-task - do several different jobs at once - in order to keep you healthy.

Multiple choice:

False True

Scaffold:

THIS is a cell



Your **body** is made of water and trillions of **cells** like these

Each one of your **cells** has a specific job to do to keep you healthy

Multiple choice:

✓ OK I am ready to answer the question again.

Scaffold:

[Try this again.](#)

True or false.

Cells have to multi-task - do several different jobs at once - in order to keep you healthy.

Multiple choice:

✓ False ✗ True

Hints:

- Select this answer:
False. (Cells have individual and specific jobs in order to keep you healthy.)

8) Assistment #345669 "345669 - number of cells"

Your cells have lots of jobs to do...so many that your body is made up of somewhere between 60 and 90 TRILLION cells*, if you lined them up end to end they could encircle the earth 4.5 times!



*There are varying estimates of just how many cells make up the human body.

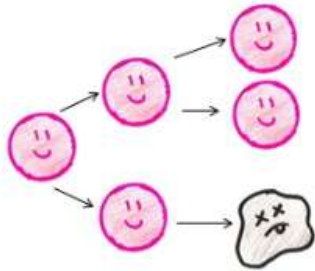
Multiple choice:

✓ Wow! ✓ Next ->

9) Assistment #345667 "Normal" Division"

Normal body cells grow, divide, and die in a very **controlled** way. **Cancer cells grow and divide, uncontrolled.** They also outlive normal cells and continue to form new cancer cells. Your body creates cells to do specific jobs and when their jobs are done, they die. New cells take over.

Normal Growth:



Multiple choice:

Next ->

10) Assistment #364171 "364171 - "Normal" Division Question"

Here is a question for you.

Select the statements that are **true** about **NORMAL** cells.



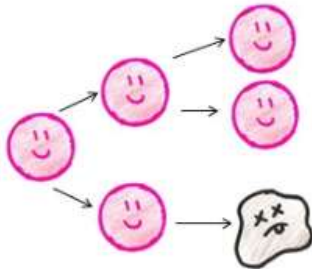
Check all that apply:

- Normal cells live longer than cancer cells
- Normal cells die quickly
- Normal cells divide and die in a very controlled way.
- Normal cells grow out of control
- Normal cells die more quickly than cancer cells

Scaffold:

Normal body cells grow, divide, and die in a very **controlled** way. **Cancer cells** grow and divide, **uncontrolled**. They also outlive normal cells and continue to form new cancer cells. Your body creates cells to do specific jobs and when their jobs are done, they die. New cells take over.

Normal Growth:



Multiple choice:

OK I am ready to answer the question again.

Scaffold:

Okay, try this again.

Select the statements that are **true** about **NORMAL** cells.

Check all that apply:

Normal cells live longer than cancer cells Normal cells die quickly Normal cells divide and die in a very controlled way. Normal cells grow out of control Normal cells die more quickly than cancer cells

Hints:

- Select both these answers:

Normal cells die more quickly than cancer cells and
Normal cells divide and die in a very controlled way

11) Assistment #350823 "350823 - Cells Not Doing Their Jobs"

Sometimes cells stop doing the job they are supposed to do because the instructions they receive from your body are incomplete or inaccurate. These cells create new jobs for themselves.



This typically results in disease, and one possible disease is cancer.

Multiple choice:

Next ->

12) Assistment #364202 "364202 - Cells Not Doing Their Jobs Question"

Here is a question for you.

Why might your cells create new jobs for themselves, resulting in a disease such as **cancer**?

Check all that apply:

Cells get bored Cells get tired and give up The instructions cells receive from your body are incomplete or inaccurate There aren't enough instructions to go around

Scaffold:

Sometimes cells stop doing the job they are supposed to do because the instructions they receive from your body are incomplete or inaccurate. These cells create new jobs for themselves.



This typically results in disease, and one possible disease is cancer.

Multiple choice:

OK I am ready to answer the question again.

Scaffold:

[Try this again.](#)

Why might your cells create new jobs for themselves, resulting in a disease such as **cancer**?

Check all that apply:

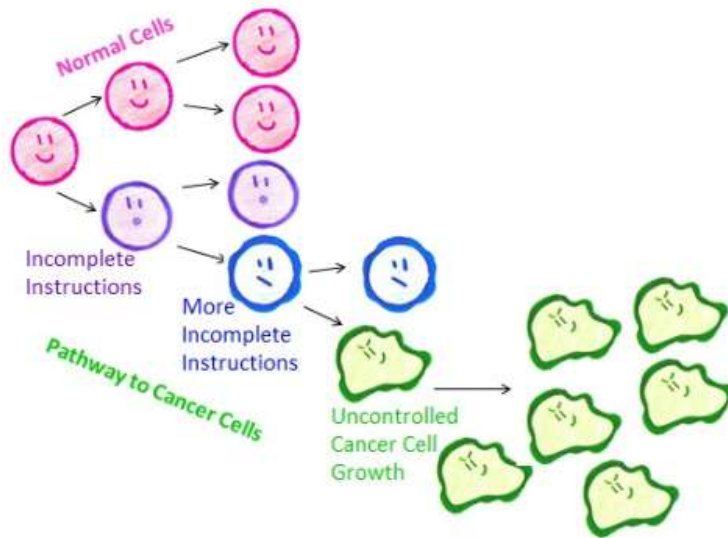
Cells get bored Cells get tired and give up The instructions cells receive from your body are incomplete or inaccurate There aren't enough instructions to go around

Hints:

- Select this answer:
[The instructions cells receive from your body are incomplete or inaccurate](#)

13) Assistent #360053 "360053 - "Cancer" Cell Division"

Take a look at this comparison. The **pink** cells show normal growth, while the bottom half depicts how cells can **grow and divide in unplanned ways.**



Multiple choice:

✓ Next ->

14) Assistent #364188 "364188 - "Cancer" Cell Division Question"

[Here is a question for you.](#)

Select the statements that are true about **Cancer** cells.

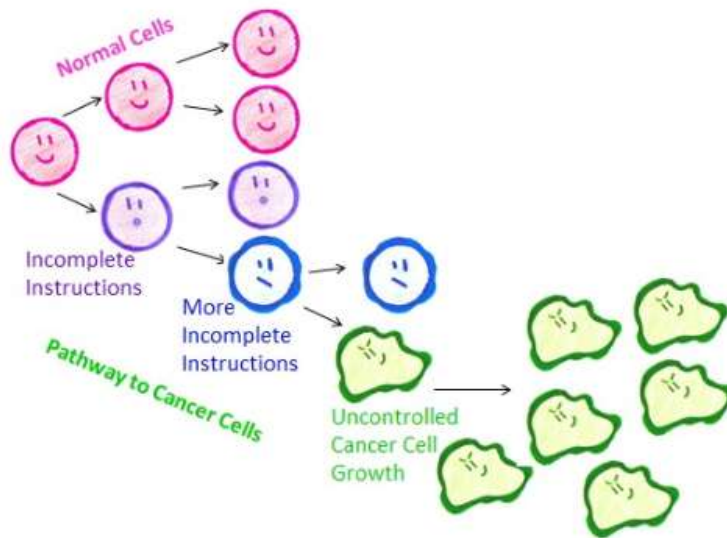


Check all that apply:

- ✓ Cancer cells live longer than normal cells
- ✗ Cancer cells die quickly
- ✗ Cancer cells divide and die in a very controlled way.
- ✓ Cancer cells grow out of control
- ✗ Cancer cells die more quickly than normal cells

Scaffold:

Take a look at this comparison. The **pink** cells show normal growth, while the bottom half depicts how cells can **grow and divide in unplanned** ways. Normal body cells grow, divide, and die in a very **controlled** way. **Cancer cells grow and divide, uncontrolled.** They also outlive normal cells and continue to form new cancer cells. Your body creates cells to do specific jobs and when their jobs are done, they die. New cells take over.



Multiple choice:

- OK I am ready to answer the question again.

Scaffold:

[Try this again.](#)

Select the statements that are **true** about **Cancer** cells.

Check all that apply:

- Cancer cells live longer than normal cells
- Cancer cells grow out of control
- Cancer cells die quickly
- Cancer cells divide and die in a very controlled way.
- Cancer cells die more quickly than normal cells

Hints:

- Select both these answers:

Cancer cells live longer than normal cells and
Cancer cells grow out of control

15) Assistent #342765 "342765 - cancer video"

[Watch how uncontrolled cell growth causes cancer:](#)

Multiple choice:

✓ Next ->

16) Assistment #342763 "342763 - Body with the Wrong Number of Cells"

So, now you know **cancer is a group of diseases with a common trait - cells growing and spreading out of control...**

This guy could have cancer, sometimes you **just can't tell from the outside**



If these cells spread throughout your body, cancer becomes life-threatening because it takes over your healthy cells and your body can no longer do all the things needed to keep you healthy.

Multiple choice:

I can definitely tell he has cancer He definitely does not have cancer Impossible to tell...

17) Assistment #360068 "360068 - Early Warning Signs I"

How might your body tell you something's not right?



Multiple choice:

CAUTION!!!

18) Assistment #360070 "360070 - CAUTION"

C hange in mole or skin - A mole with irregular shapes, colors or borders. Skin that has a change in texture, itching or oozing.

A bnormal discharge from any external opening in your body.

U nilateral pain and swelling in one knee or shoulder but not the other

T umor / bulge / bump / lump anywhere

I ncreasing lymph gland - Swollen lymph nodes may be felt in and around your head/neck area, groin, and armpit.

O bstinate fatigue, lethargy - Feeling tired most of the time and your energy does not seem to come back.

N eurologic deficit - A decrease in brain, spinal cord, muscle, or nerve function such as numbness or tingling, loss of balance, weakness, visual changes, or epic headache.

Multiple choice:

Next ->

19) Assistment #364377 "364377 - CAUTION Question"

Here is a question for you.

How does CAUTION help you?

Multiple choice:

It lets you know the ways your body can tell you that something is wrong It tells you to be cautious It lets you know that you that you have cancer It lets your body know how to act when there is something wrong It helps you remember something...

Scaffold:

C hange in mole or skin - A mole with irregular shapes, colors or borders. Skin that has a change in texture, itching or oozing.

A bnormal discharge from any external opening in your body.

U nilateral pain and swelling in one knee or shoulder but not the other

T umor / bulge / bump / lump anywhere

I ncreasing lymph gland - Swollen lymph nodes may be felt in and around your head/neck area, groin, and armpit.

Obstinate fatigue, lethargy - Feeling tired most of the time and your energy does not seem to come back.

Neurologic deficit - A decrease in brain, spinal cord, muscle, or nerve function such as numbness or tingling, loss of balance, weakness, visual changes, or epic headache.

Multiple choice:

OK I am ready to answer the question again.

Scaffold:

[Try this again.](#)

How does CAUTION help you?

Check all that apply:

It lets you know the ways your body can tell you that something is wrong It helps you remember something... It lets you know that you that you have cancer It lets your body know how to act when there is something wrong It tells you to be cautious

Hints:

- Select this answer:

[It lets you know the ways your body can tell you that something is wrong](#)

20) Assistment #360069 "360069 - Early Warning Signs II "

Often, early warning signs **don't** land you in the Emergency Room. Early red flags of cancer can be subtle changes in your normal health.

Multiple choice:

Next ->

21) Assistment #364380 "364380 - Early Warning Signs II Question"

[Here is a question for you.](#)

What best describes early warning signs of cancer?

Check all that apply:

Early warning signs can be subtle changes in your normal health Early warning signs are going to land you in the Emergency Room Early warning signs are anything but subtle Early warning signs are easy to discover

Scaffold:

Often, early warning signs **don't** land you in the Emergency Room. Early red flags of cancer can be subtle changes in your normal health.

Multiple choice:

OK I am ready to answer the question again.

Scaffold:

[Try this again.](#)

What best describes early warning signs of cancer?

Check all that apply:

Early warning signs are anything but subtle Early warning signs are easy to discover

Early warning signs are going to land you in the Emergency Room Early warning signs can be subtle changes in your normal health

Hints:

- Select both these answers:

Early warning signs can be subtle changes in your normal health

22) Assistment #366759 "366759 - Testimonials 2.0 "



Alex
Testicular Cancer

"I had a lump that didn't used to be there."



Stephanie
Thyroid Cancer

"I was getting so tired and was gaining weight."

"I had double visi

You know you better than anyone else. Pay attention!



Dav
Bra

"One of my moles looked weird."



Jen
Melanoma- Deadliest form of skin cancer



Laurel
Bone Cancer

"M
out
son

Multiple choice:

Next ->

23) Assistment #366760 "366760 - Testimonials 2.0 Question"

Here is a question for you.

What do these stories have in common?

Check all that apply:

- All are young people with cancer
- All had subtle early warning signs
- All lived near a nuclear power plant
- All knew they had cancer from the start
- All knew about CAUTION

Scaffold:



Alex
Testicular Cancer

"I had a lump that didn't used to be there."



Stephanie
Thyroid Cancer

"I was getting so tired and was gaining weight."

"I had double vis

You know you better than anyone else. Pay attention!



Da
Br

"One of my moles looked weird."



Jen
Melanoma- Deadliest form of skin cancer



Laurel
Bone Cancer

"M
ou
so

Multiple choice:

- ✓ OK I am ready to answer the question again.

Scaffold:

Try this again.

What do these stories have in common?

Check all that apply:

- ✓ All are young people with cancer
- ✓ All had subtle early warning signs
- ✗ All knew about CAUTION
- ✗ All knew they had cancer from the start
- ✗ All lived near a nuclear power plant

Hints:

- Select both these answers:

All had subtle early warning signs and
All are young people with cancer

24) Assistment #342782 "342782 - Survival Rates I"

During the past 25-30 years cancer survival rates
for teens to adults (up to age 40) have:



Multiple choice:

Increased 30% Basically stayed the same Increased 50% Decreased by 20%

25) Assistment #360076 "360076 - Survival Rates II"

One reason cancer survival rates for 15-40 year olds haven't gotten much better is
delayed diagnosis. Some things that contribute to a delay in diagnosis are:

- Feeling invincible
- Believing that cancer only happens to other people
- Not knowing what early warning signs can look and feel like
- Ignoring subtle changes in your health that last up to 2 weeks
- Not speaking up to your doctor



Multiple choice:

✓ Next ->

26) Assistment #364382 "364382 - Survival Rates II Question"

Here is a question for you.

What kinds of things contribute to a delay in cancer diagnosis?

Check all that apply:

✓ Not speaking up to your doctor ✓ Ignoring subtle changes in your health that last 2 weeks or more ✓ Not knowing what early warning signs can look and feel like ✓ Feeling invincible – cancer only happens to other people

Scaffold:

One reason cancer survival rates for 15-40 year olds haven't gotten much better is delayed diagnosis. Some things that contribute to a delay in diagnosis are:

- Feeling invincible – cancer only happens to other people
- Not knowing what early warning signs can look and feel like
- Ignoring subtle changes in your health that last up to 2 weeks
- Not speaking up to your doctor



Multiple choice:

✓ OK I am ready to answer the question again.

Scaffold:

Try this again.

What kinds of things contribute to a delay in cancer diagnosis?

Check all that apply:

- Feeling invincible – cancer only happens to other people
 Ignoring subtle changes in your health that last up to 2 weeks
 Not speaking up to your doctor
 Not knowing what early warning signs can look and feel like

Hints:

- Select all answers:
 Feeling invincible – cancer only happens to other people and
 Not knowing what early warning signs can look and feel like and
 Ignoring subtle changes in your health that last up to 2 weeks and
 Not speaking up to your doctor

27) Assistment #345671 "345671 - Know Your Normal (Step 1 of what you can do)"

Step 1:

Know Your "Normal"

Your "normal" is your regular body pattern. This is something you know better than anyone in the world!



What kinds of things do you think your "normal" includes?

Multiple choice:

- Your weight
 Your typical sleep patterns
 Your normal energy level
 The way your skin normally looks and feels (moles, freckles etc.)
 Strange, subtle pains (not caused by slipping on a banana peel!)
 All of the above

28) Assistment #345672 "345672 - Two Weeks is Key (Step 2 of what you can do)"

Step 2:

Right, but you have to pay attention to what your body tells you!

For example, if you notice any changes (remember CAUTION!) in your health that don't go away in two weeks, or that get a little worse every day, your body could be telling you that something is

wrong. So go see your doctor and get yourself checked out.



Multiple choice:

Sounds good

29) Assistment #342796 "342796 - When to See the Doctor Question"

So.....what can you do?



SPEAK UP!

You're in the driver's seat of your own health,
but your doc is the co-pilot!

Quick... when should you see your doc?

Multiple choice:

- Whenever you feel like having someone hit your knees Once a year When you need a physical for work, sports, etc. Once a year or whenever you think something's up ("abnormal" health for 14+ days)

30) Assistment #342813 "342813 - What Do You Do Once You're There Question"

Quick Quiz

So what should you do once you're actually
talking to your doctor?

Multiple choice:

- Let him/her decide and find whatever is wrong Voice your thoughts or concerns clearly Get in and out and on with your life

31) Assistment #342814 "342814 - Taking Charge"

Yes! Whenever you notice something strange happening with your body, make a note or take a picture on your phone with the date and a reminder to check again in two weeks. If it is still bothering you, get it checked. This is a great way to take charge of your health...your life!



Multiple choice:

- Next

32) Assistment #364383 "364383 - Taking Charge Question"

Here is a question for you.

How can you keep tabs on your health?

Check all that apply:

- If you notice something "strange" make a note or take a picture on your phone with the date. If you notice something "strange" set a reminder to check yourself again in two weeks. If it is still bothering you, get it checked. If you notice something "strange" just ignore it. If you notice something "strange" keep it to yourself

Scaffold:

Yes! Whenever you notice something strange happening with your body, make a note or take a picture on your phone with the date and a reminder to check again in two weeks. If it is still bothering you, get it checked. This is a great way to take charge of your health...your life!



Multiple choice:

- OK I am ready to answer the question again.

Scaffold:

Try this again.

How can you keep tabs on your health?

Check all that apply:

If you notice something "strange" set a reminder to check yourself again in two weeks. If it is still bothering you, get it checked. If you notice something "strange" just ignore it. If you notice something "strange" keep it to yourself If you notice something "strange" make a note or take a picture on your phone with the date and check yourself again in two weeks. If it is still bothering you, get it checked.

Hints:

- Select both these answers:
 If you notice something "strange" set a reminder to check yourself again in two weeks. If it is still bothering you, get it checked and
 If you notice something "strange" make a note or take a picture on your phone with the date and check yourself again in two weeks. If it is still bothering you, get it checked

33) Assistment #365451 "365451 - Ending Video"

<iframe width="560" height="315" src="http://www.youtube.com/embed/NSNGh_kXfBQ" frameborder="0" allowfullscreen></iframe>

Multiple choice:

Done

34) Assistment #366888 "366888 - Post Test - Go to the doctor?"

What would you do if your left knee swelled up and didn't get better for 16 days?

Multiple choice:

Put ice on it Get it checked out Tough it out Take some pain meds Wear a knee brace

35) Assistment #366901 "366901 - Post Test - What can you do?"

What can you do to increase cancer survival rates in your age group (15 to 40 year-old age group)?

Ungraded open response:

Speak up to your doctor Taking note of subtle changes in your health that last up to 2 weeks
 Know what early warning signs can look and feel like Realize that you aren't invincible – cancer can happen to anyone

36) Assistment #366862 "366862 - Post Test - How likely are you to share what you learned?"

How likely are you to share what you learned today about early detection with friends or family?

Multiple choice:

Very likely Likely Not sure Unlikely Very unlikely

37) Assistment #366908 "366908 - Post Test - Do you think you learned?"

In three sentences, how would you explain to a friend what you have learned here?

Ungraded open response:

Appendix IV: The Study

Problem Set "15-40 and ASSISTments" id:194249

1) Assistent #382068 "382068 - Intro to study "

This assignment is about early cancer detection.

There will be some initial questions about your previous knowledge before we start.
At the end you will be given some follow up questions to answer.



Multiple choice:

Next ->

2) Assistent #346992 "346992 - Pre Test - What is your gender?"

What is your gender?

Multiple choice:

Female Male

3) Assistent #346993 "346993 - Pre Test - How old are you?"

How old are you?

Multiple choice:

13 14 15 16 17 18 Other

4) Assistent #347091 "347091 - Pre Test - How likely would you be to go to the doctor?"

How likely would you be to go to the doctor after you noticed a change in your health (unusually tired, change in mole, lump etc.) had lasted for 2 weeks?

Multiple choice:

Very likely Likely Not sure Unlikely Very unlikely

5) Assistent #382069 "382069 - Test - What is cancer?"

What is cancer?

Multiple choice:

Uncontrolled cell growth I'm not sure A tumor A zodiac symbol

6) Assistent #382071 "382071 - Test - Who gets cancer?"

Who gets cancer? (select ALL that apply)

Check all that apply:

Young Adults Teens I'm not sure Little kids Old people

7) Assistent #382074 "382074 - Test - Early warning signs?"

Do you think early warning signs of cancer are usually subtle, or something that will land you in the ER?

Multiple choice:

Subtle symptoms ER visit I'm not sure

8) Assistent #366888 "366888 - Post Test - Go to the doctor?"

What would you do if your left knee swelled up and didn't get better for 16 days?

Multiple choice:

Put ice on it Get it checked out Tough it out Take some pain meds Wear a knee brace

9) Assistent #342684 "342684 - So What is Cancer?"

So...what IS cancer?

Well....

That's kind of a big question.

so let's start small

Multiple choice:

Let's do this!

10) Assistent #342760 "This is your body"

This is your body
(if you look like a bad cartoon)

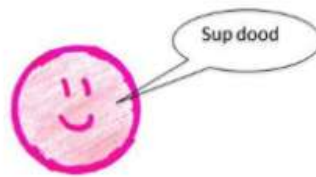


Multiple choice:

Sir yes sir I'm a lady... Why Is my hair pointy?

11) Assistent #342762 "This is a Cell"

And **THIS** is a cell



Your **body** is made of water and trillions of **cells** like these

Each one of your **cells** has a specific job to do to keep you healthy

Multiple choice:

Don't call me "dood." I'm a LADY Got it

12) Assistent #345669 "345669 - number of cells"

Your cells have lots of jobs to do...so many that your body is made up of somewhere between 60 and 90 TRILLION cells*, if you lined them up end to end they could encircle the earth 4.5 times!



*there are varying estimates of just how many cells make up the human body.

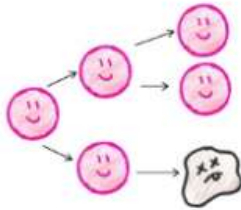
Multiple choice:

Wow! Next ->

13) Assistent #345667 "345667 - "Normal" Division"

Normal body cells grow, divide, and die in a very **controlled** way. **Cancer cells grow and divide, uncontrolled.** They also outlive normal cells and continue to form new cancer cells. Your body creates cells to do specific jobs and when their jobs are done, they die. New cells take over.

Normal Growth:



Multiple choice:

✓ Next ->

14) Assistent #350823 "Cells Not Doing Their Jobs"

Sometimes cells stop doing the job they are supposed to do because the instructions they receive from your body are incomplete or inaccurate. These cells create new jobs for themselves.



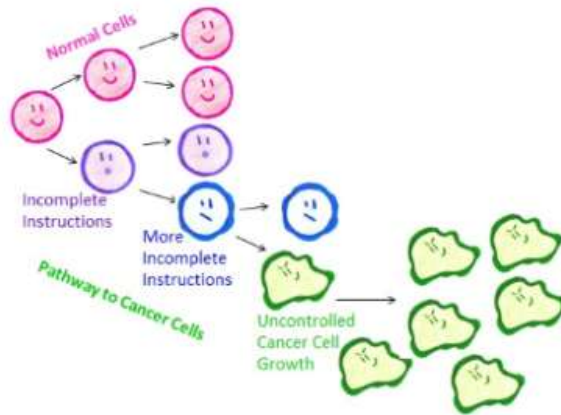
This typically results in disease, and one possible disease is cancer.

Multiple choice:

✓ Next ->

15) Assistent #360053 "Cancer" Cell Division

Take a look at this comparison. The pink cells show normal growth, while the bottom half depicts how cells can grow and divide in unplanned ways.



Multiple choice:

✓ Next ->

16) Assistent #342765 "342765 - cancer video"

[Watch how uncontrolled cell growth causes cancer:](#)

Multiple choice:

✓ Next ->

17) Assistent #342763 "342763 - Body with the Wrong Number of Cells"

So, now you know **cancer is a group of diseases with a common trait - cells growing and spreading out of control...**

This guy could have cancer, sometimes you just can't tell from the outside



If these cells spread throughout your body, cancer becomes life-threatening because it takes over your healthy cells and your body can no longer do all the things needed to keep you healthy.

Multiple choice:

- I can definitely tell he has cancer
- He definitely does not have cancer
- Impossible to tell...

18) Assistent #360068 "360068 - Early Warning Signs I"

How might your body tell you something's not right?



Multiple choice:

- CAUTION!!!

19) Assistent #360070 "360070 - CAUTION"

C hange in mole or skin - A mole with irregular shapes, colors or borders. Skin that has a change in texture, itching or oozing.

A bnormal discharge from any external opening in your body.

U nilateral pain and swelling in one knee or shoulder but not the other

T umor / bulge / bump / lump anywhere

I ncreasing lymph gland - Swollen lymph nodes may be felt in and around your head/neck area, groin, and armpit.

O bstinate fatigue, lethargy - Feeling tired most of the time and your energy does not seem to come back.

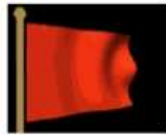
N eurologic deficit - A decrease in brain, spinal cord, muscle, or nerve function such as numbness or tingling, loss of balance, weakness, visual changes, or epic headache.

Multiple choice:

- Next ->

20) Assistent #360069 "360069 - Early Warning Signs II"

Often, early warning signs **don't** land you in the Emergency Room. Early red flags of cancer can be subtle changes in your normal health.



Multiple choice:

✓ Next ->

21) Assistent #366759 "366759 - Testimonials 2.0 "



Alex
Testicular Cancer

"I had a lump that didn't used to be there."



Stephanie
Thyroid Cancer

"I was getting so tired and was gaining weight."

"I had double vision."



David
Brain Cancer

You know you better than anyone else. Pay attention!

"One of my moles looked weird."



Jen
Melanoma- Deadliest form of skin cancer



Laurel
Bone Cancer

"My knee kept giving out and I just knew something was wrong."

Multiple choice:

✓ Next ->

22) Assistent #342782 "342782 - Survival Rates I"

During the past 25-30 years cancer survival rates for teens to adults (up to age 40) have:



Multiple choice:

Increased 50% Basically stayed the same Increased 50% Decreased by 20%

23) Assistent #360076 "360076 - Survival Rates II"

One reason cancer survival rates for 15-40 year olds haven't gotten much better is delayed diagnosis. Some things that contribute to a delay in diagnosis are:

- Feeling invincible
- Believing that cancer only happens to other people
- Not knowing what early warning signs can look and feel like
- Ignoring subtle changes in your health that last up to 2 weeks
- Not speaking up to your doctor



Multiple choice:

Next ->

24) Assistent #345671 "345671 - Know Your Normal (Step 1 of what you can do)"

[Step 1:](#)

Know Your "Normal"

Your "normal" is your regular body pattern. This is something you know better than anyone in the world!



What kinds of things do you think your "normal" includes?

Multiple choice:

- Your weight
 Your typical sleep patterns
 Your normal energy level
 The way your skin normally looks and feels (moles, freckles etc.)
 Strange, subtle pains (not caused by slipping on a banana peel!)
 All of the above

25) Assistent #345672 "345672 - Two Weeks is Key (Step 2 of what you can do)"

Step2:

Right, but you have to pay attention to what your body tells you!

For example, if you notice any changes (remember CAUTION!) in your health that don't go away in two weeks, or that get a little worse every day, your body could be telling you that something is wrong. So go see your doctor and get yourself checked out.



Multiple choice:

- Sounds good

26) Assistent #342796 "342796 - When to See the Doctor Question"

So.....what can you do?



SPEAK UP!

You're in the driver's seat of your own health,
but your doc is the co-pilot!

Quick... when should you see your doc?

Multiple choice:

- Whenever you feel like having someone hit your knees Once a year When you need a physical for work, sports, etc. Once a year or whenever you think something's up ("abnormal" health for 14+ days)

27) Assistent #342813 "342813 - What Do You Do Once You're There Question"

Quick Quiz

So what should you do once you're actually
talking to your doctor?

Multiple choice:

- Let him/her decide and find whatever is wrong Voice your thoughts or concerns clearly Get in and out and on with your life

28) Assistent #342814 "342814 - Taking Charge"

Yes! Whenever you notice something strange happening with your body, make a note or take a picture on your phone with the date and a reminder to check again in two weeks. If it is still bothering you, get it checked. This is a great way to take charge of your health...your life!



Multiple choice:

- Next

29) Assistent #382156 "382156 - Intro to tutorial"

You will want to pay close attention to the following tutorial because you will get "Questions for you" throughout.
It is OK to look at hints if you do not know the right answer this is about understanding cancer not a grade.

Multiple choice:

Okay

30) Duplicate assistment: Assistment #342684 "342684 - So What is Cancer?" was not displayed.

31) Duplicate assistment: Assistment #342760 "342760 - This is your body" was not displayed.

32) Duplicate assistment: Assistment #342762 "342762 - This is a Cell" was not displayed.

33) Assistment #364201 "364201 - This is a Cell Question"

[Here is a question for you.](#)

True or false.

Cells have to multi-task - do several different jobs at once - in order to keep you healthy.

Multiple choice:

False True

Scaffold:

THIS is a cell



Your body is made of water and trillions of cells like these

Each one of your cells has a specific job to do to keep you healthy

Multiple choice:

OK I am ready to answer the question again.

Scaffold:

[Try this again.](#)

True or false.

Cells have to multi-task - do several different jobs at once - in order to keep you healthy.

Multiple choice:

False True

Hints:

• Select this answer:

False. (Cells have individual and specific jobs in order to keep you healthy.)

34) Duplicate assistment: Assistment #345669 "345669 - number of cells" was not displayed.

35) Duplicate assistment: Assistment #345667 "345667 - "Normal" Division" was not displayed.

36) Assistment #364171 "364171 - "Normal" Division Question"

[Here is a question for you.](#)

Select the statements that are true about **NORMAL** cells.



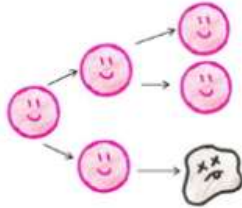
Check all that apply:

Normal cells live longer than cancer cells Normal cells die quickly Normal cells divide and die in a very controlled way. Normal cells grow out of control Normal cells die more quickly than cancer cells

Scaffold:

Normal body cells grow, divide, and die in a very **controlled** way. **Cancer cells** grow and divide, **uncontrolled**. They also outlive normal cells and continue to form new cancer cells. Your body creates cells to do specific jobs and when their jobs are done, they die. New cells take over.

Normal Growth:



Multiple choice:

OK I am ready to answer the question again.

Scaffold:

Okay, try this again.

Select the statements that are true about **NORMAL** cells.

Check all that apply:

- Normal cells live longer than cancer cells
- Normal cells die quickly
- Normal cells divide and die in a very controlled way.
- Normal cells grow out of control
- Normal cells die more quickly than cancer cells

Hints:

- Select both these answers:

Normal cells die more quickly than cancer cells and
 Normal cells divide and die in a in a very controlled way

37) Duplicate assistment: Assistment #350823 "350823 - Cells Not Doing Their Jobs" was not displayed.

38) Assistment #364202 "364202 - Cells Not Doing Their Jobs Question"

[Here is a question for you.](#)

Why might your cells **create new jobs for themselves**, resulting in a disease such as **cancer**?

Check all that apply:

- Cells get bored
- Cells get tired and give up
- The instructions cells receive from your body are incomplete or inaccurate
- There aren't enough instructions to go around

Scaffold:

Sometimes cells stop doing the job they are supposed to do because the instructions they receive from your body are incomplete or inaccurate. These cells create new jobs for themselves.



This typically results in disease, and one possible disease is cancer.

Multiple choice:

OK I am ready to answer the question again.

Scaffold:

[Try this again.](#)

Why might your cells create new jobs for themselves, resulting in a disease such as **cancer**?

Check all that apply:

- Cells get bored Cells get tired and give up The instructions cells receive from your body are incomplete or inaccurate There aren't enough instructions to go around

Hints:

- Select this answer:

The instructions cells receive from your body are incomplete or inaccurate

39) Duplicate assistment: Assistment #360053 "360053 - "Cancer" Cell Division" was not displayed.

40) Assistment #364188 "364188 - "Cancer" Cell Division Question"

[Here is a question for you.](#)

Select the statements that are true about **Cancer** cells.

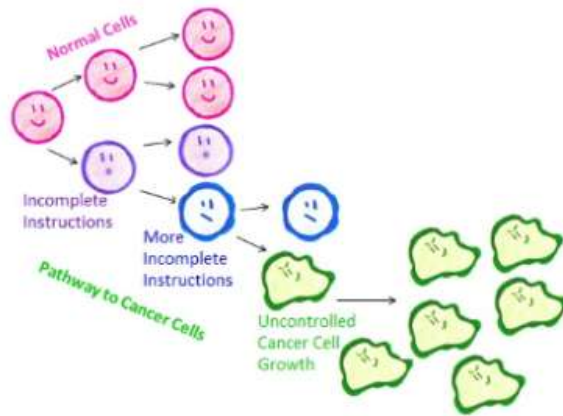


Check all that apply:

- Cancer cells live longer than normal cells Cancer cells die quickly Cancer cells divide and die in a very controlled way. Cancer cells grow out of control Cancer cells die more quickly than normal cells

Scaffold:

Take a look at this comparison. The pink cells show normal growth, while the bottom half depicts how cells can **grow and divide in unplanned ways**. Normal body cells grow, divide, and die in a very **controlled** way. **Cancer cells** grow and divide, **uncontrolled**. They also outlive normal cells and continue to form new cancer cells. Your body creates cells to do specific jobs and when their jobs are done, they die. New cells take over.



Multiple choice:

- OK I am ready to answer the question again.

Scaffold:

[Try this again.](#)

Select the statements that are true about **Cancer** cells.

Check all that apply:

- Cancer cells live longer than normal cells Cancer cells die quickly Cancer cells divide

and die in a very controlled way. Cancer cells grow out of control Cancer cells die more quickly than normal cells

Hints:

- Select both these answers:

Cancer cells live longer than normal cells and
Cancer cells grow out of control

41) Duplicate assistment: Assistment #342765 "342765 - cancer video" was not displayed.

42) Duplicate assistment: Assistment #342763 "342763 - Body with the Wrong Number of Cells" was not displayed.

43) Duplicate assistment: Assistment #360068 "360068 - Early Warning Signs I" was not displayed.

44) Duplicate assistment: Assistment #360070 "360070 - CAUTION" was not displayed.

45) Assistment #364377 "364377 - CAUTION Question"

[Here is a question for you.](#)

How does CAUTION help you?

Multiple choice:

- It lets you know the ways your body can tell you that something is wrong It tells you to be cautious It lets you know that you that you have cancer It lets your body know how to act when there is something wrong It helps you remember something...

Scaffold:

C hange in mole or skin - A mole with irregular shapes, colors or borders. Skin that has a change in texture, itching or oozing.

A bnormal discharge from any external opening in your body.

U nilateral pain and swelling in one knee or shoulder but not the other

T umor / bulge / bump / lump anywhere

I ncreasing lymph gland - Swollen lymph nodes may be felt in and around your head/neck area, groin, and armpit.

O bstinate fatigue, lethargy - Feeling tired most of the time and your energy does not seem to come back.

N eurologic deficit - A decrease in brain, spinal cord, muscle, or nerve function such as numbness or tingling, loss of balance, weakness, visual changes, or epic headache.

Multiple choice:

- OK I am ready to answer the question again.

Scaffold:

[Try this again.](#)

How does CAUTION help you?

Check all that apply:

- It lets you know the ways your body can tell you that something is wrong It helps you remember something... It lets you know that you that you have cancer It lets your body know how to act when there is something wrong It tells you to be cautious

Hints:

- Select this answer:

It lets you know the ways your body can tell you that something is wrong

46) Duplicate assistment: Assistment #360069 "360069 - Early Warning Signs II" was not displayed.

47) Assistment #364380 "364380 - Early Warning Signs II Question"

[Here is a question for you.](#)

What best describes early warning signs of cancer?

Check all that apply:

- Early warning signs can be subtle changes in your normal health Early warning signs are going to land you in the Emergency Room Early warning signs are anything but subtle Early warning signs are easy to discover

Scaffold:

Often, early warning signs **don't** land you in the Emergency Room. Early red flags of cancer can be subtle changes in your normal health.



Multiple choice:

OK I am ready to answer the question again.

Scaffold:

[Try this again.](#)

What best describes early warning signs of cancer?

Check all that apply:

Early warning signs are anything but subtle Early warning signs are easy to discover

Early warning signs are going to land you in the Emergency Room Early warning signs can be subtle changes in your normal health

Hints:

- Select both these answers:

Early warning signs can be subtle changes in your normal health

48) Duplicate assistment: Assistment #366759 "366759 - Testimonials 2.0 " was not displayed.

49) Assistment #366760 "366760 - Testimonials 2.0 Question"

[Here is a question for you.](#)

What do these stories have in common?

Check all that apply:

All are young people with cancer All had subtle early warning signs All lived near a nuclear power plant All knew they had cancer from the start All knew about CAUTION

Scaffold:



Alex
Testicular Cancer

"I had a lump that didn't used to be there."



Stephanie
Thyroid Cancer

"I was getting so tired and was gaining weight."

You know you better than anyone else. Pay attention!



David
Brain Cancer

"I had double vision."

"One of my moles looked weird."



Jen
Melanoma- Deadliest form of skin cancer



Laurel
Bone Cancer

"My knee kept giving out and I just knew something was wrong."

Multiple choice:

OK I am ready to answer the question again.

Scaffold:

[Try this again.](#)

What do these stories have in common?

Check all that apply:

All are young people with cancer All had subtle early warning signs All knew about CAUTION All knew they had cancer from the start All lived near a nuclear power plant

Hints:

• Select both these answers:

- All had subtle early warning signs and
- All are young people with cancer

80) Duplicate assistment: Assistment #342782 "342782 - Survival Rates I" was not displayed.
81) Duplicate assistment: Assistment #360076 "360076 - Survival Rates II" was not displayed.
82) Assistment #364382 "364382 - Survival Rates II Question"

Here is a question for you.

What kinds of things contribute to a delay in cancer diagnosis?

Check all that apply:

- ✓ Not speaking up to your doctor
- ✓ Ignoring subtle changes in your health that last 2 weeks or more
- ✓ Not knowing what early warning signs can look and feel like
- ✓ Feeling invincible – cancer only happens to other people

Scaffold:

One reason cancer survival rates for 15-40 year olds haven't gotten much better is delayed diagnosis. Some things that contribute to a delay in diagnosis are:

- Feeling invincible – cancer only happens to other people
- Not knowing what early warning signs can look and feel like
- Ignoring subtle changes in your health that last up to 2 weeks
- Not speaking up to your doctor



Multiple choice:

- ✓ OK I am ready to answer the question again.

Scaffold:

[Try this again.](#)

[What kinds of things contribute to a delay in cancer diagnosis?](#)

Check all that apply:

- ✓ Feeling invincible – cancer only happens to other people
- ✓ Ignoring subtle changes in your health that last up to 2 weeks
- ✓ Not speaking up to your doctor
- ✓ Not knowing what early warning signs can look and feel like

Hints:

- Select all answers:
 Feeling invincible – cancer only happens to other people and
 Not knowing what early warning signs can look and feel like and
 Ignoring subtle changes in your health that last up to 2 weeks and
 Not speaking up to your doctor

53) Duplicate assistment: Assistment #345671 "345671 - Know Your Normal (Step 1 of what you can do)" was not displayed.

54) Duplicate assistment: Assistment #345672 "345672 - Two Weeks is Key (Step 2 of what you can do)" was not displayed.

55) Duplicate assistment: Assistment #342796 "342796 - When to See the Doctor Question" was not displayed.

56) Duplicate assistment: Assistment #342813 "342813 - What Do You Do Once You're There Question" was not displayed.

57) Duplicate assistment: Assistment #342814 "342814 - Taking Charge" was not displayed.

58) Assistment #364383 "364383 - Taking Charge Question"

[Here is a question for you.](#)

[How can you keep tabs on your health?](#)

Check all that apply:

- ✓ If you notice something "strange" make a note or take a picture on your phone with the date.
- ✓ If you notice something "strange" set a reminder to check yourself again in two weeks. If it is still bothering you, get it checked.
- ✗ If you notice something "strange" just ignore it.
- ✗ If you notice something "strange" keep it to yourself

Scaffold:

Yes! Whenever you notice something strange happening with your body, make a note or take a picture on your phone with the date and a reminder to check again in two weeks. If it is still bothering you, get it checked. This is a great way to take charge of your health...your life!

**Multiple choice:**

OK I am ready to answer the question again.

Scaffold:

[Try this again.](#)

How can you keep tabs on your health?**Check all that apply:**

If you notice something "strange" set a reminder to check yourself again in two weeks. If it is still bothering you, get it checked. If you notice something "strange" just ignore it. If you notice something "strange" keep it to yourself If you notice something "strange" make a note or take a picture on your phone with the date and check yourself again in two weeks. If it is still bothering you, get it checked.

Hints:

- Select both these answers:
 - If you notice something "strange" set a reminder to check yourself again in two weeks. If it is still bothering you, get it checked and
 - If you notice something "strange" make a note or take a picture on your phone with the date and check yourself again in two weeks. If it is still bothering you, get it checked

59) Assistent #382145 "382145 - Intro to Post test"

Thanks for learning about cancer and your health.

Now we have some follow-up questions for you.

We will really appreciate your thoughtful answers.

**Multiple choice:**

Next ->

60) Assistent #382129 "382129 - Test- What is cancer II?"

What is cancer?

Multiple choice:

Uncontrolled cell growth I'm not sure A tumor A zodiac symbol

61) Assistent #382127 "382127 - Test - Who gets cancer II?"

Who gets cancer?

Check all that apply:

Young Adults Teens I'm not sure Little kids Old people

62) Assistent #382121 "382121 - Test - Early warning signs II?"

Do you think early warning signs of cancer are usually subtle, or something that will land you in the ER?

Multiple choice:

Subtle symptoms ER visit I'm not sure

63) Assistent #382147 "382147 - Post Test - Go to the doctor II?"

What would you do if your left knee swelled up and didn't get better for 16 days?

Multiple choice:

Put ice on it Get it checked out by a medical professional Tough it out Take some pain meds Wear a knee brace

64) Assistent #366901 "366901 - Post Test - What can you do?"

What can you do to increase cancer survival rates in your age group (15 to 40 year-old age group)?

Ungraded open response:

Speak up to your doctor Taking note of subtle changes in your health that last up to 2 weeks
 Know what early warning signs can look and feel like Realize that you aren't invincible – cancer can happen to anyone

65) Assistent #366862 "366862 - Post Test - How likely are you to share what you learned?"

How likely are you to share what you learned today about early detection with friends or family?

Multiple choice:

Very likely Likely Not sure Unlikely Very unlikely

66) Assistent #366908 "366908 - Post Test - Do you think you learned?"

In three sentences, how would you explain to a friend what you have learned here?

Ungraded open response:

67) Assistent #365451 "365451 - Ending Video"

<iframe width="560" height="315" src="http://www.youtube.com/embed/NSNGh_KXEBQ" frameborder="0" allowfullscreen></iframe>

Multiple choice:

Done

Appendix V: The 15 – 40 Connection and ASSISTments Reach Out

Table 7. Complete contact list. This is a complete list of both 15 – 40 Connection and ASSISTments contacts that may be appropriate targets of the study. Interested parties are highlighted in yellow. Key: HS – High School, JH – Junior High, MS – Middle School, C –College.

School	Contact Type	Contact Name	Email	Intro Email	School Type	Email #2	Interest
Acton Boxboro							
	ASSISTments		jmaxwell@abschools.org	x	HS	x	
			snugent@abschools.org	x	HS	x	
Agawam							
	ASSISTments		cagruso@agawamteachers.org	x	JH	x	
			dbudzynkiewicz@agawamteachers.org	x	JH	x	
			dmontambault@agawamteachers.org	x	JH	x	
			enolen-parkhouse@agawamteachers.org	x	JH	x	
			shopson@agawamteachers.org	x	JH	x	
			tdenton@agawamteachers.org	x	JH	x	
Ashland							
	ASSISTments		gsadana@ashland.k12.ma.us	x	MS	x	
Assumption College							
	15-40	Jack Palermo	jcp5577@gmail.com	x	C	x	
Auburn							
	ASSISTments		awhite@auburn.k12.ma.us	x	HS	x	
			lhealey@auburn.k12.ma.us	x	HS	x	
			amsgrade6@yahoo.com	x	MS	x	
			amsgrade8@gmail.com	x	MS	x	
			crobbins@auburn.k12.ma.us	x	MS	x	
			jbastien@auburn.k12.ma.us	x	MS	x	
			kcapstick@auburn.k12.ma.us	x	MS	x	
			kmoran@auburn.k12.ma.us	x	MS	x	
			mmahan@auburn.k12.ma.us	x	MS	x	
			vfitton@auburn.k12.ma.us	x	MS	x	
Bancroft School							
	15-40	Pam Sheldon	psheldon@bancroftschoool.org	x		x	x
Becker College							
	15-40	Colleen Settle	colleen.settle@becker.edu	x	C	x	
	15-40	Ashley Tello	ashley.tello@becker.edu	x	C	x	
Blackstone							

Valley Technical						
	15-40	Judy Lavallee	judithla@valleytech.k12.ma.us	x	HS	x
	15-40	Diane Cairney	dcairney@valleytech.k12.ma.us	x	HS	x
Boston College						
	15-40	Jaclyn D'Esposito	jaclyn.desposito@gmail.com	x	C	x
Fitchburg State						
	15-40	Sarah Minton	sminton1@student.fitchburgstate.edu	x	C	x
		Nathan Gregoire	ngregoir@student.fitchburgstate.edu	x	C	x
Grafton High School						
	15-40	Erin LaChapelle	lachapelle@graffon.k12.ma.us	x	HS	x
		Maureen Cimoche	mcimoch@hotmail.com	x	HS	x
Holy Cross						
	15-40	Linda Cooper	LCOOPER@holycross.edu	x	C	x
		Katherine Grant	kagran13@g.holycross.edu	x	C	x
Leicester High School						
	15-40	Tom Bowes	bowest@lpsma.net		HS	x
		Tom Lauder	laudert@lpsma.net		HS	x
	<i>Just started ASSISTments so wait until February.</i>	Mike Sheeran	sheeranm@lpsma.net		HS	x
		Dianne Moffat	moffatd@lpsma.net		HS	x
Millbury High School						
	15-40	Donna Saucier	dsaucier@millburyschools.org	x	HS	x
Nashoba Regional						
	15-40	Jennifer Cote	jnoodlebelly@yahoo.com	x	HS	x
Nichols College						
	15-40	Bryant Richards	Bryant.Richards@nichols.edu	x	C	x
		Samantha Barrett	Samantha.Barrett@nichols.edu	x	C	x
Algonquin Regional						
	15-40	Kim Honey	khoney@nsboro.k12.ma.us	x	HS	x
		Stephanie Madigan	SAMADIGANI@verizon.net	x	HS	x
Red Bank						

Catholic, NJ							
	15-40	Jordyn D'Esposito	jordyndespo@aim.com	x	HS	x	
Shrewsbury High School							
	15-40	Pat Degon	PDegon@shrewsbury.k12.ma.us	x	HS	x	
St. Peter Marian Catholic							
	15-40	Cat Kearney	cat_kearney@aol.com	x	HS		
		Joanne Ethier	ethierj@spmguardians.org	x	HS	x	
U Mass Lowell							
	15-40	Taylor Kearney	taylor.kearney@gmail.com	x	C	x	
University of Maine							
	15-40	Charlsye Diaz	Charlsye_Diaz@umit.maine.edu	x	C	x	
Wachusett Regional							
	15-40	Lorraine Chesna	lorraine_chesna@wrsd.net	x	HS	x	x
Worcester Public Schools							
	15-40	Colleen O'Brien	OBrienC@worc.k12.ma.us	x	D	x	
Worcester North							
	15-40	Barbara Drake	DrakeB@worc.k12.ma.us	x	HS	x	
		Maureen Burke	burkemoe@aol.com	x	HS	x	
Worcester State University							
	15-40	Jennifer Quinn	jquinn@worcester.edu	x	C	x	
Worcester Technical							
	15-40	Carol Mendes	MendesC@worc.k12.ma.us	x	HS	x	
Worcester Academy							
	15-40	Jennifer McCarthy	jennifer.mccarthy@worcesteracademy.org	x	HS	x	x

Information e-mail (Faculty/Staff Member):

Dear _____ -

The 15-40 Connection has partnered with WPI and the ASSISTments project to develop new instructional materials for you. We've designed a 20 minute self-paced lesson to inform students about cancer awareness and the importance of early detection and self-advocacy. [Click here](#) to view the online lesson.

In January I would like to work with your school to find a way to share this tutorial with your students. Students can do the problem set on any internet device, in school (there are videos so they will need headphones) or at home, and the ASSISTments platform will enable you to monitor completion.

I will contact you once again in the New Year so we can determine how best to introduce this to your students in the most efficient and productive way for you.

Thank you, in advance, for exploring this unique health awareness tool with us!

Sandy

Follow Up e-mail (Faculty/Staff Member):

Dear _____ -

I hope you had a wonderful and safe holiday season. We're really looking forward to working with you to introduce some important health messaging to your students this term, and we hope that 2013 proves to be a year we witness an improvement in cancer survival rates for their age group. We know it takes education so we are excited to start the year with our ASSISTments + 15-40 Connection project.

Let's set up a time to talk and plan out how best to assign this tutorial to your students.

E-mail me back so we can do just that and [click here for all the details](#).

Excited about 2013!

Sandy

Information e-mail (Student Leader):

Hi _____ -

The 15-40 Connection has partnered with WPI and the ASSISTments project to develop new instructional materials that could be an exciting piece of your school's awareness efforts. We've designed a 20 minute self-paced lesson to inform students about cancer awareness and the importance of early detection and self-advocacy. [Click here](#) to view the online lesson.

Go ahead and take it yourselves (and give me feedback!) and then in January let's work together to figure out how best to share this tutorial with students at your school. You can do the problem set on any internet device, in school or at home. This can be something you introduce via your club facebook page or with the help of your faculty advisor or other interested teacher! And we'd be happy to provide prize incentives to the first 5 or 10 students who take the tutorial!

I'll be in touch early in the New Year so we can determine how best to introduce this so it makes the most sense with your club activities.

Thank you, in advance, for being a part of this novel adventure with us!

Sandy

Follow Up e-mail (Student Leader):

Dear _____ -

I hope you had a wonderful and safe holiday season. We can't wait to help you share our new educational tool with students at your school this term, and we hope that 2013 proves to be a year we witness an improvement in cancer survival rates for the 15-40 age group. We know it takes education so we are excited to start the year with our ASSISTments + 15-40 Connection project.

When is a good time to talk and plan out next steps?

E-mail me back so we can do just that and [click here for all the details](#).

Excited about 2013!

Sandy

Information e-mail (ASSISTments User Not High School):

Hi _____ -

ASSISTments has partnered with the [15-40 Connection](#) to develop a problem set to inform students about cancer awareness and the importance of early detection and self-advocacy. This is an exciting new way to use the platform! [Click here](#) to testdrive the problem set. This problem set was designed for students 15 and older. This project has special significance to us since Neil Heffernan the founder of ASSISTments was diagnosed with a cancerous brain tumor when he was just 28 years old. He was fortunate enough to have been diagnosed early and is now on year 15 of post cancer detection and treatment.

In true ASSISTments project fashion this problem set has two versions (picked at random when the student starts working) and we are looking to not only inform young people about self-advocacy but we want to find out which version is better. In January I would like to work with you to figure out how best to share this tutorial with students in your school district. Is there a health teacher who would want to assign it? Would you feel comfortable assigning it as an extra credit activity?

Email me back now or I will be in touch early in the New Year so we can figure out if it makes sense to give this problem set to students at your school.

Thank you, in advance, for considering being a part of this novel adventure with us!

Cristina

Follow Up e-mail (ASSISTments User):

Dear _____ -

I hope you had a wonderful and safe holiday season. We can't wait to help you share our new cancer awareness problem set with students at your school this term. We hope that 2013 proves to be a year we witness an improvement in cancer survival rates for the 15-40 age group. We know it takes education so we are excited to start the year with our ASSISTments + 15-40 Connection project. [Click here for more details.](#)

Do you have an idea of how to do this in your district? Do you want to assign the problem set? Can you introduce me to someone who may want to assign it?

Excited about 2013!

Cristina

a)

15 - 40 meets ASSISTments



+

15-40 is about cancer awareness ([Learn more here](#))

ASSISTments is about feedback to students and teachers. ([Learn more here](#))

=



This is what you get when you bring them together. ([Click here to see a problem set.](#))

Objectives, then Next Steps

b)

Objectives

The following problem sets are a collaboration between the 15-40 Connection and ASSISTments. Our goal is to conduct a study in order to identify successful messages that promote cancer awareness and behavior change.

- Teens will learn how to recognize changes in their health that should be checked and learn why it is important to trust their instincts.
- The problem sets share information and stories about cancer while still maintaining a casual tone.

Students will automatically be assigned to one of two paths in the problem set.

- The first path provides students with information.
- The second path contains both information and quiz questions.

Due to the independence of this assignment, it can be assigned as a health or science enrichment activity or even as a homeroom learning opportunity (i.e. School competition...find which homeroom understands cancer best!)

Next Steps

c)

Next steps

If you already use ASSISTments:

- Simply assign the problem sets to your students. It is a standalone experience; students get feedback as they go so they do not need to go over the item report.
- The problem set number is: 94249
- You can also find it in the ASSISTments Certified Problem Sets

Research Problem Sets
2012-13 Research Projects
15-40 Cancer Awareness

If you have never used ASSISTments:

We will set things up for you. Contact Cristina Heffernan, or the 15-40 connection, and we will get started!

E-mail Cristina Heffernan (ASSISTments at WPI) ch@wpi.edu or
E-mail Sandy Foster (from 15-40 Connection) sandy.foster@15-40.org

Figure 4. The 15 – 40 Connection Meets ASSISTments Marketing PowerPoint. This PowerPoint was attached to the above recruitment emails via hyperlink in order to provide additional details about the importance and ease of adding the IQP study to existing curricula. Figure a) visually summarizes the project, b) provides greater detail and c) shows the path to take in order to get involved.