

General Education Area V (Natural Sciences)  
Summary of Online Questionnaire Results, 2006-2007

**Objective 1: Understand the basis of scientific inquiry.** (*Distinguish theory from hypothesis, recognize are many valid approaches to scientific inquiry, that science requires skepticism, the nature of an experimental control, interpretation of a graph*). Questions 4, 5, 6, 12, 13.

**Objective 2: Understand the theoretical, practical, creative and cultural dimensions of scientific inquiry.** (*Science is a creative activity, without rigid format, science and religion are not in opposition, but there are certain types of questions that science cannot address*). Questions 8, 10, 14.

**Objective 3: Understand the importance of model building for understanding the natural world.** (*A scientific model is a visualization of a phenomenon that fits all available information; useful for generating and testing hypotheses*). Questions 2, 7.

**Objective 4: Understand the dynamic interaction between society and the scientific enterprise.** (*Science is a legitimate society enterprise, not separate, distant, or antagonistic.* ). Question 9.

**Objective 5: Recognize the appropriate ethical uses of knowledge in the natural sciences.** (*Like all knowledge, science is ethically neutral.*) Questions 3, 11.

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1. Please check below ALL the science courses you have taken at Wright State to satisfy the General Education requirement, including the one in which you are currently enrolled.

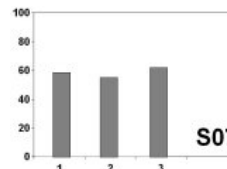
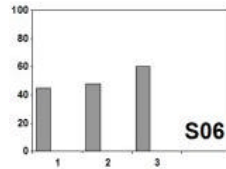
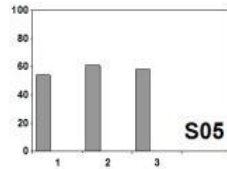
BIO 105: Biology of Food  
BIO 106: Biological Diversity  
BIO 107: Biology of Disease  
CHM 105: Chemistry of our World: Living Things  
CHM 106: Chemistry of our World: Materials  
CHM 107: Chemistry of our World: Energy and the Environment  
GL 105: The Planet Earth  
GL 106: Evolving Earth  
GL 107: The Earth and Human Affairs  
PHY 105: Sounds and Colors  
PHY 106: Planetary Astronomy  
PHY 107: Stars, Galaxies, and the Cosmos

(Responses were used to establish only the number of courses taken).

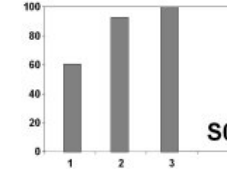
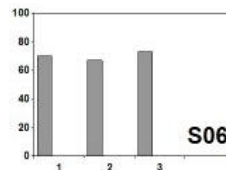
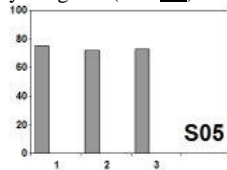
These and following graphs show the percent of answers considered **correct** (answer underlined in the text). These are listed by the number of GE science courses taken by respondent. S05, S06, S07 = Spring 2005, Spring 2006, Spring 2007.

2. Which of these would be an example of scientific modeling?

- A) Visualizing an atom as a miniature solar system.
- B) Proposing that contagious diseases are caused by tiny viruses and bacteria.
- C) Interpreting fossils as representations of ancient living things.

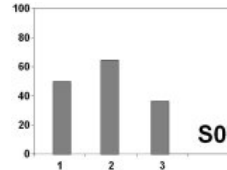
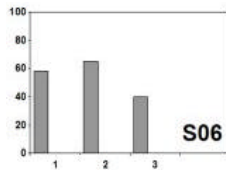
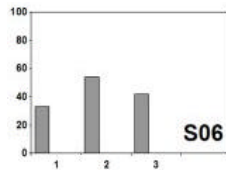
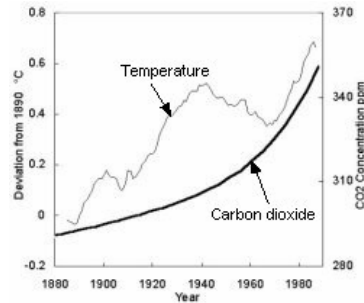


3. “Genetic engineering is just one more example of the negative impacts of science on society.” Do you agree? (Yes/No)

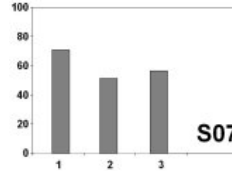
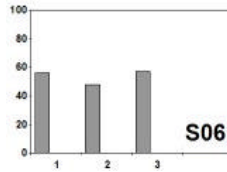
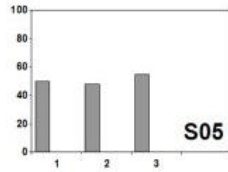


4. The figure on the left shows an eleven-year moving average of global surface temperature plotted as deviation from 1890 (left axis and light line), as compared with atmospheric CO<sub>2</sub> (right axis and dark line). What can you conclude from these data?

- A) The global temperature has been rising steadily since 1880.
- B) Since 1880 global temperatures have been more erratic than levels of CO<sub>2</sub>.
- C) There is a direct link between CO<sub>2</sub> levels and global temperature.
- D) Measurements of global temperature are more accurate than those for atmospheric CO<sub>2</sub>.



5. "An experiment can never prove a hypothesis: it can only discredit the hypothesis or add validity to it." Do you agree? (Yes/No)



6. For a science fair project a student tests the toxicity of dishwashing detergent on guppies. There were 5 fish in each concentration, and the solutions were made using aged tap water. Here are the results of a 12-hour test. The student concludes that the detergent is toxic to guppies.

*Detergent*

Concentration

1:10 dilution

1:20 dilution

1:50 dilution

Result

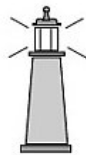
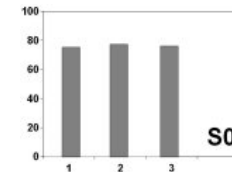
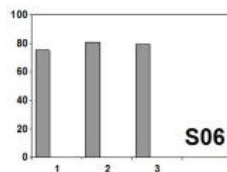
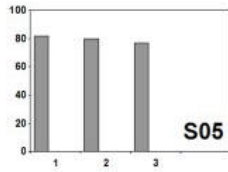
All fish died

All fish died

All fish died

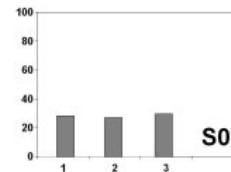
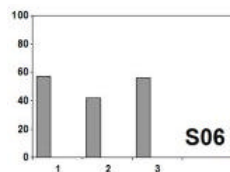
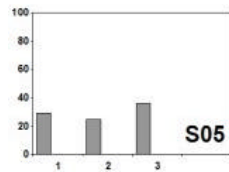
What step is missing from this experiment?

- A) Run a test on the aged tap water alone.
- B) Run a test with full-strength detergent.
- C) Shorten the tests to 6 hours instead of 12.
- D) Repeat the tests with a different kind of fish.

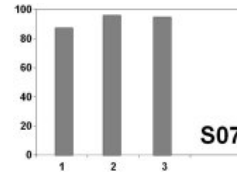
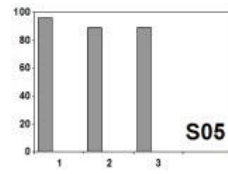
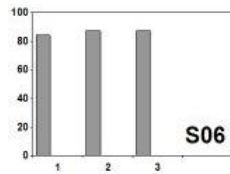


7. Pulsars are objects in space that seem to give off rhythmic bursts of electromagnetic energy. Some astronomers compare a pulsar to a lighthouse with a rotating beacon. Even though the beacon operates continuously, it appears to flash on and off because of the rotation. Maybe a pulsar emits energy in only one direction - like a lighthouse - and it is actually spinning to produce the rhythmic effect. Which of these would be an appropriate name for this idea?

- A) Lighthouse model.
- B) Lighthouse theory.
- C) Lighthouse law.



8. Which one of these questions cannot be addressed by scientific means?
- A. How much plutonium is needed to make a hydrogen bomb?
- B. What is an efficient method for producing radioactive tritium?
- C. Is it justified to kill innocent people if that action might prevent even more killings?
- D. How does the smallpox virus avoid human defense mechanisms?



9. Scientific theories sometimes challenge certain beliefs held strongly by society. Describe an example of this conflict, either current or historical. (Data are in percent. Individual responses on attached sheets).

Spring 2005

No. of courses:	1	2	3
Evolution	46	50	44
Other religious	20	10	0
Stem cell	7	5	10
Big bang	0	5	25
Other	27	30	11
Sample size	15	20	52

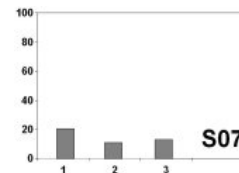
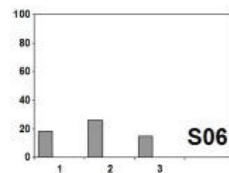
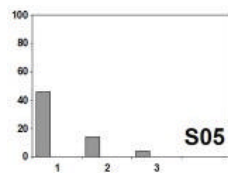
Spring 2006

No. of courses:	1	2	3
Evolution	41	62	64
Other religious	13	4	8
Stem cell	13	0	3
Big bang	3	15	0
Other	31	19	25
Sample size	32	26	36

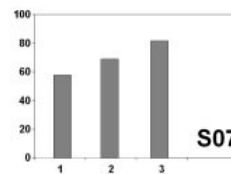
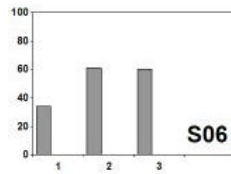
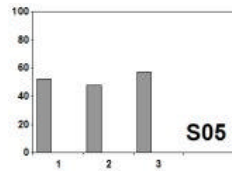
Spring 2007

No. of courses:	1	2	3
Evolution	44	43	58
Other religious	15	7	6
Stem cell	9	14	15
Big bang	9	14	0
Other	22	21	21
Sample size			

10. "Scientific method involves a series of logical steps performed in a rigidly prescribed format." Do you agree? (Yes/No)



11. "In my opinion, scientists are just as sensitive to ethical values as is the rest of society." Do you agree? (Yes/No)



12. "Clinical trials show that when used with proper diet and exercise, *Fat-B-Gone* tablets can help you lose up to 2-3 pounds per week." In one or two sentences explain why this is NOT a scientific endorsement of the tablets? (See individual responses on attached sheets).

Spring, 2005

No. of courses	1	2	3
No control	35	25	33
Other	65	75	75
Sample size	23	24	48

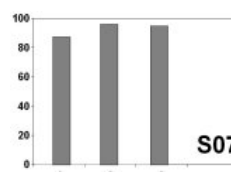
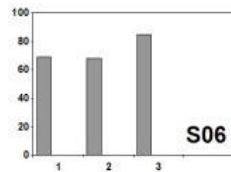
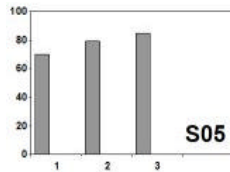
Spring, 2006

No. of courses	1	2	3
No control	47	32	30
Other	53	68	70
Sample size	47	22	40

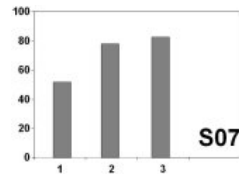
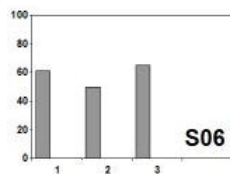
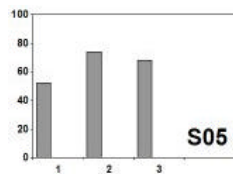
Spring, 2007

No. of courses	1	2	3
No control	47	58	39
Other	53	42	61
Sample size	53	24	31

13. "The idea that the early earth atmosphere lacked oxygen gas has no scientific merit because no human being was present to observe, measure, and record." Do you agree? (Yes/No)



14. "In order to remain objective, a scientist must suppress all imagination and creativity when analyzing data." Do you agree? (Yes/No)



**Comments.** Overall, results from this year are similar to those in previous years. One difference this year is the very slight improvement seen in several questions by the number of courses taken. For example, in Questions 3, 6, 7, 8, 11, 13, and 14 those students who had taken only one course did not respond as well as those having taken 2 or 3 science courses. These questions tended to address mostly attitudes towards science.

Students still have trouble interpreting a simple graph (Question 4), and most believe that scientific investigation follows a "rigidly prescribed format" (Question 10). Even students with three courses behind them seem to have difficulty with the concept of an experimental control (Question 12) and a scientific model (Question 7). The level of sophistication seen in the answers to the two open-ended questions (Nos. 9 and 12) does not appear to reflect the number of science GE courses taken.

There are errors in this type of survey, of course. The survey was taken anonymously on line through WebCT. Participants were offered the chance for two \$50 gift certificates to the WSU Bookstore. Some respondents may not have taken the task seriously. However, if the open-ended questions were left blank or answered with nonsense the entire questionnaire was discarded. We cannot be sure that students accurately reported the number of GE science courses they had taken, and future versions of the questionnaire will try to eliminate this weakness.

Several instructors have suggested that we approach these areas with different questions to see how that might affect the results. We have had several discussions about the "model" concept, some instructors saying they teach the idea but do not use that specific expression. We will be reviewing this and other concerns in the coming year.

Tim Wood, Coordinator for General Educator Area 5  
May 16, 2007

(Attachments: full responses to Questions 9 and 12)

## Responses to Question 9

Scientific theories sometimes challenge certain beliefs held strongly by society. Describe an example of this conflict, either current or historical.

### *Responses from students having taken 1 GE science course:*

1. Galileo's proposition that the Sun, not the Earth as was the prevailing theory, was the center of our universe comes to mind. This was met with widespread criticism and claims of heresy, but the world eventually came around and accepted that Gallileo was correct.
2. Evolution
3. Creation vs. evolution... Darwin later changed his mind, and claimed his theory was incorrect.
4. An example of science creating conflict would be the theory that genetic testing for diseases before a child is born would be better because fewer children would be born with diseases thus creating burdens on different people. Most of society believes to accept all children with or without deformities.
5. The creation of man.
6. Big Bang theory V. Creation by God
7. Scientists believe that use of stem cells in research benefit society. Society members however are split on wheth this is ethical.
8. The current debate regarding stem cell potential is an example of this.
9. Feminest views
10. Tthe thoery of evolution. Many people who believe in religion believe that man was created by god and those who believe in science believe in evolution of man.
11. Con, evolution from apes nd fish. This cotradicts the stong christian view in many first world societies of one god who created us.
12. Evolution- God did not make us in 7 days.
13. Evolution vs. Intellegent Design
14. Stem cell research is very controversial.
15. Scientific theory can interrupt religion based ideas. These theories interpret how the earth was made, where humans came from, and what our purpose on earth is.
16. Christians throw their Bibles at science constantly, about evolution especially.
17. Big Bang
18. Obviously, the theory of evolution is the first thing that comes to mind. Many people believe that God made man and woman, and they were as we are today. But scientists are finding evidence that says humans haven't always looked the same, we have evolved from a different breed.
19. Theories that surround cloning are a good example.
20. Cloning; many belief systems are against it, but I think it is for the good. The same goes with donating embryos.
21. Darwin's theory of evolution
22. Evolution
23. Creation.
24. An example of this conflict would be creation vs. evolution. Scientific theories support the theory of evolution, that all living creatures evolved into higher forms and are therefore interconnected. Historically, society has held to a creation viewpoint, that God created the world from nothing and each creature was made individually, rather than evolving. This belief used to

be strongly held by society, but due to the theory of evolution and decline in religious values it is no longer as strongly held.

25. The Scientific Revolution challenged many religious views, including how everything revolved around the earth.

26. Darwin's theory of evolution.....duh

27. Stem cell research and cloning

28. For example, Benjamin Franklin...No one believes his thoughts and ideas until they actually saw them working.

29. The Theory of evolution

30. Scientists believe that if we travel the speed of light or faster we can travel back in time.

31. Most of society would agree that we can not time travel.

32. The theory of evolution continues to threaten certain elements of society who refuse to accept it and believe it challenges their religious views.

33. Not being scientifically a "life/human" when you are an embryo or fetus etc. ....The age of the earth and the conflict Biblically

34. The idea that man is/was an evolving creature.

35. The debate over evolution or creation. Many believe that humans developed and evolved, while many religious people debate that God created the earth, solar systems, and all beings within it.

36. Evolution vs intelligent design.

37. First of all, this survey needs to be less ambiguous..the question regarding scientists being as ethical as the rest of society hinted that society was "ethical"...but what did it truly mean?

Whose point of view were you trying to champion? Not that those things matter in this context, but it was a confusing, almost tricky question whose meaning came through poorly. Anyway, on to this question. There are so many, I'm just going to stick with an obvious one. Darwin's theory of natural selection...(and, as I understand, he wasn't the only one proposing this idea)...completely threw off the commonly held view of creationism. Neither theory is completely substantiated, of course. However, despite the lack of both theories, they both suggest interesting beginnings, as well as allow us to imagine even more fascinating origins.

38. Big Bang theory, it challenges the religious folk and their religious beliefs of how the world and humans and animals came about/were created/evolved.

39. Darwin's Origin of Species proposed that all living creatures had evolved over millions of years. This challenged traditional Judeo-Christian views that God had created all creatures as they are now, and that the world was significantly younger than Darwin's theory proposed.

40. Pro choice or pro life is an example. Medical reasoning proves a fetus is not a child until it draws breath, however; some people in society feel otherwise.

41. Existence of God

42. If we should bring back our troops or not?

43. Evolution vs. God making Earth

44. Stem cell research

45. Christian believers think that God created humans and all living things. Whereas, many scientists have conducted experiments and believe that humans evolved from creatures many years ago.

46. Big Bang theory, Evolution

47. Scientists claimed that we are not the center of the universe, and received much trouble from the old churches and leaders at that time.

48. When parents are able to pick their child's gender, eye color, hair color etc...
49. Evolution is a theory that upsets some people with strong religious beliefs.
50. Evolution vs creation
51. Some people would argue against science that the world was created by God or Gods.
52. The creation of the earth and the evolution of man are two examples of theories that challenge religious beliefs and is a topic of conflict constantly.
53. Stem cell research
54. The big bang theory conflicts with the ideas of the bible, God, etc.
55. The human race
56. Was earth created by God, or was it already here.
57. Theory that people can be cloned.

***Responses from students having taken 2 GE science courses:***

58. One scientific theory is that cell phones can give you brain tumors. Society may not agree.
59. Scientists have tried many times to clone humans. they have already succeeded in making a clone of a fish...i believe, and some citizens are not for this study.
60. Everyone thought the world was flat until someone thought it was round.
61. Cloning or stem cell research; also the determination that a fetus is not an actual child
62. When Galileo said the earth was round and the Catholics and everyone at that time thought the earth was square.
63. The big bang theory challenges the certain belief that one may have of believing that Jesus is the creator.
64. Cloning
65. Darwinism
66. Evolution
67. Evolution versus religion for the creation of the earth.
68. Earth being round vs. being flat
69. Evolution (science) challenges religion (beliefs)
70. Evolution. People think there is a scientific way to prove how we came about. I don't think so.
71. There used to be a theory that the Earth was the center of the Universe. Obviously, when it was discovered that this was untrue, this challenged what society had believed.
72. SAYING THAT THE EARTH ISN'T THE CENTER OF THE UNIVERSE, BUT THAT THE SUN IS. THAT WAS A CHALLENGE TO THE CHURCH AND MANY BELIEFS THAT WE WERE THE CENTER OF EVERYTHING.
73. Stemcell Research
74. Look at what Darwin proposed, natural selection and evolution. Evolution today is still controversial but it can be proven scientifically.
75. Darwin's theory
76. Evolution VS. the Biblical way humans came to be. Apes Vs. God.
77. Historically, there was a period of time when society had the belief that the world was flat.
78. However, when the theory of the world being round came about it was quite controversial.
79. A major scientific theory that challenged long-held beliefs was that the earth is in fact a sphere and not flat. For centuries, it was believed that the earth was flat, and anyone who tried to prove that it was spherical was treated as a madman.
80. The obvious example is creation versus evolution, but I'll go with stem cell research. Scientists agree with stem cell research because they have the perspective of how much we can

accomplish medically with this research. Other societal groups, such as religious organizations, view stem cell research as being immoral, therefore causing a conflict not only in society itself, but in politics as well.

81. Evolution vs Creationism

82. The theory that stem cell research can help prevent certain diseases like Parkinson's Disease.

83. Some scientists disregard this theory and say research done has proven that stem cell research can actually cause more harm to tissues in the body and the likelihood of stem cells being able to cure specific diseases is very low.

84. Somehow, certain Christians believe that the Earth is not nearly as old as scientists say it is and that man and dinosaurs walked the earth together. There's a museum in Cincinnati. It's pretty ridiculous.

85. Evolution

86. Theory of how life began.....or who was first Adam and Eve or the Dinosaurs?

87. When Copernicus tried to convince the world that the Earth and the rest of the planet revolve around the Sun.

88. Cloning

89. Evolution: I feel this is an example of a scientific theory that is a continuous challenge on certain beliefs held strongly by society. For instance, a Catholic student may have beliefs that God created man and all the species on earth. However, scientific evidence and theories (such as evolution) question on how man was created; due to the past and present findings that scientists have found in their fields of study.

***Responses from students having taken 3 GE science courses:***

90. Global Warming

91. Natural selection!

92. The evolution theory is a scientific theory that is challenged by society.

93. Man came from apes.

94. Evolution is a huge issue in conflict with science and religious groups in society.

95. The theory of evolution challenges certain religious beliefs held strongly by society.

96. One conflict would be the evolution versus creationism battle. When religion dominated society, many believed the creation story was the only possibility of how our existence came to be. After many advances in science, scientists proposed that our current existence was the result of millions of years of evolution, not God. This created an uproar and is still a common conflict between science and society today.  
using stem cell research

97. The conflict of evolution. Science states life was created by way of the big bang and not by the hand of God Our Holy Father...

98. That genetic engineering of human cells will create a society of genetically altered superhumans, which could be construed as an affront to God in some religious beliefs.

99. One scientific theory that occurred in the past and later became a law that challenged beliefs held by society was Galileo's theory that the sun did not revolve around the earth but that the earth revolved around the sun.

100. Evolution v. intelligent design. Most Scientists believe the world is much older than mentioned in the Bible and that organisms have evolved over a long period of time from very simple single cell organisms into the complex beings they are today. The opposite of this view is that one single intelligent being created the earth and all of its creatures all at the same time only a few thousand years ago.
101. The geocentric vs. heliocentric model of the solar system was one such belief that challenged society. When inconsistencies (such as retrograde motion) were discovered, scientists used this data to support their theory of a sun-centered solar system. This challenged the belief that Earth was perfect, founded in ancient theories and continued in Christian teachings.
102. Evolution
103. Stem cell
104. A historical example could be when people thought of the world as flat and Copernicus challenged that idea by saying the world was round.
105. Evolution is a prime example because a lot of society believes in creation of creatures from God. Science says that we evolved from other animals.
106. Stem cell research
107. When Galileo presented the heliocentric model of the solar system and was then persecuted for it by the church.
108. The scientific theory of evolution. Through human history people have questioned and theorized about human existence and evolution. Some support Darwin's theories and others follow religious theories of their own.
109. A scientific theory that would challenge certain beliefs could be cloning
110. Stem cell research has been a current conflict between society and science.
111. Global warming theory has been a conflict for some people in society. Some believe that it is science, others believe it's the beginning of the Rapture, and even others have different ideas as to why this phenomena is or possibly will occur.
112. An example of this would be the belief that many individuals share about how we became on this earth. Scientists believe in evolution while Christians believe in creation.
113. Evolution challenges the Bible
114. Earlier people used to believe that whenever a solar or lunar eclipse occurred, maybe God/Sun is angry with them but science made it clear that it's nothing like that.
115. The theory of evolution opposes the Christian belief of creation. Even in my courses, when talking about evolution, professors say that they do not want to offend anyone.
116. Darwin's theory of evolution upset the churches and people the evolution theory and Darwin theory. That people were made from monkeys and not from God
117. Big Bang Theory vs. Creation Theory: Historically religious people have always been opposed to the 'big bang theory' since it is the complete opposite to their own beliefs. Beliefs have always been more important to most humans and scientists have always been at 'war' with religious fanatics due to this.
118. A current scientific theory that is challenging current beliefs are those having to do with stem cell research and the possibility of using stem cells in multiple ways
119. Evolution, the beginning of man
120. The theory of evolution and the garden of Eden.
121. Darwin's theory of evolution.

## Responses to Question 12

“Clinical trials show that when used with proper diet and exercise, *Fat-B-Gone* tablets can help you lose up to 2-3 pounds per week.” In one or two sentences explain why this is NOT a scientific endorsement of the tablets?

### *Responses from students having taken 1 GE science course:*

1. It is used with exercise and diet and everyone's metabolism is different.
2. Key word diet and exercise reduce weight
3. Maybe the exercise and proper diet is what's working.
4. No evidence of the weight loss is present in real data. Need more data.
5. Proper diet and exercise alone can help lose up to 2-3 pounds a week.
6. The endorsement states "with proper diet and exercise" as well as the tablets the weight is lost, but the weight loss may be attributed to the diet and exercise and the tablets may not attribute to weight loss at all.
7. The only evidence given is based on clinical trials, trials meaning tests, and not necessarily evidence that proves you can lose up to 2-3 pounds per week.
8. The pills haven't been tested to show what they actually do chemically to alter the body and the trial doesn't prove that the pills alone caused the weight loss.
9. The statement does not say what clinical trials took place and who did the trials. It also does not mention FDA approval of the Fat-B-Gone tablets.
10. The words "can help" shows it is not for sure
11. There are no actual scientific numeric figures in the ad.
12. there is no evidence given, there is no proven scientific process. it is just an add. clinical trials means they made it work the way they think it's supposed to be.
13. There is no reference to who performed the clinical studies.
14. There is no statistics or testing that this really works. And with diet and exercise alone people have lost weight and this has been proven time and time again.
15. There needs to be an experiment on Fat-B-Gone without proper diet and exercise.
16. There was no study done, no information was given, no conclusion, no hypothesis, it's just a crock of crap...
17. This is not a scientific endorsement because it does not state any experimental aspects or real experimental data supporting the hypothesis and conclusion.
18. This is not a scientific endorsement because we do not know who did the clinical trials and to what extent they performed the trials to conclude that Fat-B-Gone helps you lose weight.
19. This is not a scientific endorsement of the tablets because proper diet and exercise could actually be the cause of people in the clinical trials losing weight, not the tablets.
20. This is not a scientific endorsement of the tablets because the experiment used diet and exercise, not the tablets themselves which would show if they had any effect alone.
21. Well, it is not explained what the tablets do to you or what is in them. Also, is this a short or a long time solution and does the fat stay off.
22. Well, this seems like some fake information commercial.
23. Well, the person would already be dieting and exercising which will help them lose weight so the tablets probably aren't doing anything anyways.
24. What defines a proper diet and exercise?
25. When diet and exercise is used without any sort of tablet one usually will lose one through

three lbs. of fat per week.

26. With proper diet and exercise alone you can lose pounds if you are over weight. Only an overweight person would consider using this.
27. Without the pill, and proper diet and exercise, you could still lose up to 2-3 pounds for week
28. Because it does not show how many clinical trials were done. Also it does not state that it is FDA recommended which means that the scientific procedure could be faulty.
29. Because it says in a clinical trial
30. Because it's more of an advertisement.
31. Because it's showing clinical trials....there are no real life examples here.
32. Because there is no proof that it is the actual fat gone tablets are the cause for the weight loss.
33. Because weight can be lost without the tablets
34. Because when you eat a proper diet and exercise anyone can lose up to 2-3 pounds a week. you don't need any tablets to do it for you and they probably don't really work
35. Because you are putting a foreign substance in to your body.
36. Clinical trials can be done by anyone, and this label doesn't specify that an expert in this field did these trials. Also proper diet and exercise alone will allow one to lose 2-3lbs a week.
37. Clinical trials do not mean they were conducted by a scientific team; they may have been conducted by a group of gym teachers... there is nothing saying 1) that this is true, and 2) who performed the "experiments".
38. Don't know what causes this
39. It does not prove that Fat-B-Gone works. It says it can.
40. It does not give any information as to how many trials were done or how many people were done.
41. If not properly supervised, can become harmful to organs, etc. Also, what I've heard, once you get off the pill you will gain back the fat PLUS more.
42. It depends on what type of diet the patient goes on and the amount and kind of exercise used on top of the tablets. Also, these were clinical trials, not 'in home' trials where people are not monitored.
43. It didn't justify what occurred in the clinical trials to make this in fact a true statement with valid conclusions and procedures.
44. It does not give proper explanation of what is in the pills, and what the ingredient is that makes you lose weight.
45. It doesn't tell you how much you have to exercise or what your diet should be.
46. It is not a scientific endorsement because it is only in the clinical trial phase of development.
47. It is not a scientific endorsement because we don't know who used the products, what their diet was, and how strenuous the exercise program. There are a lot of unknown factors that also could affect the results and skew the tests.
48. It is not scientific because the tablets alone do not decrease your weight, instead, it is a combination of exercise and the tablets, but we all know you only need exercise in the first place to lose weight.
49. It is not scientific because there are no ingredients or chemicals specified in the pill that makes it effective. This is just advertisement, but to make it scientific they would have to support this idea with facts from tests or results.
50. It is stated that the "Fat-B-Gone" tablets can HELP you lose up to 2-3 lbs per week. 51. Therefore, it is saying that in only some trials using the tablet will help with weight loss, it is not

stated that a certified scientists/pharmacist, etc performed these tests, and the trials are not explained for further validity.

51. It is too broadly stated. Who will lose weight? Compared to what weight class? Obese? Or mildly overweight? What constitutes proper diet or exercise?

***Responses from students having taken 2 GE science courses:***

52. Because it does not define "proper diet and exercise".

53. Because it doesn't prove, or even say how the tablets work. It just says that they do work. because you are exercising and eating properly it wasn't the pill that caused you to lose weight!

54. Clearly, we need to know who conducted these trials...under what kinds of conditions, what kinds of people, etc. and so forth. We need to know EVERY detail to determine that this is a safe, efficient, and effective route to take. This advertisement gives us NO information.

55. Doesn't say anything about the nature of the scientific trials, who did them or how many.

56. Elements outside the control of clinical trial parameters make it inadvisable for scientists to endorse the product.

57. How much exercise and what kinds were the subjects getting, were they men or women, how old were they, how overweight were they, these questions were not addressed, it was not a controlled experiment.

58. I do not understand the question is asking...?

59. It does not say anything particular about the clinical trials or who ran them.

60. It doesn't say if the person had or did exercise while taking it. It also didn't say if the person had or did change the foods that they consumed.

61. It's not a scientific because it does not have a placebo effect to show that another diet exercise table works better than Fat-B-Gone .

62. None of these fat burning pills or weightloss pills are FDA approved or backed... Some doctor somewhere just says it does.

63. Proper Exercise and Dieting alone would help you lose 2-3 lbs a week

64. Science would not help endorse such a product because that is money that will go into the drug companies. Science says that just proper diet and exercise is good enough to lose weight in a healthy way.

65. That statement doesn't state what Fat-B-Gone can do by itself. For example, it doesn't say if you lose weight with only using Fat-B-Gone.

66. The advertisement is not explaining what the product does physically to produce this weight loss.

67. The endorsement doesn't say how the tablets can make you lose weight other than that it states the obvious that with diet and exercise you can lose weight.

68. There is no data to either support or contradict the statement.

69. There is no way of knowing whether or not the pills are in fact placebos. There is no control data. If they provided data regarding the amount of weight lost with only use of tablets compared to amount of weight lost with tablets, diet, and exercise, then it could be a valid endorsement. 70. Otherwise, one may assume that diet and exercise produced the weight loss.

71. There is nothing implying a constant in this process. For instance: what if one only diets or only exercises while on this Fat-B-Gone tablet?

72. There was no control.

73. This is not a scientific endorsement because it does not have any lab results shown and it does not have any scientific reasoning to why this product works

74. This is not a scientific experiment because there was no control to base upon the results.
75. This is not scientific, because it gives no research on Fat-B-Gone tablets alone. Proper diet and exercise can help one lose weight, and there is no hard evidence that the weight lost were from these tablets.
76. With "Proper diet and exercise" everyone could lose 2 or 3 pounds a week. There is no proven correlation between the pills and the weight loss.

***Responses from students having taken 3 GE science courses:***

77. Because findings haven't been posted in a scientific journal
78. Because you are dieting and exercising at the same time.
79. Because you are working out as well
80. Does not address what if an experiment was used to prove this.
81. First, the statement does not qualify "proper diet and exercise." Also, it does not cite any research institutions or methods, nor credentials of the researchers to suggest that the tests had any scientific validity.
82. How can it be proved that just diet and exercise alone did not make the person lose weight?
83. The pills could have done absolutely nothing to aid in weight loss.
84. I don't really understand what a scientific endorsement really is.
85. If you are eating a proper diet and exercising then you are probably losing the 2-3 pounds that way and not by taking a Fat-B-Gone pill.
86. It does not explain the scientific method required in these clinical trials.
87. It doesn't give enough information about the tablets and what you have to do in order to lose weight.
88. It doesn't name which clinical trials or any data or specifics about the trials. It is just an obscure claim without facts to support the statement.
89. It doesn't say what kind of drug or medicine is in the tablets or what any side effects may be.
90. It doesn't state any previous tests and it can't guarantee that everyone will lose that much weight or any at all.
91. It is merely presenting results from a drug trial. This does not mean that they are trying to sell the product or market it.
92. It may be diet and exercise that explained why a person lost weight, not necessarily the tablets.
93. In order to prove that the tablets were the cause of weight loss, the other variables would have to be eliminated.
94. Proper Diet and Exercise isn't a scientific solution.
95. The endorsement does not state how the tablets actually work.
96. The methods and results of the trial have not been specified, and the statement advertises proper diet and exercise in conjunction with the pill. Without proper test groups, you can't tell if it is the diet and exercise that's causing the people to lose weight or the pill.
97. There is no control group, proper diet and exercise is vague, the statement is generally vague,
98. There is no evidence.
99. There is no explanation of how it works. "clinical trials show" doesn't sound scientific to me.
100. There is no reference or scientific data to support that claim. It is an ambiguous statement.
101. They are simply making a statement. They are not providing any scientific evidence to support it.
102. They haven't been tested.

103. This advertisement is does not show scientific data such as their testing results.
104. This does not show a specific example it is worded more like an opinion.
105. This does not state how Fat-B-Gone might affect you and what chemicals are involved in the pill.
106. This is just stating that it will help lose weight. There is no scientific data that ensures it.
107. This is not a scientific endorsement because it does not use scientific evidence to back it up.
108. This is not a scientific endorsement because proper diet and exercise are variables that will vary from person to person.
109. This is not a scientific endorsement because there is a possibility that it was the diet and exercise that helped lose the weight and not the Fat-B-Gone.
110. We don't know who did the trials, and on whom