***Lectures: 1 semester.***

**Unit 1. IT: pros and cons.**

Theme 1. Introduction

Nowadays the technology growth has become one of the most debatable topics. Some of the scientists named it a disaster, but some take it as a blessing. Undoubtedly, we are in the techno age where technology has become an integral part. We can’t survive a single day without technology, but sometimes it also becomes difficult if our dependency increases.

Before making any conclusion, let’s know the pros and cons of [Information Technology](https://mechlintech.com/blogs/):

***PROS  
IT Improves Productivity for Business***

Any technology’s most significant benefit is that it improves the efficiency of a business process.

We can complete more work in less time. Communication, coordination, execution, and implementation of various corporate processes have become smooth and hassle-free. All credit goes to technology, which ranges from shared drives to emails.

***It Helps In Saving Time***

One of the most obvious [benefits of technology](https://mechlintech.com/blogs/) is that it saves time. We can use the saved time for other vital tasks to complete it in minimal time. As a result, many activities, such as cooking, cleaning, working, and commuting, are made easier with technology.

***Better communication***

Earlier, it wasn’t easy to communicate with a person from another part of the world, right! Let’s imagine the time when the communication was done using pigeons and letters. It is something that took days or weeks for delivering any message . However, thanks to technology, the world has become smaller, and now it is incredibly convenient to communicate anywhere in the world.

***IT Reduces Risks of Cybercrime***

Technology is exceptionally beneficial for the cyber world. The algorithms of AI are qualified enough to detect any change in patterns that are unique from the regular pattern. Implementing AI to identify cyber-attacks is still in its early stages, but it is possible to prevent them with technological advancements. As a result, the chances of a cyber-attack are reduced.

***CONS. Now let’s discuss some disadvantages of the technological advancements:***

***Extreme Dependability***

Without realizing it, we are becoming more and more reliant on technology for practically every action we perform. Using a cab service is a good illustration of this. Another example is utilizing GPS to get driving directions to any area. Unfortunately, many people nowadays don’t bother to study or memorize movements since they rely on Google Maps. In this way I can say that, it is not a good road that we are taking!

***Expensive***

Technology has already become an integral part of life, but still, some people are unable to afford technologies. In addition, most of the technologies that organizations are using are expensive. As a result, one of technology’s biggest con  is that it can only be used by those who can afford it.

***Shortage of jobs***

The technology is on its way to replace humans by showcasing its ten times better practical tasks. With the advancement of technology, computers can perform tasks similar to humans, which are reducing the vacancy for jobs in the market.

Even businesses nowadays prefer technology that can perform things more quickly than humans. As a result of technological advancements, people may be replaced by algorithms and robots.

***Malfunctions***

One of the major cons of technology is that it is all controlled by machines. And even a minor slip in performance can lead to an uncontrollable catastrophe. As a result, a little malfunction could result in a complete failure, potentially resulting in human death. We’re undecided about whether technology is a boon or a burden now that we’ve addressed how it benefits us and the drawbacks of technology today. Only time will let us know that the future of technology is bright or not? However, we also believe that being a global citizen we have responsibility  to let some of the technology  enter into our lives. It is up to us to make choice.

**Theme 2. Interesting facts about IT (storytelling)**

1.The Firefox logo isn't a fox. It’s actually a red panda. It’s a common misbelief that the Firefox logo is a fox (I mean… it is in the name), but it is actually a red panda!

2. Nintendo made playing cards long before they made video games. Nintendo was founded in 1889 as a playing card company. They didn’t make their first video game until 1978.

3. As of 2017, 2.1 millions people still use dial up. A study done in 2017 found that 2.1 million people still use a dial up service. These customers are situated mainly in rural America where internet is unreliable and expensive.

4. There are approx. 3.5 billion Google Searches per day. 7.2 percent of this traffic comes from people searching the term ‘Google’. You can view daily Google Search trends at <https://trends.google.com/trends/>.

5. Google's First Tweet was in binary. Google’s first tweet was in 2009, and it was gibberish to most. Translated from binary to English, it reads, “I’m feeling lucky”.

6. Motorola produced the first handheld mobile phone and their first phone call was to their rival. On April 3, 1973, Martin Cooper, a Motorola researcher and executive, made the first mobile telephone call from handheld subscriber equipment, placing a call to Dr. Joel S. Engel of Bell Labs (AT&T), his rival.

7. Apple were originally designing an apple shaped flip phone before the first iPhone. Before the original design for an iPhone, Apple patented a phone design in the shape of an actual apple. It was a flip phone that, when closed, would look like the Apple logo.

8. Nokia used to sell toilet paper. Before Nokia sold mobile phones, they manufactured a range of other items, such as; toilet paper, tires, computers, and other electronics.

9. More people have mobile phones than toilets. Out of the 7.7 billion people in the world, more than 6 billion people have access to a mobile phone. Compared to only 4.5 billion people who have access to a working toilet.

10. Android holds 87% of the OS market share. In 2019, The Android smartphone operating system accounts for 87% of the global market share, compared to Apple iOS which holds 13%.

**Theme 3. WWW Making PPT**

<https://www.canva.com/design/DAFXdxvdPUQ/HWH2DBa8-_dYChRWaoMzGg/edit?utm_content=DAFXdxvdPUQ&utm_campaign=designshare&utm_medium=link2&utm_source=sharebutton>

**Unit 2. Natural Disasters**

**Theme 1. Environmental Issues**

For many environmentalists, the world seems to be getting worse. They have developed a hit-list of our main fears: that natural resources are running out; that the population is ever growing, leaving less and less to eat; that species are becoming extinct in vast numbers, and that the planet's air and water are becoming ever more polluted.

But a quick look at the facts shows a different picture. First, energy and other natural resources have become more abundant, not less so, since the book The Limits to Growth' was published in 1972 by a group of scientists. Second, more food is now produced per head of the world's population than at any time in history. Fewer people are starving. Third, although species are .indeed becoming extinct, only about 0.7% of them are expected to disappear in the next 50 years, not 25-50%, as has so often been predicted. And finally, most forms of environmental pollution either appear to have been exaggerated, or are transient - associated with the early phases of industrialization and therefore best cured not by restricting economic growth, but by accelerating it. One form of pollution - the release of greenhouse gases that causes global warming - does appear to be a phenomenon that is going to extend well into our future, but its total impact is unlikely to pose a devastating problem. A bigger problem may well turn out to be an inappropriate response to it.

Yet opinion polls suggest that many people nurture the belief that environmental standards are declining and four factors seem to cause this disjunction between perception and reality.

One is the lopsidedness built into scientific research. Scientific funding goes mainly to areas with many problems. That may be wise policy, but it will also create an impression that many more potential problems exist than is the case.

Secondly, environmental groups need to be noticed by the mass media. They also need to keep the money rolling in. Understandably, perhaps, they sometimes overstate their arguments. In 1997, for example, the World Wide Fund for Nature issued a press release entitled: 'Two thirds of the world's forests lost forever'. The truth turns out to be nearer 20%.

Though these groups are run overwhelmingly by selfless folk, they nevertheless share many of the characteristics of other lobby groups. That would matter less if people applied the same degree of skepticism to environmental lobbying as they do to lobby groups In other fields. A trade organization arguing for, say, weaker pollution controls is instantly seen as self-interested. Yet a green organization opposing such a weakening is seen as altruistic, even if an impartial view of the controls in question might suggest they are doing more harm than good.

A third source of confusion is the attitude of the media. People are clearly more curious about bad news than good. Newspapers and broadcasters are there to provide what the public wants. That, however, can lead to significant distortions of perception. An example was America's encounter with El Nino in 1997 and 1998. This climatic phenomenon was accused of wrecking tourism, causing allergies, melting the ski-slopes and causing 22 deaths. However, according to an article in the Bulletin of the American Meteorological Society, the damage it did was estimated at US$4 billion but the benefits amounted to some US$19 billion. These came from higher winter temperatures (which saved an estimated 850 lives, reduced heating costs and diminished spring floods caused by meltwaters).

The fourth factor is poor individual perception. People worry that the endless rise in the amount of stuff everyone throws away will cause the world to run out of places to dispose of waste. Yet, even if America's trash output continues to rise as it has done in the past, and even if the American population doubles by 2100, all the rubbish America produces through the entire 21st century will still take up only one-12.000th of the area of the entire United States.

So what of global warming? As we know, carbon dioxide emissions are causing the planet to warm. The best estimates are that the temperatures will rise by 2-3°C in this century, causing considerable problems, at a total cost of US$5,000 billion.

Despite the intuition that something drastic needs to be done about such a costly problem, economic analyses clearly show it will be far more expensive to cut carbon dioxide emissions radically than to pay the costs of adaptation to the increased temperatures. A model by one of the main authors of the United Nations Climate Change Panel shows how an expected temperature increase of 2.1 degrees in 2100 would only be diminished to an increase of 1.9 degrees. Or to put ft another way, the temperature increase that the planet would have experienced in 2094 would be postponed to 2100.

So this does not prevent global warming, but merely buys the world six years. Yet the cost of reducing carbon dioxide emissions, for the United States alone, will be higher than the cost of solving the world's single, most pressing health problem: providing universal access to clean drinking water and sanitation. Such measures would avoid 2 million deaths every year, and prevent half a billion people from becoming seriously ill.

It is crucial that we look at the facts if we want to make the best possible decisions for the future. It may be costly to be overly optimistic - but more costly still to be too pessimistic.

**Theme 3. Focus on Kazakhstan: reporting on the causes and consequences of natural disasters**

Today there is not a single person on the planet who would not experience global climate change. Due to its large territory, lack of access to the World Ocean, and extreme continental climate, in the coming years, Kazakhstan will have to face desertification, an increase in forest and steppe fires, melting glaciers, degradation of water systems; and floods, hurricanes, and other adverse consequences in some regions.

To understand the impact of climate change on the health of population of Kazakhstan, experts have compiled a ‘Report on initial assessment of the impact of climate change on health of population and the healthcare system of the Republic of Kazakhstan’ supported by United Nations Development Program (UNDP). According to the report, climate change in Kazakhstan can have more than 30 negative consequences, both as a result of direct and indirect impacts.

The direct impact of climate change can be expressed as:

* Natural disasters: for example, earthquakes, floods, landslides, mudslides, forest and steppe fires, etc. As a result, the risk of deaths and injuries among residents of the country increases.
* Quantity reduction and deterioration of quality of drinking water. According to experts, already existing shortage of water resources in Kazakhstan is due to natural conditions, inefficient and irretrievable consumption and the fact that about half of the runoff is formed on the territory of neighboring states.
* An increase in ambient temperature can increase the number of deaths from cardiovascular diseases, exacerbation of mental illness.
* The deterioration of air quality leads to an increase in the incidence of various respiratory, allergic and oncological diseases.
* Climate warming affects the prevalence rate of natural focal infectious diseases, for example, cholera, hepatitis A, dysentery, tick-borne encephalitis, malaria.

            The indirect impact of climate change is expressed in various spheres:

* Growth and/or exacerbation of mental illnesses, such as post-traumatic stress disorders, depression.
* Impact on women's health and safety: violation of women's reproductive health, various types of violence against women.
* Food production and consumption: reduced availability and increased cost of food, hunger and malnutrition, poisoning due to the need to use pesticides.
* Changes in infrastructure and services: power outages, increased demand for electricity, restriction of access to emergency medical services, restriction of access to medical services in clinics and hospitals, restriction of access to medicines, increased burden on utilities.
* Socio-economic consequences: forced migration of the population, the emergence of conflicts, unemployment, increased crime.

To date, Kazakhstan is actively involved in international regulation of environmental protection and chemical safety issues. The country has ratified many international agreements and conventions in this area. The national legislation of the Republic of Kazakhstan is also aimed at implementing measures to protect the environment and combat climate change. The main regulatory legal acts in environmental protection is the Environmental Code of the Republic of Kazakhstan, approved on January 2, 2021.

The information presented in the report shows the seriousness of climate change and its impact on the health of the population of Kazakhstan from the increase in mortality due to natural disasters to the aggravation of food security. To avoid the worst-case scenarios, it is necessary to take appropriate effective measures as soon as possible, both for the state and residents of the country.

**Unit 3. Virtual Reality**

Theme 1. Mobile applications

**What Does Mobile Application Mean?**

A mobile application, most commonly referred to as an app, is a type of application software designed to run on a mobile device, such as a smartphone or tablet computer. Mobile applications frequently serve to provide users with similar services to those accessed on PCs. Apps are generally small, individual software units with limited function. This use of app software was originally popularized by Apple Inc. and its App Store, which offers thousands of applications for the iPhone, iPad and iPod Touch.

mobile application also may be known as an app, web app, online app, iPhone app or smartphone app.

**Techopedia Explains Mobile Application**

Mobile applications are a move away from the integrated software systems generally found on PCs. Instead, each app provides limited and isolated functionality such as a game, calculator or mobile web browsing. Although applications may have avoided multitasking because of the limited hardware resources of the early mobile devices, their specificity is now part of their desirability because they allow consumers to hand-pick what their devices are able to do.

The simplest mobile apps take PC-based applications and port them to a mobile device. As mobile apps become more robust, this technique is somewhat lacking. A more sophisticated approach involves developing specifically for the mobile environment, taking advantage of both its limitations and advantages. For example, apps that use location-based features are inherently built from the ground up with an eye to mobile given that the user is not tied to a location, as on PC.

Apps are divided into two broad categories: native apps and web apps. Native apps are built for a specific mobile operating system, usually iOS or Android. Native apps enjoy better performance and a more finely-tuned user interface (UI), and usually need to pass a much stricter development and quality assurance process before they are released.

Web apps are used in HTML5 or CSS and require minimum device memory since they’re run through a browser. The user is redirected on a specific web page, and all information is saved on a server-based database. Web apps require a stable connection to be used.

There are several types of apps currently available.

* **Gaming apps:** The equivalent of computer video games, they are among the most popular types of apps. They account for one-third of all app downloads and three-fourths of all consumer spending.
* **Productivity apps:** These focus on improving business efficiency by easing various tasks such as sending emails, tracking work progress, booking hotels, and much more.
* **Lifestyle and entertainment apps:** Increasingly popular, these encompass many aspects of personal lifestyle and socialization such as dating, communicating on social media, as well as sharing (and watching) videos. Some of the most widely known apps such as Netflix, Facebook or TikTok fall into this category.

Other app types include mobile commerce (M-commerce) apps used to purchase goods online such as Amazon or eBay, travel apps that help a traveler in many ways (booking tours and tickets, finding their way through maps and geolocation, travel diaries, etc.), and utility apps such as health apps and barcode scanners.

**Theme 2. Gamification (discussion)**

“**Gamification** is about taking something that is not a game and applying game mechanics to increase user engagement, happiness and loyalty!”

This means that gamification takes elements from game-design and the general principles and theories which drive gameplay and applies them to other contexts.

Secondly, gamification is ordinarily applied to solve problems. These range from issues of engagement in the workplace through to voter apathy. As such, here’s a list of just some of the problems gamification can help solve:

* Learner engagement in workplace training
* Sales staff performance
* Your ability to complete chores and mundane tasks
* Performance at the gym
* Organisational productivity
* Your ability to enter ‘flow’
* Knowledge retention
* Crowdsourcing
* Recruitment issues
* Customer retention

**Theme 3. Advantages of the Web**

1. Connectivity, communication, and sharing
2. Information, knowledge, and learning
3. Address, mapping, and contact information
4. Selling and making money
5. Banking, bills, and shopping
6. Donations and funding
7. Entertainment
8. Work from home, collaboration, and access to a global workforce
9. Cloud computing and cloud storage

**Unit 4. Mining and Environment**

**Theme 1. Mining and Sediments**

Sediment is solid material that is moved and deposited in a new location. Sediment can consist of rocks and minerals, as well as the remains of plants and animals. It can be as small as a grain of sand or as large as a boulder.  
Sediment moves from one place to another through the process of erosion. Erosion is the removal and transportation of rock or soil. Erosion can move sediment through water, ice, or wind.  
Water can wash sediment, such as gravel or pebbles, down from a creek, into a river, and eventually to that river's delta. Deltas, river banks, and the bottom of waterfalls are common areas where sediment accumulates.  
Glaciers can freeze sediment and then deposit it elsewhere as the ice carves its way through the landscape or melts. Sediment created and deposited by glaciers is called moraine.  
Wind can move dirt across a plain in dust storms or sandstorms. Sand dunes are made of rocky sediment worn down by wind and collision with other sand particles.  
Sediment is important because it often enriches the soil with nutrients. Areas rich in sediments are often also rich in biodiversity. Sedimentary soil is usually better for farming. Deltas and river banks, where much sediment is deposited, are often the most fertile agricultural areas in a region.  
For thousands of years, the Nile River flooded yearly and brought with it 4 million metric tons (4.4 million short tons) of nutrient-rich sediment. The banks of the Nile are still Egypt's richest agricultural land.  
***Sedimentary Rock***  
Over millions of years, layers of sediment may build up and harden into sedimentary rock. Some of the many forms of sedimentary rock include sandstone, rock salt, and coal.  
Sandstone forms as sand hardens. For centuries, sandstone has been mixed with sticky cement to form concrete. Concrete is an important construction material used for many buildings and roads.  
Rock salt, also known as halite, forms as oceans evaporate. Oceans are made of salt water. When the water enters the atmosphere as vapor, it leaves the salt behind. The Bonneville Salt Flats, in the U.S. state of Utah, are flat desert areas covered by a layer of rock salt sediment. Lake Bonneville, the ancient sea that once covered the area, has long since evaporated.  
Coal is a sediment that is made up of hardened plant debris. Coal, present on every continent except Antarctica, is found on the sites of former swamps and wetlands.

***FAST FACT***

Dregs  
Sediment can accumulate in tea and coffee! The tiny materials left at the bottom of coffee mugs and teacups--the remains of coffee grounds and tea leaves--are a type of sediment called dregs.

**Theme 2. Advantages and disadvantages of Plastics**

Plastics is the term commonly used to describe a wide range of synthetic or semi-synthetic materials that are used in a huge and growing range of applications.

***Introduction To Plastics***

Plastic has become an inseparable and integral part of our lives. The amount of plastics consumed annually has been growing steadily. Its low density, strength, user-friendly designs, fabrication capabilities, long life, low weight and low cost are the factors behind such phenomenal growth.

Plastic waste is very visible as it contributes to a large volume of the total solid wastes. Precisely because of their large visibility [plastic wastes](https://byjus.com/chemistry/plastics/) have been viewed as a serious solid waste problem.

**Advantages of Plastics**

The growth in the use of plastic is due to its beneficial properties which include:

* Extreme versatility and ability to be tailored to meet specific technical needs.
* Lighter weight than competing materials reduces fuel consumption during transportation.
* Good safety and hygiene properties for food packaging.
* Durability and longevity
* Resistance to chemicals, water and impact.
* Excellent thermal and electrical insulation properties
* Comparatively lesser production cost
* Unique ability to combine with other materials like aluminium foil, paper, adhesives
* Far superior aesthetic appeal.
* The material of choice – Human lifestyle and plastic inseparable.
* Intelligent features, smart materials and smart systems.

**Disadvantages of Plastics**

Plastics production also involved the use of potentially harmful chemicals which are added as stabilizers or colourants. Many of these have not undergone environmental risk assessment and their impact on human health and the environment is currently uncertain.

Such an example is phthalates which are used in the manufacture of PVC. PVC has in the past been used in toys for young children and there have been concerns that [phthalates](https://byjus.com/chemistry/phthalimide/) may be released when these toys are sucked. Risk assessment of the effects of phthalates on the environment is currently being carried out. The disposal of plastics products also contributes significantly to their environmental impact.

Most plastics are non-degradable and they may take a long time to break down once they are landfilled. With more and more plastic products, particularly plastics packaging, being disposed of soon after their purchase, the landfill space required by plastics waster is a growing concern.

**Theme 4. BOOPPPS. "Karachaganak Field»**

The Karachaganak field, discovered in 1979, is one of the world’s largest gas and condensate fields. Located in north-west Kazakhstan and covering an area of over 280 square kilometres, it holds estimated hydrocarbons initially in place (HIIP) of 9 billion barrels of condensate and 48 trillion cubic feet (tcf) of gas, with estimated gross reserves of over 2.4 billion barrels of condensate and 16 tcf of gas.

Karachaganak Petroleum Operating B.V. (KPO) is a joint venture between Royal Dutch Shell (29.25%), Eni (29.25%), Chevron (18%), LUKOIL (13.5%) and KazMunaiGas (10%).

**Unit 5. Reading for pleasure**

**Theme 1. Reading a non-fiction text "What is «Gamification?»**

Games are fun, engaging, and addicting. It is, therefore, no surprise that Gamification is widely used as a customer engagement strategy by marketers and product designers in almost every industry. Gamification has proven to be an efficient strategy for improving people’s motivation and performance.

Change is hard. Be it our learning methods, health habits, day-to-day activities, or financial habits. Certain variables always prevent us from achieving what we want. Gamification triggers powerful and real human emotions that motivate us to finish these tasks.

In this article, we’ll cover gamification, whether it is overhyped, and why it is a winning strategy for customer and community engagement. Also, read about different industries — from eCommerce to Urban Planning, where Gamification can boost your profits.

**Gamification — The Latest Fad?**

Gamification has become a buzzword in the last few years, but it has been around for decades. It has just taken time for business leaders to see the benefits of applying gamification techniques to their products and services. It is the secret weapon that helped many product leaders significantly increase their engagement and conversion metrics by up to 100%.

As per the trends, the global gamification market size was USD 11.69 Billion in [2021](https://www.emergenresearch.com/industry-report/gamification-market#:~:text=The%20global%20gamification%20market%20size,factors%20driving%20market%20revenue%20growth.) and is expected to register a revenue CAGR of 27.4% during the forecast period.

**Why Does Gamification Work?**

[Gamification](https://www.upshot.ai/blog/understanding-gamification-series-a-winning-strategy-for-better-customer-engagement/) is a technique where you take the crux of what makes games fascinating and incorporate it into a non-gaming context. It involves absorbing fun and addicting elements from game mechanics and dynamics into real-world applications.

* Using gamification elements such as badges, leaderboards, points, rewards, personalization, and more will increase user engagement, loyalty, and results in your business.
* A compelling gamification experience can trigger real and powerful human emotions.
* It also helps you create an unforgettable experience for your user, resulting in better user interaction, participation, and satisfaction.
* It could be as simple as collecting points every time you buy coffee which can collectively lead you to a free drink.

**Gamification is 75% psychology and 25% technology!**

[Game Mechanics](https://www.upshot.ai/blog/understanding-gamification-series-game-mechanics-and-game-dynamics/) are elements that trigger certain [behaviors](https://www.upshot.ai/blog/understanding-gamification-series-how-does-behavior-gamification-work/). On a digital platform, game mechanics refer to the rules and rewards that appear in the program. These include points, levels, missions, leaderboards, badges, and progress bars. Gamification mechanics determine how users engage with a gamification program and receive feedback on their progress.

Game Dynamics are the emotions, behaviors, and desires embodied in-game mechanics. These include competitive leaderboards, team missions, community feeds, a collection of badges, and surprises when unlocking new missions. The combination of game dynamics and mechanics fosters engagement and motivates users toward habit formation.

**Fintech Gamification — Bringing Fintech into Play**

People are now beginning to understand the importance of financial literacy and wealth management. To enable them to do this, fintech apps came into existence. Fintech incorporates technology and innovation in helping people and businesses conduct transactions. Since money management is involved, the fintech app experience is usually very monotonous, serious, and boring. This is where gamification in fintech was a game-changer.

Gamification in fintech includes adding gaming elements and mechanics into a non-game solution to improve user experience and provide value to the user. It could be setting objectives, completing tasks, monitoring progress, and then receiving rewards in the form of badges, points, bonuses, gifts, or cash incentives. The objective is to drive users to develop healthy financial habits and reinforce their positive behavior with rewards.

Gamified fintech apps usually follow a “PLB” (points, leaderboards, badges) system to simulate and motivate users to perform actions like saving or investing money and planning their monthly budgets.

Areas to gamify in fintech:

* Encourage savings
* Promote financial literacy
* Ensure finance management
* Gain customer insights

**eCommerce Gamification — Revolutionizing The Shopping Experience**

Gamification in eCommerce is the inclusion of game-like features in the eCommerce app or website to make the shopping experience more fun and entertaining for its users. If the customer enjoys the app experience, it will increase user engagement, retention, and satisfaction. It also boosts sales and attracts new customers to the brand by using different [motivators](https://www.upshot.ai/blog/understanding-gamification-series-intrinsic-and-extrinsic-motivation/), both hidden and visible.

Elements like points, badges, leaderboards, and offers incentivize customers to share this with friends and family. Customer “bragging” about their winnings helps increase word-of-mouth marketing and motivates others to join the eCommerce brand.

Areas to gamify in eCommerce:

* Boost customer loyalty
* Minimize cart abandonments
* Drive product recommendations

**Gamification in Community Engagement for Urban Planning**

Can we understand cities better through play? Urban gamification initiatives prove that it’s more fun and impactful to explore, discover, and make opinions about a built environment with a playful twist. And it’s not only about catching creatures in PokemonGo or building cities in Minecraft.

Gamification in urban planning can be triggered by an object in a physical space. A QR code on a ubiquitous street object like a trashcan leads you to a digital space that prompts you to take action — share an opinion, vote, or take part in a digital public consultation. And so enters community engagement.

Here is an example of urban gamification in community engagement that had a tangible impact. [The Finnish city of Espoo invited its residents to choose locations for 100 benches via an online map survey](https://www.maptionnaire.com/customer-stories/qr-code-online-map-survey). There, residents could also share stories connected with each location. As a result, each installed bench had a QR code leading to a webpage with these stories. In this way, urban gamification fosters a sense of community and shows residents how their choices and stories visibly affect the environment.

Indeed, gamification can become one of the communication and engagement tools in urban planning. Some elements (like mentioned badges, scoreboards, and so on) can be used to reward residents for participating in consultations and voting. But these tools mainly influence residents’ extrinsic motivation — and not for too long.

As a planner, you can apply gamification design principles to your digital community engagement activities. With [Maptionnaire](https://maptionnaire.com/), residents can engage in gamified budget allocation, scenario resolution, voting, and space design. This type of gamification helps residents better understand the planning process and make more informed decisions.

In the [Flooding City game](https://app.maptionnaire.com/q/6jkm3ioi9ffp), a participant gets into the Mayor’s shoes and investigates how planning choices affect the environment and the city’s future. At the same time, planners get useful information about what kind of environmental activities residents support.

**Areas to gamify in Community Engagement:**

* Raise awareness about planning initiatives
* Stimulate a better understanding of a specific planning project
* Build scenarios to estimate the effects of planning decisions
* Encourage better decision-making with gamified budgets and resource allocation

**3 Gamification Pitfalls and Tips to Avoid them**

**#1 Lack of User Research**

Research is the foundation for designing strategies. Implementing gamification without proper research is a big pitfall. If you don't do adequate user research, your gamification strategy will almost certainly be flawed. Finding your target audience's fundamental requirements and goals should become the primary motive for conducting user research.

**Tip**

You must understand your users, their objectives, and what motivates them. To use gamification to engage your users more deeply, you must first determine the reasons behind your users' behaviors.

**#2 Dependence on Extrinsic Motivation**

Extrinsic gamification won't last very long if earning rewards or reaching the top spot on leaderboards are the only primary motivators for users to engage with the app. For these, you need to add new rewards if you rely on extrinsic motivation constantly. Users may lose interest and rapidly become intrusive as the novelty wears off because extrinsic motivational factors are only so influential for some time.

**Tip**

Users won't use your app again once they've won all the rewards, so give them something to look forward to. Include intrinsic rewards in your gamification plan as well; this is essential.

**#3 Prioritizing Rewards Over Results**

Your gamification strategy does not revolve around rewards. By selecting prizes, users run the risk of prioritizing rewards above results. They only serve as one of many motivators to assist your users' achievement of the intended outcome. Placing rewards above results is one of the most frequent gamification mistakes.

**Tip**

Prioritize users' overall learning and benefits of using the app. Incentivize participants with badges or awards when they complete a task or show that they have mastered the target skill set.

**Your Takeaway**

* Gamification is a powerful strategy, especially when it comes to the world of business. After all, who doesn't like to be rewarded? But what exactly is Gamification? And how can you leverage it to make your business more successful?
* The truth is that Gamification can take many forms, depending on your aims and objectives. For example, increasing customer loyalty by encouraging return visits is one reason you might use Gamification in your business while improving your sales go-to-market strategies can benefit from games with cash prizes.
* Gamification works best for businesses that solve meaningful problems, like saving time, money, and energy and creating a better urban environment.

**Theme 2. "Kanysh Satbaev" Skimming reading.**

Satpayev Kanysh Imantayevich. A prominent scientist-geologist of the XX century, a prominent public figure and statesman, Doctor of Geological-Mineralogical Sciences (1942), Professor (1950), the first Head of Institute of Geological Sciences of the Kazakh branch of the USSR Academy of Sciences (1941-1964), Deputy Chairman of Presidium of the Branch (1942-1946), President of the Academy of Sciences of the Kazakh SSR (1946-1952) and (1955-1964), academician of the Academy of Sciences of the Kazakh SSR (1946), academician of the Academy of Sciences of the USSR (1946), member of the Presidium of the Academy of Sciences of the USSR (1961-1964 she), Deputy Chairman of the national Committee of geologists of the USSR (1957-1964), honourary member of the Academy of Sciences of Tajikistan (1951), a Member of the Central Committee of the Communist party of Kazakhstan (1949), a Deputy of the Supreme Soviet of the USSR, Deputy Chairman of the Board of the Union of the Supreme Soviet of the USSR (1962-1964), laureate of the State (1942) and the Lenin (1958) prizes.

K.I. Satpaev –is one of the greatest people not only of the former Soviet Union, but also of the past century, which his genius, his work practically created and headed the school of geologists of Kazakhstan and has made great influence on the development of geological science.

No one from Kazakhs has yet raised

“For such a high level from Kazakhstan”

N.A. Nazarbayev

Kanysh Imantayevich Satpayev was born in April 12, 1899 in Pavlodar disctrict of Semipalatinsk region (at present Tendik, Bayanaul district, Pavlodar region).

Mikhail Antonovich Usov, who came in 1921 to be treated in Bayanaul affected on boy’s choice of profession. He burned a desire in K.I.Satpayev to explore the bowels of the native land, give them to Motherland and people. Later K.I.Satpayev would write: “I had the great honour to raise the socialist industry…, create advanced science in Kazakhstan.

In 1926 K.I.Satpayev successfully graduated from Tomsk technological institute and became the first Kazakh with diploma of mining engineer-geologist, was sent to the Central Council of national economy.

K.I. Satpayev headed Geological Department of the trust «Atbastsvetmet». Serious problem fell on its share – carrying out of the first stationary prospecting works on a systematic identification of mineral reserves in Zhezkazgan-Ulytau area. Unlike the English and Geological Committee of the CPC, which assessed the reserves of Zhezkazgan as modest, Satpayev was convinced of the enormous reserves of ore in this region.

In 1932 K.I. Satpayev published the first scientific monograph “Jezkazgan copper-ore area and its mineral resources”. By the time it was established, that in the mines of Zhezkazgan more than 2 million tons of copper, and not 60 thousand tons, of which spoke English specialists and staff of the Geological Committee of the SNK. This was proof of the scientific foresight of K.I. Satpaev.

In 1934, at the session of the USSR Academy of Sciences K.I. Satpayev acted with the report «Copper, coal, iron, manganese ore and other minerals Dzhezkazgan-Ulytau district», which fully justified the rich prospects of Zhezkazgan Deposit and the whole region.

By 1937 explored reserves of copper allowed to name Zhezkazgan largest deposits of copper in the world and justify construction of the mining enterprise. On February 13, 1938 came out the Order of people’s Commissariat on the construction of Zhezkazgan mining and metallurgical complex.

In 1941 K.I. Satpayev was appointed Director of Geological Institute of Kazakh branch of the USSR Academy of Sciences, and after a year he became Head of this Department is future Academy of Sciences of the Republic.

In autumn of 1943, for merits in development of science and great scientific achievements K.I.Satpayev was elected a corresponding member of the USSR Academy of Sciences. Those years he devoted special attention to design and construction of Kazakhstan Magnitka, Balkhash and Atasu mining complex.

In June 1946 K.I. Satpayev was elected as the first President of the Academy of Sciences of Kazakhstan. In October of the same year he was elected as academician of the Academy of Sciences of the USSR.

There were held visiting sessions of Academy of Sciences on initiative of K.I.Satpayev in the largest industrial regions of the republic – Ust-Kamenogorsk, Atyrau, Karaganda, Jezkazgan, Kustanay. There were opened new academic institutes: Nuclear Physics, Mathematics and Mechanics, Hydrogeology and Hydrophysics, Chemistry of oil and natural salts, chemical-metallurgical, mining-metallurgical, Ichthyology and fish industry, Experimental Biology, Economics, Philosophy and Law, Literature and Art, Linguistics. Encyclopedic erudition allowed President to accept personal participation in the creation of these centres of great science. He personally led a comprehensive study of natural resources of the Mangyshlak Peninsula, the research of new deposits of coal, oil, gas, ores of ferrous metallurgy, actively supported construction of the channel Irtysh-Karaganda.

He created and headed school of metallogeny in Kazakhstan. Developed complex approach of formation metallogenic analysis has become fundamental for the geological science and practice.

In 1958 for development of methodological basis and drawing up of forecast metallogenic maps of Central Kazakhstan, which had no analogue in worldwide geological practice, group of Kazakhstan’s scientists-geologists headed by K.I.Satpayev was awarded with Lenin prize. This work showed role of Kazakhstan’s scientists and school of K.I.Satpayev all over the world.

Protruding scientist of the country, he presented Kazakhstan’s science abroad too. So, in 1947 in membership of delegation of Supreme Council of the USSR he visited England, where worthily represented scientists of the country. As member of Soviet Parliament group was accepted by Winston Churchill, premier-minister of England Ettley. In 1958 K.I.Satpayev in membership of representative delegation was in China, where participation in work of geological conference of PRC. He was awarded with four orders of Lenin and order of the Great Patriotic War, elected as deputy of Supreme Court of the USSR and Kazakh SSR.

Academician K.I. Satpayev died on January 31, 1964, he was buried in Almaty. City in the Karaganda region, Institute of geological Sciences of the Academy of Sciences of Kazakhstan, Zhezkazgan mining and metallurgical complex, a small planet in the constellation of Taurus, the glacier and mountain peak of Jungar Alatau were named after academician K.I.Satpayev,, geologists onamed one of the minerals- Satpayevit, variety of colours. Eight large cities of Kazakhstan, including Semipalatinsk, its streetswere named after academician. Corner of Satpaev created at Museum of Revolution in Moscow, in Tomsk Polytechnic Institute and Institute of Geological Sciences of Academy of Sciences of KazSSR, in the house, where Satpayev lived in Alma-Ata, was established Memorial Board.

At the present time there established award of Academy of Sciences of the RK by his name for outstanding achievements in the field of Natural Sciences, International Fund of K.I. Satpaev was created.

1999 year – was declared as year of Kanysh Satpayev by UNESCO.

Three big things he left after himself: the first – Dzhezkazgan, the second – Academy of Sciences of Kazakhstan, the third – Institute of Geological Sciences. Hundreds of people work and live in all of them, and continue deeds of worthy son of Kazakh people, scientist, geologist K.I. Satpayev.

Years will pass, there will be new scientists, but noble memory of the first Director of the Kazakh Academy of Sciences will remain.

From an interview Of Abylkas Saginovich Saginov to correspondent of the newspaper “Industrial Karaganda” Natalia Rozhkova, 26.12.2005.

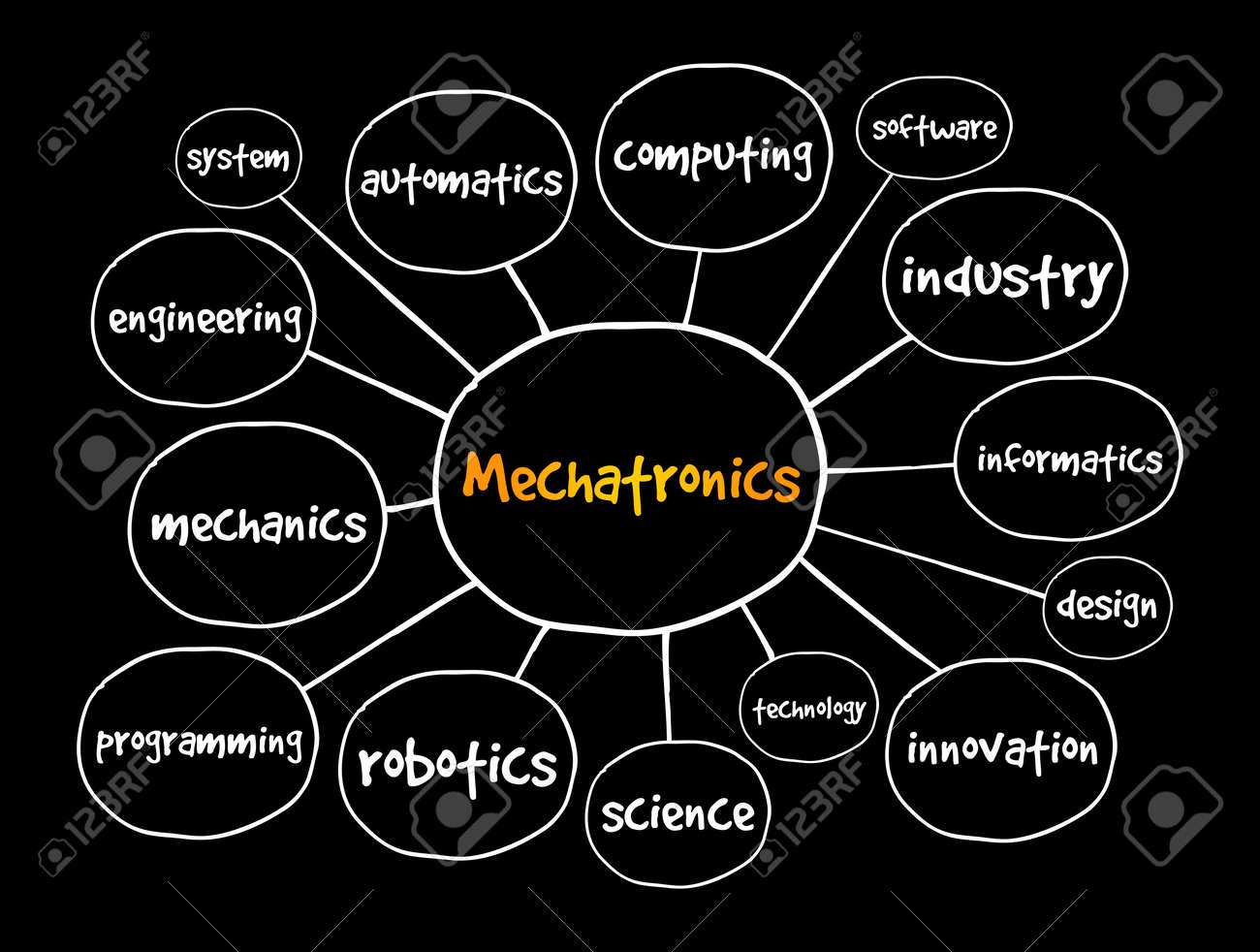
“Industrial life taught me a lot. Exactly at that time I firstly met Kanysh Imantayevich Satpayev. He was at mature age. I finished candidate dissertation, there was need in opponent. Defense was held in Alma-Ata. I was advised to apply to Satpayev, nobody except him wouldn’t solve that question. That was how I came to academician and president of AS of Kazakhstan at first time, about whom I knew a lot. In 1951 he was too old.

Kanysh Imantayevich asked me in details where I was born, where studied. When he knew about Dnepropetrovsk, he was surprised “How far you’d gone!”. All questions academician solved without He left the kindest impression on me. He is example indicator of action in a particular situation, example of impact on my civil and professional formation”.

Theme 3. Giving advice on how to reduce stress (psychology). Simple Passive Voice Tenses.

Theme 4. Pros and cons of reading a book. Writing a blog post

**Unit 6. Electronics and automation**

**Theme 1. Functions of mechatronics (Mind-map)**

What is Mechatronics?

Mechatronics is a multidisciplinary field that refers to the skill sets needed in the contemporary, advanced automated manufacturing industry. At the intersection of mechanics, electronics, and computing, mechatronics specialists create simpler, smarter systems. Mechatronics is an essential foundation for the expected growth in automation and manufacturing.

Mechatronics deals with **robotics, control systems**, and **electro-mechanical systems** Do you like mechanics, robotics, or production equipment? Do you have a knack for creative problem solving? Do you enjoy technical and engineering activities? Can you work well as a member of a team? **Mechatronics could be for you.** [Request information today.](https://www.mtu.edu/request/?utm_campaign=MTU+Recruitment&utm_medium=SEO+referral&utm_source=google.com&utm_content=What%20is%20Mechatronics&utm_term=mechatronics)

**What do mechatronics professionals do?**

**Mechatronics specialists** can do quite a bit across multiple disciplines and have a solid base from which to grow. Mechatronics specialists know both mechanical and electrical engineering fundamentals—they speak both languages—so a mechatronics specialist can work with both mechanical and engineering teams.

Mechatronics specialists work with massive industrial robots, smaller robots in pick-and-place operations, control systems for bottling or packaging of food and drink products, drones, designing control systems for rides in amusement parks, prototype development.

Some mechatronics specialists are employed in firms where it is necessary to design and maintain automatic equipment. This includes industries such as manufacturing, mining, aviation, robotics, defense, and transport. Other mechatronic specialists are employed by large manufacturing companies involved in high-volume production. Many new career opportunities are on the horizon due to technological advances.

**Mechantroics Disciplines**

Mechatronic systems can be found in a wide range of applications, from manufacturing and robotics to automotive and consumer electronics. Here are some key aspects of the *mechatronics field*:

**Mechanical Engineering:** Mechatronics involves the design and analysis of mechanical systems, such as sensors, actuators, and mechanical structures. This can include anything from robotic arms and automated machinery to consumer products like cameras with auto-focus mechanisms.

**Electronics:** Electronic components and circuits are used to control and monitor the mechanical aspects of a system. Sensors collect data from the environment, and microcontrollers or microprocessors process this data to make decisions and control actuators. This might involve things like circuit design, PCBs (Printed Circuit Boards), and electronic components.

**Control Systems:** Mechatronic systems often rely on control theory to regulate the behavior of mechanical components. This can involve feedback loops and control algorithms to ensure precise and desired system performance. Control engineering is crucial to maintaining stability and optimizing the system's operation.

**Software and Programming:** Mechatronics systems often involve software development to control and coordinate the various components. This can include writing code for microcontrollers, implementing user interfaces, and integrating systems with computer networks.

**Sensors and Actuators:** Sensors gather information about the system's environment, and actuators take action based on this information. Sensors can include things like cameras, accelerometers, temperature sensors, and more. Actuators might be motors, solenoids, or other mechanisms that move, manipulate, or change the state of the system.

**Integration:** Mechatronics requires a holistic approach, bringing together experts from various disciplines to work collaboratively. Engineers in this field need to understand and bridge the gaps between mechanical, electrical, and software engineering.

**Applications:** Mechatronics is applied in a wide range of industries, such as manufacturing, automotive, aerospace, healthcare, and consumer electronics. Examples include industrial automation, robotics, automated vehicles, smart appliances, and more.

**Innovation and Automation:** Mechatronics has a strong focus on automation and improving the efficiency and performance of systems. It plays a crucial role in enabling advancements in industries by developing smarter and more capable machines and products.

**What careers are there in mechatronics?**

A degree in mechatronics can lead to management positions, including project management. Workplaces range from laboratories and processing plants to engineering design offices.

Mechatronics specialists work in the fields of cybersecurity, telecommunications, computer science, automotive engineering, robotics, artificial intelligence, and consumer products and packaging.

Mechatronic specialists may use the following job titles:

* Automotive Engineer
* Control System Engineer
* Data Logging Engineer
* Instrumentation Engineer
* Project Engineer
* Software Engineer
* Systems Engineer
* Service Engineer

**Where do mechatronics professionals work?**

* Mining, Quarrying, and Oil and Gas Extraction
* Public Administration
* Finance and Insurance
* Manufacturing
* Management of Companies and Enterprises
* Transportation and Warehousing
* Accommodation and Food Services
* Construction
* Health Care and Social Assistance
* Retail Trade
* Arts, Entertainment, and Recreation
* Educational Services

**What skills do mechatronics specialists need?**

Mechatronic specialists have broad multidisciplinary skills, so they are able to move into more traditional engineering disciplines.

A mechatronics specialist is a creative problem solver who can work on a team. Thinking creatively is the first step; being able to communicate good ideas to coworkers involves tact.

Many mechatronic engineers use **computer-aided design (CAD)** and other engineering software for modeling, simulating, and analyzing complex mechanical, electronic, or other engineering systems.

**What tasks do mechatronics specialists do?**

There are many tasks mechatronic specialists perform, depending on their particular industry.

* Some design, develop, maintain, and manage high-technology engineering systems for the automation of industrial tasks.
* Others apply mechatronic/automated solutions to the transfer of material components or finished goods, or design and assist with the manufacture of consumer products such as cameras and video recorders.
* Still others carry out studies into the feasibility, cost implications, and performance benefits of new mechatronic equipment.
* And others apply electronic and mechanical processes and computers to tasks where the use of human labor may be dangerous (for example, underwater exploration, mining, or forestry).

**Theme 2. Use of English. Relative clauses, determiners and quantifiers. Creative people (Geology,Engineering,IT)**

Nouns: Determiners and Quantifiers.

1. **Every** is a determiner. However, **each** can be a determiner and a pronoun.

We use **each** when we are talking about separate individuals in the group (**Each** person chooses a different route to the castle.) and we use **every** when we are talking more about the group as a whole (**Every** route was of about the same length.).

We use **each** to talk about two or more things or people, but we can use **every** for more than two. We use **each** and **every** as determiners with a singular noun or a singular verb.

1) We use **each** as a pronoun:

with of + noun

**Each of them** spent more time on completing the tasks than we expected.

Each of the participants was over eighteen.

after nouns and pronouns for emphasis

**They have each** taken a compass with them.

**They have each** been asked to answer some questions.

2) We use **every**:

after a possessive

The judges followed **my every** move during the competition.

He listened to **her every** word.

with plural nouns in frequency expressions

I have extra classes **every few weeks**.

with adverbs just about, nearly, almost, practically and the negative not

**Not every** person would be ready to emigrate nowadays.

**Practically every** trip was over two weeks.

2. We can use **all** and **both** as a determiner and a pronoun.

**Both of them** are really well-qualified teachers.

Have you eaten both these pieces of cake?

**It all** tastes the same to me.

**All of the people** in this country are friendly to foreigners.

Although **both** can be used as a pronoun on its own, **all** can’t be used in the similar way, except when it is followed by a relative clause.

3. We use **the whole** instead of **all the…** with singular countable nouns. Also, we must use **the whole + of** with words like the, this, these, that, etc.

**The whole** team was shocked by her outstanding presentation. (~~All the team~~…)

I was feeling absolutely exhausted during **the whole of the week.**

4. We use **either** and **neither** to talk about two things or people.

1) **Neither** allows us to make a negative statement about two people or things at the same time. **Neither** goes before singular countable nouns. Neither means “not a single one of two people or things”.

**Neither** T-shirt fitted her.

**Neither** **of** us went to the concert.

We can use **neither** as a conjunction with nor. It connects two or more negative alternatives.

**Neither** my brother **nor** his wife mentioned anything about moving house.

**Neither** she **nor** her children liked the concert.

2) We use **either** to talk about two choices or options. The noun that follows **either** must be a singular countable noun.

**Either restaurant** will be okay, as they both serve delicious food.

**Either** must be followed by **of** if we use it before the, these, those, or possessives (my, your) with a plural noun.

Either **of the** cousins can come with us.

I don’t want **either of my** parents to know I’ve lost my phone..

When used as a determiner, **either** means “both” before a singular countable noun.

There were nice cafes on **either** side of the street.

5. **No** and **none of** are determiners. Each of them indicates negation.

1) We use **no** before singular, plural, or uncountable nouns.

I’ve got no extra money to waste.

Michael says he has **no close friends.**

2) **None** is the pronoun form of no. **None** means not one or not any.  We use it as a pronoun to replace countable and uncountable nouns. We use it as a subject or an object.

My mother had two sisters. My father had **none**. (My father didn’t have any sisters.)

What answers did he give?- **None**.

6. We use the quantifiers **much, many, a lot of, lots of** to talk about quantities, amounts and degrees. We can use them as determiners.

1) We usually use **much** and **many** in questions and negative sentences. We use **much** with uncountable nouns and **many** with countable nouns.

How **much sugar is there** in this birthday cake?

Do you think **many people** will come?

There aren’t **many** policemen in the streets nowadays.

We don’t have **much** money.

When we use **much** or **many** before articles, demonstratives, possessives, or pronouns, we need to use **of.**

How **much of** this book is fact and how much is fiction?

Unfortunately, not **many of** the colleagues were there.

2) We use **a lot of** and **lots of** in informal styles. **Lots of** is even more informal. We use these expressions with plural countable nouns and with singular uncountable nouns for affirmatives, negatives, and questions.

We’ve got **lots of** things to do.

There weren’t **a lot of** choices.

Are there **a lot of** good players at your golf club?

Do you eat **lots of** sugar?

We usually use **a lot of** or **a great deal of** instead of **very much**.

7. **(A) little** and **(a) few** are quantifiers meaning not a lot. We use (a) little with singular uncountable nouns and **(a) few** with plural countable nouns. When we use **few** and **little** without an article, these quantifiers have a negative connotation.

We stayed **a few** days in France and visited museums and galleries.

I was disappointed because only a few people had showed up at my party.

Have you got any money left? – Yes, **a little**.

I’m not very happy about it but I have **little** choice.

8. **Some** and **any** are determiners. We use them with uncountable and plural nouns. We use **any** to describe indefinite or unspecified quantities in questions and negative sentences. We use **some** in affirmative sentences.

I’ve got **some** questions which I’d like to ask you.

Have you got **any** water?

There aren’t **any** new offers in the shop.

However, we can use **some** in questions when we make offers or requests, or when the quantity of something isn’t specified.

Would you like **some** tea?

Do you need **some** help?

Can you get me **some** juice?

**Theme 3. Reading biographies of famous people**

**A Brief Biography of Thomas Edison**

People often say Edison was a genius. He answered, "Genius is hard work, stick-to-it-iveness, and common sense."

Thomas Alva Edison was born February 11, 1847 in Milan, Ohio (pronounced MY-lan). In 1854, when he was seven, the family moved to Michigan, where Edison spent the rest of his childhood.

"Al," as he was called as a boy, went to school only a short time. He did so poorly that his mother, a former teacher, taught her son at home. Al learned to love reading, a habit he kept for the rest of his life. He also liked to make experiments in the basement.

Al not only played hard, but also worked hard. At the age of 12 he sold fruit, snacks and newspapers on a train as a "news butcher." (Trains were the newest way to travel, cutting through the American wilderness.) He even printed his own newspaper, the *Grand Trunk Herald*, on a moving train.

At 15, Al roamed the country as a "tramp telegrapher." Using a kind of alphabet called Morse Code, he sent and received messages over the telegraph. Even though he was already losing his hearing, he could still hear the clicks of the telegraph. In the next seven years he moved over a dozen times, often working all night, taking messages for trains and even for the Union Army during the Civil War. In his spare time, he took things apart to see how they worked. Finally, he decided to invent things himself.

After the failure of his first invention, the electric vote recorder, Edison moved to New York City. There he improved the way the stock ticker worked. This was his big break. By 1870 his company was manufacturing his stock ticker in Newark, New Jersey. He also improved the telegraph, making it send up to four messages at once.

During this time he married his first wife, Mary Stilwell, on Christmas Day, 1871. They had three children -- Marion, Thomas, Jr., and William. Wanting a quieter spot to do more inventing, Edison moved from Newark to Menlo Park, New Jersey, in 1876. There he built his most famous laboratory.

He was not alone in Menlo Park. Edison hired "muckers" to help him out. These "muckers" came from all over the world to make their fortune in America. They often stayed up all night working with the "chief mucker," Edison himself. He is sometime called the "Wizard of Menlo Park" because he created two of his three greatest works there.

The *phonograph* was the first machine that could record the sound of someone's voice and play it back. In 1877, Edison recorded the first words on a piece of tin foil. He recited the nursery rhyme "Mary Had a Little Lamb," and the phonograph played the words back to him. This was invented by a man whose hearing was so poor that he thought of himself as "deaf"!

Starting in 1878, Edison and the muckers worked on one of his greatest achievements. The *electric light system* was more than just the incandescent lamp, or "light bulb." Edison also designed a system of power plants that make the electrical power and the wiring that brings it to people's homes. Imagine all the things you "plug in." What would your life be like without them?

In 1885, one year after his first wife died, Edison met a 20-year-old woman named Mina Miller. Her father was an inventor in Edison's home state of Ohio. Edison taught her Morse Code. Even when others were around, the couple could "talk" to each other secretly. One day he tapped a question into her hand: would she marry him? She tapped back the word "yes."

Mina Edison wanted a home in the country, so Edison bought Glenmont, a 29-room home with 13-1/2 acres of land in West Orange, New Jersey. They married on February 24, 1886 and had three children: Madeleine, Charles and Theodore.

A year later, Edison built a laboratory in West Orange that was ten times larger than the one in Menlo Park. In fact, it was one of the largest laboratories in the world, almost as famous as Edison himself. Well into the night, laboratory buildings glowed with electric light while the Wizard and his "muckers" turned Edison's dreams into inventions. Once, the "chief mucker" worked for three days straight, taking only short naps. Edison earned half of his 1,093 patents in West Orange.

But Edison did more than invent. Here Edison could think of ways to make a better phonograph, for example, build it with his muckers, have them test it and make it work, then manufacture it in the factories that surrounded his laboratory. This improved phonograph could then be sold throughout the world.

Not only did Edison improve the phonograph several times, but he also worked on X-rays, storage batteries, and the first talking doll. At West Orange he also worked on one of his greatest ideas: *motion pictures,* or "movies." The inventions made here changed the way we live even today. He worked here until his death on October 18, 1931, at the age of 84.

By that time, everyone had heard of the "Wizard" and looked up to him. The whole world called him a genius. But he knew that having a good idea was not enough. It takes hard work to make dreams into reality. That is why Edison liked to say, "Genius is 1% inspiration and 99% perspiration.»

***2 semester.***

**Unit 7. Breakthrough technologie**

Theme 1. Nanotechnology Making PPT

Nanotechnology involves the understanding and control of matter at the nanometer-scale. The so-called nanoscale deals with dimensions between approximately 1 and 100 nanometers.

A nanometer is an extremely small unit of length—a billionth (10-9) of a meter. Just how small is a nanometer (nm)?

On the nanometer-scale, materials may exhibit unusual properties. When you change the size of a particle, it can change color, for example. That’s because in nanometer-scale particles, the arrangement of atoms reflects light differently. Gold can appear dark red or purple, while silver can appear yellowish or amber-colored.

Nanotechnology can increase the surface area of a material. This allows more atoms to interact with other materials. An increased surface area is one of the chief reasons nanometer-scale materials can be stronger, more durable, and more conductive than their larger-scale (called bulk) counterparts.

Nanotechnology is not microscopy. "Nanotechnology is not simply working at ever smaller dimensions," the U.S.-based National Nanotechnology Initiative says. "Rather, working at the nanoscale enables scientists to utilize the unique physical, chemical, mechanical, and optical properties of materials that naturally occur at that scale."

Scientists study these properties for a range of uses, from altering consumer products such as clothes to revolutionizing medicine and tackling environmental issues.

Classifying Nanomaterials

There are different types of nanomaterials, and different ways to classify them.

Natural nanomaterials, as the name suggests, are those that occur naturally in the world. These include particles that make up volcanic ash, smoke, and even some molecules in our bodies, such as the hemoglobin in our blood. The brilliant colors of a peacock’s feathers are the result of spacing between nanometer-scale structures on their surface.

Artificial nanomaterials are those that occur from objects or processes created by people. Examples include exhaust from fossil fuel burning engines and some forms of pollution. But while some of these just happen to be nanomaterials—vehicle exhaust, for instance, was not developed as one—scientists and engineers are working to create them for use in industries from manufacturing to medicine. These are called intentionally produced nanomaterials.

**Fullerenes and Nanoparticles**

One way to classify nanomaterials is between fullerenes and nanoparticles. This classification includes both naturally occurring and artificial nanomaterials.

Fullerenes

Fullerenes are allotropes of carbon. Allotropes are different molecular forms of the same element. The most familiar carbon allotropes are probably diamond and graphite, a type of coal.

Fullerenes are atom-thick sheets of another carbon allotrope, graphene, rolled into spheres or tubes.

The most familiar type of spherical fullerene is probably the buckminsterfullerene, nicknamed the buckyball. Buckyballs are nanometer-sized carbon molecules shaped like soccer balls—tightly bonded hexagons and pentagons.

Buckyballs are very stable—able to withstand extreme temperatures and pressure. For this reason, buckyballs are able to exist in extremely harsh environments, such as outer space. In fact, buckyballs are the largest molecules ever discovered in space, detected around planetary nebula in 2010.

Buckyballs’ cage-like structure seems to protect any atom or molecule trapped within it. Many researchers are experimenting with "impregnating" buckyballs with elements, such as helium. These impregnated buckyballs may make excellent chemical "tracers," meaning scientists could follow them as they wind through a system. For example, scientists could track water pollution kilometers away from where it entered a river, lake, or ocean.

Tubular fullerenes are called nanotubes. Thanks to the way carbon atoms bond to each other, carbon nanotubes are remarkably strong and flexible. Carbon nanotubes are harder than diamond and more flexible than rubber.

Carbon nanotubes hold great potential for science and technology. The U.S. space agency NASA, for example, is experimenting with carbon nanotubes to produce "blacker than black" coloration on satellites. This would reduce reflection, so data collected by the satellite are not "polluted" by light.

**Theme 2. Robotics**

Many definitions have been suggested for what we call a robot. The word may conjure up various levels of technological sophistication, ranging from a simple material handling device to a humanoid. The image of robots varies widely with researchers, engineers, and robot manufacturers. However, it is widely accepted that today’s robots used in industries originated in the invention of a programmed material handling device by George C. Devol. In 1954, Devol filed a U.S. patent for a new machine for part transfer, and he claimed the basic concept of teach- in/playback to control the device. This scheme is now extensively used in most of today's industrial robots.

1.1 Era of Industrial Robots

Devol's industrial robots have their origins in two preceding technologies: numerical control for machine tools, and remote manipulation. Numerical control is a scheme to generate control actions based on stored data. Stored data may include coordinate data of points to which the machine is to be moved, clock signals to start and stop operations, and logical statements for branching control sequences. The whole sequence of operations and its variations are prescribed and stored in a form of memory, so that different tasks can be performed without requiring major hardware changes. Modern manufacturing systems must produce a variety of products in small batches, rather than a large number of the same products for an extended period of time, and frequent changes of product models and production schedules require flexibility in the manufacturing system. The transfer line approach, which is most effective for mass production, is not appropriate when such flexibility is needed (Figure 1-1). When a major product change is required, a special-purpose production line becomes useless and often ends up being abandoned, despite the large capital investment it originally involved. Flexible automation has been a central issue in manufacturing innovation for a few decades, and numerical control has played a central

role in increasing system flexibility. Contemporary industrial robots are programmable machines that can perform different operations by simply modifying stored data, a feature that has evolved from the application of numerical control.

Another origin of today's industrial robots can be found in remote manipulators. A remote manipulator is a device that performs a task at a distance. It can be used in environments that human workers cannot easily or safely access, e.g. for handling radio-active materials, or in some deep sea and space applications. The first master-slave manipulator system was developed by 1948. The concept involves an electrically powered mechanical arm installed at the operation site, and a control joystick of geometry similar to that of the mechanical arm (Figure 1-2). The joystick has position transducers at individual joints that measure the motion of the human operator as he moves the tip of the joystick. Thus the operator's motion is transformed into electrical signals, which are transmitted to the mechanical arm and cause the same motion as the one that the human operator performed. The joystick that the operator handles is called the master manipulator, while the mechanical arm is called the slave manipulator, since its motion is ideally the replica of the operator's commanded motion. A master-slave manipulator has typically six degrees of freedom to allow the gripper to locate an object at an arbitrary position and orientation. Most joints are revolute, and the whole mechanical construction is similar to that of the human arm. This analogy with the human arm results from the need of replicating human motions. Further, this structure allows dexterous motions in a wide range of workspaces, which is desirable for operations in modern manufacturing systems.

**Unit 8. Energy X**

**Theme 1. Grammar in context. Conditional sentences**

**Grammar explanation**

Conditionals describe the result of a certain condition. The *if* clause tells you the condition (*If you study hard*) and the main clause tells you the result (*you will pass your exams*). The order of the clauses does not change the meaning.

If you study hard, you will pass your exams.  
You will pass your exams if you study hard.

Conditional sentences are often divided into different types.

***Zero conditional***

We use the zero conditional to talk about things that are generally true, especially for laws and rules.

If I drink too much coffee, I can't sleep at night.  
Ice melts if you heat it.  
When the sun goes down, it gets dark.

The structure is: *if*/w*hen* + present simple >> present simple.

***First conditional***

We use the first conditional when we talk about future situations we believe are real or possible.

If it doesn't rain tomorrow, we'll go to the beach.  
Arsenal will be top of the league if they win.  
When I finish work, I'll call you.

In first conditional sentences, the structure is usually: *if*/*when* + present simple >> *will* + infinitive.

It is also common to use this structure with *unless*, *as long as,* *as soon as* or *in case* instead of *if*.

I'll leave as soon as the babysitter arrives.  
I don't want to stay in London unless I get a well-paid job.  
I'll give you a key in case I'm not at home.  
You can go to the party, as long as you're back by midnight.

***Second conditional***

The second conditional is used to imagine present or future situations that are impossible or unlikely in reality.

If we had a garden, we could have a cat.  
If I won a lot of money, I'd buy a big house in the country.  
I wouldn't worry if I were you.

*The structure is usually: if + past simple >> + would + infinitive.*

When *if* is followed by the verb *be,* it is grammatically correct to say *if I were*, *if he were*, *if she were* and *if it were*. However, it is also common to hear these structures with *was*, especially in the *he*/*she* form.

If I were you, I wouldn't mention it.  
If she was prime minister, she would invest more money in schools.  
He would travel more if he was younger.

**Theme 2. A scientific video review (physics, biology, economics)**

**Theme 3. "Solar Energy" Skimming reading.**

Solar energy is an alternative source of energy which has become popular recently. You might have heard about solar batteries and seen them, too, because there are many people in Europe who set solar batteries up on the roofs of their country houses. However, this is not the only way to utilize solar energy. Transportation is another field in which solar energy is actively used nowadays. Planes, cars, railways, buses and even roads themselves are powered by the energy taken from the sun. A new way of powering transport is good not only because this kind of energy is renewable, but also because it helps many nations to reduce carbon footprint.

Solar powered charges may seem a myth to you but they are real already. You can have your own portable solar battery and charge many devices from smartphones to tablets. Some companies produce devices that are already powered by solar energy. For example, you can buy a mini-freezer or an air conditioner which work without electricity.

Solar lighting and heating are also a thing. Solar lighting is popular in country houses where people set them up in the gardens and yards. They are easy to set up and have no cables. You just place the lights somewhere outside and wait until it is dark to see them work. As for solar heating, it is also very efficient and may save up you some money usually spent on electricity bills.

**Unit 9. Materials Production**

**Theme 1. Grammar in context. Active and Passive Voice Perfect forms**

Active sentences in the present perfect tense have the following structure:  
**Subject + has/have + past participle form of the verb + object**  
Passive sentences in the present perfect tense have the following structure:  
**Object of the active sentence + has/have + been + past participle form of the verb + by + subject of the active sentence**

**Changing an assertive sentence into the passive**

Active: I **have written** a story.  
Passive: A story **has been written** by me.  
Active: They **have built** a house.  
Passive: A house **has been built** by them.  
Active: He **has broken** my window.  
Passive: My window **has been broken** by him.  
Active: I **have placed** an order for a digital camera.  
Passive: An order for a digital camera **has been placed** by me.  
Active: She **has done** her work.  
Passive: Her work **has been done** by her.

**Changing a negative sentence into the passive**

Active: I **have not received** a telegram.  
Passive: A telegram **has not been received** by me.  
Active: She **has not written** a story.  
Passive: A story **has not been written** by her.  
Active: She **has not cheated** anybody.  
Passive: Nobody **has been cheated** by her.

**Changing an interrogative sentence into the passive**

Passive forms of these sentences will begin with **has** or **have**. When the active sentence begins with a question word (e.g. when, where, which, why etc.), the passive sentence will also begin with a question word. When the active sentence begins with **who** or **whose** the passive sentence will begin with **by whom** or **by whose**. When the active sentence begins with **whom,** the passive sentence will begin with **who.**

Active: **Have** you **kept** the secret?  
Passive: **Has** the secret **been kept** by you?  
Active: Who **has done** this?  
Passive: **By whom has** this **been done?**  
Active: **Why have** you **told** a lie?  
Passive: Why **has** a lie **been told** by you?  
Active: **Who has torn** my book?  
Passive: **By whom has** my book **been torn?**  
Active: **Have you written** the letter?  
Passive: **Has** the letter **been written** by you?  
Active: **Has** the policeman **caught** the thief?  
Passive: **Has** the thief **been caught** by the policeman?  
Active: **Has** the postal department **released** a new stamp?  
Passive: **Has** a new stamp **been released** by the postal department?

**Theme 2. "Floor Materials" Skimming reading.**

There are so many different details to consider when designing or [renovating](https://www.moving.com/tips/how-to-find-a-contractor/) your home—and that includes plenty of different flooring options. Choosing the right floors is an important part of bringing together the entire look of your space, and they should provide you with the right functionality as well. It’s not enough for flooring options to just look great; they need to meet the needs of your home and your family as well.

So where should you start? In this article, we’ll cover some of the different types of floors that are available, plus the various factors that you’ll want to keep in mind as you do your research on flooring options.

6 Popular Types of Flooring Options

You’ve got a lot to choose from when it comes to picking out flooring for your home. Here are six common types of flooring options used in today’s homes.

* **Hardwood**Let’s start with the classic. Hardwood has been one of the most popular flooring options around for decades, thanks in no small part to its stunning effect and the timeless quality that it can bring to your home.  
  If you’ve watched any HGTV renovation shows, then you know that finding hardwood in a home is tantamount to striking gold. That’s because it’s rather expensive to put in, and it’s not always in a renovator’s budget to install hardwood throughout a house. If you love the look of hardwood but don’t want to overspend, consider just using it in your main living space. You can also opt for flooring options that can look like hardwood but aren’t, like laminate or vinyl.  
  **Cost:** The [average price for hardwood](https://www.homeadvisor.com/cost/flooring/install-wood-flooring/) flooring is between $6 and $22 per square foot, with most homeowners spending between $2,498 and $6,745 to have it installed.  
  **Pros:** Hardwood has a beautiful appearance, and also helps add value to your home.  
  **Cons:** On top of its high expense, hardwood also isn’t very durable. It’s prone to scratches, dents, and water damage, and may have to be refinished as often as every three to five years [at a cost of about $1,685](https://www.homeadvisor.com/cost/flooring/refinish-wood-flooring/).
* **Laminate**Laminate flooring is becoming increasingly popular as a hardwood alternative, since it offers an almost identical look at a cheaper price and with more durability. To make it, manufacturers take plywood or compressed fiber and then add a thin veneer to seal it. And it’s not just wood that laminate can emulate. Manufacturers are able to achieve a wide range of looks with this flooring option, including tile and stone.  
  **Cost:** [Expect to spend](https://homeguide.com/costs/cost-to-install-laminate-flooring) about $3 to $8 per square foot for laminate flooring, with a total average cost of about $2,352.  
  **Pros:** Laminate is relatively inexpensive to purchase and have professionally installed, and can be adapted to give the appearance of a wide range of flooring options. It’s also quite durable, and is more resistant than many other materials to things like pets, kids, and shoes.  
  **Cons:** The plywood or fiber board used to make laminate flooring is prone to water damage, and since it can be hard to repair, you’ll almost certainly have to completely replace the laminate in an area where there’s been any sort of standing water.
* **Engineered Wood**For another flooring option that looks like hardwood but offers more durability at a lower cost, consider engineered wood. This type of flooring is used by creating a thick base layer of plywood and then adding a thin veneer of real wood on top. Because it’s not hardwood all the way through, it’s not susceptible to the same degree of damage risks that hardwood is, and it’s also not as expensive to make or install.  
  **Cost:** It depends on what type of wood makes up the veneer layer, with the [average price per square foot for engineered wood](https://www.homeadvisor.com/cost/flooring/install-wood-flooring/#engineer) coming in at anywhere from $3 to $13.  
  **Pros:** Engineered wood is more stable than hardwood while offering the exact same appearance. A lot of times, it can also be purchased in clickable boards that, if you’ve got some [DIY](https://www.moving.com/tips/16-super-easy-diy-home-improvement-ideas/) know-how, you can install on your own to save even more money.  
  **Cons:** While it’s more resistant to damage in the first place than hardwood, engineered wood can still take a beating over time. Unfortunately though, it can only be refinished a couple of times since that top layer is so thin, which eventually means you’ll have to replace it if and when damage occurs.
* **Vinyl**There are multiple types of vinyl flooring, and each of them offer something a little bit different. There’s the sheet vinyl that comes in a roll and is glued into place (and is perhaps not the most ideal way to go), thicker vinyl flooring with peel-and-stick backings, and then clickable vinyl planks that can give off the appearance of more expensive flooring options.  
  If you want to go with vinyl, we recommend opting for the planks, since in addition to looking nicer, they have a cushioned layer beneath them that makes them quite comfortable to walk on. Thicker vinyl flooring—so either clickable planks or peel-and-stick—also feature textured surfaces that don’t give off the shiny look you get from vinyl that comes in a roll.  
  **Cost:** The [average cost for vinyl](https://www.fixr.com/costs/install-vinyl-flooring) flooring is between $800 and $1,000.  
  **Pros:** You’ve got a variety of options when it comes to vinyl, which allows you to work this option into a lot of budgets. And with today’s luxury vinyl, you get a much more expensive-looking result for a relatively cheap price, at least as far as flooring options go.  
  **Cons:** All flooring options have a lifespan, with vinyl’s being a bit lower than that of wood and tile. It’s also produced with petroleum, which means it’s not as sustainable or environmentally-friendly as other types of flooring.
* **Ceramic Tile**Ceramic tile has long been a top pick for bathrooms and [kitchens](https://www.moving.com/tips/how-to-design-a-kitchen/) since it’s quite effective when it comes to moisture resistance. It’s also available in a rainbow of colors and patterns, meaning you can adapt tile to any design aesthetic, no matter how bold.  
  There are four primary types of ceramic tile: terracotta, porcelain, glazed, and quarry. Each type offers a different look and texture, with differences in durability as well. Keep in mind that if you’re installing ceramic tile in a high traffic area of your home, you’ll need to make sure the tile you choose is strong enough to hold up to heavy use.  
  **Cost:** Tile comes in at an [average price](https://www.homeadvisor.com/cost/flooring/install-ceramic-or-porcelain-tile/) of $15 to $20 per square foot, with the average homeowner spending $1,774 to have it installed.  
  **Pros:** Ceramic tile is incredibly versatile in appearance. It’s also easy to clean and quite durable—two things that matter a lot when you’re choosing flooring.  
  **Cons:** Some types of ceramic tile require regular sealing and/or other maintenance treatments to keep them looking their best, and it’s also a hard material so it’s not quite as comfortable to walk on as other flooring options.
* **Carpet**It’s pretty hard to come across a home that doesn’t have carpet in at least some of its rooms. That’s because carpet is available in a ton of different textures, styles, and colors, and more notably, because it’s super comfortable to walk on, especially if you invest in some good padding underneath. As for durability, that depends on the density of the material that you choose. More dense carpets will be more durable, and will stand up to use for longer.  
  **Cost:** The [average price for carpet](https://www.homeadvisor.com/cost/flooring/install-carpeting/) flooring is $3.50 to $11 per square foot, for a total average price of $1,620.  
  **Pros:** Carpet is cozy, warm, and slip-resistant. It’s also easy to install and can last for a long time if you take proper care of it.  
  **Cons:** Carpet requires quite a bit of maintenance, since unlike with other flooring options, things like dirt and debris can get trapped in its fibers and build up over time. Regular deep cleanings are especially important if you have allergies, since carpet has a way of grabbing and holding on to allergens floating in the air.

**Theme 3. Future Continuous Tense. A future city design**

The future continuous tense is a verb tense that shows an action happening over a period of time in the future. “I will be dancing all night” is an example of the future continuous tense, as it indicates an action continuing over a specific future period of time. Compare it to this sentence, written in the simple future tense: “I will dance.” Although this example indicates an intention to dance in the future, it does not refer to a continuous action over a specific period of time in the future.

The future continuous tense can be confusing because it sometimes seems interchangeable with other future tenses. Below, we cover the specifics of the future continuous tense so you know when to use it—and when *not* to use it.

The future continuous tense, also known as the future progressive tense, is a [verb tense](https://www.grammarly.com/blog/verb-tenses/) that shows an ongoing action in the future. It is the future version of the [present continuous tense](https://www.grammarly.com/blog/present-continuous/), which uses a similar construction.

Future continuous: I **will** **be** **watching** my shows from lunch until dinner.

Present continuous: *I* ***am watching*** *my shows.*

It is helpful to use the future continuous tense when describing:

* multiple actions happening in the future
* planned or confirmed future events taking place at a specific time

Although the future continuous tense is often confused with the [simple future tense,](https://www.grammarly.com/blog/simple-future/) there are some key differences between the two. The future continuous tense is usually used with a **specified period of time**, whereas the simple future tense can be used with or without an exact time.

**The future continuous tense also shows more certainty than the simple future tense does**. We use the future continuous tense for actions we know will happen, but we use the simple future tense for actions that are less likely.

Future continuous (certain): *They* ***will*** ***be*** ***promoting*** *me to manager on Friday.*

Simple future (uncertain): *They* ***will promote*** *me to manager one day.*

There’s also some confusion about the **future continuous tense vs. the future perfect continuous tense**. Keep in mind that the future continuous tense is for actions taking place over a specific period of time in the future, while the [future perfect continuous tense](https://www.grammarly.com/blog/future-perfect-continuous-tense/) is for actions that are ongoing into the future but lack a specified end date.

Future continuous: I **will be working** as a sales assistant from November to December.

Future perfect continuous: In December, I **will have been working** as a sales assistant for a year.

Like all other continuous tenses, you cannot use the future continuous tense with stative verbs like *want*, *need*, *love*, or *hate*. Use the simple future tense with stative verbs instead.

Future continuous tense (incorrect): I will be needing help with the repairs tomorrow.

Simple future tense (correct): I will need help with the repairs tomorrow.

How does the future continuous tense work?

The future continuous tense is formed with the words *will* and *be* plus the present [participle](https://www.grammarly.com/blog/participle/) of the actionable verb. Unlike most other verb tenses, you do **not** need to conjugate any [verbs](https://www.grammarly.com/blog/verbs/) to match person, number, or gender.

[*will*] + [*be*] + [present participle of verb]

She **will** **be** **speaking** in the auditorium this evening.

Essentially, the future continuous tense takes the present continuous tense and adjusts it to speak to the future.

Remember that when using the [modal verb](https://www.grammarly.com/blog/modal-verbs/) *will*, the verb that follows uses its bare infinitive form (the infinitive without *to*). So when we add *will* to the present continuous, the verbs *is*, *are*, or *am* take their bare infinitive form, *be*. The present participle remains the same.

Future continuous: He **will** **be** **studying** for the test all night.

Present continuous: He **is** **studying** for the test right now.

How to use the future continuous tense with negatives

When using the future continuous tense with [negatives](https://www.grammarly.com/blog/negatives/), insert the word *not* after *will* and before *be*.

[*will*] + [*not*] + [*be*] + [present participle of verb]

She will not be joining us this evening.

How to use the future continuous tense with contractions

[Contractions](https://www.grammarly.com/blog/contractions/) can be tricky with the future continuous tense because positive and negative sentences have different rules.

For positive sentences, if the subject is a [pronoun](https://www.grammarly.com/blog/pronouns/), use a contraction with the subject and the word *will*.

**She’ll** be coming around the mountain.

**I’ll** be sleeping until noon.

For negative sentences, instead of using a contraction with the subject, use the contraction *won’t* to replace *will* and *not*.

I **won’t** be attending the party this weekend.

They **won’t** be checking their email while on holiday.

How to use the future continuous tense in questions

When using the future continuous tense in a question, the subject comes after *will* and before *be*.

[*will*] + [subject] + [*be*] + [present participle of verb]

**Will** she **be** **acting** in the sequel next year?

For negative questions, we typically use the contraction *won’t* to replace *will*.

**Won’t** she **be** **acting** in the sequel next year?

When to use the future continuous tense, with examples

There are a few particular instances when the future continuous tense is preferable over the other future tenses.

**1** To describe a future action happening during a specific time

As we talked about above, the future continuous tense is often used with specified times.

We **will be watching** horror movies from dusk until dawn.

The museum **will be hosting** a special tour at 8 p.m.

**2** To describe multiple future actions happening at the same time

When more than one action is happening in the future and at least one action is ongoing, use the future continuous tense.

My brother **will be babysitting** while I’m at work.

**I’ll be playing** basketball on Sunday, and my partner **will be playing** tennis.

**3** To describe a future action interrupted by another action

In a situation involving multiple future actions and one action interrupting another, **use the future continuous tense for the action being interrupted**, and use the simple present for the action that interrupts.

This construction is often used with a [subordinate clause](https://www.grammarly.com/blog/subordinate-clause/) beginning with *when*.

I **will be taking** a shower when the guests arrive.

When the clock strikes midnight, we **will be drinking** champagne.

**4**  To describe likely hypothetical situations in the future

All future events are hypothetical, so you can use any future tense to describe them. However, use the future continuous tense for hypothetical events that seem likely—or that you want to seem likely.

Everyone **will be cheering** for me at the game tomorrow.

We**’ll be driving** hover cars any day now.

For more details on using the future continuous tense and other tenses, check out our free [grammar guide](https://www.grammarly.com/grammar).

**Theme 4. Dream House: Design a home**

**Theme 5 "Office Paper Production "Making PPT**

**Unit 10. Work and inventions**

**Theme 1. Investigating the world of Digital Devices**

With technological advancements resulting in a more compact hand-held device with respect to size yet offering more storage on the hard drive and memory, the Internet of Things (IoT) realm condenses to comprise a subset of Small-Scale Digital Devices (SSDDs) that are nearly fit-in-your-pocket. Personal Data Assistants (PDAs) such as smartphones, tablets, and smart wearables, along with smart toys, gaming consoles, digital cameras, and drones are some of the more common SSDDs (Figure 1). There are applications of IoT devices and SSDDs in everyday life including wearable technology, fitness, smart homes, health care, smart cities, agriculture, industrial automation, etc. that emphasize their impact. Nearly every member of society uses a variety of IoT/SSDDs in today’s digital world. Worryingly, with these devices, practically anything can be connected to the Internet or another “thing”– which highlights the fact that in many instances, we are creating our problems with a wider attack surface and underlying security issues (MacDermott, 2019a). The accessibility of technology makes it easier for cybercriminals to utilize IoTs and SSDDs to covertly commit criminal activity. The Mirai malware targeted vulnerable IoT devices, such as those with default passwords and unsafe protocols turning them into a network of infected devices (also known as a botnet) that was used to flood targeted services with traffic, making them unavailable to normal users (Buxton, 2022). SSDDs such as smartphones, for example, store a lot of user data including calls, texts, images, and address books that may be subject to similar criminal activities (Nelson et al. 2014). Users’ personal information is constantly at risk of threats and security lapses in the digital environment.

The usage of cyberspace for conducting criminal activity has introduced Digital Forensic (DF) investigation as a mandatory part of conventional investigations. For SSDD Forensics (SSDDF), past events are reconstructed to extract potential evidence from the device. This process encompasses various forensic analysis categories, i.e., (1) the type of Operating System (OS), (2) memory, (3) network, (4) browser, and (5) any paired device’s investigation. Each branch of forensic analysis facilitates investigators to identify criminal activity performed in cyberspace in a holistic manner, which helps piece together information (artifacts) to establish the full picture (Maria Jones and Godfrey Winster, 2018).

Useful artifacts concerning memory, OS, geo-location network activity, call logs, pictures, and videos can be extracted from IoT devices and SSDDs. In addition, browser history may store potential evidence. Memory artifacts, from slack and unallocated spaces, which preserve crucial information about running processes, are also the primary source of forensic artifacts. Digital devices are connected to the Internet by various means of communication, i.e., the wired network, Wi-Fi, Bluetooth Zigbee, ports, etc., and artifacts of forensic interest may be extracted from them.

The forensic processes in question pose challenges of various degrees. For example, finding the appropriate tool for forensic investigation is one of the major challenges because of diverse SSDDs. Such multifaceted issues stem from several variables such as different OSs, device models, and implemented security mechanisms that are constantly changing and evolving. In addition, jurisdictional issues present a unique barrier to forensic testing; only applicable laws are admissible in court. The entailing discussion elaborates on various other challenges in SSDD forensics and the use of cutting-edge technologies that may be utilized to annihilate them.

**2 Small-scale digital devices**

2.1 Smartphones

The smartphone is the most prevalent SSDD. With the world population currently amounting to 8 billion, approximately 6.84 billion smartphones exist, as of 2023 (Howarth, 2023). In addition, these smartphones connect to other IoT devices, which amounts to approximately 10.47 billion IoT connections in total. Smartphones store data inclusive of call logs, call records, SMS, MMS, chats, GPS information, voice recordings, calendars, address books, Web pages, browsing history, videos, music files, and financial data as well.

Some of the most dominant OSs in the smartphone marketplace include Android, iOS, Samsung, Windows, etc. Constant updates of OSs have resulted in a collection of versions that need individual study and research for apt forensic practices.

The prevalence also results in the most malicious attacks which emphasize the need for digital smartphone forensics as a top priority. It has been observed that criminals hide their footprints through data deletion or data hiding practices, generally known as anti-forensic techniques. Therefore, a forensic examiner must know the extraction, retrieval, analysis, interpretation, and presentation of both apparent and hidden artifacts.

2.2 Wearable technology

A rising technology trend is wearable technology, such as fitness bands with amazing functionalities. Users wear a variety of well-known fitness bands every day to monitor their activities such as sleeping, walking, and running, among others. Employers have recently started using them to monitor workers' productivity, resource utilization, etc.

These devices are developed with multiple applications and communication interfaces. Their OSs are diverse, including but not limited to WatchOS, Wear OS, Fitbit OS, Band, Pebble OS, Tizen, and Garmin (Loomis & Edward et al. 2019). Because such smart wearable devices are capable of being connected to smartphones, they are important evidence repositories from a forensics perspective as well. In addition, they are synchronized with the Internet and the cloud, making them the ideal source of evidence because they provide a wealth of personal information, biometrics, and other user data.

2.3 Gaming consoles

Recently, gaming consoles have also been connected to online offenses such as gambling, theft, fraud, kidnapping, and software violations. Therefore, it is essential to be able to thoroughly evaluate such devices while minimizing the risk of data corruption.

The eighth-generation Xbox One console was released in 2013. Microsoft introduced the Xbox One, which runs on a version of Windows specifically made for it. The OS for Xbox One games, and any associated applications are separate. The OS is stored on the internal hard drive and has a backup in the internal console storage, so it may be restored in the event of corruption, or a factory reset. The Xbox One includes a central processing unit and 8 GB of DDR3 RAM, of which 3 GB is set aside for the OS and the remaining space is used by games and applications (Khanji et al. 2016).

The Sony-made PlayStation 4 (PS4) is an 8th-generation video game console with a lot of Internet features. The PS4 does accept FAT and exFAT formatted USB storage devices, but its internal hard drive utilizes a proprietary system structure. Using USB-attached devices, the PS4 enables users to view images, watch videos, and play music. Full hard drive encryption is a major challenge with the forensic analysis of PS4. Nintendo makes the Nintendo 3DS, a handheld, portable gaming system. In addition to the integrated NAND chip, the 3DS can save data on an external memory card.

2.4 Drones

Drones are widely used in the market for a range of applications, mostly to decrease manual labor and increase process efficiency in both commercial and non-commercial applications. Drone applications are special and can be used practically everywhere to conduct reconnaissance, gather data or resources, and deploy resources, with a variety of payloads. Major players in the consumer market including 3D Robotics, Parrot, and DJI are constantly updating their Unmanned Aerial Vehicles (UAV) product lines with new features, better performance and energy efficiency, smaller size, lighter weight, and greater usability. Drone forensics, anti-drone technologies, and more restrictions are required because of the rise in occurrences and unlawful use of drones.

2.5 Smart toys

Smart or internet-connected toys now come in a variety of sizes and designs with Wi-Fi, Bluetooth, microphones, cameras, and GPS tracking capabilities. They also contain microprocessors, microcontrollers, non-volatile memories, input-output devices, and storage devices (Hosani et al. 2020). For executing digital forensic tasks, such as the recovery of deleted records in the hard drive, memory, etc., conventional investigation skills with the proper understanding of the most recent methodology and instruments are very important. Smart Connected Toys (SCTs) make it more challenging to examine digital evidence and locate the evidence’s difficult-to-remove digital footprint. In a normal SCT crime case, there is no way to charge suspects if the investigator is unable to present strong evidence against the culprit (Yankson et al. 2020). To establish the facts essential to prove a person’s guilt or innocence in a court of law, it is important to be able to extract evidence. By the use of Bluetooth, Wi-Fi, the cloud, and mobile apps, connected toys link events, and data. They frequently have cameras and microphones for gathering audio and video information. Future iterations of smart toys might have Artificial Intelligence (AI)-enhanced facial recognition technologies. With those links, information is gathered, saved, and shared that feeds the toys; yet there are numerous security concerns, reports stating that up to 98% of IoT traffic is not encrypted.

**Theme 2. Considering success in oil business**

Behind the scenes of the multifaceted oil and gas industry lies a set of strategies and insights that can make all the difference in your journey to achieving your career goals. Whether you are an experienced professional seeking growth or a fresh graduate aspiring to make your mark, our top tips will equip you with the necessary tools to excel in the oil and gas industry.

**1. Continuous learning and skill development**

The oil and gas industry is ever more driven by technological advancements, regulatory changes, and market dynamics. To thrive in this industry, it is crucial to embrace a mindset of continuous learning and skill development. Stay up-to-date with [industry trends](https://www2.deloitte.com/us/en/pages/energy-and-resources/articles/oil-and-gas-industry-outlook.html), read journals and research data from trusted industry sources like the [International Association of Oil & Gas](https://www.iogp.org/), and seek opportunities to enhance your technical knowledge and expertise.

**2. Embrace innovation**

The oil and gas industry is constantly evolving. A sign of the healthiest oil and gas companies is their ability to embrace innovation in balance with operational discipline. If you’re searching for jobs in oil and gas, look out for the ones that embrace new technologies and processes, as they’re more likely to succeed. Don’t just take it from us, McKinsey also reports this as a [key marker of success](https://www.mckinsey.com/industries/oil-and-gas/our-insights/what-it-takes-to-be-successful-three-hallmarks-of-a-healthy-oil-and-gas-organization) in the oil and gas industry. Professionals who are open to learning new things, experimenting with new ideas, and pushing boundaries are highly sought after in the industry.

**3. Priorities safety**

Safety is paramount in the oil and gas industry. It can be a hazardous environment, and it’s essential to always keep safety at the forefront of your mind. If you’re new to the industry, it's important to familiarize yourself with a critical safety concept known as "[Stop Work Authority](https://iadclexicon.org/stop-work-authority/)" or "Stop Work Obligation." This principle empowers individuals at all levels to intervene and halt any work activities if they believe there is an immediate safety concern. By exercising your Stop Work Authority, you contribute to the overall safety and well-being of yourself, your colleagues, and the entire operation.

**4. Cultivate strong professional networks**

Building and nurturing a strong professional network is crucial for success in the oil and gas industry. Attend industry conferences, seminars, and networking events to connect with industry experts, potential mentors, and peers. Engage in conversations, share insights, and collaborate on projects to expand your knowledge and create opportunities for career growth. A robust network not only provides valuable industry insights but also opens doors to potential job opportunities and collaborations that can propel your career forward.

Pro tip: have a 30-second elevator pitch prepared for networking events – it’s a key skill for any professional and a great way to quickly spark conversation and start a relationship with a prospective client, partner or employer.

**5. Be adaptable**

The oil and gas industry is subject to a wide range of factors that can impact business, including fluctuations in the price of oil and gas, changes in regulations, and geopolitical events. So it’s important to be able to adapt to changing circumstances and find ways to succeed despite challenges. An ever-present and growing challenge is Environmental, Social and Governance (ESG), an umbrella framework to help companies consider their impact and dependencies on the environment and society. As an [area that many executives are grappling with](https://www.strategyand.pwc.com/uk/en/insights/esg.html) in this sector, candidates who are able to identifying growth opportunities, and bridge the gap to the more technical aspects of ESG are in-demand.

Propel your career forward

Are you ready to take your job search in the oil and gas industry to the next level? By embracing key values such as continuous learning, adaptability, and building strong professional networks, you can position yourself for success in the oil and gas industry. These tips will help you navigate the industry's ever-changing landscape, stay competitive, and seize opportunities for career advancement.

The oil and gas industry is waiting for talented individuals like you who are eager to make an impact. So, what are you waiting for? Get out there, apply these tips, and secure the opportunities you deserve.

Whether you’re searching for [civil engineer jobs](https://www.trsstaffing.com/civil-engineering-jobs), [mining jobs](https://www.trsstaffing.com/mining-jobs), [construction manager jobs](https://www.trsstaffing.com/construction-management-jobs) or other exciting jobs in the oil industry, you’re in safe hands with TRS.

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**Unit 11. Architecture and Construction**

**Theme 1. «Cement»**

Cement is a fine, soft powder used as a binder because it hardens after contact with water. It is produced from a mixture of limestone and clay that’s charred and then ground up.

*How is cement made?*

Since ancient Greece and Rome, humankind has used cement for construction. However, the process for making this quick-drying gray paste has changed significantly since those times. The rudimentary methods of yesteryear are no longer used to work with limestone; instead, special machinery is used to generate very fine powders in quantities never before seen.

Starting in the 19th century, the industrialization of cement production has allowed this material to become present in a wide variety of construction sites, and it has also been used for aesthetic and utilitarian purposes in modern architecture.

How is construction cement made?

* The process begins in the quarry with the extraction of limestone and clay.
* The raw material is transported to a special plant, where it’s crushed.
* In pre-homogenization, gamma-ray equipment analyzes the raw material, and it is then mixed with precise amounts of iron and limestone, which is determined according to the type of cement being made.
* This rustic mixture is pulverized during grinding until a fine “flour” is obtained.
* Then, it goes to the homogenization silo.
* When subjected to high temperatures, it crystallizes and then cools, transforming into a homogenized ground substance (small, gray round crystallized stones).
* Pre-grinding. After a certain amount of time in storage, the clinker passes through a roller mill.
* During grinding, the clinker is ground with gypsum (the gypsum-to-clinker ratio will determine the type of cement produced).
* Finally, the finished cement is packed and distributed in bags.

**Theme 2. "Ancient architecture" Making PPT**

One of the lasting contributions ancient cultures have made to modern life is [architecture](https://www.worldhistory.org/disambiguation/architecture/), both in terms of surviving monuments and their influence on contemporary buildings around the world. Ambitious rulers set up [pyramids](https://www.worldhistory.org/pyramid/) in [Egypt](https://www.worldhistory.org/egypt/) and the Americas, while arches of one form or another dotted many [Roman](https://www.worldhistory.org/disambiguation/Roman/) [cities](https://www.worldhistory.org/city/) and Japanese sacred sites. Walls were another popular and often necessary feature of ancient landscapes, amongst the most famous being [Hadrian's Wall](https://www.worldhistory.org/Hadrians_Wall/) in [Britain](https://www.worldhistory.org/britain/), the [Great Wall of China](https://www.worldhistory.org/Great_Wall_of_China/) and the [Theodosian Walls](https://www.worldhistory.org/Theodosian_Walls/) of [Constantinople](https://www.worldhistory.org/Constantinople/) but there were many more besides. Theatres, amphitheatres and stadiums were all common features of ancient cities from North [Africa](https://www.worldhistory.org/disambiguation/africa/) to Western [Turkey](https://www.worldhistory.org/Asia_Minor/) and are still being imitated today from Rio to Qatar.

The Classical architectural orders, adapted from Near Eastern and [Egyptian](https://www.worldhistory.org/disambiguation/Egyptian/) prototypes, were first seen in [Greece](https://www.worldhistory.org/greece/) and then expanded by the [Etruscans](https://www.worldhistory.org/Etruscan_Civilization/) and the Romans, gaining such wide acceptance as a symbol of grand building schemes that few cities around the world today do not have a courthouse, opera house or public library with a facade bristling with classical columns. This collection examines all the above and more, including [Hindu architecture](https://www.worldhistory.org/Hindu_Architecture/) and its complex mathematics and rules which are followed across the [temple](https://www.worldhistory.org/temple/) sites of the sub-Indian continent, the master masons of the [Incas](https://www.worldhistory.org/Inca_Civilization/), and the still-influential churches of the Byzantines.

A lasting [Greek](https://www.worldhistory.org/disambiguation/greek/) architectural contribution to world [culture](https://www.worldhistory.org/disambiguation/culture/) was the [stadium](https://www.worldhistory.org/Stadium/), named after the distance (600 ancient feet or around 180 metres) of the foot-race they originally hosted - the stade or stadion. Initially constructed near natural embankments, stadia evolved into more sophisticated structures with rows of stone or even marble steps for seating which had divisions for ease of access. Conduits ran around the track to drain off excess rainfall and in [Hellenistic](https://www.worldhistory.org/Hellenic_World/) times vaulted corridors provided a dramatic entrance for athletes and judges.

<https://www.worldhistory.org/collection/56/architecture-in-the-ancient-world/>

**Theme 3. "The history of Engines’ Skimming reading.**

The first gasoline-fueled, four-stroke cycle engine was built in Germany in 1876. In 1886, Carl Benz began the first commercial production of motor vehicles with internal combustion engines. By the 1890s, motor cars reached their modern stage of development. In fact, the models of that decade were so successful that there has been no fundamental change in the principles of the ordinary automobile engine since that time.

It took several more years for the internal combustion engine to sweep the American market, however. General conditions, such as the expansiveness of the nation, the lack of decent roads, and the relatively well-developed urban transit system, worked against adoption of any and all motor vehicles for a time. Mass production of gasoline-powered cars, however, brought to the market a vehicle that was modestly priced, easy to maintain, relatively fast and powerful, able to travel long distances, and fueled by a cheap, abundant, widely-available source of energy.

Before the era of the Model T, gasoline-fueled vehicles had stiff competition from steam-driven and electric cars. In fact, of the 4,200 cars built in the United States in 1900, only one-fourth employed internal combustion engines. And of the approximately 8,000 automobiles on the road, most were steam-driven. Steam had been used as early as 1769 to power a road vehicle. French Army engineer Nicholas Joseph Cugnot designed a three-wheel truck for hauling artillery. Experimentation with steam-powered vehicles began in the United States in the 1780s primarily in the Northeast. Into the nineteenth century, however, steam-engine technology tended to focus on locomotives rather than cars.

Particularly noteworthy in the United States were steam cars produced by twins [Francis E. and Freeland O. Stanley](http://www.autolife.umd.umich.edu/Environment/E_Overview/Stanley_Brothers.htm), who had been school teachers in Maine. For several years, the “Stanley Steamer” was the fastest vehicle on the road. In 1906, the Stanley Rocket set five world speed records in Daytona Beach, Florida, hitting over 127 miles per hour. By the 1910s, however, the Stanleys were producing only 600 to 700 vehicles per year. Despite the simplicity of their engines, fast acceleration, low pollution, economy, and great power, the early steamers started up slowly and ran noisily, had unreliable controls and problems with freezing, and required extensive engineering knowledge to operate. Although many of the steamer’s weaknesses were overcome, they suffered from little infusion of capital into their production, some untimely accidents, and vigorous competition from the mass-produced gas-powered cars that had overtaken the market by the 1910s.

The electric car, utilizing rechargeable batteries, was another promising alternative to the gas-powered vehicle. In 1900, more than one-quarter of the almost 4,200 American automobiles produced were electric. However, twenty years later the commercial viability of the electrics had ended. As with the steamers, electric cars had some decided advantages over the motorcar: ease of operation, no emissions of foul odors and gases, and a quiet ride. Yet as a road vehicle, electric cars had a major problem: limited range. At the turn of the twentieth century, they could only go twenty miles before requiring a recharge. Furthermore, storage-battery life was limited and the batteries themselves were bulky. Even the celebrated [Thomas Edison](http://www.autolife.umd.umich.edu/Environment/E_Overview/Edison_electric.htm) could not produce a viable battery in time to compete with gasoline-powered cars. As one writer noted: “Like many products before and after, the electric car was a technological success that found no more than a miniscule market; it was a spectacular flop.”

With greater availability of gasoline and oil lubricants after the gigantic [Spindletop](http://www.autolife.umd.umich.edu/Environment/E_Overview/Spindletop.htm) oil strike in southeast Texas in 1901, and favorable publicity from automobile race results, the gasoline-powered car claimed performance superiority over its competitors. In 1900, Ransom E. [Olds](http://www.autolife.umd.umich.edu/Environment/E_Overview/1902_Oldsmobile.htm) switched from producing steam-driven cars to producing gasoline-fueled vehicles, and in 1903, Henry Ford founded a motorcar company specializing in automobiles with internal combustion engines. When Henry Ford put his mass-produced Model T on the market in 1908, the car ceased to be a toy for the rich and firmly entrenched the internal-combustion vehicle as the standard.

Demand for gasoline was the major impetus to the growth of the petroleum industry in the twentieth century. [Gasoline consumption](http://www.autolife.umd.umich.edu/Environment/E_Overview/Gasoline.htm) soared from less than three billion gallons in 1919 to approximately fifteen billion in 1929, 46.5 billion in 1955, and more than 135 billion in 2002. By 1973 transportation was responsible for more than half of all consumption of petroleum in the United States; by 1990 almost 64 percent. Since 1975, the United States has consumed more oil for transportation than it produced. Today, automobiles alone are responsible for almost 90 percent of the energy consumed for travel in the U.S.

Over the years, changes in the design, size, weight, and power of automobiles all contributed to greater gasoline use. The addition of amenities such as air conditioning, power steering, power brakes, automatic windows, and automatic transmissions reduced fuel economy. Quality of gasoline—not simply quantity—was crucial to automobile performance. The discovery and commercialization of tetraethyl lead as an **antiknock** agent was a major breakthrough. Criticized for blaming poor performance on the fuel rather than on engine design, **Charles F. Kettering** and **Thomas H. Midgley** were soon praised throughout the automobile industry for perfecting the additive in 1922. In 1926 an octane scale for gasoline was introduced by the **Ethyl Corporation** (a joint venture between Jersey Standard and General Motors). With higher octane antiknock fuels, **higher compression engines** could be produced. The economic benefit of such a venture for both the automotive industry and the petroleum industry overshadowed questions of safety in the production of tetraethyl lead and questions of health through the use of leaded gasoline in general.

Since petroleum products were so essential to the proliferation and use of the automobile, the environmental implications of [drilling for, transporting](http://www.autolife.umd.umich.edu/Environment/E_Overview/Petroleum.htm), and refining oil assume an important role in the relationship of the automobile to the environment. The euphoria over striking oil was not matched with foresight and restraint in producing and marketing it. Abundance of “black gold” appeared to be a permanent blessing for the United States, and in the early years particularly, waste and overproduction was due to several factors: poor drilling and storing techniques, natural disasters, the competitive market, simple disregard, and greed. Many of the problems oilmen encountered in fields across the continent were first experienced in Pennsylvania in the late nineteenth century before the surge to refine oil for fuel in the West and Southwest.

The patterns of waste and the disregard for conservation measures at Oil Creek and elsewhere in Pennsylvania were remarkably similar at Spindletop despite years of experience in drilling for oil. [Great fires](http://www.autolife.umd.umich.edu/Environment/E_Overview/Oilfield_Fires.htm) periodically spread across the fields, with one fire burning 62 derricks and sending flames 1,000 feet into the air. The general squandering of oil was legendary. In 1902, the *Oil Investors’ Journal* estimated that 10 million barrels of oil at Spindletop had been wasted since the initial strike. To impress investors, oil promoters often opened the wells, sending [gushers](http://www.autolife.umd.umich.edu/Environment/E_Overview/Beaumont.htm) of 125 feet into the air.

The basic urge to get rich quick, however, usually meant depleting supplies as quickly as possible, despite warnings from geologists about the dangers of extracting too much, too quickly or wasting substantial amounts along the way. Through the “Rule of Capture,” which dominated the production of oil until the 1930s, those who owned the surface property over a common oil pool could keep all the oil and gas that they took from wells, regardless of the possible drainage from adjoining property. In most respects, the problem of waste at the wellhead was viewed as an economic problem. Conservation practices, when implemented, ultimately produced oil in a more rational fashion by protecting prices and limiting wild fluctuations in supply. These practices, however, were usually limited to large companies—not wildcatters—that controlled major sources of supply and benefited from industrial stability.

Beyond overproduction and squandering of oil, drilling and refining polluted the land, air, and water where oil was taken from the ground and where it was processed for marketing. Localized pollution in areas such as Beaumont-Port Arthur, Texas, was serious but rarely attracted attention from oil companies or state government before World War I. Drain-offs of crude soaked the ground in the fields immediately around the wells. Rapid pumping of oil led to the introduction of salt water into the underground pools as well as into local water supplies. Among the wells, the pumping stations, and the tankers, spillage was frequent. When strikes occurred it was common for thick, yellow fog laden with sulfur to engulf houses and other structures in the area. In addition, early refineries were built with little regard for environmental concerns: unrecovered petroleum was simply discarded in the most convenient location; open (sulfurous) flames from burning crude were noticeable everywhere. Floods along the coast washed oil into the rivers, streams, lakes, and the Gulf of Mexico.

In the early twentieth century, oil conservation laws in some states tried to cope with the most egregious practices in the oil industry, concentrating on casing requirements and the plugging of wells. With the major discoveries in the Southwest and the rise in demand for gasoline, legislation shifted to production controls. State and federal authorities, although concerned with potential oil depletion, gave scant attention to oil-field waste, and other forms of pollution and self-regulation of environmental problems within the industry was a very low priority. In Congress, efforts to pass legislation to control oil-related pollution issues met with stiff resistance from oil-producing states. Secretary of Commerce Herbert Hoover in the Coolidge administration proposed curbing oil discharges from shore plants as well as from ships, which resulted in the Oil Pollution Act of 1924. The law was a weaker version of Hoover ’s proposal, however, offering inadequate enforcement provisions and dealing only with dumping fuel at sea by oil-burning vessels.

Only after World War II, with a system of production controls in place, did attention turn to preventing oil field pollution. Population growth, urbanization, and industrialization in the oil-producing states in particular influenced this effort. Most important, the increased demand for water by cities, farms, and industry encouraged the passage of laws to prevent the contamination of fresh water supplies. In the late 1940s, several states adopted more sophisticated petroleum conservation laws to protect groundwater and to reduce external damage caused by oil-field discharges. Much more limited success was achieved in controlling petroleum-related pollution in the Gulf Coast refining region. Hydrocarbons and other chemical pollutants blanketed the skies over Beaumont-Port Arthur and along the Houston Ship Channel. Water pollution in estuaries, tidelands, and especially in the Ship Channel added to the environmental deterioration.

The oil industry preferred to deal with pollution questions internally. However, those most directly affected by the contamination did speak out. In the early 1950s, the actions of a citizen’s group from the area near the Houston Ship Channel led to the establishment of a water and air pollution control section in the Harris County Health Department. Additional successes were thwarted by the state court, which handed down several decisions making it more difficult to prosecute companies responsible for the pollution. In the 1960s, the argument that further pollution threatened economic growth was persuasive. Charges by federal investigators that the Houston Ship Channel had the worst water pollution problem in the state, among other things, encouraged the Texas legislature to pass a clean air act in 1965 and a water quality act in 1967. Enforcement proved minimal, however.

World attention turned to the problem of oil pollution in March 1967, when the supertanker *Torrey Canyon* ran aground off the coast of England, spilling most of its 120,000 tons of crude into the sea. In May, President Lyndon Johnson initiated a study of oil pollution problems, but no major change came in federal offshore policy in the United States. On January 28, 1969, however, Union Oil's Well A-21 blew off the California coast at Santa Barbara. The hole was capped quickly, but thousands of gallons of oil escaped from a fissure in the ocean floor. By February 1, the pollution extended along five miles of beach, and the leak ultimately released 235,000 gallons of crude with a slick of 800 miles. Throughout February and into March, the crisis continued with no immediate end to the pollution of the beaches. Efforts to use chemical dispersants on the oil were started and stopped several times. Union Oil attempted other methods but to no avail.

Washington and Sacramento responded with investigations and studies. The investigatory process offered little immediate relief to Santa Barbara, however. Lawsuits against Union Oil from commercial fishermen and owners of beachfront property soon followed, as well as state lawsuits against the federal government. Citizen groups, especially GOO-Get Oil Out, protested against the remaining oil operations. Efforts to permit Union Oil to resume offshore production simply led to renewed blowouts and leaks. By March 6, the oil was washing up on San Diego beaches, and it was not until the end of the month that the worst leaks were plugged.

The Santa Barbara oil spill brought into question the rush to exploit offshore oil, corporate responsibility for environmental disasters, and the need for environmental protection. At the time of the spill, 925 wells had been constructed along the coastal tidelands from Santa Barbara to Los Angeles. Beyond a state-imposed three-mile coastal limit barring drilling, the federal government controlled the leases, granting its first one in 1963. Fearing that poorly regulated wells in the "federal zone" could pollute the state's beaches, California demanded jurisdiction beyond the three-mile limit, but the request was denied. Industrial concern over oil leaks was negligible before the Santa Barbara incident.

The aftermath of the Santa Barbara crisis was significant. Union Oil assumed liability for the blowout, but the financial settlements were well below the total damage costs. Congress tightened regulations on leases and made offshore operators liable for cleaning spills. Luckily, the worst fears about the damage to the California coast were not realized. While more than 3,500 birds died, damage to wildlife and the beaches was not permanent. But the spill was a dramatic event that helped stimulate the growth of the modern environmental movement, and moved the federal government toward the passage of the omnibus environmental law, the National Environmental Policy Act (NEPA), in 1969.

Despite the Santa Barbara spill, the search for new sources of petroleum inevitably led to increased interest in offshore wells. Ocean drilling and greater tanker traffic guaranteed more blowouts and spills. In February 1970, the *New York Times* reported three Exxon oil spills in one month: 15,000 gallons off the coast of Florida, 3 million gallons in Nova Scotia Bay, and 50,000 gallons a day for several weeks in the Gulf of Mexico. During 1975 alone, there were 12,000 reported spills resulting in 21 million gallons of oil dumped into U.S. waters.

In 1977, the Coast Guard initiated more stringent regulations for tankers, but illegal flushing continued. An exploratory well some fifty-seven miles off the Yucatan Peninsula experienced a massive blowout on June 3, 1979—the same year the *Amoco Cadiz* tanker spilled 200,000 tons of oil off the coast of Brittany, France. While the [Ixtoc](http://www.autolife.umd.umich.edu/Environment/E_Overview/Ixtocl_popup.htm) well in the Bay of Campeche was a Pemex venture, it threatened the Texas coast as much as the Mexican coast. The explosion and fire destroyed the rig and created a slick sixty to seventy miles long. The ultimate discharge not only exceeded the Santa Barbara spill but also exceeded the 1977 Ekofisk blowout in the Norwegian North Sea—the largest on record at the time. The new spills reignited the controversy over oil exploration along the continental shelf. In the wake of the [energy crisis](http://www.autolife.umd.umich.edu/Design/Gartman/encyclopedia/energy_crisis.htm) in the 1970s, the Nixon administration and its successors had continued to authorize leasing of federally controlled sites through the Department of the Interior. Coastal states, especially California, were concerned about leaving the fate of their coastlines to the Interior Department and the oil companies. Even after the passage of NEPA, many environmentalists were concerned that regulation was more ceremonial than substantive.

The major battle over oil production during the 1970s, however, was fought not over water, but land: the Alaska pipeline. Oil exploration was on the rise in the late 1960s after the world oil glut receded. After an unsuccessful attempt near the Sagvanirktok River, Atlantic Richfield (ARCO) struck a massive field (estimated at 4.8 billion barrels) at Prudhoe Bay in 1968. Soon there was growing support for the construction of a pipeline to run 800 miles from Prudhoe Bay south to the Port of Valdez. Environmentalists fought against the pipeline, fearing that it would destroy precious wilderness areas. The 1973 oil embargo undermined their case, and, in that year, Congress passed the Trans-Alaska Pipeline Authorization Act. Thousands of people poured into Alaska seeking jobs with the Alyeska Pipeline Service Company. The first oil began to flow three years later.

In 1989, the collision of the [Exxon-Valdez](http://www.autolife.umd.umich.edu/Environment/E_Overview/ExxonValdez.htm)oil tanker with a reef in Prince William Sound became the most famous—and infamous—discharge of oil since the Santa Barbara spill and part of the continuing debate over the pipeline and other efforts at exploiting Alaskan oil. The tanker burst open and discharged thousands of gallons of crude into the unspoiled waters off the coast of Alaska. Unfortunately, the *Exxon* Valdez accident would not be the last. At the time of the trial of the *Exxon Valdez’s* captain, Greenpeace published an advertisement with a broad critical indictment: “It wasn’t his driving that caused the Alaska oil spill. It was yours.”

**Unit 12. Transport for Tomorrow**

Theme 1. "City Transport" Skimming reading.

Visitors to America are immediately struck by the number of automobiles on the highways and in the city streets. Cars fill the roads and crowd the streets of the city.

For a city like New York, city transport is a big problem. Though there are a lot of private automobiles, many people still use public transport. New York’s public transport includes the subway, an extensive bus and street car service and taxi cabs.

In rush hours it is better to take the subway.You walk a few blocks to the nearest subway and get downstairs. You buy some tokens at the change booth and get through the turnstile. Then you have to find the right platform. In New York subway system there are parallel tracks for local and express trains. The local train stops at eveiy station, the express only at every fifth or sixth station. It is very convenient to take an express if you go very far to the other end of the city. New York subway system is a rather compli­cated one.

New York has an extensive bus service operating on a transit basis. When a passenger enters a bus or street car and deposits his fare in the fare box, he may request a transfer. The driver or operator will give him a slip of paper on which there will be printed the time and direction of the trip. With this transfer, the passenger may get on another bus or street car at a transfer point on his route and continue his ride without additional cost.

A taxi cab service is another means of transpor­tation in the city. There are no taxi stands and you can stop a taxi by whistling, shouting or raising your hand. Taxi cabs keep running along the streets all the time. Tips are a vital part of drivers’ earning.

**Theme 3. Producing information leaflets about "Car sharing»**

**Theme 5. Making Transport Map of your town.**