

## Designing ACT Practice Material for Transportation

The purpose of this document is to assist educators in building relevant ACT preparatory resources for the CTE classroom. Upon picking a CTE standard and the aligned ACT tested subject, educators may use this document to assist in the design process based on current ACT sample materials.

The ACT is set up in four parts:

Subject	Number of Questions	Time	Tested Topics Include
English	75	45 minutes	Grammar, punctuation, sentence structure, rhetorical skills
Math	60	60 minutes	Algebra I and II, geometry, and some trigonometry
Reading	40	35 minutes	Four passages (prose fiction, social studies, humanities, and natural sciences) with 10 questions per passage
Science	40	35 minutes	Science-based passages presented with graphs, charts, tables, and research summaries

Information from Princeton Review at <https://www.princetonreview.com/college/act-sections>

### Step 1: Choose a CTE Standard on which to Build an ACT Practice Material

Decide which CTE standard to use as a foundation for your practice material. For example, one might choose this standard from [Maintenance & Light Repair I](#):

**Standard 6.0**

**Students will perform basic vehicle engine service and maintenance.**

**6.1 Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins. (P-1)**

### Step 2: Choosing an ACT Subject

Select the ACT subject areas that align with your career cluster. Most CTE subjects find close connections with math, reading, and science, so they are the focus of this document. Look at samples of questions in these areas. For example, additional cluster-specific [ACT practice materials](#) can be found on the Career Cluster page under [Resources](#).

For the standard chosen in Step 1, one might choose Reading because it closely aligns itself with what a student is asked to master in the standard.

Standard 6.0

Students will perform basic vehicle engine service and maintenance.

**6.1 Research** applicable vehicle and service **information**, vehicle service history, service precautions, and technical service **bulletins**. (P-1)

Page Three of this document begins a section on building practice material based on subject area. Please see the Table of Contents below to build on your specific choice.

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Ask another educator to review the resource. Is it robust? Does it align to both the ACT format and rigor? Feedback will be beneficial in building stronger resources for students.

### **Step 3: Sharing the Resource with Students**

The practice materials created can be used as bell-ringers or as a part of the regular lesson plan. After the students engage with your resource, it is important to go over it with them so they understand how to arrive at the correct answer. These resources will build student knowledge in your program of study while also teaching them to be comfortable with ACT format.

If you create several of these questions, consider putting them on your classroom or school website so students will have continuous access to them. Share these ideas in Professional Learning Communities to inspire other educators to do the same.

## Designing Practice Materials Based on ACT Subject Area

### Math

There are several word problems on the ACT. Below is an example:

**Sales for a business were three million dollars more the second year than the first, and sales for the third year were double the sales for the second year. If sales for the third year were 38 million dollars, what were sales, in millions of dollars, for the first year?**

- A. 16
- B. 17.5
- C. 20.5
- D. 22
- E. 35

This ACT sample question involves multiple steps. This speaks to the rigor of ACT. In building ACT practice material, add two to four steps in word problems.

For example, an educator may be designing a math practice question for Culinary Arts I:

14) Compare and contrast the components of a standardized recipe with a home recipe, citing evidence from each recipe format to support comparisons. Using proper formulas, apply the correct conversion factor to increase and decrease the yield according to specifications noted in recipes.

In the initial design, the educator creates this question:

**Adam's recipe for chocolate chip cookies calls for two cups of sugar to make 24 cookies. Adam is only make 12 cookies. How much sugar will he need?**

- A. 6 cups
- B. 2 cups
- C. 2 ½ cups
- D. 1 cup
- E. ½ cup

While this is a word problem, it only asks a student to complete one step: Divide 2 cups of sugar by two. While this involves math, it does not contain a rigorous math computation.

A better culinary math question is this:

**Adam is baker at Chocolate Oasis, a bakery in a busy section of town. Adam's chocolate chip recipe calls for 22 pounds of sugar. He has received a special order for a weight loss group. They would like to enjoy the cookies, but have requested 25% less sugar to be used in the recipe. How much sugar will Adam need?**

- A. 17 pounds
- B. 16.5 pounds
- C. 20.25 pounds

- D. 12 pounds
- E. 6 pounds

In this question, students must multiply the 22 pounds by .25, and then subtract that number from 22 to arrive at 16.5 pounds.

There are math problems on the ACT that may not look like they are CTE, but they are. For instance:

**A rectangle with a perimeter of 30 centimeters is twice as long as it is wide. What is the area of the rectangle in square centimeters?**

- A. 15
- B. 50
- C. 200
- D.  $3\sqrt{15}$
- E.  $6\sqrt{15}$

To find area, we multiply length times width. If the perimeter is 30 centimeters and it is twice as long as it is wide, If  $w$ =width, then  $2w$ =length. So, the perimeter is  $2(w+2w) = 30$ , and  $w=5$ . Since the width is 5, the length is  $2(5) = 10$ . Then the area is  $5(10) = 50$ .

This looks like it has no CTE connection, but it does. If we are looking at the area of a field in which we are going to plant crops, this has a direct connection. When looking at ACT questions, go beyond the words in the problems, and look for connections in the mathematical equations.

An ACT question example from [Maintenance and Light Repair I](#) is shown below:

**Standard 5.0**

**Students will prepare a vehicle for service.**

5.1 Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.

**Johnny is an auto-mechanic at Coldstone Auto Care. He has just completed an oil change and replaced the windshield wiper blades for a customer. As Johnny computes the total charge for the services, the customer hands him a coupon for a 15% discount for parts only. Based on information from the work order, calculate the total cost including the discount and sales tax.**

<b>Parts:</b> oil filter	- \$7.30	Labor	- \$35.24	
oil	- \$11.50	Sub Total	-	
wiper blades	- \$16.00	Sales Tax	- 9%	<b>Total Amount: \$ _____</b>

- A. \$76.34
- B. \$80.54
- C. \$70.65
- D. \$70.58
- E. \$71.74

**Answer.** In this question, students add the total of the price of parts (\$35.80) and multiply it by 15% for the discount (\$5.22). Then, subtract the discount from \$35.80 and you get \$30.58. Next, add the cost of labor (35.24) and you have \$65.82. Multiply that by the sales tax 9% and add that (\$5.92) to the \$65.82 and you get the answer **\$71.74**.

For more math problems, visit [ACT.org](https://www.act.org) for sample questions in math.

## Reading

Reading passages are an easy way to incorporate ACT practice materials into the CTE classroom. It is easy to find passages, but it takes some time to learn how to craft similar questions.

The objectives for designing passages for the CTE classroom are two-fold:

- 1) Students have a deeper understanding of the passages because the questions require them to think critically about the materials.
- 2) Students become accustomed to the length of passages and the structure of ACT questions.

First, let's look at a passage from [ACT.org](http://ACT.org) that highlights a Law and Public Safety issue. Skip to page 6, read the [passage](#), and look at the [questions](#) on pages 9—14. When you are finished, return to this section of the document.

### After Reading the Passage and Questions

Notice that the passage, double-spaced, is a little over two pages. While it may be tempting to use a shorter passage, it is important that students not be overwhelmed by the length of a passage. If they can regularly interact with passages of this length in the CTE classroom, students will be less likely to “shut down” during the ACT reading test. However, it is acceptable to start with smaller passages if the intent is to expand the length to grow students’ abilities.

Remember to site sources.

### Types of Passages to Use in CTE

#### Articles from Industry Journals

These texts allow students to interact with current industry-specific materials complete with industry vocabulary and topics of importance to the professionals. Many classroom already use these materials. Consider crafting questions to mimic ACT style as an assessment tool for student understanding of the materials.

For example, the article, “[Optimizing Built-in Tire Pressure Monitoring Sensors](#)” from a recent issue of [Automotive-Technology.com](http://Automotive-Technology.com) has information that aligns to [Maintenance and Light Repair I](#):

#### **Standard 7.0**

#### **Students will properly inspect and service tires and wheels.**

- 7.1 Identify and test tire pressure monitoring systems (indirect and direct) for operation; verify operation of instrument panel lamps.

#### Editorials

These opinionated texts can be used for the purposes of practicing ACT Reading, but can be the foundation for classroom discussions. This is a simple way to teach students the differences between a factual article and one based on opinions.

For example, the editorial, “[Where's the Respect for 'Parts Changers?'](#)” from the August 16th, 2016 issue of [Auto Service Professional](http://Auto Service Professional) has information that aligns to [Maintenance and Light Repair I](#):

## Standard 5.0

### Students will prepare a vehicle for service.

#### 5.1 Demonstrate use of the three C's: concern, cause, and correction.

#### Current Events/ News Articles

CTE fields are often the topic of articles in newspapers and online news outlets. Check the APPENDIX for websites with possible industry specific news articles.

Finally, always use these passage as the topic of discussions, additional writing assignments, or projects. Students are more likely to engage if they know this is not something they will read and never discuss.

Let's look at an example of an ACT passage and the structure of the questions.

## Personality Disorders

How should the law treat a mentally disturbed person who commits a criminal offense?

Should individuals whose mental faculties are impaired be held responsible for their actions? These questions are of concern to social scientists, to members of the legal profession, and to individuals  
5 who work with criminal offenders.

Over the centuries, an important part of Western law has been the concept that a civilized society should not punish a person who is mentally incapable of controlling his or her conduct. In 1724, an English court maintained that a man was not responsible for an act if "he doth not know what he is doing, no more than . . . a wild beast." Modern standards of legal responsibility, however,  
10 have been based on the McNaghten decision of 1843. McNaghten, a Scotsman, suffered the paranoid delusion that he was being persecuted by the English prime minister, Sir Robert Peel. In an attempt to kill Peel, he mistakenly shot Peel's secretary. Everyone involved in the trial was convinced by McNaghten's senseless ramblings that he was insane. He was judged not responsible by reason of insanity and sent to a mental hospital, where he remained until his death. But Queen Victoria was

15 not pleased with the verdict— apparently she felt that political assassinations should not be taken  
lightly—and called on the House of Lords to review the decision. The decision was upheld and rules  
for the legal definition of insanity were put into writing. The McNaghten Rule states that a defendant  
may be found “not guilty by reason of insanity” only if he were so severely disturbed at the time of  
his act that he did not know what he was doing, or that if he did know what he was doing, he did not  
20 know it was wrong.

The McNaghten Rule was adopted in the United States, and the distinction of knowing right  
from wrong remained the basis of most decisions of legal insanity for over a century. Some states  
added to their statutes the doctrine of “irresistible impulse,” which recognizes that some mentally ill  
individuals may respond correctly when asked if a particular act is morally right or wrong but still be  
25 unable to control their behavior.

During the 1970s, a number of state and federal courts adopted a broader legal definition of  
insanity proposed by the American Law Institute, which states: “A person is not responsible for  
criminal conduct if at the time of such conduct, as a result of mental disease or defect, he lacks  
substantial capacity either to appreciate the wrongfulness of his conduct or to conform his conduct  
30 to the requirements of the law.” The word *substantial* suggests that “any” incapacity is not enough to  
avoid criminal responsibility but that “total” incapacity is not required either. The use of the  
word *appreciate* rather than *know* implies that intellectual awareness of right or wrong is not  
enough; individuals must have some understanding of the moral or legal consequences of their  
behavior before they can be held criminally responsible.

35 The problem of legal responsibility in the case of mentally disordered individuals is currently  
a topic of intense debate, and a number of legal and mental health professionals have

recommended abolishing the insanity plea as a defense. The reasons for this recommendation are varied. Many experts believe that the current courtroom procedures—in which psychiatrists and psychologists for the prosecution and the defense present contradictory evidence as to the  
40 defendant’s mental state—are confusing to the jury and do little to help the cause of justice. Some also argue that the abuse of the insanity plea by clever lawyers has allowed too many criminals to escape conviction. Others claim that acquittal by reason of insanity often leads to a worse punishment (an *indeterminate* sentence to an institution for the criminally insane that may confine a person for life) than being convicted and sent to prison (with the possibility of parole in a few years).

45           Despite the current controversy, actual cases of acquittal by reason of insanity are quite rare. Jurors seem reluctant to believe that people are not morally responsible for their acts, and lawyers, knowing that an insanity plea is apt to fail, tend to use it only as a last resort. In California in 1980, only 259 defendants (out of approximately 52,000) were successful in pleading not guilty by reason of insanity.

This passage is adapted from the chapter “Personality Disorders” in *Introduction to Psychology*, edited by Rita L. Atkinson and Richard C. Atkinson (©1981 by Harcourt Brace Jovanovich, Inc.).

## Questions

1. One of the author’s main points about the legal concept of responsibility in the passage is that:
  - a. The phrase “not guilty by reason of insanity” has made our legal system more efficient.
  - b. *Responsibility* and *guilt* are legal concepts, and their meanings can be modified.
  - c. Knowing right from wrong is a simple matter of admitting the truth to oneself.
  - d. People become severely disturbed with a word of warning to anyone.
  
2. Based on the passage, the primary purpose for the 1970’s redefinition of insanity proposed by the American Law Institute was to:
  - a. Eliminate the insanity defense from American courtrooms.
  - b. More precisely define the concepts of responsibility and intellectual capacity.
  - c. Redefine legal insanity so that it might include as many criminals as possible.
  - d. Apply the McNaghten Rule only to trials involving cases of mistaken identity.
  
3. From the information in the third and fourth paragraphs (lines 21-34) it can reasonably be inferred that the legal definition of insanity was changed in the 1970s after:
  - a. Federal courts won a dispute with state courts over a proposal made by the American Law Institute.
  - b. The doctrine of “irresistible impulse” was found to contradict accepted notions of justice.
  - c. Proponents of the McNaghten Rule had been using the insanity defense in far too many murder trials.
  - d. Several courts found that justice was not always best served when the McNaghten Rule was applied.
  
4. According to the explanation provided in the fourth paragraph (lines 26—34), use of the word *appreciate* in the phrase “to appreciate the wrongfulness” (line 29) instead of *know* implies which of the following?
  - a. The difference between right and wrong is something people feel rather than know, which makes deciding legal responsibility difficult.
  - b. To *know* implies certainty, and distinguishing right from wrong is often a subjective matter in determining legal responsibility.

- c. The word *appreciate* suggests that an action and that action's implications must be understood for there to be legal responsibility.
  - d. An insane person would "know" something the way a sane person would "know" something, and be able to appreciate that knowledge, too.
5. The passage indicates that the McNaghten case became the basis for future decisions about legal insanity because:
- a. The House of Lords upheld the verdict of the court despite considerable political pressure.
  - b. There has been an increase in cases of murder involving mistaken identity arising from delusions.
  - c. McNaghten was unable to convince the jury at this trial that he was incoherent and insane.
  - d. McNaghten used a gun to commit murder, thus aggravating the crime in the jury's mind.

See answers on next page.

## Answers (from [ACT.org](https://www.act.org))

1. **The best answer is B** because the passage focuses mainly on how standards of legal responsibility regarding a mentally incompetent person who commits a crime have been modified over time. These changes in responsibility also affect whether or not a person is guilty. To support the point that the legal concepts of *responsibility* and *guilt* can be modified, the author first presents the information regarding the McNaghten Rule in the second paragraph and then goes on in the fourth and fifth paragraphs to show that in the 1970s, "a number of state and federal courts adopted a broader legal definition of insanity" (lines 43-44), which modified a mentally ill person's legal responsibility. The passage further states that "the problem of legal responsibility in the case of mentally disordered individuals is currently a topic of intense debate" (lines 59-61), which indicates that additional modifications to the meanings of *responsibility* and *guilt* are likely.
2. **The best answer is B.** Support for this choice is found in the direct quote from the definition proposed by the American Law Institute (lines 27-30). This 1970s redefinition of insanity set out to define more precisely when "a person is not responsible for criminal conduct" and to explain that a person must have "substantial capacity either to appreciate the wrongfulness of his conduct or to conform his conduct to the requirements of the law."
3. **The best answer is D.** The inference in the third and fourth paragraphs is that the narrowness of the McNaghten Rule led to modifications. "Some states added to their statutes the doctrine of 'irresistible impulse,'" (lines 38-39), and later "a number of state and federal courts adopted a broader legal definition of insanity" (lines 43-44). Both of these changes suggest that strictly applying the original McNaghten Rule could in some cases be unjust.
4. **The best answer is C.** Support for this choice is found in lines 31—34. This section of the passage explains the use of the word *appreciate*, which implies that before persons can be held criminally responsible, they "must have some understanding of the moral or legal consequences of their behavior."
5. **The best answer is A.** Support for this choice is clearly stated in lines 24-29, which explains how Queen Victoria, not pleased with the result of an insanity judgment in favor of a defendant named McNaghten, "called on the House of Lords to review the decision. The decision was upheld and rules for the legal definition of insanity were put into writing," and this came to be known as the McNaghten Rule, the basis for future decisions regarding legal insanity.

## Questioning

Let's look at the structure of the questions used for this passage.

### Question 1

**One of the author's main points about the legal concept of responsibility in the passage is that:**

- a. The phrase "not guilty by reason of insanity" has made our legal system more efficient.
- b. **Responsibility and guilt are legal concepts, and their meanings can be modified.**
- c. Knowing right from wrong is a simple matter of admitting the truth to oneself.
- d. People become severely disturbed with a word of warning to anyone.

This question asks the student to determine the main point of the passage. The correct answer is B. Answers A and D are incorrect because they are not true. Answer C is an opinion, and in light of this passage, doesn't really make any sense.

When crafting the first question, think about the main point and what knowledge students should gain from reading this passage. Is the main point connected to your standards? If not, consider finding a passage that is.

### Question 2

**Based on the passage, the primary purpose for the 1970's redefinition of insanity proposed by the American Law Institute was to:**

- a. Eliminate the insanity defense from American courtrooms.
- b. **More precisely define the concepts of responsibility and intellectual capacity.**
- c. Redefine legal insanity so that it might include as many criminals as possible.
- d. Apply the McNaghten Rule only to trials involving cases of mistaken identity.

For this question, it is necessary to find the redefinition which is located on lines 27—30.

*"A person is not responsible for criminal conduct if at the time of such conduct, as a result of mental disease or defect, he lacks substantial capacity either to appreciate the wrongfulness of his conduct or to conform his conduct to the requirements of the law."*

The question requires the student to go back in to the passage, find an important piece of information, and determine its importance. If Question One is the main idea, Question Two can bring out another important point or supporting details.

### Question 3

**From the information in the third and fourth paragraphs (lines 21-34) it can reasonably be inferred that the legal definition of insanity was changed in the 1970s after:**

- a. Federal courts won a dispute with state courts over a proposal made by the American Law Institute.
- b. The doctrine of “irresistible impulse” was found to contradict accepted notions of justice.
- c. Proponents of the McNaghten Rule had been using the insanity defense in far too many murder trials.
- d. Several courts found that justice was not always best served when the McNaghten Rule was applied.**

“Reasonably inferred” is a phrase all students should know. Using this regularly on these passages benefits the students by asking them to think critically about what the passage is saying and make an educated guess as to the meaning. Critical thinking is an important employability skill, and this is one way to assist students in developing it.

### Question 4

**According to the explanation provided in the fourth paragraph (lines 26—34), use of the word *appreciate* in the phrase “to appreciate the wrongfulness” (line 29) instead of *know* implies which of the following?**

- a. The difference between right and wrong is something people feel rather than know, which makes deciding legal responsibility difficult.
- b. To *know* implies certainty, and distinguishing right from wrong is often a subjective matter in determining legal responsibility.
- c. The word *appreciate* suggests that an action and that action’s implications must be understood for there to be legal responsibility.**
- d. An insane person would “know” something the way a sane person would “know” something, and be able to appreciate that knowledge, too.

Lines 31—34 in the passage give us this answer:

“The use of the word *appreciate* rather than *know* implies that intellectual awareness of right or wrong is not enough; individuals must have some understanding of the moral or legal consequences of their behavior before they can be held criminally responsible.”

Question like these teach the students to use the materials available to them. An automotive student wouldn’t look once at a page in a technical manual and then try to tackle a brake job for the first time. The student is going to look at the materials several times during the process. This is an important understanding when taking the ACT as well. Consult the materials. In most cases, it will give you the answer.

When crafting questions for ACT practice materials, ask students to go back and re-read certain lines before answering. Let them know that this is a skill they will use for life.

*(To learn how to add line numbers to a passage, please consult the [appendix](#).)*

#### Question 5

**The passage indicates that the McNaghten case became the basis for future decisions about legal insanity because:**

- e. The House of Lords upheld the verdict of the court despite considerable political pressure.**
- f. There has been an increase in cases of murder involving mistaken identity arising from delusions.
- g. McNaghten was unable to convince the jury at this trial that he was incoherent and insane.
- h. McNaghten used a gun to commit murder, thus aggravating the crime in the jury's mind.

The final question summarizes the answer to the question, “What impact does this have on today?” This question structure allows the teacher to connect the material to the present or the current topic in class. This question can also be a discussion starter. For example, what might have happened if decisions about legal insanity were NOT based on the McNaghten case?

#### **More About Questioning**

None of the questions on ACT are for simple “hunt and find” questions, such as, “What year was the McNaghten Case?” A student does not need any understanding of the passage to find this answer.

While these example questions are a good place to start, there are numerous ways to design questions to assist students in understanding the reading passage.

For example:

Industry Vocabulary—In passages where industry vocabulary is used but not defined, ask students to use context clues to infer the meaning.

For more ACT sample passages, visit [ACT.org](http://ACT.org).

## Science

The science section of the ACT requires that students be able to interpret charts and graphs. For instance, look at this question:

The human *threshold of hearing* is the minimum intensity at each sound frequency required for a sound to be heard by humans. The *human threshold of pain* is the maximum intensity at each sound frequency that humans can tolerate without pain.

The figure below displays, for sounds in water and in air, the human thresholds of hearing and pain. The figure also shows  $S$ , the percent increase in air density and water density that accompanies the compression of air and water by sound waves of given intensities. Sound intensities are given in decibels (db) and frequencies are given in hertz [(Hz); 1 Hz = 1 cycle/sec].

According to the figure, which of the following is closest to the lowest frequency that can be heard by a human being?

- 8 Hz
- 20 Hz
- 1,000 Hz
- 20,000 Hz

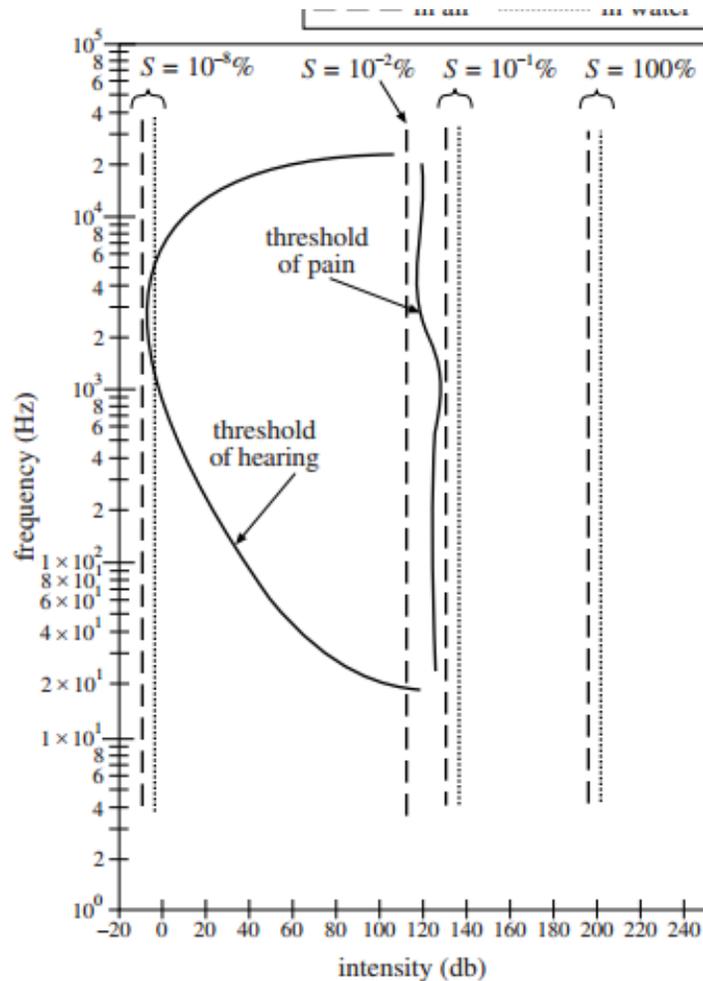


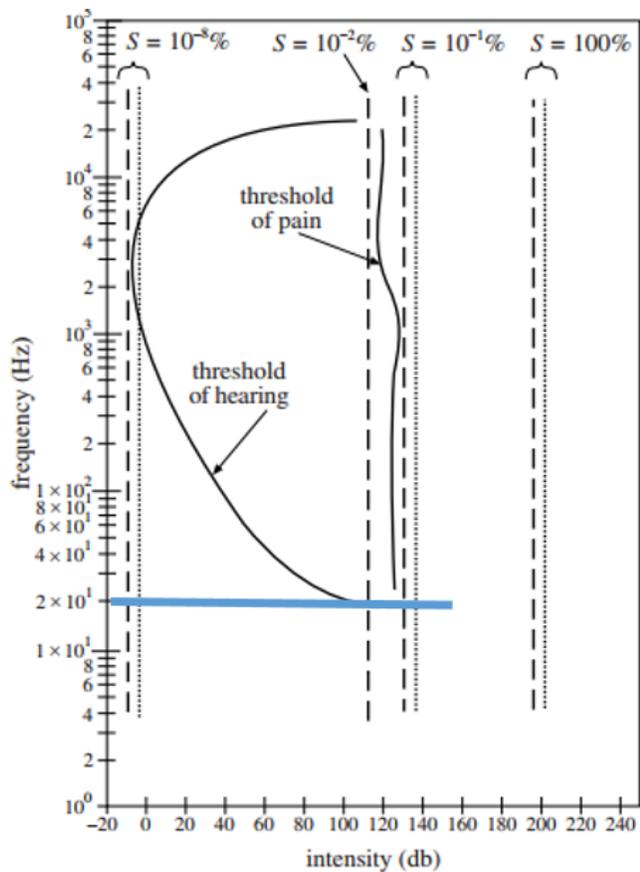
Figure adapted from Rita G. Lerner and George L. Trigg, eds., *Encyclopedia of Physics*, 2nd ed. ©1991 by VCH Publishers, Inc.

While the passage and chart appear complicated, the student is being asked to look at the chart and determine the lowest frequency at which a person can hear.

In order to answer this question, the student must find the lowest frequency heard. The line added here marks that frequency, which corresponds with answer B, or  $2 \times 10^1$ .

**According to the figure, which of the following is closest to the lowest frequency that can be heard by a human being?**

- a. 8 Hz
- b. 20 Hz
- c. 1,000 Hz
- d. 20,000 Hz



This question taken from [http://cdn2.hubspot.net/hub/360031/file-2226679255-pdf/Documents/ACT\\_Test\\_2014-15.pdf?t=1456342256968](http://cdn2.hubspot.net/hub/360031/file-2226679255-pdf/Documents/ACT_Test_2014-15.pdf?t=1456342256968).

To create a similar question with Transportation, Distribution, & Logistics material, create or search for a chart or graph that contains information related to your chosen standard. Using a paragraph, give students the background information necessary to interpret the chart or graph. Write the question so that the student must interpret the information in order to arrive at the answer.

To create a Transportation, Distribution, & Logistics science question, first choose a standard.

Example from [Maintenance and Light Repair I](#):

**Standard 7.0**

**Students will properly inspect and service tires and wheels.**

Learning Expectations and Performance Indicators:

- 7.1 Inspect tire condition; identify tire wear patterns; **check for correct size and application (load and speed ratings) and adjust air pressure; determine necessary action.**
- 7.2 Rotate tires according to manufacturer’s recommendations.
- 7.3 Dismount, inspect, and remount tire on wheel; balance wheel and tire assembly (static and dynamic).
- 7.4 Dismount, inspect, and remount tire on wheel equipped with tire pressure monitoring system sensor.
- 7.5 **Inspect tire and wheel assembly for air loss; perform necessary action.**

After a simple search, the following chart was found:

### AA1Car.com Tire Pressure Inflation Chart

Air pressure changes with temperature. To maintain the recommended inflation pressure, add more air to compensate for colder ambient temperatures  
NOTE: For passenger car and light truck tires only. Never exceed the maximum inflation pressure on the sidewall

Outside Temperature (°F)	OEM Recommended Inflation Pressure in PSI																	
	30	32	34	35	38	40	41	42	45	50	55	60	65	70	75	80	85	90
70	30	32	34	35	38	40	41	42	45	50	55	60	65	70	75	80	85	90
60	31	33	35	36	39	41	42	43	46	51	56	61	67	72	77	82	87	92
50	32	34	36	37	40	42	43	44	47	53	58	63	68	73	79	84	89	94
40	33	35	37	38	41	43	44	45	49	54	59	64	70	75	80	86	91	96
30	34	36	38	39	42	44	46	47	50	55	61	66	72	77	82	87	92	97
20	35	37	39	40	43	46	47	48	51	57	62	67	72	77	82	87	92	97
10	36	38	40	41	45	47	48	49	52	57	62	67	72	77	82	87	92	97
0	37	39	41	42	45	47	48	49	52	57	62	67	72	77	82	87	92	97
-10	37	39	41	42	45	47	48	49	52	57	62	67	72	77	82	87	92	97
-20	37	39	41	42	45	47	48	49	52	57	62	67	72	77	82	87	92	97
-30	37	39	41	42	45	47	48	49	52	57	62	67	72	77	82	87	92	97
-40	37	39	41	42	45	47	48	49	52	57	62	67	72	77	82	87	92	97

PSI = pound per square inch. OEM – original equipment manufacturer.

The correct air pressure may be found in the vehicle owner's manual or on the tire placard (attached to the vehicle door edge, doorpost, glove box door or fuel door). The placard tells you the maximum vehicle load, the cold tire pressures and the tire size recommended by the vehicle manufacturer.

For more material go to [AA1Car.com](http://AA1Car.com)

To write a question, first determine the knowledge students will need to gain from this visual. Begin the question with the phrase, "According to the figure". This will prompt students to look at the chart.

In this figure, students will need to interpret the Tire Pressure Inflation Chart to find recommended inflation pressure in PSI. The question might look something like this:

**According to the figure, if the recommended inflation pressure for a given automobile is 42 PSI and the outside temperature is 0 degrees Fahrenheit, what adjustments should be made to the tire pressure?**

- a) Decrease the pressure by 7 degrees
- b) Increase the pressure by 7 degrees
- c) Make no change to the pressure.
- d) Increase the pressure by 5 degree.

The student will find the answer by following these steps: first, locating the recommended PSI (42) horizontally across the top on the chart. Secondly, the student should factor in the outside temperature (0 degrees) by locating the temperature in the far left column. The student should follow that column horizontally until they reach the PSI (49) that directly aligns with the PSI 42 in the top column. 49 PSI is the recommended tire pressure when outside temperature reaches 0 degrees. Finally, the change is from 42 PSI to 49 PSI, an increase in pressure by 7 degrees.

Regular practice in interpreting scientific visual data can make the students feel less intimidated by the material and assist in critical thinking and problem solving skills.

For more ACT science practice materials, visit [ACT.org](https://www.act.org).

## APPENDIX

### How to Add Line Numbers to Reading Passages

1. Type or copy and paste your reading passage into a Word document.
2. Go to *Page Layout* and look at the *Page Setup* section. Click *Line Numbers*.
3. Go to “Line Numbering Options” to make your choices about numbering an entire page or a selected text. You will most likely want to make it continuous rather than beginning at each new page, in case the passage spans multiple pages.

### Sources for News Articles to be used as Reading Passages

Site	Relevance
<a href="#">CNN Money</a>	This site contains articles related to business, careers, and personal finance. All CTE courses have ties to business. Click the link and type the subject in the search box.
<a href="#">Automotive-Technology.com</a>	This site contains the latest news and articles with in-depth coverage of the automotive industry.
<a href="#">Auto Service Professional</a>	This site is great for auto professionals containing tech news, tool reviews, product reviews and technician tips.
<a href="#">AA1Car.com</a>	This site provides car diagnosis and repair help with numerous repair topics and articles.

### Additional Resources

[Preparing for the ACT, Postsecondary and Career Standards](#)

[Information on the ACT in Tennessee](#)

[Steps for Registering for the ACT](#)