Instructions for teachers:

The ACT Science practice allows the students and teacher to break down the figures, examine more carefully what the variables are in each graph, what is being studied, and how everything is measured.

The document is 3 pages (one page for each day of ACT week). You can photocopy the first 2 pages of the document front-to-back and have students keep this paper for the entire week.

The last page can be read out loud, projected on an LCD or an overhead projector, or photocopied. However, it should not be handed out to students until the final day, as many students want to rush into the multiple choice questions.

It is more important that some discussion takes place about the figures rather than rushing through the answers to the questions.

Any feedback on Science ACT practice is appreciated to the science team. Send e-mails to Victor Chen.

DAYS 1-2 of ACT Week

PASSAGE VI

Cholesterol is a soft, waxy compound that is found in many foods and throughout the entire human body. The body's liver produces cholesterol to form and maintain cell membranes, some hormones, and vitamin D. The liver is also responsible for eliminating cholesterol from the body. Excessive levels of cholesterol in the blood, however, can lead to health problems, including heart disease.

The dietary consumption of special types of fats is a major factor influencing the levels of low-density lipoprotein cholesterol (LDL), or "bad" cholesterol, and high-density lipoprotein (HDL), or "good" cholesterol. The circulation of too much LDL cholesterol in the blood can lead to buildup in the arteries and subsequently, the development of heart disease.

Table 1 shows specific types of fats and their effect on cholesterol levels.

Table 1

Type of fat	Effect on cholesterol	
	LDL	HDL
Monounsaturated	Decrease	Increase
Polyunsaturated	Decrease	Increase
Saturated	Increase	Increase
Trans	Increase	Decrease

In the ACT Science Section, you will see three "Figures" passages. In these passages, you will usually notice very little text, and a bunch of charts, tables, or graphs.

1. As you look at Table 1, what are the variables? (what is changing in the table? What is the table trying to show?)

2. How are the variables measured? Keep in mind that values can also be represented as percentages.

3. As you look at Figure 1, what are the variables? (what is changing in the figure? what is the figure trying to show?)

4. How are the variables measured? Keep in mind that values can also be represented as percentages.

Science ACT Instructions: Graphs and Tables (**IMPORTANT: You do NOT need to know ANYTHING about the science topic to do well on the ACT Science test. The test is purely a reading test that tests your ability to interpret data, graphs, and experiments.)**

In the Science portion of the ACT, you will see 3 passages that include graphs and tables. There is usually a paragraph of text that goes with the passage. DO **NOT** READ THE ENTIRE PARAGRAPH! It takes up too much of your time. Instead, read the first sentence, skim to see if there are any **boldfaced** or *italicized* words that stand out, and then read the last sentence.

Next, read the figure caption (if there is one) and look at the axes to see what is being shown in the figure. Spend a little bit of time examining the figure to get a feel for what is being shown, and then go to the questions. DON'T BE AFRAID TO MARK UP YOUR PAPER. Circle what you are trying to find, and underline important information.

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Polyunsaturated	Decrease	Increase
Saturated	Increase	Increase
Trans	Increase	Decrease

1. Approximately 75% of the cholesterol in the blood is produced in the body. According to the passage, the remaining 25% of cholesterol that can be found in the blood comes from what? Circle where you found this information in the passage.

2. If HDL protects against the development of heart disease, how might HDL do this, according to the passage? What other things in the body help to protect against heart disease? Underline where you find this information.

3. According to the passage and table, what type of fat has the greatest negative net effect on cholesterol levels? Box in where you find this information.

4. According to the following table, which type of cooking oil would most likely be suggested for a person with high cholesterol? Why would you say this?

Oil	Saturated	Monounsaturated	Polyunsaturated	Trans
Canola	8	57	35	0
Palm	50	37	13	0
Coconut	87	8	5	0

5. Based on the information in the table, which type of fat would work the best to lower the potential the risk of heart disease? Put a star by where you found this information and briefly explain why you made this choice.

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The dietary consumption of special types of fats is a major factor influencing the levels of low-density lipoprotein cholesterol (LDL), or "bad" cholesterol, and high-density lipoprotein (HDL), or "good" cholesterol. The circulation of too much LDL cholesterol in the blood can lead to buildup in the arteries and subsequently, the development of heart disease.

Table 1 shows specific types of fats and their effect on cholesterol levels.

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Trans	Increase	Decrease

1. Approximately 75% of the cholesterol in the blood is produced in the body. According to the passage, the remaining 25% of cholesterol that can be found in the blood comes from:
F. diet
G. LDL
H. genetics
J. HDL

2. If HDL protects against the development of heart disease, which of the following statements is most likely to be true?
A. HDL carries cholesterol to the liver where it can be eliminated.
B. HDL dissolves in the bloodstream and increases total cholesterol levels.
C. HDL becomes "bad" cholesterol after it enters the bloodstream.
D. HDL cholesterol cannot be affected by diet or any other risk factor.

3. According to the passage and table, what type of fat has the greatest negative net effect on cholesterol levels?
F. Monosaturated fats G. Polyunsaturated fats
H. Trans fats J. Saturated fats

4. According to the following table, which type of cooking oil would most likely be suggested for a person with high cholesterol? Why would you say this?

Oil	Saturated	Monounsaturated	Polyunsaturated	Trans
Canola	8	57	35	0
Palm	50	37	13	0
Coconut	87	8	5	0

A. Coconut oil, because it has the least amount of polyunsaturated fats.
B. Palm oil, because it has a good amount of both mono- and poly-unsaturated fats.
C. Canola oil, because it has the least amount of saturated fats and a low amount of polyunsaturated fats.
D. Canola oil, because it has the least amount of saturated fats and the most unsaturated fats.

5. Omega-3 fatty acid (found in fish such as mackerel, salmon, sardines, or swordfish) is known for its potential to lower the risk of heart disease. Which of the following best explains why this statement may be true? Omega-3 fatty acid:
F. is a form of saturated fat that increases the levels of both HDL and LDL in the bloodstream
G. Is a form of monounsaturated fat that lowers the level of HDL and increases the level of LDL
H. is a form of polyunsaturated fat that lowers the level of HDL and increases the level of LDL
J. is a form of polyunsaturated fat that lowers the level of LDL and increases the level of HDL

Open-ended Answers:

1. As you look at Figure 1, what are the variables? (what is changing in the figure? what is the figure trying to show?)

2. How are the variables measured? Keep in mind that values can also be represented as percentages.

3. As you look at Figure 2, what are the variables? (what is changing in the figure? what is the figure trying to show?)

4. How are the variables measured? Keep in mind that values can also be represented as percentages.

Multiple Choice Answers

1. The best answer is F. According to the passage, the body produces all of the cholesterol that it needs. Therefore, cholesterol is found in the body or in particular foods only. It can be inferred that any other cholesterol in the body that was not created there must come from what you eat, answer choice F.

2. The best answer is A. HDL protects against the development of heart disease and is considered "good" cholesterol. Answer choice B says that HDL increases cholesterol levels and answer choice C claims that HDL is "bad" cholesterol, so you can eliminate both of these choices. You know from the passage that answer choice D is also false, so answer choice A must be correct. The passage also states that the liver is responsible for cholesterol from the body.

3. The best answer is H. According to Table 1, trans fats are the only type of fats that increase "bad" LDL cholesterol and decrease "good" HDL cholesterol. Therefore, this type of fat would have the greatest net negative effect on cholesterol levels.

4. The best answer is D. According to Table 1, monounsaturated and polyunsaturated fats are the best for overall cholesterol levels. Saturated and trans fats are the worst for overall cholesterol levels. Based on this information and the data in the question, you can eliminate answer choices A and B. Both palm and coconut oils have high amounts of saturated fats, which increase "bad" cholesterol levels. Canola oil is the best choice, but not because it is low in polyunsaturated fats, which increase "good" cholesterol levels, so answer choice C can also be eliminated. Canola oil is the best choice because it is high in monounsaturated and polyunsaturated fats and low in saturated fats, answer choice D.

5. The best answer is J. According to the question, ometa-3 fatty acid is known to lower the risk of heart disease. You know from the passage that high cholesterol levels can cause heart disease, so you can assume that omega-3 fatty acid lowers cholesterol levels. You can also assume that omega-3 fatty acids have lower amounts of "bad" LDL cholesterol and higher amounts of "good" HDL cholesterol. Therefore, lowering the level of "bad" LDL cholesterol and increasing the levels of "good" HDL cholesterol would probably lower the risk of heart disease.