Aim of this test. This ACT diagnostic test evaluates your current skills in four of the subjects that the ACT covers:

1. English style and grammar
2. Mathematics
3. Science
4. Reading

The results of this test will suggest to you which areas – English, math, science, or reading -- you should concentrate on in order to raise your ACT score.

This diagnostic test is 30 minutes long. Take it in one sitting, if that’s convenient, timing yourself in each section. When the time limit elapses for one section, move on to the next one. When you have finished the entire test, check your answers against the answer sheet at end of the test.

Using the results of this test. Before taking this diagnostic test, you already have a pretty good idea of which academic subjects are easier for you and which ones you find more difficult. The results of this test will help you refine that evaluation. If you have a tutor or counselor, then discuss your test results with that person. Set up a preparation plan for improving your skills in areas that, here at the beginning of your preparation, you find challenging. That does not mean that you will pay no attention at all to the areas where your skills are already pretty strong. Your test preparation will help you improve those skills too.

If your plan is well thought out and you undertake it seriously, you’ll be excellently prepared to do well on the day of the test.

Bon voyage!

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Cell Phones: The Safety Issue

I use a cell phone; just about everyone I know uses one also. But is the radiation emitted by these phones hazardous to our health? In my community, the city council is considering legislation that aims to protect the public from alleged dangers of cell phone radiation. The council would require telecommunications companies to label cell phone packages with the level of radiation the phones transmit. Would I, along with friends and family, favor a requirement of this kind? It’s true that federal agencies such as the FCC and FDA tell us that cell phone radiation is harmless. Yet empirical studies have been published over the past several years in scientific journals find a correlation between using a cell phone and the development of brain tumors!

I’ve recently done a bit of research on this subject and have discovered that the prevalent mainstream view among researchers in the physical and biological sciences appears to be that radiation at cell phone frequencies is too weak (by a factor of at least a million) to wreak any biological damage.
The heating effects of this radiation are dismissed by these authorities as insignificant.

Diminishing our fears still farther, they also point out an important difference between nuclear radiation and cell-phone radiation: Cell phones emit and receive microwaves that are non-ionizing -- that lack the energy to lift an electron out of its orbit in an atom, thereby leading to potential biological damage.

I expect that the debate about cell phone safety continues in communities across the country. Should these communities be empowered to approve or change safety standards governing telecommunications? Can a lay public be expected to disentangle the very different kinds of radiation and assess the hazards of each? There is a dilemma here at the heart of political theory, authentic democracy requires that citizens be well-informed. But in a technologically complex society, how can ordinary citizens (or their political representatives, who also lack specialized knowledge) thoughtfully evaluate and oversee technical innovation? Democratic decision-making will work well only if the American public becomes more knowledgeable and better informed about scientific matters than they are today.
1. If \(7x - 20 = -3(x - 5) + 5\) then \(x = ?\)
   
   A. 3  
   B. 4  
   C. 5  
   D. 10

2. What is the correct evaluation of this expression:
   
   \(4a^2 - (10ab - 25b^2)\)
   
   A. \((2a - 10b)(2a - 5b)\)  
   B. \(2a^2 + 5b^2\)  
   C. \(4a^2 - 7ab + 5b^2\)  
   D. \((2a - 5b)^2\)

3. \(\sqrt{64} + \sqrt{128} = ?\)
   
   A. \(8 + 6\sqrt{8}\)  
   B. \(8(1 + \sqrt{2})\)  
   C. \(6\sqrt{2}\)  
   D. \(\sqrt{192}\)

4. What is 5.387 rounded to the nearest tenth?
   
   A. 5  
   B. 5.3  
   C. 5.4  
   D. 5.39
5. Solve for x in the equation \( x^2 - 5x + 6 = 0 \)

A. \( x = 2 \quad x = 3 \)
B. \( x = -3 \quad x = 2 \)
C. \( x = -2 \quad x = -3 \)
D. \( x = 6 \quad x = 1 \)

6. Janet is 6 years older than her brother Bob. In two years, the sum of their ages will be 20. How old is Janet today?

A. 7 
B. 11 
C. 12 
D. 15

7. A vest normally costs $20 but the price was reduced last week by 5% because of a sale. At the end of week, too many shirts remained unsold, so the price was reduced another 5%. What is the price of the vest this week?

A. $18 
B. $10 
C. $18.05 
D. $19

8. Solve for x in the inequality: \(|2x - 3| > 5\).

A. \( x < -1 \) or \( x > 4 \)
B. \( x > 5 \)
C. \( x < -1 \) and \( x > 5 \)
D. \( x < 5 \)
9. Suppose that for an invented function \( \circ \), we know that \( 1 \circ 2 = 2 \) and \( 3 \circ 4 = 12 \). Which of these is a possible definition of his function?

I. \( x \circ y = xy \)
II. \( x \circ y = x + y \)
III. \( x \circ y = x^2 + y - 1 \)

A. I only
B. II only
C. III only
D. I and III only

10. The equation \( y = (x - 1)^2 + 2 \) could be represented by which one of the following graphs?

A. 
B. 
C. 
D. 

11. What is the sine of angle A in the triangle?

A. \( \frac{2}{3} \)  
B. \( \frac{1}{3} \)  
C. \( \frac{\sqrt{5}}{3} \)  
D. \( \frac{\sqrt{5}}{2} \)
SOCIAL SCIENCE: This passage is adapted from The Political Economy of Deforestation in the Tropics (2011), by Robin Burgess (LSE), Matthew Hansen (SDSU), Benjamin Olken (MIT), Peter Potapov (SDSU), and Stefanie Sieber (World Bank).

Viewed from space two great bands of green -- the equatorial, tropical forests and northern, temperate and boreal forests -- encircle the globe. Deforestation has been extremely rapid in tropical forests relative to their northern counterparts. One reason for this is the greater prevalence of illegal extraction which often negates or overturns attempts to sustain forest cover in tropical areas. Understanding why illegal extraction is often sanctioned or facilitated is therefore likely to be central to countering tropical deforestation.

Tropical deforestation accounts for almost one-fifth of greenhouse gas emissions worldwide and threatens the world’s most diverse ecosystems. The prevalence of illegal forest extraction in the tropics suggests that understanding the incentives of local bureaucrats and politicians who enforce forest policy may be critical to understanding tropical deforestation.

The current importance attached to understanding the determinants of tropical deforestation stems from a growing realization that the disappearance of these forests will have impacts that extend beyond national boundaries. Globally, deforestation accounts for almost 20 percent of annual emissions of greenhouse gases, with the bulk of this coming from tropical forests. To put this in perspective, deforestation contributes more greenhouse gas emissions than the global transportation sector, and roughly the same amount of emissions as the entire United States. Tropical forests are also the most biodiverse environments on the planet and their disappearance brings with it a mass extinction of species which deprives future generations of the value associated with this genetic diversity. These dual concerns of climate change and biodiversity have served to put tropical deforestation, and particularly understanding how to counter illegal extraction, towards the top of the current global policy agenda.

The vast majority of tropical forests are owned and managed by national governments, which in turn rely on local bureaucrats and politicians to enforce national logging rules. Central monitoring of these local officials is imperfect, and these officials can (and do) allow deforestation above and beyond the amount officially sanctioned by the central government. As a result, it is not uncommon in tropical areas for the majority of the wood extracted to involve some illegal action.

Indonesia, which has been the focus of our research, comprises an archipelago of islands in South-East Asia stretching from the Indian Ocean to the Pacific Ocean. It is a vast country. From tip-to-tip (from Sabang in Aceh to Merauke in Papua), Indonesia is 3250 miles across; this is the same as the distance from Tampa, Florida to Juneau, Alaska. The conditions in Indonesia are ideal for the growth of forests and without the involvement of
humans, Indonesia would be largely covered in forest. But rapid deforestation places it just behind the US and China as the third largest producer of greenhouse gases worldwide.

In Indonesia, district governments play an important role in facilitating illegal logging in a variety of ways. For example, district heads have been found to allow logging to take place outside official concessions, to facilitate the creation of new oil palm plantations inside national forest areas, and to sanction the transport and processing of illegally harvested logs. District officials also have been known to issue conversion permits to clear cut forest and plant oil palm on their own, even though they do not have the legal authority to do so. Estimates suggest that illegal logging makes up as much as 60-80% of total logging in Indonesia, making illegal logging a roughly US $1 billion a year market, suggesting that these forces play a substantial role in determining the total amount of deforestation.

The world’s tropical forests are rapidly disappearing and climate change and biodiversity concerns have made countering tropical deforestation a key global policy challenge. In common with other natural resources that fall under national ownership, command and control systems for forests in tropical countries are typified by weak governance. Monitoring of local bureaucrats and politicians who de facto control forest extraction, including that which is not officially sanctioned, is often imperfect. In these situations the decision to extract or conserve forests may be affected by the return these officials face in timber markets, by their short-term electoral needs, and by the availability of potential alternative sources of rent extraction. Where these incentives do not line up with national forestry policy, illegal extraction can become widespread and actual extraction can exceed planned extraction.

The results of our study suggest that, to the extent that policy makers seek to encourage conservation in countries like Indonesia, Brazil and the Democratic Republic of Congo -- which contain the last great stands of tropical forest -- central government policies though necessary may not be sufficient. Therefore the raft of measures under the REDD – Reducing Emissions from Deforestation and Forest Degradation -- banner, which are now a central plank in efforts to combat global climate change and biodiversity loss, may not work unless they also take on board the decisions of local bureaucrats and politicians.
1. The phrase “future generations” on line 20 refers to the future of:
   A. Trees.
   B. Loggers.
   C. Human beings. (correct)
   D. Endangered species.

2. The author would agree that:
   A. If deforestation in the tropics were to be halted, the problem of greenhouse emissions would be solved.
   B. National governments in countries with tropical forests profit from deforestation.
   C. Transportation is a greater source of greenhouse gases than is deforestation.
   D. The United States and China share responsibility for emissions of harmful greenhouse gases. (correct)

3. “Extraction” in line 4 refers to:
   A. The export of forest products.
   B. The felling of trees. (correct)
   C. The processing of trees into lumber.
   D. The removal of people from their forest habitats.

4. The first three paragraphs do all of the following, EXCEPT:
   A. Describe two global zones of forestation.
   B. Explain how deforestation occurs. (correct)
   C. Give a reason why deforestation occurs.
   D. Explain why deforestation is a significant concern.

5. The author believes that deforestation results from:
   A. Action by local government. (correct)
   B. Action by central government.
   C. Inaction by central government.
   D. Inaction by local government.
DIRECTIONS: Read the two passages below and answer the questions. Circle the correct choice: A, B, C, or D.

Passage I

Three experiments were done to investigate the relationship between the volume and pressure of a gas. Each experiment was conducted at a fixed temperature, using air as the gas. The plunger of a syringe was used to set the pressure and the volume was measured at various pressures.

<table>
<thead>
<tr>
<th></th>
<th>Experiment 1 Temperature 24°C</th>
<th>Experiment 2 Temperature 28°C</th>
<th>Experiment 3 Temperature 32°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure</td>
<td>Vol. mL</td>
<td>Pressure</td>
<td>Vol. mL</td>
</tr>
<tr>
<td>atm</td>
<td></td>
<td>atm</td>
<td></td>
</tr>
<tr>
<td>3.50</td>
<td>14.70</td>
<td>3.50</td>
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<tr>
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<td>17.04</td>
<td>2.96</td>
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<tr>
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<td>21.09</td>
<td>2.43</td>
<td>22.15</td>
</tr>
<tr>
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<tr>
<td>.70</td>
<td>73.50</td>
<td>.70</td>
<td>76.9</td>
</tr>
</tbody>
</table>

1. In each of these three experiments, there is an independent variable, a dependent variable, and a control variable. Keeping the variables in this order – independent, dependent, control – identify the correct variable list:

A. Pressure, volume, temperature (correct)
B. Pressure, temperature, volume
C. Temperature, pressure, volume
D. Volume, pressure, temperature
2. In Experiment 1, suppose that the pressure had been increased to 4 atm. What reading would be expected for the volume?

A. Between 17.04 and 14.70 mL.
B. Between 14.70 and 13.70 mL.
C. Between 13.70 and 11.70 mL. (correct)
D. Below 11.70 mL.

3. Based on the table, Which of these graphs best shows how the gas volume in Experiment 2 varied with changing pressure?

A. ![Graph A]
B. ![Graph B]
C. ![Graph C]
D. ![Graph D]

4. The three experiments taken together provide evidence that

A. A higher temperature tends to elevate the volume of a gas. (correct)
B. The pressure and volume of a gas are positively correlated.
C. A higher temperature tends to lower the pressure of a gas.
D. The temperature of a gas does not affect the relationship between gas pressure and volume.
Passage II

The brook trout is the only native stream-dwelling trout in Vermont, and it has flourished in the past. Cool water temperatures in Vermont, measuring between 50 and 75 degrees, along with high levels of oxygen in clear water rivers and streams, have made the state an ideal habitat for this fish species.

But Vermont’s trout population has been decreasing at an alarming pace, reports the Eastern Brook Trout Joint Venture, made up of state fish and wildlife agencies, federal environmental offices, and conservation groups.

Viewpoint 1.

Global warming is having deleterious consequences for fish species in ocean and inland habitats, including Vermont, where over the past century the average temperature has gone up 0.4 degrees Centigrade. Scientists project that the rise in temperature will accelerate, and that if the current trend continues we can expect that, by the end of this century, the average temperature will be between 2 and 10 degrees higher than it is today. But a 5-degree rise in average temperature would ravage trout and salmon populations in Vermont, and eliminate brook trout completely.

Contributing to the warming of Vermont’s waterways is the Vermont Yankee nuclear power plant in Vernon, which discharges millions of gallons of hot water into the Connecticut River.

Scientists note that as water temperatures rise, oxygen levels decline, which deprives trout, along with the insects on which they feed, of an essential life support. This explains, at least in part, why rising temperatures endanger Vermont’s trout population.

Viewpoint 2.

It’s true that Vermont's rivers and streams are warming, but that fact doesn’t explain the declining number of trout, shad, and other fish species. One culprit here is pollution, due to acid rain. But the most important cause of the problem is over-fishing, which has been going on for decades in Vermont. This is most evident in the Lake Willoughby area, where amateur as well as commercial fishermen arrive in large numbers in April to harvest the spring trout supply. Yes, oxygen is essential to the flourishing of trout, especially in early stages of their life cycle. But there is no evidence to show that falling oxygen levels explain declining trout population.

5. The two scientists agree that:

A. Global warming is gradually raising the temperature of the earth’s rivers and streams.
B. Declining oxygen levels are endangering the survival of Vermont trout.
C. The government should take action to preserve healthy trout habitats.
D. Vermont’s trout population is diminishing. (correct)
6. A scientist favoring Viewpoint 1 might counter Viewpoint 2 by reasoning that:

A. The Governor of Vermont has said that global warming is to blame for the state's declining fish populations.

B. The extent of over-fishing of trout is too small to account for the declining number of fish belonging to this species. (correct)

C. Much of Vermont's annual trout harvest in the Lake Willoughby area is exported to Canada.

D. Over-fishing is a problem in Vermont.

7. What course of action might be recommended by a scientist favoring Viewpoint 2 and opposed by a scientist favoring Viewpoint 1?

A. Advocate that Vermont legislators pass laws to shorten the spring fishing season in the state. (correct)

B. Advocate that Vermont legislators pass laws to lengthen the spring fishing season in the state.

C. Mobilize support at local, state, and federal levels for legislation that will control CO² emissions that contribute to global warming.

D. Advocate that Vermont's fish stock be replenished by funding trout fish farms.

Diagnostic Test Answer Key


If you achieved all or mostly correct answers on a particular part of this diagnostic test, that indicates a relatively high skill level in that part.

In preparing for the ACT, you should concentrate on those subject areas that you find most challenging. Devote most of your preparation time to those areas where you feel less confident and where your school grades, along with the results of this diagnostic test, indicate that you experience the most difficulty.

Even in areas where your skills are advanced, you should still do some preparation, in order to raise even those skills to a higher level.