I'm not a robot



```
When a force is applied over a certain distance, that force does mechanical work, $W$. If the force is not constant but a function of the position, this turns into an integral: x_1^x and the object it is exerted on is moved by a distance $\Delta x$, then $W=F\Delta x$. If the force is not constant but a function of the position, this turns into an integral: x_1^x and the object it is exerted on is moved by a distance $\Delta x$.
yet, just ignore this. Note, that is is not important how long (in time) the force is exerted. E.g. a cup on a table will feel the constant force due to gravity but is won't move (because the table is pushing it upwards with an equal but opposite force) so there is no work done on that cup, meaning that its energy content won't change. Work is basically just
 energy change. Depending on how the work is applied, it will increase (or decrease) a specific kind of energy. If the work leads to a change in the (absolute) velocity, it will exert a constant forward force on the car), its velocity increases
 linearly in time, v(t)=vt and its position quadratically, x(t)=\sqrt{1}{2} at 2, the work done by the engine will be x_1=v(t_1)=t_1, so we can write the work done by the engine as v_1=v(t_1)=t_1, it went over a distance x_1=v(t_1)=t_1.
 {2} mv 1^2$. This is exactly the amount of kinetic energy gained by the car. So the work done by the engine was used to increase the car's kinetic energy. By the end of this section, you will be able to do the following: Describe and apply the work-energy theorem.
students master the following standards: (6) Science concepts. The student knows that changes occur within a physical system and applies the laws of conservation of energy and momentum. The student is expected to: (A) describe and applies the laws of conservation of energy and momentum. The student is expected to: (B) describe and applies the laws of conservation of energy and momentum.
 Laboratory Manual addresses the following standards: (6) Science concepts. The student knows that changes occur within a physical system and applies the laws of conservation of energy and momentum of a physical system. Use
the lab titled Work and Energy as a supplement to address content in this section. energy gravitational potential energy power watt work work-energy theorem In this section, students learn how work determines changes in kinetic energy and that power is the rate at which work is done. [BL][OL]
Review understanding of mass, velocity, and acceleration due to gravity will also be constant, therefore PE e =fmg W=P E e =fmg W=P E e =fmg w=relation due to gravity will also be constant. Compare this
to acceleration due to other forces, such as applying muscles to lift a rock, which may not be constant. In physics, the term work has a very specific definition. Work, W, is described by the equation W=fd. W=fd. Some things that we typically
consider to be work are not work in the scientific sense of the term. Let's consider a few examples. Think about why each of the following statements is true. Homework is not work. Carrying a rock in a straight path across the lawn at a constant speed is not work. The first two examples are fairly simple.
Homework is not work because objects are not being moved over a distance. Lifting a rock up off the ground is work because the rock is moving in the direction that force is applied. The last example is less obvious. Recall from the laws of motion that force is applied to move an object at constant velocity. Therefore, while some force may be applied to
keep the rock up off the ground, no net force is applied to keep the rock moving forward at constant velocity. [BL][OL] Explain that, when this theorem is applied to an object that is initially at rest and then accelerates, the 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m v 1 2 1 2 m 
distance in meters, so joules are equivalent to newton-meters (N·m) (N·m) Work and energy to do work. Energy can be defined as the ability to do work. Energy can take a variety of different forms, and one form of
energy can transform to another. In this chapter we will be concerned with mechanical energy, which comes in two forms: kinetic energy is also called energy of motion. A moving object has kinetic energy is the
stored energy an object has as a result of its position above Earth's surface (or another object in space). A roller coaster car at the top of a hill has gravitational potential energy. Let's examine how doing work on an object changes the object's energy. If we apply force to lift a rock off the ground, we increase the rock's potential energy, PE. If we drop the
rock, the force of gravity increases the rock's kinetic energy as the rock moves downward until it hits the ground. The force we exert to lift the rock is equal to its mass, m, multiplied by acceleration due to gravity, g. f=w=mg f=w
lift the rock. The work we do on the rock also equals the rock's gain in gravitational potential energy, PEe. W=PE e =mgd Kinetic energy depends on the mass of an object and its velocity, v. KE=12 m v 2 When we drop the rock the force of gravity causes the rock to fall, giving the rock kinetic energy. When work done on an
object increases only its kinetic energy, then the net work equals the change in the value of the quantity 1 2 m v 2 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 2 - 1 2 m v 2 
respectively. This theorem was proposed and successfully tested by James Joule, shown in Figure 9.2. Does the name Joule sound familiar? The joule (J) is the metric unit of measurement for both work and energy with the same unit reinforces the idea that work and energy are related and can be converted into one
another. 1.0 J = 1.0 N•m, the units of force multiplied by distance. 1.0 N = 1.0 kg•m/s2, so 1.0 J = 1.0 kg•m/s2. Analyzing the units of the term (1/2)mv2 will produce the same units for joules. Figure 9.2 The joule is named after physicist James Joule (1818–1889). (C. H. Jeens, Wikimedia Commons) This video explains the work energy theorem and
discusses how work done on an object increases the object's KE. Access multimedia content True or false—The energy increase of an object acted on only by a gravitational force is equal to the product of the object sweight and the distance the object falls. Repeat the information on kinetic and potential energy discussed earlier in the section. Have the
students distinguish between and understand the two ways of increasing the energy of an object (1) applying a vertical force to increase PE. In applications that involve work, we are often interested in how fast the work is done. For example, in roller coaster design, the amount of time it takes to lift a roller
coaster car to the top of the first hill is an important consideration. Taking a half hour on the ascent will surely irritate riders and decrease ticket sales. Let's take a look at how to calculate the time it takes to do work. Recall that a rate can be used to describe a quantity, such as work, over a period of time. Power is the rate at which work is done. In this
case, rate means per unit of time. Power is calculated by dividing the work done by the time it took to do the work. P= W t P= W t Let's consider an example that can help illustrate the differences among work, force, and power. Suppose the woman in Figure 9.3 lifting the TV with a pulley gets the TV to the fourth floor in two minutes, and the man carrying
the TV up the stairs takes five minutes to arrive at the same mass over the same amount of work (fd) (fd) on the TV, because they have moved the same amount of upward force. However, the woman using the pulley has generated more power. This is because she did the work in
a shorter amount of time, so the denominator of the power formula, t, is smaller. (For simplicity's sake, we will leave aside for now the fact that the man climbing the stairs has also done work on himself.) Figure 9.3 No matter how you move a TV to the fourth floor, the amount of work performed and the potential energy gain are the same. Power can be
expressed in units of watts (W). This unit can be used to measure power related to any form of energy or work. You have most likely heard the term used in relation to electrical devices, especially light bulbs. Multiplying power by time gives the amount of energy. Electricity is sold in kilowatt-hours because that equals the amount of electrical energy
consumed. The watt unit was named after James Watt (1736-1819) (see Figure 9.4). He was a Scottish engineer and inventor who discovered how to coax more power out of steam engines. Figure 9.4 Is James Watt thinking about watts? (Carl Frederik von Breda, Wikimedia Commons) [BL][OL] Review the concept that work changes the energy of an object
or system. Review the units of work, energy, force, and distance. Use the equations for mechanical energy and work to show what is not. Make it clear why holding something over a level surface is not work in the scientific sense. [OL] Ask the students to use the mechanical energy equations to explain
why each of these is or is not work. Ask them to provide more examples until they understand the difference between the scientific term work and a task that is simply difficult but not literally work (in the scientific sense). [BL][OL] Stress that power is a rate and that rate means "per unit of time." In the metric system this unit is usually seconds. End the
section by clearing up any misconceptions about the distinctions between force, work, and power. If W=fd to power can be expressed in units of N·m s N·m s Also explain that we buy electricity in kilowatt-hours
because, when power is multiplied by time, the time units cancel, which leaves work or energy. James Watt did not invent the steam engines were not only inefficient, they only produced a back and forth, or reciprocal, motion. This was natural because pistons move
in and out as the pressure in the chamber changes. This limitation was okay for simple tasks like pumping water or mashing potatoes, but did not work so well for moving a train. Watt was able build a steam engine that converted reciprocal motion. With that one innovation, the industrial revolution was off and running. The world would
never be the same. One of Watt's steam engines is shown in Figure 9.5. The video that follows the figure explains the importance of the steam engine in the industrial revolution. Figure 9.5. A late version of the Watt steam engine in the industrial revolution. Figure 9.5. The video that follows the figure explains the importance of the steam engine in the industrial revolution.
of power available to industries and transportation. Have students consider the fact that the speed of transportation increased roughly tenfold. Changes in lifestyle compare to more recent changes brought about by innovations such as air travel and the
Internet. This video demonstrates how the watts that resulted from Watt's inventions helped make the industrial energy Solar energy Before
proceeding, be sure you understand the distinctions among force, work, energy, and power. Force exerted on an object over a distance does work. Work can increase energy, and energy can do work. Power is the rate at which work is done. An ice skater with a mass of 50 kg is gliding across the ice at a speed of 8 m/s when her friend comes up from behind
and gives her a push, causing her speed to increase to 12 m/s. How much work did the friend do on the skater? The work-energy theorem can be applied to the problem. Write the equation for the theorem and simplify it if possible. W=\Delta KE=12 \text{ m v} 12 \text{ M}=\Delta KE=12 \text{ m v} 12 \text{ M}=\Delta KE=12 \text{ m v} 12 \text{ M}=\Delta KE=12 \text{ m} \text{ v} 12 \text{ m} \text{ v} 12 \text{ M}=\Delta KE=12 \text{ m} \text{ v} 12 \text{ M}=\Delta KE=12 \text{ m} \text{ v} 12 \text{ m} \text{ v} 12 \text{ M}=\Delta KE=12 \text{ m} \text{ v} 12 \text{ m} 12 \text{ m} \text{ v} 12 \text{ m} 12 \text{ 
12 \text{ m} ( v 2 2 - v 1 2 ) Identify the variables. m = 50 \text{ kg}, v 2 = 12 \text{ m} s, and v 1 = 8 \text{ m} s v 2 = 12 \text{ m} s, and v 1 = 8 \text{ m} s Substitute. v = 12 \text{ m} s, and v = 12 \text{ m} s. v = 12 \text{ m} s, and v = 12 \text{ m} s. v = 12 \text{ m} s, and v = 12 \text{ m} s. v = 12 \text
difference in KE before and after the push. This problem illustrates a general technique for approaching problems that require you to apply formulas: Identify the unknown variables, and then enter all the known variables, and then enter all the known variables and choose the relevant
equation. Distinguish between initial and final velocity and pay attention to the minus sign. Identify the variables. m = 50 kg, v 2 = 12 m s, and v 1 = 8 m s v 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m s V 2 = 12 m s, and v 1 = 8 m
barbell from the floor to a height of 2 m. How much work is done? 2. Identify which of the following actions generates more power. Show your work. carrying a 24 N watermelon to the second floor in 10 s? Carrying a 100 N TV generates more power than carrying a 24 N watermelon to the same height
because power is defined as work done times the time interval. Carrying a 24 N watermelon to the same height because power is defined as the ratio of work done to the same height because power is defined
 as work done times the time interval. Carrying a 24 N watermelon generates more power than carrying a 100 N TV to the same height because power is defined as the ratio of work and force energy and weight work and energy weight and force 4. When a
the distance the nut falls, m is the mass of the earth, v1 is the velocity with which it hits the beach, and v2 is the initial velocity. Use Check Your
Understanding questions to assess students' achievement of the section's learning objective, the Check Your Understanding will help identify which one and direct students to the relevant content. Work Formula: \[ W = F \times d \] Definition: This equation calculates the work done when a force moves an
 object over a distance, which is equivalent to the energy transferred. Purpose: It helps physicists, engineers, and students understand the relationship between force, distance, and energy transferred (Joules, J) \(F\) — Force
applied (Newtons, N) \( d \) — Distance moved in direction of force (meters, m) Explanation: Work is done when a force causes displacement. The amount of work equals the force multiplied by the distance moved in the force some causes displacement.
transfer, forming the basis for understanding mechanical systems, energy conservation, and many engineering applications. 4. Using the Calculator Tips: Enter the force in Newtons and distance in meters. Both values must be positive numbers. 5. Frequently Asked Questions (FAQ) Q1: What if the force isn't parallel to the displacement? A: Use \( W = F \)
 \times d \times \cos(\theta) \) where \theta is the angle between force and displacement. Q2: How does this relate to kinetic energy? A: The work done on an object equals its change in kinetic energy (Work-Energy Theorem). Q3: What are typical Newton values in everyday situations? A: 1 N \approx the weight of an apple (0.1 kg). Lifting a 1kg object requires \sim9.81 Nimes distinct the contraction of the contraction 
encyclopedia that anyone can edit. 107,766 active editors 7,028,600 articles in English Liz Truss (born 26 July 1975) is a British politician who was prime minister from September to October 2022. A Liberal Democrat in her youth, she defected to the Conservatives in 1996. After several bids for public office she was elected as an MP in 2010 and served
 continuously in government in the Cameron, May and Johnson ministries, latterly as foreign secretary. After Johnson resigned in July 2022 Truss stood in the election to replace him, defeating Rishi Sunak and becoming the leader of the party. Two days after her appointment as prime minister Queen Elizabeth II died, freezing government business for ten
days during a national mourning period; after its conclusion Truss's ministry announced a mini-budget which was received badly by markets, the fallout from which subsequently engulfed her government. Facing a rapid loss of confidence in her leadership, Truss resigned fifty days into her premiership and was succeeded by Sunak, becoming the shortest.
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and dispersal of the Gozitan population. 1778 - On the orders of Catherine the Great the first of tens of thousands of Greek and Armenian Christians were removed from Crimea and resettled in Pryazovia. 1953 - In Short Creek, Arizona, police conducted a mass arrest of approximately 400 Mormon fundamentalists for polygamy. 1993 - Asiana Airlines
 Flight 733 crashed into a mountain during a failed attempt to land at Mokpo Airport, South Korea, leading to the deaths of 68 people on board. 2016 - Hillary Clinton (pictured) became the first female nominee for president of the United States by a major political party at the Democratic National Convention in Philadelphia. Carl Jung (b. 1875)Ana María
 Matute (b. 1925)George W. Romney (d. 1995)Olivia de Havilland (d. 2020) More anniversaries: July 25 July 26 July 27 Archive By email List of days of the year About Cytoplasmic streaming is a biological process in which cytoplasm flows inside a cell, driven by forces from the cytoskeleton. It is usually observed in large plant and animal cells, as well as
 amoebae, fungi, and slime moulds. It is likely that its function is, at least in part, to speed up the transport of molecules and organelles around the cell. The process was first discovered by the Italian scientist Bonaventura Corti in 1774, within the algae genera Nitella and Chara. While its mechanism is not fully understood, what is clearly visible in plant
cells which exhibit cytoplasmic streaming is the motion of the chloroplasts moving with the cytoplasmic flow. This motion results from fluid being entrained by moving motor molecules of the plant cell. Video credit: Heiti Paves Recently featured to the company of the chloroplasmic streaming occurring in an onion epidermal cell. Video credit: Heiti Paves Recently featured to the company of the chloroplasmic streaming occurring in an onion epidermal cell. Video credit: Heiti Paves Recently featured to the company of the chloroplasmic streaming occurring in an onion epidermal cell. Video credit: Heiti Paves Recently featured to the chloroplasmic streaming occurring in an onion epidermal cell.
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bottom, left to right: The Vietnam War escalates as the United States begins regular bombing campaigns in Operation Rolling Thunder and deploys ground combat troops for the first time; the Indo-Pakistani War of 1965 erupts over Kashmir, drawing international concern and resulting in thousands of casualties before a UN-brokered ceasefire; the Voting
Rights Act of 1965 is signed into law by President Lyndon B. Johnson, prohibiting racial discrimination in voting; Malcolm X is assassinated while delivering a speech in New York City, silencing one of the most influential and controversial voices in the civil rights movement; the Dominican Civil War breaks out as constitutionalist and loyalist factions clash,
prompting a U.S. military intervention amid fears of a second Cuba; former British Prime Minister Winston Churchill dies at the age of 90, prompting a global outpouring of tributes and a state funeral attended by world leaders; the Battle of Ia Drang becomes the first major battle between U.S. and North Vietnamese forces, signaling a new phase of intense
ultimately leading to new federal protections. Calendar year Years Millennium 2nd millennium 2nd
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and Anno Domini (AD) designations, the 965th year of the 20th century, and the 65th year of the 20th century, and the 65th year of the 1960s decade. Calendar year Main article: January 1965 Main article: February 1965 January 
January 20 Lyndon B. Johnson is sworn in for a full term as President of the United States. Indonesian President Sukarno announces the withdrawal of the Indonesian government from the United States. Indonesian President Sukarno announces the withdrawal of the Indonesian government from the United States. Indonesian President Sukarno announces the withdrawal of the Indonesian government from the United States. Indonesian President Sukarno announces the withdrawal of the Indonesian President Sukarno announces the withdrawal of the Indonesian government from the United States. Indonesian President Sukarno announces the withdrawal of the Indonesian government from the United States. Indonesian President Sukarno announces the withdrawal of the Indonesian government from the United States. Indonesian president Sukarno announces the withdrawal of the Indonesian President Sukarno announces the withdrawal of the Indonesian government from the United States. Indonesian president Sukarno announces the withdrawal of the Indonesian government from the United States. Indonesian government from the United States and Indonesian government from the United States. Indonesian government from the United States and Indonesian government from the United States and
London with the largest assembly of dignitaries in the world until the 2005 funeral of Pope John Paul II.[2] February 4 - Trofim Lysenko is removed from his post as director of the Institute of Genetics at the Academy of Sciences in the Soviet Union. Lysenkoist theories are now treated as pseudoscience.[3][4] February 12 - The African and Malagasy
Common Organization (Organization Commune Africaine et Malgache; UAM) is formed as successor to the Africaine et Malgache; UAM). February 18: Flag of the newly independent
Gambia February 15 - The maple leaf is adopted as the flag of Canada, replacing the Canadian Red Ensign flag. February 18 - The Gambia becomes independent from the United Kingdom. February 20 Ranger 8 crashes into the Moon, after a successful mission of photographing possible landing sites for the Apollo program astronauts. Suat Hayri Ürgüplü
forms the new (interim) government of Turkey (29th government). February 21 - Malcolm X is gunned down while giving a speech at the Audubon Ballroom in Harlem. Main article: April 1965 March 2 - Vietnam War: Operation Rolling Thunder - The United States Air Force 2nd Air Division, United States Navy and South
 Vietnamese air force begin a 31/2-year aerial bombardment campaign against North Vietnam. March 7 Mass in the Catholic Church worldwide is said in local languages (rather than Latin) for the first time.[5][6] "Bloody Sunday": Some 200 Alabama State Troopers attack 525 civil rights demonstrators in Selma, Alabama, as they attempt to march to the
 state capitol of Montgomery. March 8 - Vietnam War: Some 3,500 United States Marines arrive in Da Nang, South Vietnam, becoming the first American ground combat troops in Vietnam War: Some 3,500 United States Marines arrive in Da Nang, South Vietnam, becoming the first American ground combat troops in Vietnam, becoming the first American ground combat troops in Vietnam. March 9 - The "Turnaround Tuesday" march from Selma to Montgomery, Alabama, under the leadership of Martin Luther King Jr., stops at the site of "Bloody Sunday"
to hold a prayer service and return to Selma, in obedience to a court restraining order. On the same day, White supremacists attack three white ministers, leaving Unitarian Universalist minister James J. Reeb in a coma. March 10 - An engagement is announced between Princess Margriet of the Netherlands and Pieter van Vollenhoven, who will become the
(staged in Naples) for Luxembourg.[8] The Indo-Pakistani War of 1965 begins. March 23 Events of March 25 Events of March 26 Events of March 27 Events of March 27 Events of March 27 Events of March 28 Eve
issue of The Vigilant is published from Khartoum. March 25 - Martin Luther King Jr. and 25,000 civil rights activists successfully end the 4-day march from Selma, Alabama, to the capitol in Montgomery. March 20 - The second ODECA
charter, signed by Central American states on December 12, 1962, becomes effective. April 3 - The world's first space nuclear power reactor, SNAP-10A, is launched by the United States from Vandenberg AFB, California. The reactor operates for 43 days and remains in low Earth orbit. April 5 - At the 37th Academy Awards, My Fair Lady wins 8 Academy
Awards, including Best Picture and Best Director. Rex Harrison wins an Oscar for Best Actor. Mary Poppins takes home 5 Oscars. Julie Andrews wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars including Best Picture and Best Director. Rex Harrison wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars. Julie Andrews wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars including Best Director. Rex Harrison wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars. Julie Andrews wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars. Julie Andrews wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars. Julie Andrews wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars. Julie Andrews wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars. Julie Andrews wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars. Julie Andrews wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars. Julie Andrews wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars. Julie Andrews wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars. Julie Andrews wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars. Julie Andrews wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars. Julie Andrews wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars. Julie Andrews wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars. Julie Andrews wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars. Julie Andrews wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars. Julie Andrews wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars. Julie Andrews wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars. Julie Andrews wins an Academy Award for Best Actor. Mary Poppins takes home 5 Oscars. Julie Andrews wins an Academy Award for Best Actor
 satellite is launched. It becomes operational May 2 and is placed in commercial service in June. April 12 - A historic and extremely destructive tornado outbreak struck the Midwest region of the United States, killing 266. April 18 - Consecration of Saint Clement of
Ohrid Macedonian Orthodox Cathedral in Toronto, Canada. April 23 - The Pennine Way officially opens. April 24 The 1965 Yerevan demonstrations start in Yerevan, demanding recognition of the Armenian genocide. The bodies of Portuguese opposition politician Humberto Delgado and his secretary Arajaryr Moreira de Campos are found in a forest near
 Villanueva del Fresno, Spain (they were killed February 12). In the Dominican Republic, officers and civilians loyal to deposed President Juan Bosch mutiny against the right-wing junta running the country, setting up a provisional government. Forces loyal to the deposed military-imposed government stage a countercoup the next day, and civil war breaks
out, although the new government retains its hold on power. April 26 - Rede Globo is founded in Rio de Janeiro, Brazil. April 28 U.S. troops occupy the Dominican Republic. Vietnam War: Prime Minister of Australia Robert Menzies announces that the country will substantially increase its number of troops in South Vietnam, supposedly at the request of the
 Saigon government (it is later revealed that Menzies had asked the leadership in Saigon to send the request at the behest of the Americans). April 29 - Australia announces that it is sending an infantry battalion to support the South Vietnam government. Main article: May 1965 Main article: June 1965 May 1 Bob Askin replaces Jack Renshaw as Premier of
 New South Wales. The Battle of Dong-Yin occurs as a conflict between Taiwan and the People's Republic of China. May 9 - Pianist Vladimir Horowitz returns to the stage after a 12-year absence, performing a legendary concert in Carnegie Hall in New York. May 12 -West Germany and Israel establish diplomatic relations. Muhammad Ali standing over
 Sonny Liston May 25 - Muhammad Ali knocks out Sonny Liston in the first round of their championship rematch with the "Phantom Punch" at the Central Maine Civic Center in Lewiston. May 27 - Internazionale beats Benfica 1-0 at the San Siro, Milan and wins the 1964-65 European Cup in Association football. May 29 - A mining accident in Dhanbad,
accident in Kakanj, Bosnia and Herzegovina, results in 128 deaths. June 10 - Vietnam War - Battle of Dong Xoai: About 1,500 Viet Cong mount a mortar attack on Đồng Xoài, overrunning its military headquarters and the adjoining militia compound. June 19 Houari Boumediene's Revolutionary Council ousts Ahmed Ben Bella, in a bloodless coup in Algeria
Air Marshal Nguyen Cao Ky, head of the South Vietnamese Air Force, was appointed prime minister at the head of the military juntas. [10][non sequitur] June 20 - Police in Algiers break up demonstrations by people who have taken to the streets
 chanting slogans in support of deposed President Ahmed Ben Bella. June 22 - The Treaty on Basic Relations between Japan and the Republic of Korea is signed in Tokyo. June 25 - A U.S. Air Force Boeing C-135 Stratolifter bound for Okinawa crashes just after takeoff at MCAS El Toro in Orange County, California, killing all 85 on board. Main article: July
1965 Main article: August 1965 July - The Commonwealth secretariat is created. July 14 - U.S. spacecraft to return images from the Red Planet. July 15 - Greek Prime minister Georgios Papandreou and his government are dismissed by King Constantine II. July 16 - The Mont Blanc Tunnel, a highway
 tunnel between France and Italy, is inaugurated by presidents Giuseppe Saragat and Charles de Gaulle. July 24 - Vietnam War: Four F-4C Phantoms escorting a bombing raid at Kang Chi are targeted by antiaircraft missiles, in the first such attack against American planes in the war. One is shot down and the other 3 sustain damage. July 26 - The Maldives
obtains full independence from Great Britain.[11] July 27 - Edward Heath becomes Leader of the British Conservative Party. July 28 - Vietnam War: U.S. President Lyndon B. Johnson announces his order to increase the number of men drafted per month
from 17,000 to 35,000. July 30 - War on Poverty: U.S. President Lyndon B. Johnson signs the Social Security Act of 1965 into law, establishing Medicare and Medicaid. August 7 - Tunku Abdul Rahman, Prime Minister of Malaysia, recommends the expulsion of Singapore from the Federation of Malaysia following a deterioration of PAP-UMNO relations,
negotiating its separation with Lee Kuan Yew, Prime Minister of Singapore: Singapore is expelled from the Federation of Malaysia, which recognises it as a sovereign nation. Lee Kuan Yew announces Singapore is expelled from the Federation of Malaysia, which recognises it as a sovereign nation. Lee Kuan Yew announces Singapore is expelled from the Federation of Malaysia, which recognises it as a sovereign nation.
 1990. An explosion at an Arkansas missile plant kills 53. Indonesian president Sukarno collapses in public. August 11 - Racial rioting in the Los Angeles, California neighborhood of Watts breaks out after an African American motorist, Marquette Frye, [12] is stopped on suspicion of drunken driving. Six days of unrest are quelled by over 14,000 members of
American ground battle of the war. The Marines were tipped off by a Viet Cong deserter who said that there was an attack planned against the U.S. base at Chu Lai. August 19 - At the conclusion of the Frankfurt Auschwitz trials, 66 ex-SS personnel receive life sentences, 15 others shorter ones. August 21 - NASA launches Gemini 5 (Gordon Cooper, Petersonnel receive life sentences)
 article: September 1965 Main article: October 1965 September 2 Pakistani troops enter the Indian sector of Kashmir, while Indian troops counter at Lahore. The People's Republic of China announces that it will reinforce its troops on the Indian border. Vietnam War: In a follow-up to August's Operation Starlite, United States Marines and South Vietnamese.
 forces initiate Operation Piranha on the Batangan Peninsula, 23 miles (37 km) south of the Chu Lai Marine base. September 8 India opens 2 additional fronts against Pakistan on the Batangan Peninsula, 23 miles (37 km) south of the Chu Lai Marine base. September 8 India opens 2 additional fronts against Pakistan Navy destroys Indian Port of Dwarka.
 Pakistan President Ayub Khan. U Thant recommends China for United Nations membership. September 14 - The fourth and final period of the Second Vatican Council opens. September 17 - King Constantine II of Greece forms a new government with Prime Minister
 Stephanos Stephanopoulos, in an attempt to end a 2-year-old political crisis. September 18 In Denmark, Palle Sørensen shoots 4 policemen in pursuit; he is apprehended the same day. Comet Ikeya-Seki is first sighted by Japanese astronomers. Soviet Premier Alexei Kosygin invites the leaders of India and Pakistan to meet in the Soviet Union to negotiate
 Starfighter piloted by Captain Philip Eldon Smith is shot down by a Chinese MiG-19 Farmer. The pilot is held until March 15, 1973. September 21 - Gambia, Maldives and Singapore are admitted as members of the United Nations. September 21 - Gambia, Maldives and Singapore are admitted as members of the United Nations.
 September 24 Fighting resumes between Indian and Pakistani troops. The British governor of Aden cancels the constitution and takes direct control of the protectorate, due to the bad security situation. September 27 - The largest tanker ship at this time, Tokyo Maru, is launched in Yokohama, Japan. September 28 Fidel Castro announces that anyone who
 wants to can emigrate to the United States. Taal Volcano in Luzon, Philippines, erupts, killing hundreds. September 30 The Indonesian army, led by General Suharto, crushes an alleged communist coup attempt (see Transition to the New Order and 30 September Movement). The classic family sci-fi show Thunderbirds debuts on ITV in the United Kingdom
October 3 - Fidel Castro announces that Che Guevara has resigned and left Cuba. October 4 At least 150 are killed when a commuter train derails at the outskirts of Durban, KwaZulu-Natal, South Africa. Prime minister Ian Smith of Rhodesia and Arthur Bottomley of the Commonwealth of Nations begin negotiations in London. Pope Paul VI makes the first
for allegedly hacking to death (with a hatchet) 17-year-old apprentice electrician Edward Evans at a house on the Hattersley housing estate. October 8 Indonesian mass killings of 1965-1966: The Indonesian army instigates the arrest and execution of
communists which last until next March.[14] The 7 Fundamental Principles of the Red Cross and Red Crescent are adopted at the XX International Conference in Vienna, Austria. The International Olympic Committee admits East Germany as a member. October 10 - The first group of Cuban refugees travels to the U.S. October 12 Per Borten forms a
government in Norway. The U.N. General Council recommends that the United Kingdom try everything to stop a rebellion in Rhodesia. October 13 - Congo President Joseph Kasavubu fires Prime Minister Moise Tshombe and forms a provisional government, with Évariste Kimba in a leading position. October 15 - Vietnam War: The Catholic Worker
Movement stages an anti-war protest in Manhattan. One draft card burner is arrested, the first under the new law. October 17 - The New York World's Fair at Flushing Meadows, closes. Due to financial losses, some of the projected site park improvements fail to materialize. October 18 - The Indonesian government outlaws the Communist Party of
 Indonesia.[15] October 20 - Ludwig Erhard is re-elected Chancellor of West Germany (he had first been elected in 1963). October 21 Comet Ikeya-Seki approaches perihelion, passing 450,000 mi) from the sun. The Organization of African Unity meets in Accra, Ghana. October 22 African countries demand that the United Kingdom use
force to prevent Rhodesia from declaring unilateral independence. Colonel Christophe Soglo stages a second coup in Dahomey. October 25 - The Soviet Union declares its support of African countries in case Rhodesia unilaterally declares its support of African countries in case Rhodesia unilaterally declares its support of African countries in case Rhodesia unilaterally declares its support of African countries in case Rhodesia unilaterally declares its support of African countries in case Rhodesia unilaterally declares its support of African countries in case Rhodesia unilaterally declares its support of African countries in case Rhodesia unilaterally declares its support of African countries in case Rhodesia unilaterally declares its support of African countries in case Rhodesia unilaterally declares its support of African countries in case Rhodesia unilaterally declares its support of African countries in case Rhodesia unilaterally declares its support of African countries in case Rhodesia unilaterally declares its support of African countries in case Rhodesia unilaterally declares its support of African countries in case Rhodesia unilaterally declares its support of African countries in case Rhodesia unilaterally declares its support of African countries in case Rhodesia unilateral unitarity declares its support of African countries in case Rhodesia unilateral unitarity declares its support of African countries in case Rhodesia unilateral unitarity declares its support of African countries in case Rhodesia unilateral unitarity declares its support of African countries in case Rhodesia unilateral unitarity declares its support of African countries in case Rhodesia unilateral unitarity declares its support of African countries in case Rhodesia unilateral unitarity declares its support of African countries in case Rhodesia unitarity declares its support of African countries in case Rhodesia unitarity declares its support of African countries its support of African countries its support of African countries its su
legal courts and opposition parties. Süleyman Demirel of AP forms the new government of Turkey (30th government). October 28 - Pope Paul VI promulgates Nostra aetate, a "Declaration on the Relation of the (Roman Catholic) Church with Non-Christian Religions" by the Second Vatican Council which includes a statement that Jews are not collectively
responsible for the death of Jesus (Jewish deicide). October 29 - An 80-kiloton nuclear device is detonated at Amchitka Island, Alaska, as part of the Vela Uniform program, code-named Project Long Shot. October 30 - Vietnam War: Near Da Nang, United States Marines repel an intense attack by Viet Cong forces, killing 56 guerrillas. A sketch of Marine
positions is found on the dead body of a 13-year-old Vietnamese boy who sold drinks to the Marines the day before. Main article: November 1 - A trolleybus plunges into the Nile at Cairo, Egypt, killing 74 passengers. November 1 - A trolleybus plunges into the Nile at Cairo, Egypt, killing 74 passengers.
that he will stand for re-election. November 5 - Martial law is announced in Rhodesia if necessary by a vote of 82-9. November 6 - Freedom Flights begin: Cuba and the United States formally agree to start an airlift for Cubans who want to go to the United States (by
1971, 250,000 Cubans take advantage of this program). November 8 - Vietnam War - Operation Hump: The United States Army 173rd Airborne is ambushed by over 1,200 Viet Cong. November 11 In Rhodesia (modern-day Zimbabwe), the white-minority government of Ian Smith unilaterally declares de facto independence ('UDI'). United Airlines Flight 227
crashes short of the runway and catches fire at Salt Lake City International Airport, killing 43 out of 91 passengers and crew. November 12 - A UN Security Council resolution (voted 10-0) recommends that other countries not recognize independent Rhodesia. November 13 The SS Yarmouth Castle burns and sinks 60 miles (97 km) off Nassau, Bahamas,
with the loss of 90 lives. British theatre critic Kenneth Tynan says "fuck" during a discussion on BBC satirical programme BBC-3 for what many believed was the first time on British theatre critic Kenneth Tynan says "fuck" during a discussion on BBC satirical programme BBC-3 for what many believed was the first time on British theatre critic Kenneth Tynan says "fuck" during a discussion on BBC satirical programme BBC-3 for what many believed was the first
major engagement of the war between regular United States and North Vietnamese forces begins. November 15 - U.S. racer Craig Breedlove sets a new land speed record of 600.601 mph (966.574 km/h). November 16 - Venera program: The Soviet Union launches the Venera 3 space probe from Baikonur, Kazakhstan toward Venus (on March 1, 1966, it
becomes the first spacecraft to reach the surface of another planet). November 20 - The United Nations Security Council recommends that all states stop trading with Rhodesia. November 23 - Soviet general Mikhail Kazakov
assumes command of the Warsaw Pact. November 24 - Congolese lieutenant general Mobutu ousts Joseph Kasavubu and declares himself president. November 26 - At the Hammaguir launch facility in the Sahara Desert, France launches a Diamant A rocket with its first satellite, Astérix-1 on board, becoming the third country to enter outer space.
November 27 Tens of thousands of Vietnam War: The Pentagon tells U.S. President Lyndon B. Johnson that if planned major sweep operations to neutralize Viet Cong forces during the next year are to succeed, the number of American troops in Vietnam will have to
be increased from 120,000 to 400,000. November 28 - Vietnam War: In response to U.S. President Lyndon B. Johnson's call for "more flags" in Vietnam. November 29 - The Canadian satellite Alouette 2 is launched. December 5 Charles de Gaulle is
re-elected as French president with 10,828,421 votes. The "Glasnost Meeting" in Moscow becomes the first generation, and the first demonstration for civil rights in the Soviet Union. December 8: End of the Second Vatican Council December 8: End of the 
Rhodesia will resist a trade embargo by neighboring countries with force. The Race Relations Act becomes the first legislation to address racial discrimination in the UK. December 9 - A Charlie Brown Christmas, the first Peanuts television special, debuts on CBS in the United States. It becomes a Christmas tradition. December 15 The Caribbean Free
Trade Association (CARIFTA) is formed. Gemini 6 and Gemini 7 perform the first controlled rendezvous in Earth orbit. December 21 The Soviet Union announces that it has shipped rockets to North Vietnam. In West Germany, Konrad Adenauer resigns as
chairman of the Christian Democratic Party. The United Nations adopts the International Convention on the Elimination of All Forms of Racial Discrimination. A new 1-hour German-American production of the ballet The Nutcracker, with an international cast that includes Edward Villella in the title role, makes its U.S. television debut. It is repeated
annually by CBS over the next 3 years but after that is virtually forgotten until issued on DVD in 2009 by Warner Archive. December 22 - A military coup is launched in Ta'izz. December 30: Ferdinand Marcos is the 10th President of the Philippines December 30
Ferdinand Marcos becomes President of the Philippines. President Kenneth Kaunda of Zambia announces that Zambi
Australia. Hainzl Industriesysteme GmbH company is founded in Austria.[16] Tokyo officially becomes the largest city of the world, taking the lead from New York City.[17] World population 1965 1960 1970 World 3,334,874,000 357,283,000 43,539,000 36,346,000 377,283,000 43,539,000 377,283,000 43,539,000 377,283,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,539,000 43,5
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19,443,000 1,786,000 Julia Ormond Vinnie Jones Joely Richardson Diane Lane January 4 Julia Ormond, British actress[18] Yvan Attal, Israeli-born French actor and director January 9 Haddaway, German singer Farah Khan, Indian choreographer, film director
Joely Richardson, British actress January 10 - Butch Hartman, American animator and voice actor January 12 Nikolai Borschevsky, Russian ice hockey player Bob
 Essensa, Canadian ice hockey player January 25 Adam Jones, American musician, quitarist of metal band Tool James Nesbitt, Northern Irish actor[21] January 21 - Jam Master Jay, American DJ, rapper and producer (d. 2002) January 22 DJ Jazzy Jeff, American disc jockey
Diane Lane, American actress January 23 - Catherine Guillouard, French businesswoman January 24 - Porfirio Fisac, Spanish basketball coach January 25 - Esa Tikkanen, Finnish ice hockey player January 26 - Natalia Yurchenko, Soviet artistic gymnast January 27 Alan Cumming, Scottish actor Ignacio Noé, Argentine artist January 29 Dominik Hašek,
Czech hockey player Jo Min-su, South Korean actress Chris Rock Adama Barrow Michael Bay Dr. Dre February 1 Dave Callaghan, South Korean actress February 3 - Maura Tierney, American actress February 5 - Gheorghe Hagi, Romanian
footballer, manager and club owner[22] February 7 - Chris Rock, African-American actor, comedian, and film director February 8 - Dicky Cheung, Hong Kong actor February 11 - Roberto Moya, Cuban athlete (d. 2020) February 12 - Brett Kavanaugh, American attorney and Supreme Court Justice February 15 - Héctor Beltrán Leyva, Mexican drug lord (d.
2018) February 16 - Adama Barrow, Gambia February 18 - Dr. Dre, African-American film director[23] February 18 - Dr. Dre, African-American computer manufacturer[25] Vincent Chalvon-Demersay, French producer
Helena Suková, Czech tennis player[26] February 25 - Sylvie Guillem, French ballerina February 27 - Claudia Zobel, Filipina actress (d. 1984) February 28 - Park Gok-ji, South Korean film editor Aamir Khan Mark Carney Rick Harrison The Undertaker Sarah Jessica Parker March 1 Mike Dean, Record producer Stewart Elliott, Canadian jockey Jack Tu,
Taiwanese-Canadian cardiologist (d. 2018) March 2 - Ami Bera, American politician [27] March 3 Tedros Adhanom, Director of the World Health Organization March 8 Mac Jack, South African
educator and politician (d. 2020) Caio Júnior, Brazilian football forward and manager (d. 2016) March 9 - Antonio Saca, 43rd President of El Salvador March 11 Catherine Fulop, Venezuelan actress, model, beauty pageant contestant, and television presenter Jesse Jackson Jr., African-American politician Laurence Llewelyn-Bowen, British designer and
television presenter March 14 - Aamir Khan, Indian film director, producer, film and scriptwriter and actor March 16 Utut Adianto, Indonesian chess grandmaster and politician Mark Carney, Canadian economist and politician March 23 - Rick Harrison, American businessman and reality television personality March 23 -
Marti Pellow, Scottish singer (Wet Wet Wet) March 24 Rob MacCachren, American racecar driver The Undertaker, American professional wrestler March 25 Stefka Kostadinova, Bulgarian Olympic Committee Sarah Jessica Parker, American actress March 26 - Prakash Raj, Indian actor, producer and director
March 29 - Voula Patoulidou, Greek athlete March 30 - Piers Morgan, British journalist and television personality Robert Downey Jr. Martin Lawrence Leni Robredo Kevin James April 3 - Nazia Hassan, Pakistani pop singer-songwriter,
lawyer and social activist (d. 2000) April 4 - Robert Downey Jr., American actor, producer, and singer April 6 Black Francis, American musician Rica Reinisch, German swimmer April 9 - Paulina Porizkova, Swedish-American musician Rica Reinisch, German swimmer April 9 - Paulina Porizkova, Swedish-American musician Rica Reinisch, German swimmer April 9 - Paulina Porizkova, Swedish-American musician Rica Reinisch, German swimmer April 9 - Paulina Porizkova, Swedish-American musician Rica Reinisch, German swimmer April 9 - Paulina Porizkova, Swedish-American musician Rica Reinisch, German swimmer April 9 - Paulina Porizkova, Swedish-American musician Rica Reinisch, German swimmer April 9 - Paulina Porizkova, Swedish-American musician Rica Reinisch, German swimmer April 9 - Paulina Porizkova, Swedish-American musician Rica Reinisch, German swimmer April 9 - Paulina Porizkova, Swedish-American musician Rica Reinisch, German swimmer April 9 - Paulina Porizkova, Swedish-American musician Rica Reinisch, German swimmer April 9 - Paulina Porizkova, Swedish-American musician Rica Reinisch, German swimmer April 9 - Paulina Porizkova, Swedish-American musician Rica Reinisch, German swimmer April 9 - Paulina Porizkova, Swedish-American musician Rica Reinisch, German swimmer April 9 - Paulina Porizkova, Swedish-American musician Rica Reinisch, German swimmer April 9 - Paulina Porizkova, Swedish-American musician Rica Reinisch, German swimmer April 9 - Paulina Porizkova, Swedish-American musician Rica Reinisch, German Swedish-American Rica Reinisch, German Swedish-American Rica Reinisch, German Rica Reinisch, Ger
Asperen, Dutch computer scientist April 12 - Kim Bodnia, Danish actor and director April 19 - Suge Knight, American record producer and convicted felon April 20 - Jovy Marcelo, Filipino racing driver
(d. 1992) April 21 - Julio Robaina, Republican politician, Mayor of Hialeah, Florida April 23 - Leni Robredo, 14th Vice President of the Philippines April 26 - Kevin James, American comedian and actor April 27 - Edwin Poots, Irish politician
April 29 - David Shafer, American politician, Georgia April 30 - Adrian Pasdar, Iranian-American actor and voice artist Trent Reznor John C. Reilly Yahya Jammeh Brooke Shields May 2 - Myriam Hernández, Chilean singer May 3 Gary Mitchell, Irish playwright Rob Brydon, Welsh actor, comedian, impressionist and presenter May 7 Owen Hart, Canadian
professional wrestler (d. 1999)[30] Norman Whiteside, Northern Irish football player May 9 - Steve Yzerman, Canadian hockey player May 10 - Linda Evangelista, Canadian supermodel May 11 - Monsour del Rosario, Filipino Olympic athlete and actor May 12 - Renée Simonsen, Danish model and writer May 13 - José Antonio Delgado, Venezuelan
mountain climber (d. 2006) May 14 - Eoin Colfer, Irish novelist May 16 Rodica Dunca, Romanian artistic gymnast Krist Novoselic, American musician and activist (Nirvana) May 17 - Trent Reznor, American musician and activist (Nirvana) May 17 - Trent Reznor, American musician and activist (Nirvana) May 18 - Philippe Dhondt, French singer May 23 Melissa McBride, American musician activist (Nirvana) May 19 - Philippe Dhondt, French singer May 20 Melissa McBride, American musician activist (Nirvana) May 19 - Philippe Dhondt, French singer May 20 Melissa McBride, American musician activist (Nirvana) May 19 - Philippe Dhondt, French singer May 20 Melissa McBride, American musician (Nine Inch Nails) May 19 - Philippe Dhondt, French singer May 20 Melissa McBride, American musician activist (Nirvana) May 19 - Philippe Dhondt, French singer May 20 Melissa McBride, American musician (Nine Inch Nails) May 19 - Philippe Dhondt, French singer May 20 Melissa McBride, American musician (Nine Inch Nails) May 19 - Philippe Dhondt, French singer May 20 Melissa McBride, American musician (Nine Inch Nails) May 19 - Philippe Dhondt, French singer May 20 Melissa McBride, American musician (Nine Inch Nails) May 19 - Philippe Dhondt, French singer May 20 Melissa McBride, American musician (Nine Inch Nails) May 19 - Philippe Dhondt, French singer May 20 Melissa McBride, American musician (Nine Inch Nails) May 19 - Philippe Dhondt, French singer May 20 Melissa McBride, American musician music
Carlos Franco, Paraguayan golfer John C. Reilly, American actor and comedian Shinichirō Watanabe, Japanese anime director May 25 - Yahya Jammeh, President of the Gambia May 29 - Emilio Sánchez, Spanish tennis player May 30 - Guadalupe Grande, Spanish tennis player May 30 - Guadalupe Grande, Spanish poet (d. 2021) May 31 - Brooke Shields, American actor and comedian Shinichirō Watanabe, Japanese anime director May 25 - Yahya Jammeh, President of the Gambia May 29 - Emilio Sánchez, Spanish tennis player May 30 - Guadalupe Grande, Spanish tennis player May 30 - Guadalupe G
Elizabeth Hurley Kim Dickens June 1 Larisa Lazutina, Russian cross-country skier Nigel Short, English chess player June 2 - Steve and Mark Waugh, Australian motorcycle racer Andrea Jaeger, American tennis player[31] June 6 Cam Neely, Canadian ice hockey player Megumi Ogata, Japanese voice actress and
singer[32] June 7 Mick Foley, American professional wrestler Damien Hirst, British artist Christine Roque, French singer (d. 1998) June 10 Veronica Ferres, German actor[33] Rob Pilatus, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 Veronica Ferres, German model, dancer and singer (d. 1998) June 10 V
2014) June 12 - Carlos Luis Morales, Ecuadorian journalist (d. 2020) June 13 - Infanta Cristina of Spain, Spanish princess June 15 - Bernard Hopkins, American actress[35] Dan Jansen, American speedskater Dara O'Kearney,
Irish ultra runner and professional poker player June 18 Kim Dickens, American actress Hani Mohsin, Malaysian celebrity, actor and host (d. 2006) June 21 Yang Liwei, Chinese major general, military pilot and China National Space Administration astronaut Gabriella Selmeczi, Hungarian jurist and politician Tim Lajcik, Czech American mixed martial artist,
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stuntman, actor and writer June 22 - Anubhav Sinha, Indian film director June 23 - Paul Arthurs, English Musician June 26 - Jana Hybášková, Czech politician and diplomat June 27 Frédéric Lemoine, French businessman S. Manikavasagam, Malaysian politician June 28 - Belayneh Dinsamo, Ethiopian long-distance runner June 29 Véronique Laury, French businesswoman Dado Villa-Lobos, Brazilian musician Matthew Weiner, American television writer, director and producer[36] June 30 Philippe Duquesne, French actor Cho Jae-hyun, South Korean actor Mitch Richmond, American basketball player Connie Nielsen

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Hailemariam Desalegn Shawn Michaels Slash Illeana Douglas Jeremy Piven J. K. Rowling July 1 Teddy McCarthy, hurler and Gaelic footballer Carl Fogarty, English motorcycle racer Mohammed Abdul Hussein, Iraqi former footballer Carl Fogarty, English motorcycle racer Mohammed Abdul Hussein, Iraqi former footballer Carl Fogarty, English motorcycle racer Mohammed Abdul Hussein, Iraqi former footballer Ramdas Ambatkar, Indian politician, Maharashtra MLC (d. 2025)[37] July 2 - Fredrik Sejersted, Norwegian jurist July 3
Komsan Pohkong, Thai lawyer Shinya Hashimoto, Japanese professional wrestler (d. 2005) Connie Nielsen, Danish actress Eyran Katsenelenbogen, Israeli jazz pianist July 7 Paula Devicq, Canadian actress Jeremy Kyle
English radio and television presenter July 10 Danny Boffin, Belgian footballer Princess Alexia of Greece and Denmark Alec Mapa, American comedian July 11 - Ernesto Hoost, Dutch kickboxer July 12 - Mama Kandeh, Gambian politician July 13 - Akina Nakamori, Japanese singer and actress July 14 - Lou Savarese, American boxer July 15 - Dafna Rechter,
Israeli actress and singer July 17 Santiago Segura, Spanish actor, screenwriter, producer and director Rosa Gumataotao Rios, 43rd Treasurer of the United States Alex Winter, British actor July 18 - Eva Ionesco, French actress, film director and screenwriter July 19 Dame Evelyn Glennie, Scottish virtuoso percussionist Hailemariam Desalegn, 15th Prime
Minister of Ethiopia July 21 - Guðni Bergsson, Icelandic footballer July 22 - Shawn Michaels, American professional wrestler July 23 Grace Mugabe, First Lady of Zimbabwe Slash (Saul Hudson), English-born American professional wrestler July 25 - Illeana Douglas, American actress and producer[38] July 26 Vladimir Cruz, Cuban actor Jeremy Piven, American professional wrestler July 25 - Illeana Douglas, American actress and producer[38] July 26 Vladimir Cruz, Cuban actor Jeremy Piven, American professional wrestler July 25 - Illeana Douglas, American professional wrestler July 26 Vladimir Cruz, Cuban actor Jeremy Piven, American professional wrestler July 27 - Illeana Douglas, American professional wrestler July 28 Vladimir Cruz, Cuban actor Jeremy Piven, American professional wrestler July 28 Vladimir Cruz, Cuban actor Jeremy Piven, American professional wrestler July 28 Vladimir Cruz, Cuban actor Jeremy Piven, American professional wrestler July 28 Vladimir Cruz, Cuban actor Jeremy Piven, American professional wrestler July 28 Vladimir Cruz, Cuban actor Jeremy Piven, American professional wrestler July 28 Vladimir Cruz, Cuban actor Jeremy Piven, American professional wrestler July 28 Vladimir Cruz, Cuban actor Jeremy Piven, American professional wrestler July 28 Vladimir Cruz, Cuban actor Jeremy Piven, American professional wrestler July 28 Vladimir Cruz, Cuban actor Jeremy Piven, American professional wrestler July 29 Vladimir Cruz, Cuban actor Jeremy Piven, American professional wrestler July 29 Vladimir Cruz, Cuban actor Jeremy Piven, American professional wrestler July 29 Vladimir Cruz, Cuban actor Jeremy Piven, American professional wrestler July 20 Vladimir Cruz, Cuban actor Jeremy Piven, American professional wrestler July 20 Vladimir Cruz, Cuban actor Jeremy Piven, American professional wrestler July 20 Vladimir Cruz, Cuban actor Jeremy Piven, American professional wrestler July 20 Vladimir Cruz, Cuban actor Jeremy Piven, American professional wrestler American professional wrestler American professional 
actor Jimmy Dore, American comedian and political commentator July 27 José Luis Chilavert, Paraguayan footballer (d. 2016)[40] July 28 - Daniela Mercury, Brazilian singer, songwriter, dancer, producer, actress and television host July 29 - Chang-Rae Lee, Korean-American novelist July 31 - J. K. Rowling, English
author Sir Sam Mendes Viola Davis Kyra Sedgwick August 1 - Sam Mendes, English film director August 2 Sandra Ng, Hong Kong actress Hisanobu Watanabe, Japanese baseball player and coach August 1 - Sam Mendes, English film director August 2 Sandra Ng, Hong Kong actress Hisanobu Watanabe, Japanese baseball player and coach August 1 - Sam Mendes, English film director August 2 Sandra Ng, Hong Kong actress Hisanobu Watanabe, Japanese baseball player and coach August 5 -
Monica Ward, Italian actress and voice actress August 6 - David Robinson, American basketball player August 10 Claudia Christian, American basketball player August 11 - Viola Davis, African-American actress August 15 - Vincent Kok, Hong Kong
director and actor August 16 - Michael O'Gorman, American coxswain (d. 2018) August 19 Kevin Dillon, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actress Kyra Sedgwick, American actor Maria de Medeiros, Portuguese actor Maria de M
2004)[42] August 24 - Reggie Miller, American basketball player and commentator August 25 - Mia Zapata, American singer (d. 1993) August 26 - Azela Robinson, Mexican actress Shania Twain, Canadian country singer and songwriter
August 31 - Daniel Bernhardt, Swiss actor and martial artist Charlie Sheen Bashar al-Assad Dmitry Medvedev Kyle Chandler Tim Scott Petro Poroshenko September 2 - Lennox Lewis, British boxer September 3 Costas Mandylor, Greek-Australian actor Charlie Sheen, American actor and producer
September 5 - Derby Makinka, Zambian footballer (d. 1993) September 6 - Gleisi Hoffmann, Brazilian lawyer and politician September 7 - Jörg Pilawa, German television presenter September 10 - Marco Pastors, Dutch politician September 5 - Jörg Pilawa, German television presenter September 10 - Marco Pastors, Dutch politician September 5 - Jörg Pilawa, German television presenter September 10 - Marco Pastors, Dutch politician September 5 - Jörg Pilawa, German television presenter September 10 - Marco Pastors, Dutch politician September 5 - Jörg Pilawa, German television presenter September 10 - Marco Pastors, Dutch politician September 5 - Jörg Pilawa, German television presenter September 10 - Marco Pastors, Dutch politician September 5 - Jörg Pilawa, German television presenter September 10 - Marco Pastors, Dutch politician September 5 - Jörg Pilawa, German television presenter September 6 - Gleisi Hoffmann, Brazilian september 8 - Gleisi Hoffmann, Brazilian september 10 - Marco Pastors, Dutch politician September 5 - Jörg Pilawa, German television presenter September 10 - Marco Pastors, Dutch politician September 5 - Jörg Pilawa, German television presenter September 10 - Marco Pastors, Dutch politician September 10 - Jörg Pilawa, German television presenter September 10 - Marco Pastors, Dutch politician September 10 - Jörg Pilawa, German television presenter September 10 - Marco Pastors, Dutch politician September 10 - Jörg Pilawa, German television presenter September 10 - Marco Pastors, Dutch politician September 10 - Jörg Pilawa, German television presenter September 10 - Marco Pastors, Dutch politician September 10 - Jörg Pilawa, German television presenter September 10 - Marco Pastors, Dutch politician September 10 - Jörg Pilawa, German television presenter September 10 - Marco Pastors, Dutch politician September 10 - Marco Pastors, Dutch Pastors, Dutch Pastors, Dutc
 September 11 Bashar al-Assad, President of Syria Moby, American musician September 12 Einstein Kristiansen, Norwegian cartoonist, designer, and television host September 16 - Katy Kurtzman, American actress, director and producer
 September 17 Kyle Chandler, American actor Yuji Naka, Japanese video game programmer September 19 Goldie, English record producer and DJ Iliya Lazarov, Bulgarian politician actor Yuji Naka, Japanese video game programmer September 21 Chery
Hines, American actress Johanna Vuoksenmaa, Finnish film director David Wenham, Australian actor Pramila Jayapal, American politician September 23 - Mark Woodforde, Australian tennis player September 25 - Scottie Pippen, American politician September 23 - Mark Woodforde, Australian tennis player September 25 - Scottie Pippen, American politician September 26 Radisav Čurčić, Serbian-Israeli basketball player [44] Alexei Mordashov, Russian
businessman Petro Poroshenko, former President of Ukraine September 27 - Steve Kerr, American basketball player Lennie James Steve Coogan October 1 - Andreas Keller, German field hockey player October 3 Adriana Calcanhotto, Brazilian
singer and composer Jan-Ove Waldner, Swedish table tennis player [47] October 5 Mario Lemieux, Canadian ice hockey player Patrick Roy, Canadian ice hockey player Patr
- Dionicio Cerón, Mexican long-distance runner October 10 - Chris Penn, American actor (d. 2006) October 13 - Kalpana, Indian film actress (d. 2016) October 14 Steve Coogan, British comedian and actor Jüri Jaanson, Estonian rower
and politician October 16 - Kang Kyung-ok, South Korean artist October 17 Aravinda de Silva, Sri Lankan cricketer Rhys Muldoon, Australian actor, writer, and director October 18 - Zakir Naik, Indian doctor and Islamic activist October 18 - Zakir Naik, Indian doctor and Islamic activist October 19 The Renegade, American professional wrestler (d. 1999) Ty Pennington, American television presenter Tracy Griffith
American actress, sushi chef, and painter October 20 Amos Mansdorf, Israeli tennis player[50] Stefano Pioli, Italian football player and manager[51] October 22 - Sumito Estévez, Venezuelan chef[52] October 26 Aaron Kwok, Hong Kong singer and actor Kelly Rowan, Canadian actress Kenneth Rutherford, New Zealand cricketer October 29 - Christy Clark
Canadian politician October 30 - Zaza Urushadze, Georgian film director, producer and screenwriter (d. 2019) October 31 - Rob Rackstraw, British actor Shah Rukh Khan Björk Mads Mikkelsen Ben Stiller November 1 Patrik Ringborg, Swedish conductor November 2 Paweł Adamowicz, Polish politician and lawyer (d. 2019) Shah Rukh Khan, Indian actor,
film/television producer and television producer and television presenter November 4 - Wayne Static, American singer and musician (Static-X) (d. 2014) November 7 - Sigrun Wodars, German athlete November 8 - Patricia Poleo, Venezuelan journalist[53] November 9 - Sir Bryn Terfel, Welsh baritone November 10 - Eddie Irvine, Northern Irish racing driver November 11 - Max
Mutchnick, American television producer November 13 - Rick Roberts, Canadian actor November 17 - Pam Bondi, American attorney and politician, 87th U.S. Attorney General [54] November 19 Paulo Barreto, Brazilian cryptographer Laurent Blanc, French football player and manager November 10 - Yoshiki Hayashi, Japanese rock composer, pianist and
drummer November 21 Björk, Icelandic singer-songwriter and musician Reggie Lewis, American basketball player (d. 1993) Alexander Siddig, Sudanese-British actor November 22 - Mads Mikkelsen, Danish actor November 23 - Radion Gataullin, Uzbek-Russian pole-vaulter November 24 - Shirley Henderson, Scottish actor November 25 - Ana Paula
Padrão, Brazilian journalist, chief editor, entrepreneur, writer and television presenter November 26 - Scott Adsit, American actor, comedian and filmmaker Tashi Tenzing, Indian mountaineer Salman Khan Andrew Stanton
 David Harewood, English actor December 9 - Brad Savage, American actor December 10 - Stephanie Morgenstern, Canadian actress December 15 - Luis Fabián Artime, Argentine footballer (d. 2015)[56] December 19 - Jessica Steen
Canadian actress December 21 Andy Dick, American actor and comedian Anke Engelke, German comedian, actress and voice-over actress December 23 - Andreas Kappes, German cyclist (d. 2018) December 27 - Salman Khan, Indian actor, television presenter December 23 - Andreas Kappes, German cyclist (d. 2018) December 23 - Andreas Kappes, German cyclist (d. 2018) December 27 - Salman Khan, Indian actor, television presenter December 23 - Andreas Kappes, German cyclist (d. 2018) December 27 - Salman Khan, Indian actor, television presenter December 28 - Andreas Kappes, German cyclist (d. 2018) December 29 - Andreas Kappes, German cyclist (d. 2018) December 29 - Salman Khan, Indian actor, television presenter December 29 - Andreas Kappes, German cyclist (d. 2018) December 29 - Andreas Kappes, German cyclist (d. 2018) December 29 - Andreas Kappes, German cyclist (d. 2018) December 29 - Andreas Kappes, German cyclist (d. 2018) December 29 - Andreas Kappes, German cyclist (d. 2018) December 29 - Andreas Kappes, German cyclist (d. 2018) December 29 - Andreas Kappes, German cyclist (d. 2018) December 29 - Andreas Kappes, German cyclist (d. 2018) December 20 - Andreas Kappes, German cyclist (d. 2018) December 20 - Andreas Kappes, German cyclist (d. 2018) December 20 - Andreas Kappes, German cyclist (d. 2018) December 20 - Andreas Kappes, German cyclist (d. 2018) December 20 - Andreas Kappes, German cyclist (d. 2018) December 20 - Andreas Kappes, German cyclist (d. 2018) December 20 - Andreas Kappes, German cyclist (d. 2018) December 20 - Andreas Kappes, German cyclist (d. 2018) December 20 - Andreas Kappes, German cyclist (d. 2018) December 20 - Andreas Kappes, German cyclist (d. 2018) December 20 - Andreas Kappes, German cyclist (d. 2018) December 20 - Andreas Kappes, German cyclist (d. 2018) December 20 - Andreas Kappes, German cyclist (d. 2018) December 20 - Andreas Kappes, German cyclist (d. 2018) December 20 - Andreas Kappes, German cyclist (d. 2018) December 20 - Andreas Kappes, German cyclist (d. 2018) December 20 - Andr
2020) Robert Rep, Dutch politician December 31 Nicholas Sparks, American author[57] Gong Li, Chinese actress Yklymberdi Paromov, Turkmen politician Marga Hoek, Dutch businesswoman T. S. Eliot Winston Churchill January 4 - T. S. Eliot, American-British poet, Nobel Prize laureate (b. 1888)[58] January 10 Antonín Bečvář, Czechoslovak astronomer
(b. 1901) Frederick Fleet, British sailor and lookout aboard the RMS Titanic (b. 1887) January 12 - Lorraine Hansberry, African-American playwright and writer (b. 1930) January 14 - Jeanette MacDonald, American actress and singer (b. 1930) January 20 -
Alan Freed, American disc jockey (b. 1921) January 24 - Sir Winston Churchill, British politician and statesman, twice Prime Minister of the United Kingdom, World War II leader, recipient of the Nobel Prize in Literature (b. 1874)[59] January 27 - Hassan Ali Mansur, Iranian politician, 69th Prime Minister of Iran (b. 1923) January 28 Taimur bin Feisal,
Sultan of Oman (b. 1886) Tich Freeman, English cricketer (b. 1888)[60] Maxime Weygand, French general (b. 1867) January 3 - Konstantin Muraviev, 31st Prime Minister of Bulgaria (b. 1893) Nat King Cole Malcolm X February 5 - Irving Bacon, American actor (b. 1893) February 6 - Frederick, Prince of Hohenzollern (b. 1891) February 7 - Nance O'Neil
 American stage and film actress (b. 1874) February 9 - Khan Bahadur Ahsanullah, Indian educationist, philosopher, philanthropist, social reformer and spiritualist (b. 1874) February 13 Humberto Delgado, Portuguese general and opposition politician (b. 1806) William Heard Kilpatrick, American mathematician and philosopher (b. 1871) February 14 -
Désiré-Émile Inghelbrecht, French composer (b. 1880) February 15 - Nat King Cole, American actor (b. 1880) February 20 - Michał Waszyński, Polish film director and producer (b. 1904)[64] February 21 - Malcolm X, American civil rights
activist (b. 1925)[65] February 22 - Felix Frankfurter, U.S. Supreme Court Justice (b. 1882) February 23 - Stan Laurel, British actor (b. 1890)[66] February 24 - Takeo Itō, Japanese general (b. 1889) February 23 - Adolf Schärf, Austrian politician, 6th President of Austria (b. 1890) King Farouk of Egypt Mary, Princess Royal and Countess of Harewood
March 5 - Salvador Castaneda Castro, 31st President of El Salvador (b. 1889) March 6 Margaret Dumont, American actress (b. 1889) March 7 - Louise Mountbatten, queen consort of Sweden as second wife of King Gustaf VI Adolf (b. 1889) March 13 Corrado Gini, Italian statistician (b. 1884)[68] Vittorio
Jano, Italian automobile designer (b. 1891)[69] Fan Noli, Albanian bishop, poet and politician, 13th Prime Minister of Albania (b. 1882) March 14 - Marion Jones Farquhar, American tennis champion (b. 1879) March 17 Nancy Cunard, English writer, heiress and politician, 13th Prime Minister of Albania (b. 1882) March 14 - Marion Jones Farquhar, American tennis champion (b. 1879) March 17 Nancy Cunard, English writer, heiress and politician, 13th Prime Minister of Albania (b. 1882) March 17 Nancy Cunard, English writer, heiress and politician, 13th Prime Minister of Albania (b. 1882) March 18 Nancy Cunard, English writer, heiress and politician, 13th Prime Minister of Albania (b. 1882) March 18 Nancy Cunard, English writer, heiress and politician (b. 1896) Amos Alonzo Stagg, American baseball, basketball and football players.
and coach (b. 1862) March 18 - Farouk of Egypt, deposed king (b. 1920) March 29 - Fidel Dávila, Spanish general and minister (b. 1878) March 23 - Mae Murray, American silent film actress (b. 1885) March 25 - Viola Liuzzo, American Unitarian
Universalist and civil rights activist (b. 1825) March 28 Mary, Princess Royal and Countess of Harewood, member of the British royal family (b. 1897) Jack Hoxie, American actor, rodeo performer (b. 1885) March 30 - Philip Showalter Hench, American physician, recipient of the Nobel Prize in Physiology or Medicine (b. 1896) Edward Victor Appleton April
3 - Ray Enright, American film director (b. 1896) April 9 - Sherman Minton, American actress (b. 1893) La Belle Otero, Spanish actress, dancer and courtesan (b. 1868) April 14 Leonard Mudie, English actor (b. 1883)[71] Perry Smith (b. 1890)[70] April 10 Linda Darnell, American actress (b. 1890)[70] April 10 Linda Darnell, American actress (b. 1890)[71] Perry Smith (b. 1890)[70] April 10 Linda Darnell, American actress (b. 1890)[71] Perry Smith (b. 1890)[71
1928) and Richard Hickock (b. 1931), American convicted murderers April 16 - Sydney Chaplin, English actor (b. 1885) April 18 - Guillermo González Camarena, Mexican inventor (b. 1892) Pedro Albizu Campos, advocate of Puerto Rican independence (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891) Pedro Albizu Campos, advocate of Puerto Rican independence (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891) Pedro Albizu Campos, advocate of Puerto Rican independence (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891) Pedro Albizu Campos, advocate of Puerto Rican independence (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891)[72] April 18 - Guillermo González Camarena, Mexican inventor (b. 1891)[72] April 18 - Guillermo
23 - George Adamski, Polish-American UFO writer (b. 1891) April 24 - Louise Dresser, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen Chandler, American actress (b. 1908)[73] April 30 - Helen
10th Governor of Hawai'i (b. 1889) May 7 Charles Sheeler, American photographer (b. 1883) Alf Bjørnskau Bastiansen, Norwegian priest and politician (b. 1883) May 9 - Leopold Figl, 14th Chancellor of Austria and acting President of Austria (b. 1883) May 9 - Leopold Figl, 14th Chancellor of Austria (b. 1883) Alf Bjørnskau Bastiansen, Norwegian priest and politician (b. 1883) May 9 - Leopold Figl, 14th Chancellor of Austria (b. 1883) Alf Bjørnskau Bastiansen, Norwegian priest and politician (b. 1883) May 9 - Leopold Figl, 14th Chancellor of Austria (b. 1883) Alf Bjørnskau Bastiansen, Norwegian priest and politician (b. 1883) May 9 - Leopold Figl, 14th Chancellor of Austria (b. 1883) Alf Bjørnskau Bastiansen, Norwegian priest and politician (b. 1883) May 10 - Hubertus van Mook, Dutch Governor-General of the Dutch East Indies (b. 1894)[74] May 14 - Ma
Frances Perkins, first woman appointed as a United States presidential cabinet member (Labor) (b. 1880) May 15 - Yisrael Bar-Yehuda, Zionist activist and Israel politician (b. 1895) May 21 - Sir Geoffrey de Havilland, British aviation pioneer and aircraft company
founder (b. 1882)[75] May 23 Rosina Anselmi, Italian actress (b. 1880) David Smith, American sculptor (b. 1906) May 24 - Sonny Boy Williamson, American military officer, educator, businessperson, and politician (b. 1905)[76] Martin Buber June 1 - Curly Lambeau, American football player
and coach (b. 1898) June 5 Eleanor Farjeon, British author of children's literature (b. 1881) Prince Wilhelm, Duke of Södermanland (b. 1884) June 7 - Judy Holliday, American actress, comedian, and singer (b. 1881) Iune 11 - José Mendes Cabeçadas, Portuguese navy officer, 94th Prime Minister of Portugal and 9th President of Portugal (b. 1883) June 13 -
Martin Buber, Austrian-Israeli philosopher (b. 1878) June 15 - Steve Cochran, American film producer (b. 1870) June 23 - Mary Boland, American actors (b. 1882) June 20 - Bernard Baruch, American film producer (b. 1892) June 23 - Mary Boland, American actors (b. 1882) June 21 - David O. Selznick, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American actors (b. 1882) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 23 - Mary Boland, American film producer (b. 1892) June 24 - Mary Boland, American film producer (b. 1892) June 25 - Mary Boland, American film producer (b. 1892) June 26 - Mary Boland, American film producer (b. 1892) June 27 - Mary Boland, American film producer (b. 1892) June 28 - Mary Boland, American film producer (b. 1892) June 28 - Mary Boland, American film produc
28 - Red Nichols, American jazz cornettist (b. 1905) June 30 - Bessie Barriscale, American actress (b. 1884) Syngman Rhee July 1 - Wally Hammond, English cricketer (b. 1893) July 7 - Moshe Sharett, 2nd Prime Minister of Israel (b. 1884) Syngman Rhee July 1 - Wally Hammond, English cricketer (b. 1805) June 30 - Bessie Barriscale, American actor (b. 1889) July 13 - Moshe Sharett, 2nd Prime Minister of Israel (b. 1894) July 8 - T. S. Stribling, American novelist (b. 1881)[77] July 11 - Ray Collins, American actor (b. 1889) July 13 -
Laureano Gómez, 43rd President of Colombia (b. 1889) July 14 Adlai Stevenson II, American animal trainer (b. 1903) Ingrid Jonker, South African Afrikaans poet (b. 1933) Syngman Rhee, Korean statesman, 1st President of South Korea (b. 1875) July 24 -
Constance Bennett, American actress (b. 1904) July 28 - Rampo Edogawa, Japanese author and critic (b. 1894) July 30 Pier Ruggero Piccio, Italian World War I fighter ace, air force general (b. 1880)[78] Jun'ichirō Tanizaki, Japanese writer (b. 1886) Le Corbusier August 1 - John Miller, American Olympic rower - Men's eights (b. 1903) August 6 Nancy
Carroll, American actress (b. 1903) Everett Sloane, American actor (b. 1882) August 8 - Shirley Jackson, American actor (b. 1886) August 27 - Le
Corbusier, Swiss architect (b. 1887) August 28 Rashid Ali al-Gaylani, Iraqi politician, 9th Prime Minister of Iraq (b. 1892) Giulio Racah, Israeli physicist (b. 1907) Albert Schweitzer, Alsatian Dorothy Dandridge September 4 Tommy Hampson, British Olympic athlete (b. 1907) Albert Schweitzer, Alsatian Dorothy Dandridge September 4 Tommy Hampson, British Olympic athlete (b. 1907) Albert Schweitzer, Alsatian Dorothy Dandridge September 4 Tommy Hampson, British Olympic athlete (b. 1907) Albert Schweitzer, Alsatian Dorothy Dandridge September 4 Tommy Hampson, British Olympic athlete (b. 1907) Albert Schweitzer, Alsatian Dorothy Dandridge September 4 Tommy Hampson, British Olympic athlete (b. 1908) August 29 - Paul Waner, American Dorothy Dandridge September 4 Tommy Hampson, British Olympic athlete (b. 1908) August 29 - Paul Waner, American Dorothy Dandridge September 4 Tommy Hampson, British Olympic athlete (b. 1908) August 29 - Paul Waner, American Dorothy Dandridge September 4 Tommy Hampson, British Olympic athlete (b. 1908) August 29 - Paul Waner, American Dorothy Dandridge September 4 Tommy Hampson, British Olympic athlete (b. 1908) August 29 - Paul Waner, American Dorothy Dandridge September 4 Tommy Hampson, British Olympic athlete (b. 1908) August 29 - Paul Waner, American Dorothy Dandridge September 4 Tommy Hampson, British Olympic athlete (b. 1908) August 29 - Paul Waner, American Dorothy Dandridge September 4 Tommy Hampson, British Olympic athlete (b. 1908) August 20 - Paul Waner, American Dorothy Dandridge September 4 Tommy Hampson, British Olympic athlete (b. 1908) August 20 - Paul Waner, American Dorothy Dandridge September 4 Tommy Hampson, British Olympic athlete (b. 1908) August 20 - Paul Waner, American Dorothy Dandridge September 4 Tommy Hampson, British Olympic athlete (b. 1908) August 20 - Paul Waner, American Dorothy Dandridge September 4 Tommy Hampson, British Olympic athlete (b. 1908) August 20 - Paul Waner, American Dorothy Dandridge September 4 Tommy Hampson, British Olympic August 20 - Paul W
physician and missionary, recipient of the Nobel Peace Prize (b. 1875) September 6 - Yunus Hussain, Pakistani fighter pilot (b. 1935) September 8 Dorothy Dandridge, American actress (b. 1822) Hermann Staudinger, German chemist, Nobel Prize laureate (b. 1881) September 12 - Lucian Truscott, American general (b. 1895) September 16 - Fred Quimby
American animated film producer (b. 1886) September 17 - Alejandro Casona, Spanish poet and playwright (b. 1903) September 22 - Othmar Ammann, Swiss-born American engineer (b. 1879)[79] September 27 - Clara Bow, American founder of the
clinical pastoral education movement (b. 1876)[80] October 3 - Zachary Scott, American actor (b. 1914) October 3 - Thomas B. Costain, Canadian author and journalist (b. 1885)[81] October 12 - Samir Al-Rifai, 6-time Prime
Minister of Jordan (b. 1901) October 13 - Paul Hermann Müller, Swiss chemist, recipient of the Nobel Prize in Physiology or Medicine (b. 1893) October 15 - Abraham Fraenkel, Israeli mathematician and recipient of the Israel Prize (b. 1891) October 17 - Bart King, American poet (b. 1873)[82]
October 18 Oscar Beregi, Hungarian actor (b. 1874) October 21 Bill Black, American musician and bandleader (b. 1874) October 22 - Paul Tillich, German American christian existentialist philosopher and theologian (b. 1886) October 23 - Luis de la Puente Uceda,
Peruvian guerrilla leader (b. 1926) October 24 - Hans Meerwein, German chemist (b. 1879) October 26 - Sylvia Likens, American murder victim (b. 1888)[83] October 31 - Rita Johnson, American actress (b. 1913) Henry A
Wallace Emir Abdullah III Al-Salim Al-Sabah November 2 Félix Paiva, 28th President of Paraguay (b. 1877) H.V. Evatt, Australian politician, judge (b. 1893) November 8 Dorothy Kilgallen, American newspaper columnist and television
personality (b. 1913) Emma Gramatica, Italian actress (b. 1889) [85] W. T. Cosgrave, Irish politician, president of the Provisional
Government and the Executive Council of the Irish Free State (b. 1880) November 18 Khalid al-Azm, 5-time Prime Minister of Syria and acting President of the United States (b. 1885) November 25 - Dame Myra Hess, English
pianist (b. 1890) Somerset Maugham December 5 - Joseph Erlanger, American physiologist and academic, Nobel Prize laureate (b. 1874) December 10 - Henry Cowell, American composer (b. 1897) December 11 - George Constantinescu, Romanian scientist (b. 1881) December 15 -
 Joseph Bamina, 8th Prime Minister of Burundi (executed) (b. 1927) December 16 W. Somerset Maugham, English writer (b. 1874) Tito Schipa, Italian tenor (b. 1809) December 27 - Edgar Ende, German painter (b. 1901) December 29 - Kosaku
Yamada, Japanese composer and conductor (b. 1886) Physics - Shin'ichirō Tomonaga, Julian Schwinger, Richard P. Feynman Chemistry - Robert Burns Woodward Physiology or Medicine - François Jacob, André Michel Lwoff, Jacques Monod Literature - Mikhail Sholokhov Peace - United Nation's Children's Fund (UNICEF) ^ Matson-Mäkelä, Kirsi (January
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as part of the Industrial Revolution Millennia 2nd millenn
vte The 19th century began on 1 January 1801 (represented by the Roman numerals MDCCCI), and ended on 31 December 1900 (MCM). It was the 9th century of the 2nd millennium. It was characterized by vast social upheaval. Slavery was abolished in much of Europe and the Americas. The First Industrial Revolution, though it began in the late 18th
century, expanded beyond its British homeland for the first time during the 29th century, particularly remaking the economies and societies of the Low Countries, France, the Rhineland, Northern Italy, and the Northeastern United States. A few decades later, the Second Industrial Revolution led to ever more massive urbanization and much higher levels of the Low Countries, France, the Rhineland, Northeastern United States.
were sent from the Americas and Europe to Asia, Africa and the Middle East, it was an era of change and reform. The Islamic gunpowder empires fell into decline and European imperialism brought much of South Asia, Southeast Asia, and almost all of Africa under colonial rule. Reformers were opposed at every turn by conservatives
who strove to maintain the centuries-old Islamic laws and social order. [1] The 19th century also saw the collapse of the British, French, German, Russian, Austro-Hungarian, Italian, and Japanese empires along with the United States. Following the
defeat of France in the Napoleonic Wars, it marked the end of France's status as the world superpower. Britain took France's status as the world superpower 
a period of Westernization and reform known as the Tanzimat, vastly increasing its control over core territories in the Middle East. However, it remaining powers in the Indian subcontinent, such as the Maratha and Sikh empires, suffered
which ushered in unprecedented globalization on a massive scale. Britain's overseas possessions grew rapidly in the first half of the century, especially with the expansion of vast territories in Canada, Australia, India, and in the last two decades of the century in Africa. By the end of the 19th century, the British controlled a fifth of the world's land and a
quarter of the world's population. By the end of the century, Britain, France, Germany, and the United States had colonized almost all of Oceania. In East Asia, China under the Qing dynasty endured its century of humiliation by foreign powers that lasted until the first half of the 20th century. The last surviving man and woman, respectively, verified to have
been born in the 19th century were Jiroemon Kimura (1897-2013) and Nabi Tajima (1900-2018), both Japanese. Official portrait of Queen Victoria, 1859 The first electronics appeared in the 19th century, with the introduction of the electric relay in 1835, the telegraph and its Morse code protocol in 1837, the first telephone call in 1876,[2] and the first
functional light bulb in 1878.[3] The 19th century was an era of rapidly accelerating scientific discovery and invention, with significant developments in the fields of mathematics, physics, chemistry, biology, electricity, and metallurgy that laid the groundwork for the technological advances of the 20th century.[4] The Industrial Revolution began in Great
Britain and spread to continental Europe, North America, and Japan. [5] The Victorian era was notorious for the employment of young children in factories and mines, as well as strict social norms regarding modesty and gender roles. [6] Japan embarked on a program of rapid modernization following the Meiji Restoration, before defeating China, under the
Qing dynasty, in the First Sino-Japanese War. Advances in medicine and the understanding of human anatomy and disease prevention took place in the 19th century, from approximately 200 million to more
than 400 million.[7] The introduction of railroads provided the first major advancement in land transportation for centuries, changing the way people lived and obtained goods, and fuelling major urbanization movements in countries across the globe. Numerous cities worldwide surpassed populations of a million or more during this century. London became
the world's largest city and capital of the British Empire. Its population increased from 1 million in 1800 to 6.7 million a century later. The last remaining undiscovered landmasses of Earth, including vast expanses of interior Africa and Antarctic, accurate
and detailed maps of the globe were available by the 1890s. Liberalism became the pre-eminent reform movement in Europe.[8] Arab slave traders and their captives along the Ruvuma River, 19th century Slavery was greatly reduced around the world. Following a successful slave revolt in Haiti, Britain and France stepped up the battle against the Barbary
pirates and succeeded in stopping their enslavement of Europeans. The UK's Slavery Abolition Act 1833 charged the British, who did so in 1834. America's Thirteenth Amendment following their Civil War abolished slavery there in
 1865, and in Brazil slavery was abolished in 1888 (see abolitionism). Similarly, serfdom was abolished in Russia in 1861. The 19th century was remarkable in the widespread formation of new settlement foundations which were particularly prevalent across North America and Australia, with a significant proportion of the two continents' largest cities being
States.[10] The 19th century also saw the rapid creation, development, and codification of many sports, particularly in Britain and the United States. Association football, rugby union, baseball, and many other sports such as cricket to many different parts
of the world. Also, women's fashion was a very sensitive topic during this time, as women showing their ankles was viewed to be scandalous. The boundaries set by the Congress of Vienna, 1815 It also marks the fall of the Ottoman rule of the Balkans which led to the creation of Serbia, Bulgaria, Montenegro, and Romania as a result of the second Russo-
Turkish War, which in itself followed the great Crimean War. Map of the world from 1897. The British Empire (marked in pink) was the superpower of the 19th century. Industrial Revolution European imperialism British Regency, Victorian era (UK, British Empire) Bourbon Restoration, July Monarchy, French Second Republic, Second French Empire,
French Third Republic (France) Risorgimento (Italy) Belle Époque (Europe) Edo period, Meiji period (Japan) Qing dynasty (Vietnam) Joseon dynasty (Vietnam) Joseon dynasty (Korea) Zulu Kingdom (South Africa) Tanzimat, First Constitutional Era (Ottoman Empire) Russian Empire Manifest destiny, Antebellum era, Reconstruction era, American frontier
against a fluctuating array of European powers formed into various coalitions, financed and usually led by the United Kingdom. The wars stemmed from the unresolved disputes associated with the French Revolution and its resultant conflict. In the aftermath of the French Revolution, Napoleon Bonaparte gained power in France in 1799. In 1804, he
crowned himself Emperor of the French. In 1805, the French victory over an Austrian-Russian army at the Battle of Austerlitz ended the War of the Third Coalition. As a result of the Treaty of Pressburg, the Holy Roman Empire was dissolved. Later efforts were less successful. In the Peninsular War, France unsuccessfully attempted to establish Joseph
Bonaparte as King of Spain. In 1812, the French invasion of Russia had massive French casualties, and was a turning point in the War of the Sixth Coalition, Napoleon abdicated and was exiled to Elba. Later that year, he escaped exile and began the
Hundred Days before finally being defeated at the Battle of Waterloo and exiled to Saint Helena, an island in the South Atlantic Ocean. After Napoleon's defeat, the Congress of Vienna was held to determine new national borders, with limited impact.
Main article: Spanish American wars of independence The Chilean Declaration of Independence from France. In Mexico, the Mexican War of
Independence was a decade-long conflict that ended in Mexican independence in 1821. Due to the Napoleonic Wars, the royal family of Portugal relocated to Brazil from 1808 to 1821, leading to Brazil having a separate monarchy from Mexico in 1823 and from Mexico in 1823.
After several rebellions, by 1841 the federation had dissolved into the independent countries of Guatemala, El Salvador, Honduras, Nicaragua, and Costa Rica.[11] In 1830, the post-colonial nation of Gran Colombia dissolved and the nations of Colombia (including modern-day Panama), Ecuador, and Venezuela took its place. Main article: Revolutions of
1848 Liberal and nationalist pressure led to the European revolutions of 1848. The revolutions of 1848 were a series of political upheavals throughout Europe in 1848. The revolutions were essentially democratic and liberal in nature, with the aim of removing the old monarchical structures and creating independent nation states. The first revolution began
in January in Sicily, [clarification needed] Revolutions then spread across Europe after a separate revolution began in France in February. Over 50 countries were affected, but with no coordination or cooperation among their respective revolutionaries. According to Evans and von Strandmann (2000), some of the major contributing factors were widespread
dissatisfaction with political leadership, demands for more participation in government and democracy, demands for freedom of the press, other demands made by the working class, the upsurge of nationalism, and the regrouping of established government forces.[12] Main articles: Abolitionism and American Civil War Politician and philanthropist William
Wilberforce (1759-1833) was a leader of the movement to abolish the slave trade was abolished in the United States in 1808, and by the end of the century, almost every government had banned slavery Abolition Act 1833 banned slavery throughout the
worked with a network of antislavery activists and safe houses known as the Underground Railroad. The American Civil War took place from 1861 to 1865. Eleven southern states seceded from the United States, largely over concerns related to slavery. In 1863, President Abraham Lincoln issued the Emancipation Proclamation. Lincoln issued a
preliminary [13] on September 22, 1862, warning that in all states still in rebellion (Confederacy) on January 1, 1863, he would declare their slaves "then, thenceforward, and forever free." [14] He did so. [15] The Thirteenth Amendment to the Constitution, [16] ratified in 1865, officially abolished slavery in the entire country. Five days after Robert E. Lee
surrendered at Appomattox Courthouse, Virginia, Lincoln was assassinated by actor and Confederate sympathizer John Wilkes Booth. Main article: Decline and modernization of the Egyptian-Ottoman War (1831-1833)[17] In 1817, the Principality of Serbia became suzerain from
the Ottoman Empire, and in 1867, it passed a constitution that defined its independence from the Ottoman Empire after the Greek War of Independence. In 1831, the Bosnian Uprising against Ottoman rule occurred. In 1831, The First Egyptian-Ottoman War (1831-1833)
the April Uprising against Ottoman rule. Following the Russo-Turkish War, the Treaty of Berlin recognized the formal independence of the Serbia, Montenegro, and Romania. Bulgaria became autonomous. Main article: Taiping Rebellion A scene of the Serbia, Montenegro, and Romania. Bulgaria became autonomous.
deaths of around 20-30 million people. Its leader, Hong Xiuquan, declared himself the younger brother of Jesus Christ and developed a new Chinese religion known as the God Worshipping Society. After proclaiming the establishment of the Taiping Heavenly Kingdom in 1851, the Taiping army conquered a large part of China, capturing Nanjing in 1853. In
1864, after the death of Hong Xiuquan, Qing forces recaptured Nanjing and ended the rebellion.[19] Main article: Meiji Restoration During the Edo period, Japan largely pursued an isolationist foreign policy. In 1853, United States Navy Commodore Matthew C. Perry threatened the Japanese capital Edo with gunships, demanding that they agree to open
trade. This led to the opening of trade relations between Japan and foreign countries, with the policy of Sakoku formally ended in 1854. By 1872, the Japanese government under Emperor Meiji had eliminated the daimyō system and established a strong central government. Further reforms included the abolition of the samurai class, rapid industrialization
and modernization of government, closely following European models. [20] Main articles: Western imperialism in Asia and Scramble for Africa Arrival of Marshal Randon in Algiers, French Algeria in 1857 The Maratha Confederacy and the East India Company sign the Treaty of Bassein in 1802. 1803: United States more than doubles in size when it buys out
 France's territorial claims in North America via the Louisiana Purchase. This begins the U.S.'s westward expansion to the Pacific, referred to as its Manifest Destiny, which involves annexed the Maratha Confederacy after the Third Anglo-Maratha War
purchased Alaska from Russia. Comparison of Africa in the years 1880 and 1913 In Africa, European exploration and technology led to the colonization of almost the entire continent by 1898. New medicines such as quinine and more advanced firearms allowed European nations to conquer native populations. [21] Motivations for the Scramble for Africa
included national pride, desire for raw materials, and Christian missionary activity. Britain seized control of Egypt to ensure control of Egypt to ensure control of the Suez Canal, but Ethiopia defeated Italy in the First Italo-Ethiopian War at the Battle of Adwa. France, Belgium, Portugal, and Germany also had substantial colonies. The Berlin Conference of 1884-1885 attempted to
reach agreement on colonial borders in Africa, but disputes continued, both amongst European powers and in resistance by the native populations. [21] In 1867, diamonds were discovered in the Kimberley region of South Africa. In 1886, gold was discovered in Transvaal. This led to colonization in Southern Africa by the British and business interests, led by
Cecil Rhodes.[21] 1801-1815: First Barbary War and the Second Barbary War between the United States of North Africa. 1802: Tay Son army recaptured Phu Xuan, causing Vo Tanh to commit suicide, Nguyen Phuc Anh successfully captured Thang Long, founded the Nguyen dynasty 1804-1810: Fulani Jihad in Nigeria. 1804-1813:
areas of southern Africa. 1810: Grito de Dolores begins the Mexican War of Independence. 1811: Battle of Tippecanoe: U.S. outnumbering Native Americans resulting in defeat and burning of community 1812-1815: War of 1812 between the United States and Britain; ends in a draw, except that Native Americans lose power. 1813-1837: Afghan-Sikh Wars
1814-1816: Anglo-Nepalese War between Nepal (Gurkha Empire) and British Empire. 1817: First Seminole War begins in Florida. 1817: Russia commences its conquest of the Caucasus. 1820: Revolutions of 1820 in Southern Europe 1821-1830: Greek War of Independence against the Ottoman Empire. 1825-1830: Java War begins. 1826-1828: After the
final Russo-Persian War, the Persian Empire took back territory lost to Russia from the previous war. 1828-1832: Black War in Tasmania leads to the near extinction of the Tasmanian aborigines 1830: July Revolution overthrew old line of Bourbons. 1830: November Uprising in Poland against Russia. 1830: Belgian Revolution results in Belgium's
independence from Netherlands. 1830: End of the Java War. The whole area of Yogyakarta and Surakarta and Permanently divide the kingdom of Mataram was signed by Sasradiningrat, Pepatih Dalem Surakarta, and Danurejo
Mexican-American War leads to Mexico's cession of much of the modern-day Southwestern United States. 1848: February Revolution overthrew Louis Philippe's government. Second Republic proclaimed; Louis Napoleon, nephew of Napoleon, nephew of Napoleon, nephew of Napoleon I, elected president. 1853-1856: Crimean War between France, the United Kingdom, the Ottoman Empire and
 Russia. 1856-1860: Second Opium War 1857: Indian Rebellion against the Company Raj. After this the power of the East India Company is transferred to the British Crown. 1859: Franco-Austrian War is part of the wars of Italian unification. 1861-1865: American Civil War between the Union and seceding Confederacy. Dead Confederate soldiers. In the
American Civil War, 30% of all Southern white males aged 18-40 were killed.[22] 1861-1867: French intervention in Mexico and the creation of the Second Mexican Empire, ruled by Maximilian I of Mexico and his consort Carlota of Mexico and the creation of the Second Mexican Empire.
for expansion and destroys much of the Paraguayan population. 1866: Austro-Prussian War results in the dissolution of the German Confederation and the creation of the Shoqunate and the founding the Japanese Empire. 1868-1878: Ten
against the Ottoman Empire. 1879: Anglo-Zulu War results in British victory and the annexation of the Zulu Kingdom. 1879-1883: Chile battles with Peru and Bolivia over Andean territory in the War of the Pacific. 1880-1881: First Boer War begins. 1881-1899: Mahdist War in
the First Sino-Japanese War, China cedes Taiwan to Japan and grants Japan and grants Japan as a result of the Empire of Japan as a result of the Empire of Japan as a result of the Empire of Japan and grants Japan and grants Japan as a result of the Empire of Japan and grants Japan as a result of the Empire of Tapan as a result of the Empire of Tapan as a result of
Spain. 1896-1898: Philippine Revolution results in a Filipino victory. 1898: Spanish-American War results in the independence of Cuba. 1899-1901: Boxer Rebellion in China is suppressed by the Eight-Nation Alliance. 1899-1902: Thousand Days' War in Colombia breaks out between the "Liberales" and "Conservadores", culminating with the loss of Panama
term of natural philosopher. Among the most influential ideas of the 19th century were those of Charles Darwin (alongside the independent researches of Alfred Russel Wallace), who in 1859 published the book The Origin of Species, which introduced the idea of evolution by natural selection. Another important landmark in medicine and biology were the
experiments, theories and discoveries of Michael Faraday, André-Marie Ampère, James Clerk Maxwell, and their contemporaries led to an understanding of heat and the notion of energy was defined. Other highlights include the discoveries unveiling the nature of atomic
structure and matter, simultaneously with chemistry - and of new kinds of radiation. In astronomy, the planet Neptune was discovered. In mathematics, the notion of complex numbers finally matured and led to a subsequent analytical theory; they also began the use of hypercomplex numbers. Karl Weierstrass and others carried out the arithmetization of
analysis for functions of real and complex variables. It also saw rise to new progress in geometry beyond those classical theories of Euclid, after a similarly long period of stagnation. But the most important step in science at this time
were the ideas formulated by the creators of electrical science. Their work changed the face of physics and made possible for new technology to come about including a rapid spread in the use of electric illumination and power in the last two decades of the century and radio wave communication at the end of the 1890s. Michael Faraday (1791-1867)
 Charles Darwin (1809-1882) 1807: Potassium and Sodium are individually isolated by Sir Humphry Davy. 1831-1836: Charles Darwin's journey on HMS Beagle. 1859: Charles Darwin publishes On Physical Lines of Force, formulating the four Maxwell's equations. 1865: Gregor Mende
formulates his laws of inheritance. 1869: Dmitri Mendeleev creates the Periodic table. 1873: Maxwell's A Treatise on Electricity and Magnetism published. 1877: Asaph Hall discovers the moons of Mars 1896: Henri Becquerel discovers the moons of Mars 1896: Henri Becquerel discovers radioactivity; J. J. Thomson identifies the electron, though not by name. Robert Koch discovered the tuberculosis bacilli. In
the 19th century, the disease killed an estimated 25% of the adult population of Europe. [26] 1804: Morphine first isolated by Friedrich Gaedcke. 1885: Louis Pasteur
creates the first successful vaccine against rabies for a young boy who had been bitten 14 times by a rabid dog. 1889: Aspirin patented. Thomas Edison was an American inventor, scientist, and businessman who developed many devices that greatly influenced life around the world, including the motion picture camera, phonograph and long-lasting, practical
electric light bulb. Built for the Netphener bus company in 1895, the Benz Omnibus was the first motor bus in history. 1804: First steam locomotive begins operation. 1816: Laufmaschine invented by Karl von Drais. 1825: First isolation of aluminium. 1827: First photograph taken
(technique of heliography) by Joseph Nicephore Niepce. 1825: The Stockton and Darlington Railway, the first public railway in the world, is opened. 1826: Samuel Morey patents the internal combustion engine. 1824: First publicly funded
telegraph line in the world—between Baltimore and Washington—sends demonstration message on 24 May, ushering in the age of the telegraph. This message read "What hath God wrought?" (Bible, Numbers 23:23) 1849: The safety pin and the gas mask are invented. 1852: The first successful blimp is invented 1855: Bessemer process enables steel to be
mass-produced. 1856: World's first oil refinery in Romania 1858: Invention of the phonautograph, the first true device for recording sound. 1859: The first ironclad was launched into sea by the French Navy. 1860: Benjamin Tyler Henry invents the 16-shot Henry Rifle 1861: Richard Gatling invents the Gatling Gun, first modern machine gun used notably in
the battles of Cold Harbor and Petersburg 1862: First meeting in combat of ironclad warships, USS Monitor and CSS Virginia, during the American Civil War. 1863: First section of the London Underground opens. 1866: Successful transatlantic telegraph cable follows an earlier attempt in 1858. 1867: Alfred Nobel invents dynamite. 1868: Safety bicycle
invented. 1869: First transcontinental railroad completed in United States on 10 May. 1870: Rasmus Malling-Hansen's invented. 1877: Thomas Edison invents the phonograph 1878: First commercial telephone exchange in New Haven,
Connecticut. c. 1875/1880: Introduction of the widespread use of electric lighting systems by 1880.[27] 1879: Thomas Edison patents a practical incandescent light bulb. 1882: Introduction of large scale electric power utilities with the Edison
Holborn Viaduct (London) and Pearl Street (New York) power stations supplying indoor electric lighting using Edison's incandescent bulb.[28][29] 1884: Sir Hiram Maxim invents the first self-powered Machine gun, the Maxim gun. 1885: Singer begins production of the 'Vibrating Shuttle'. which would become the most popular model of sewing machine.
1886: Karl Benz sells the first commercial automobile. 1892: John Froelich develops and constructs the first gasoline/petrol-powered tractor. 1894: Karl Elsener invents the Swiss Army knife. 1894: Karl Elsener invents the first gasoline/petrol-powered tractor. 1894: Karl Elsener invents the Swiss Army knife. 1894: Wilhelm Röntgen identifies x-rays. Brigham Young led the LDS Church from 1844 until his
death in 1877. 1818: The first permanent Reform Judaism congregation, the Neuer Israelitischer Tempel, is founded in Hamburg on October 18. Around the same time, through the development of Wissenschaft des Judentums, the seeds of Conservative Judaism are sown. 1830: The Church of Jesus Christ of Latter Day Saints is established. 1844: The Báb
announces his revelation on 23 May, founding Bábism. He announced to the world of the coming of "He whom God shall make manifest". He is considered the forerunner of Bahá'u'lláh, the founder of the Bahá'í Faith. 1850s-1890s: In Islam, Salafism grows in popularity. 1851: Hong Xiuguan, the leader of the God Worshipping Society, founds the Taiping
Heavenly Kingdom. 1857: In Paris, France, Allan Kardec, publishes The Spirits' Book and founds the Spiritism. 1868: In Japan, State Shinto is established amidst the Meiji Restoration. 1869-1870: The First Vatican Council is convened, articulating the dogma of papal infallibility and promoting a revival of scholastic theology. 1871-1878: In Germany, Otto
von Bismarck challenges the Catholic Church in the Kulturkampf ("Culture War") 1875: Helena Blavatsky co-founds the Church of Christ, Scientist. The Watchtower, published by the Jehovah's Witnesses, releases its first issue. 1881: In the Sudan,
Muhammad Ahmad claims to be the Mahdi, founding the Mahdist State and declaring war on the Khedivate of Egypt. 1889: Mirza Ghulam Ahmad establishes the Ahmadiyya Muslim Community. 1891: Pope Leo XIII issues the papal encyclical Rerum novarum, the first major document informing modern Catholic social teaching. The Great Exhibition in
London. Starting during the 18th century, the UK was the first country in the world to industrialize. 1808: Beethoven composes his Fifth Symphony 1813: Jane Austen publishes Frankenstein; or, The Modern Prometheus. 1819: John Keats writes his six of his best-known odes. 1819: Théodore Géricault
paints his masterpiece The Raft of the Medusa, and exhibits it in the French Salon of 1819 at the Louvre. 1824: Premiere of Beethoven's Ninth Symphony. 1829: Johann Wolfgang von Goethe's Faust premieres. 1833-1834: Thomas Carlyle publishes Self-
Reliance. 1845: Frederick Douglass publishes Narrative of the Life of Frederick Douglass, an American Slave. 1847: The Brontë sisters publish Jane Eyre, Wuthering Heights and Agnes Grey. 1848: Karl Marx and Friedrich Engels publish Jane Eyre, Wuthering Heights and Agnes Grey. 1848: Karl Marx and Friedrich Engels publish Jane Eyre, Wuthering Heights and Agnes Grey. 1848: Karl Marx and Friedrich Engels publish The Communist Manifesto. 1849: Josiah Henson publishes The Life of Josiah Henson, Formerly a Slave, Now an
Inhabitant of Canada, as Narrated by Himself. 1851: Herman Melville publishes Uncle Tom's Cabin. 1855: Walt Whitman publishes the first edition of Leaves of Grass. 1855: Frederick Douglass publishes the first edition of My Bondage and My
Freedom. 1862: Victor Hugo publishes Les Misérables. 1863: Jules Verne begins publishes Les Misérables. 1863: Jules Verne begins publishes Alice's Adventures in Wonderland. 1869: Leo Tolstoy publishes War and Peace. Auguste Renoir, Bal du moulin de la Galette, 1876.
Musée d'Orsay 1875: Georges Bizet's opera Carmen premiers in Paris. 1876: Richard Wagner's Ring Cycle is first performed in its entirety. 1883: Robert Louis Stevenson's Treasure Island is published. 1884: Mark Twain published the Adventures of Huckleberry Finn. 1886: Strange Case of Dr Jekyll and Mr Hyde by Robert Louis Stevenson is published.
1887: Sir Arthur Conan Doyle publishes his first Sherlock Holmes story, A Study in Scarlet. 1889: Vincent van Gogh paints The Starry Night. 1889: Wincent van Gogh paints The Jungle Book is published 1895: Trial of Oscar Wilde and premiere of his play The
Importance of Being Earnest. 1897: Bram Stoker writes Dracula. 1900: L. Frank Baum publishes The Wonderful Wizard of Oz. Main articles: Romantic poetry and 19th century opens with romanticism, a movement that spread
throughout Europe in reaction to 18th-century rationalism, and it develops more or less along the lines of the Industrial Revolution, with a design to react against the dramatic changes wrought on nature by the steam engine and the railway. William Wordsworth and Samuel Taylor Coleridge are considered the initiators of the new school in England, while
in the continent the German Sturm und Drang spreads its influence as far as Italy and Spain. French arts had been hampered by the Napoleonic Wars but subsequently developed rapidly. Modernism began.[30] The Goncourts and Émile Zola in France and Giovanni Verga in Italy produce some of the finest naturalist novels. Italian naturalist novels are
especially important in that they give a social map of the new unified Italy to a people that until then had been scarcely aware of its ethnic and cultural diversity. There was a huge literary output during the 19th century. Some of the most famous writers included the Russians Alexander Pushkin, Nikolai Gogol, Leo Tolstoy, Anton Chekhov and Fyodor
Dostoyevsky; the English Charles Dickens, John Keats, Alfred, Lord Tennyson and Jane Austen; the Scottish Sir Walter Scott, Thomas Carlyle and Arthur Conan Doyle (creator of the character Sherlock Holmes); the Irish Oscar Wilde; the Americans Edgar Allan Poe, Ralph Waldo Emerson, and Mark Twain; and the French Victor Hugo, Honoré de Balzac
Jules Verne, Alexandre Dumas and Charles Baudelaire. [31] Some American literary writers, poets and novelists were: Walt Whitman, Mark Twain, Harriet Beecher Stowe, Joel Chandler Harris, and Emily Dickinson to name a few. See also: History of
photography, List of photojournalists, Photojournalists, Photojournalists, Photojournalism, and Daguerreotype One of the first photographs, produced by Nicephore Niepce in 1826 Nadar, self-portrait, c. 1860 Ottomar Anschütz, chronophotographs, produced by Nicephore Niepce in 1826 Nadar, self-portrait, c. 1860 Ottomar Anschütz, chronophotographs, produced by Nicephore Niepce in 1826 Nadar, self-portrait, c. 1860 Ottomar Anschütz, chronophotographs, produced by Nicephore Niepce in 1826 Nadar, self-portrait, c. 1860 Ottomar Anschütz, chronophotographs, produced by Nicephore Niepce in 1826 Nadar, self-portrait, c. 1860 Ottomar Anschütz, chronophotographs, produced by Nicephore Niepce in 1826 Nadar, self-portrait, c. 1860 Ottomar Anschütz, chronophotographs, produced by Nicephore Niepce in 1826 Nadar, self-portrait, c. 1860 Ottomar Anschütz, chronophotographs, produced by Nicephore Niepce in 1826 Nadar, self-portrait, c. 1860 Ottomar Anschütz, chronophotographs, produced by Nicephore Niepce in 1826 Nadar, self-portrait, c. 1860 Ottomar Anschütz, chronophotographs, produced by Nicephore Niepce in 1826 Nadar, self-portrait, c. 1860 Ottomar Anschütz, chronophotographs, produced by Nicephore Niepce in 1826 Nadar, self-portrait, c. 1860 Ottomar Anschütz, chronophotographs, produced by Nicephore Niepce in 1826 Nadar, self-portrait, c. 1860 Ottomar Anschütz, chronophotographs, produced by Nicephore Niepce in 1826 Nadar, self-portrait, c. 1860 Ottomar Anschütz, chronophotographs, produced by Nicephore Niepce in 1826 Nadar, self-portrait, c. 1860 Ottomar Anschütz, chronophotographs, produced by Nicephore Niepce in 1826 Nadar, self-portrait, c. 1860 Ottomar Anschütz, chronophotographs, produced by Nicephore Niepce in 1826 Nadar, self-portrait, c. 1860 Ottomar Anschütz, chronophotographs, produced by Nicephore Niepce in 1826 Nadar, self-portrait, c. 1860 Ottomar Anschütz, chronophotographs, chronophotographs, chronophotographs, chronophotographs, chronophotographs, chronophotographs, chronophotographs, chronophotographs, chron
Daguerre, inventor of daguerreotype process of photography, chemist Thomas Eakins, pioneer motion photographer George Eastman, inventor of roll film Hércules Florence, pioneer inventor of photographer, chronophotographer Eadweard
Muybridge, pioneer motion photographer, chronophotographer Nadar a.k.a. Gaspard-Félix Tournachon, portrait photographer Niépce, pioneer inventor of photographer William Fox Talbot, inventor of the negative / positive
photographic process. Main articles: History of art § 19th century, Western painting, and Ukiyo-e Francisco Goya, The Third of May 1808, 1814, Museo del Prado Eugène Delacroix, Liberty Leading the People, 1830, Louvre Vincent van Gogh, Self-portrait, 1889, National Gallery of Art Biscuits Lefèvre-Utile poster artwork by Alphonse Mucha, 1897 The
Realism and Romanticism of the early 19th century gave way to Impressionism and Post-Impressionism in the later half of the century, with Paris being the dominant art capital of the world. In the United States the Hudson River School was prominent. 19th-century painters included: Ivan Aivazovsky Léon Bakst Albert Bierstadt William Blake Arnold
Böcklin Rosa Bonheur William Burges Mary Cassatt Camille Claudel Paul Cézanne Frederic Edwin Church Thomas Cole Jan Matejko John Constable Camille Claudel Paul Gauguin Théodore Géricault Vincent van Gogh William Morris Francisco Goya Andō
Hiroshige Hokusai Winslow Homer Jean-Auguste-Dominique Ingres Isaac Levitan Édouard Manet Claude Monet Gustave Moreau Berthe Morisot Edvard Munch Mikhail Nesterov Camille Pissarro Auguste Renoir Ilya Repin Auguste Renoir Ilya Renoir Ilya Repin Auguste Renoir Ilya Renoir Ilya Repin Auguste Renoir Ilya Reno
Surikov James Tissot Henri de Toulouse-Lautrec Joseph Mallord William Turner Viktor Vasnetsov Eugène Viollet-le-Duc Mikhail Vrubel James Abbott McNeill Whistler Tsukioka Yoshitoshi Main articles: List of Romantic-era composers, Romantic music, and Romanticism Ludwig van Beethoven (1770–1827) Pyotr Ilyich Tchaikovsky (1840–1893) Sonata form
matured during the Classical era to become the primary form of instrumental compositions throughout the 19th century. Much of the music from the 19th century was referred to as being in the Romantic style. Many great composers lived through this era such as Ludwig van Beethoven, Franz Liszt, Frédéric Chopin, Pyotr Ilyich Tchaikovsky, and Richard
Wagner. The list includes: Mily Balakirev Ludwig van Beethoven Hector Berlioz Georges Bizet Alexander Borodin Johannes Brahms Anton Bruckner Frédéric Chopin Claude Debussy Antonín Dvořák Mikhail Glinka Edvard Grieg Scott Joplin Alexandre Levy Franz Liszt Gustav Mahler Felix Mendelssohn Modest Mussorgsky Jacques Offenbach Niccolò
Paganini Nikolai Rimsky-Korsakov Gioachino Rossini Anton Rubinstein Camille Saint-Saëns Antonio Salieri Franz Schubert Robert Schumann Alexander Scriabin Arthur Sullivan Pyotr Ilyich Tchaikovsky Giuseppe Verdi Richard Wagner 1858: The Melbourne Football Club was formed, starting the sport of Australian Rules Football 1867: The Marquess of
Queensberry Rules for boxing are published. 1872: The first recognised international football match, between England and Scotland, is played. 1891: Basketball is invented by James Naismith. 1895: Volleyball is invented. 1896: Olympic Games revived in Athens. For a
chronological guide, see Timeline of the 19th century. Main articles: 1800s, 1810s, 1820s, 1830s, and 1840s 1801: The Kingdom of Great Britain and the Kingdom of Ireland merge to form the United States; he serves until 1809. 1802: The Wahhabis of the First Saudi State sack
Karbala. 1803: William Symington demonstrates his Charlotte Dundas, the "first practical steamboat". 1804: Austrian Empire founded by Francis I. 1804: World population reaches 1 billion. 1805: The Battle of Trafalgar eliminates the French and Spanish naval fleets and allows for
British dominance of the seas, a major factor for the British East India Company; 8 February, the treaty is signed between Sultan Hussein of Johor,
Temenggong Abdul Rahman and Stamford Raffles. Farguhar is installed as the first Resident of the settlement. 1810: The University reform proves to be so successful that its model is copied around the world (see History of European research
universities). 1814: Elisha Collier invents the Flintlock Revolver. 1814: February 1 Eruption of Mayon Volcano 1815: April, Mount Tambora in Sumbawa island erupts, becoming the largest volcanic eruption in recorded history, destroying Tambora culture, and killing at least 71,000 people, including its aftermath. The eruption created global climate
anomalies known as "volcanic winter".[32] 1816: Year Without a Summer: Unusually cold conditions wreak havoc throughout the Northern Hemisphere, likely influenced by the 1815 explosion of Mount Tambora. 1816-1828: Shaka's Zulu Kingdom becomes the largest in Southern Africa. 1819: The Republic of Colombia (Gran Colombia) achieves
independence after Simón Bolívar's triumph at the Battle of Boyacá. 1819: The modern city of Singapore is established by the American Colonization Society for freed American slaves. 1820: Dissolution of the Maratha Empire. 1821-1823: First Mexican Empire, as
Mexico's first post-independence government, ruled by Emperor Agustín I of Mexico. 1822: Pedro I of Brazil declared by US President James Monroe. 1825: The Decembrists at the Senate Square 1829: Sir Robert Peel founds the Metropolitan Police
Service, the first modern police force. Emigrants leaving Ireland. From 1830 to 1914, almost 5 million Irish people emigrated to the U.S. 1831: November Uprising ends with crushing defeat for Poland in the Battle of Warsaw. 1832: The British Parliament
passes the Great Reform Act 1832. 1834-1859: Imam Shamil's rebellion in Russian-occupied Caucasus. 1835-1836: The Texas Revolution in Mexico resulted in the short-lived Republic of Texas. 1836: Samuel Colt popularizes the revolver, a six bullets firearm short
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one by one without reloading manually. 1837-1838: Rebellions of 1837 in Canada. 1838: By this time, 46,000 Native Americans have been forcibly relocated in the Trail of Tears. 1839-1860: After the First and Second Opium Wars, France, the United Kingdom, the United Kingdom, the United States and Russia gain many trade and associated concessions from China resulting in the start of the decline of the Qing dynasty. 1839-1919: Anglo-Afghan Wars lead to stalemate and the establishment of the Durand line 1842: Treaty of Nanking cedes Hong Kong to the British. 1843: The first wagon train sets out from Missouri. 1844: Rochdale Society of Equitable Pioneers establish what is considered the first cooperative in the world. 1845-1849: The Great Famine of Ireland leads to the Irish diaspora. 1848: Seneca Falls Convention in the United States and leads to the battle for women's rights convention in the United States and leads to the battle for women's rights convention in the United States and leads to the battle for women's rights convention in the United States and leads to the battle for women's rights convention in the United States and leads to the battle for women's rights convention in the United States and leads to the battle for women's rights convention in the United States and leads to the battle for women's rights convention in the United States and leads to the battle for women's rights convention in the United States and leads to the battle for women's rights convention in the United States and leads to the battle for women's rights convention in the United States and leads to the battle for women's rights convention in the United States and leads to the battle for women's rights convention in the United States and leads to the battle for women's rights convention in the United States and leads to the battle for women's rights convention in the United States and leads to the battle for women's rights convention in the United States and leads to the battle for women's rights convention in the United States and leads to the battle for women's rights convention in the United States and leads to the battle for women's rights and lea ordnance against Venice. 1850: The Little Ice Age ends around this time. 1850: Franz Hermann Schulze-Delitzsch establishes the first cooperative financial institution. Historical territorial expansion of the United States Main articles: 1850s, 1860s, 1870s, 1880s, 1890s, and 1900s For later events, see Timeline of the 20th century. 1851: The Great Exhibition in London was the world's first international Expo or World Fair. 1852: Frederick Douglass delivers his speech "The Meaning of July Fourth for the Negro" in Rochester, New York. 1857: Sir Joseph Whitworth designs the first long-range sniper rifle. 1857-1858: Indian Rebellion of 1857. The British Empire assumes control of India from the East New York. India Company. 1858: Construction of Big Ben is completed. 1859-1869: Suez Canal is constructed. The first vessels sail through the Suez Canal. 1860: Giuseppe Garibaldi launches the Expedition of the International Red Cross is followed. by the adoption of the First Geneva Convention in 1864. 1865-1877: Reconstruction in the United States; Slavery is banned in the United States by the Thirteenth Amendment to the United States Constitution. 1867: Canada is formed, via the process of Canadian Confederation. 1868: Michael Barrett is the last person to be publicly hanged in England 1869: The Suez Canal opens linking the Mediterranean to the Red Sea. A barricade in the Paris Commune, 18 March 1871. Around 30,000 Parisians were killed, and thousands more were later executed. Black Friday, 9 May 1873, Vienna Stock Exchange. The Panic of 1873 and Long Depression followed. 1870: Official dismantling of the Cultivation System and beginning of a 'Liberal Policy' of deregulated exploitation of the Netherlands East Indies. [33] 1870-1890: Long Depression in Western Europe and North America. 1871-1872: Famine in Persia is believed to have caused the death of 2 million. 1871: The Paris Commune briefly rules the French capital. 1872: Yellowstone National Park, the first national park, is created. 1874: The Société Anonyme Coopérative des Artistes Peintres, Sculpteurs, and Graveurs, better known as the Impressionists, organize and present their first public group exhibition at the Paris studio of the photographer Nadar. 1874: The Home Rule Movement is established in Ireland. 1875: HMS Challenger surveys the deepest point in the Earth's oceans, the Challenger Deep 1876: Battle of the Little Bighorn leads to the death of General Custer and victory for the alliance of Lakota, Cheyenne and Arapaho 1876: Battle of the Little Bighorn leads to the death of General Custer and victory for the alliance of Lakota, Cheyenne and Arapaho 1876: Battle of the Little Bighorn leads to the death of General Custer and victory for the alliance of Lakota, Cheyenne and Arapaho 1876: Battle of the Little Bighorn leads to the death of General Custer and victory for the alliance of Lakota, Cheyenne and Arapaho 1876: Battle of the Little Bighorn leads to the death of General Custer and victory for the alliance of Lakota, Cheyenne and Arapaho 1876: Battle of the Little Bighorn leads to the death of General Custer and victory for the alliance of Lakota, Cheyenne and Arapaho 1876: Battle of the Little Bighorn leads to the death of General Custer and victory for the alliance of Lakota, Cheyenne and Arapaho 1876: Battle of the Little Bighorn leads to the death of General Custer and Victory for the alliance of Lakota, Cheyenne and Arapaho 1876: Battle of the Little Bighorn leads to the death of General Custer and Victory for the alliance of Lakota, Cheyenne and Arapaho 1876: Battle Office Arapa may have been the world's first nationwide labour strike. 1881: Wave of pogroms begins in the Russian Empire. 1881-1882: The Jules Ferry laws are passed in France establishing free, secular education. 1883: Krakatoa volcano explosion, one of the largest in modern history. 1883: The quagga is rendered extinct. 1886: Construction of the Statue of Liberty Coca-Cola is developed. 1888: Founding of the shipping line Koninklijke Paketvaart-Maatschappij (KPM) that supported the unification and development of the colonial economy.[33] 1888: The Golden Law abolishes slavery in Brazil. 1889: Eiffel Tower is inaugurated in Paris. Studio portrait of Ilustrados in Europe, c. 1890 1889: A republican military coup establishes the First Brazilian Republic. The parliamentary constitutional monarchy is abolished. 1889-1890; Partie and in Chicago celebrating the 400th anniversary of Christopher Columbus's arrival in the New World. 1892: Fingerprinting is officially adopted for the first time. 1893: The Coremans-de Vriendt law is passed in Belgium, creating legal equality for French and Dutch intervention in Lombok and Karangasem[33] resulted in the looting and destruction of Cakranegara Palace in Mataram.[34] J. L. A. Brandes, a Dutch philologist, discovers and secures Nagarakretagama manuscript in Lombok royal library. 1898: The United States gains control of Cuba, Puerto Rico, and the Philippines after the Spanish-American War. 1898: Empress Dowager Cixi of China engineers a coup d'état, marking the end of the Hundred Days' Reform; the Guangxu Emperor is arrested. 1900-1901: Eight nations invade China at the same time and ransack Forbidden City. Born on 19 April 1897, Japanese Jiroemon Kimura died on 12 June 2013, marking the death of the last man verified to have been born in the century. [38] Subsequently, on 21 April 2018, Japanese Nabi Tajima (born 4 August 1900) died as the last person to verifiably have been born in the century. [39] Carl Friedrich Gauss Charles Darwin Victor Hugo, c. 1876 Dmitri Mendeleev Louis Pasteur, 1878 Marie Curie, c. 1898 Nikola Tesla José Rizal Jane Austen Leo Tolstoy, c. 1897 Edgar Allan Poe Jules Verne Charles Dickens Arthur Rimbaud, c. 1872 Mark Twain, 1894 Ralph Waldo Emerson Henry David Thoreau, 1861 Émile Zola, c. 1900 Anton Chekhov Fyodor Dostoevsky, 1876 John L Sullivan in his prime, c. 1882 David Livingstone 1864, left Britain for Africa in 1840 Jesse and Frank James, 1872 Sitting Bull and Buffalo Bill, in a studio portrait from 1885 Geronimo, 1887, prominent leader of the Chiricahua Apache William Bonney aka Henry McCarty aka Billy the Kid, c. late 1870s Deputies Bat Masterson and Wyatt Earp in Dodge City, 1876 Mathew Brady, self-portrait, c. 1875 Alfred, Lord Tennyson Thomas Nast, c. 1860-1875, photo by Mathew Brady or Levin Handy Mirza Ghulam Ahmad Mikhail Bakunin Søren Kierkegaard Solomon Northup Dred Scott Madam C. J. Walker Claude Monet's Impression, Sunrise (1872) gave the name to Impressionism. Paul Cézanne, self-portrait, 1880-1881 Scott Joplin Niccolò Paganini, c. 1819 Frédéric Chopin, 1838 John D. Rockefeller Timelines of modern history Long nineteenth century in film 19th century in games 19th-century philosophy Nineteenth century in film 19th century in games 19th-century philosophy Nineteenth century in film 19th century in games 19th-century philosophy Nineteenth century philosop nineteenth century History of Spain (1808-1874) History of Russia (1855-1892) Slavery in the United States Timeline of 19th-century Muslim history of the Modern Middle East. doi:10.4324/9780429495502. ISBN 9780429495502. S2CID 153025861. The 19th century is frequently characterized as a period of tension between forces of continuity and change. The reformers who advocated the adoption of European institutions and technology, have often been portrayed as the progressive elements of society courageously charting the course toward an inevitably Westernized twentieth century. Conversely, the adherents of society courageously charting the course toward an inevitably Westernized twentieth century. continuity, who viewed with alarm the dismantling of the Islamic order and sought to preserve tradition and retain the values and ideals
that had served Ottoman and Islamic society so well for so long, are sometimes portrayed as nothing but archaic reactionaries. But we should avoid these simplistic characterizations if we are to appreciate the agonizing and dangerous process of transforming an established religious, social and political worldview. ^ "The First Telephone Call". www.americaslibrary.gov. Archived from the original on 21 October 2016. Retrieved 4 March 2017. ^ Encyclopædia Britannica. ^ "The United States and the Industrial Revolution in the 19th Century". Americanhistory.about.com. 2012-09-18. Archived from the original on 2012-10-31. ^ Laura Del Col, West Virginia University, The Life of the Industrial Worker in Nineteenth-Century England Archived 2008-03-13 at the Wayback Machine ^ "Modernization - Population Change". Encyclopædia Britannica. Archived 2009-02-18 at the Wayback Machine. Encyclopædia Britannica. ^ Sailing against slavery. By Jo Loosemore Archived 2009-01 08 at the Wayback Machine. 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Retrieved from 4 The following pages link to 19th century External tools (links | edit) Century (links | edit) List of decades, centuries, and millennia (links | edit) December 6 (links | edit) Folk music (links | edit) Folk music (links | edit) Flag of the United States (links | edit) 1977 (links | edit) 1964 (links | edit) Thuggee (links | edit) History of Mali (links | edit) 1960s (links | edit) 1960s (links | edit) 1960s (links | edit) 1960s (links | edit) 1977 (links | edit) 1964 (links | edit) 1960s (links | edit) 1960 | edit) 1999 (links | edit) 1970s (links | edit) 1970s (links | edit) 1990s (links | edit) 1940s (links | edit) 1940s (links | edit) 1950s (links | edit) 1756 (links edit) 1818 (links | edit) 1918 (links | edit) 1918 (links | edit) 1917 (links | edit) 1943 (links | edit) 1943 (links | edit) 1957 (links | edit) 1957 (links | edit) 1957 (links | edit) 1957 (links | edit) 1958 (links | edit) 1958 (links | edit) 1957 (links | edit) 1958 (links | edit) 1958 (links | edit) 1958 (links | edit) 1959 (links | edit) | 250 | 500) Retrieved from "WhatLinksHere/19th century" Learning Objectives Explain work as a transfer of energy and net work done by the met force. Explain and apply the work done by the work done on a system? Energy is transferred into the system, but in what form? Does it remain in the system or move on? The answers depend on the situation. For example, if a lawn mower is pushed just hard enough to keep it going at a constant speed, then energy put into the mower by the person is removed continuously by friction, and eventually leaves the system in the form of heat transfer. In contrast, work done on a briefcase by a person carrying it up stairs is stored in the briefcase-Earth system and can be recovered at any time. In fact, the building of the pyramids in ancient Egypt is an example of storing energy in a system by doing work on the system and has the potential to do work. In this section we begin the study of various types of work and forms of energy. We will find that some types of work leave the energy of a system constant, for example, whereas others change the system in some way, such as the energy of motion. We know from the study of Newton's laws that net force causes acceleration. We will see in this section that work done by the net force gives a system energy of motion. Let us start by considering the total, or net, work done on a system. Net work is defined to be the sum of work done by all external forces—that is, net work is the work done by the net external force Fnet over a distance, d, and is given by the equation \[W {\mathrm{net}}=F {\mathrm{net}}d. onumber \] By using Newton's second law gives \ $[W_{\mathrm{nathrm}\{net}] = mad. onumber] After doing more algebraic substitution, we eventually derive the work on a system equals the change in the quantity (\frac{1}{2} m v^{2}\). \[W_{\mathrm{nathrm}\{net}] = mad. onumber \]$ $f^2 = 1$ {2} m v_{0}^{2} onumber\] The quantity \(\frac_{1}_{2} m v^{2}\) in the work-energy (KE) of a mass \(m\) moving at a speed \(v\). In equation form, the translational kinetic energy, \[\mathrm_{KE}_{1}_{2} m v^{2}\, onumber \] is the energy associated with translational motion. Kinetic energy associated with translational motion. energy is a form of energy associated with the motion of a particle, single body, or system of objects moving together. The work-energy to get an object, like a car, up to speed, but it may be a bit surprising that kinetic energy is proportional to speed squared. This proportional to speed squared that kinetic energy is proportional to speed squared. This proportional to speed squared that kinetic energy is proportional to speed squared. This proportional to speed squared that kinetic energy is proportional to speed squared. work and energy. Suppose a 30.0-kg package on a roller belt conveyor system is moving at 0.500 m/s. What is its kinetic energy is given by \ (\mathrm{KE}=\frac{1}{2} m v^{2}\). Solution The kinetic energy is given by \ $[\mathbb{K}] = \frac{1}{2} m v^{2}. onumber] Entering known values gives \\[\mathbb{K}] = 3.75 \\ \mathbb{K}] = 3.75 \\$ joule, the same as the unit of work, as mentioned when work was first defined. It is also interesting that, although this is a fairly massive packages like this without exhausting themselves. Some of the examples in this section for force is newton (N). 1 newton (N) = 1 kg*1m/s2, which can be translated to the force of 1 newton (N) over the amount of work is joule (J). 1 joule = 1 Nm = 1 kg * 1m/s2, which can be translated to the amount of work performed by a force of 1 newton (N) over the force of 1 ne a distance of 1 meter in the same direction as the force (or a component of the force). Energy - The unit for energy is joule (I). 1 joule = 1Nm = 1 kg * 1m2/s2. This is the amount of energy necessary to apply a force of 1 newton over a distance of 1 meter. Power - The unit for power is watt (W). 1 watt (W) = 1 I/s = 1 Nm/s = 1 kg * 1 m2/s3 or the power is watt (W). produced by a current of one ampere acting across a potential difference of one volt. This can be translated to the amount of work performed per second or the rate of using energy: E=mc^2 and Rest energy (energy at rest): $E = 0 - m \cdot 0c^2$ Where: $m = m \cdot 0c^2$ Where: $m = m \cdot 0c^2$ Where: $m = m \cdot 0c^2$ and $m = m \cdot 0c^2$ $m \cdot
0c^2$ E_k=\dfrac{m_0c^2} {\sqrt{1-(v/c)^2}} - m_0c^2 At very low speeds, compared to the speed of light, the classical formula for relativistic kinetic energy (above). E_k=\dfrac{m_0c^2} {\sqrt{1-(v/c)^2}} - m_0c^2 At very low speeds, compared to the speed of light, the classical formula for relativistic kinetic energy (above). $+ \frac{3}{8} \cdot 0^2 = \frac{1}{2}m \cdot 0^2 + \frac{5}{16} \cdot 0^2 + \frac{5}{16} \cdot 0^2 = \frac{1}{2}m \cdot 0^2 = \frac{1$ over a certain distance, that force does mechanical work, \$W\$. If the force is constant \$F\$ and the object it is exerted on is moved. will modify the kinetic energy. E.g. if a car accelerates from standstill with constant acceleration a (i.e. the engine will exert a constant forward force on the car), its velocity increases linearly in time, a (i.e. the engine will exert a constant forward force on the car), its velocity increases linearly in time, a (i.e. the engine will exert a constant forward force on the car), its velocity increases linearly in time, a (i.e. the engine will exert a constant forward force on the car), its velocity increases linearly in time, a (i.e. the engine will exert a constant forward force on the car), its velocity increases linearly in time, a (i.e. the engine will exert a constant forward force on the car), its velocity increases linearly in time, a (i.e. the engine will exert a constant forward force on the car), its velocity increases linearly in time, a (i.e. the engine will exert a constant forward force on the car), its velocity increases linearly in time, a (i.e. the engine will exert a constant forward force on the car), its velocity increases linearly in time, a (i.e. the engine will exert a constant forward force on the car), its velocity increases linearly in time, a (i.e. the engine will exert a constant forward force on the car), its velocity increases linearly in time, a (i.e. the engine will exert a constant forward force on the car), its velocity increases linearly in time, a (i.e. the engine will exert a constant forward force on the car), its velocity increases linearly in time, a (i.e. the engine will exert a constant forward force on the car), its velocity increases linearly in time, a (i.e. the engine will exert a constant forward force on the car). is applied over a certain distance, that force does mechanical work, \$W\$. If the force is constant \$F\$ and the object it is exerted on is moved by a distance \$\Delta x\$, then \$W=F\Delta x\$, then \$W=F\Delta x\$. If the force is not constant but a function of the position, this turns into an integral: \$\$W = \left(x_1\right)^{x_2}F(x)\ change. Depending on how the work is applied, it will increase (or decrease) a specific kind of energy. If the work leads to a change in the (absolute) velocity, it will modify the kinetic energy. E.g. if a car accelerates from standstill with constant acceleration \$a\$ (i.e. the engine will exert a constant forward force on the car), its velocity increases linearly in time, v(t)=v and its position quadratically, $x(t)=\sqrt{1}{2}$ at 1^2 , it went over a distance $x_1=x(t_1)=x(t_1$ SystemSymbollbfConversions 1 lbf in is equal to ... SI units 4.448222 N CGS units 444,822.2 dyn Absolute English System 32.17405 pdl Look up pound-force or pound in Wiktionary, the free dictionary. The pound of force or pound-force (symbol: lbf,[1] sometimes lbf,[2]) is a unit of force used in some systems of measurement, including English avoirdupois pound on the surface of Earth. Since the 18th century, the unit has been used in low-precision measurements, for which small changes in Earth's gravity (which varies from equator to pole by up to half a percent) can safely be neglected.[4] The 20th century, however, brought the need for a more precise definition, requiring a standardized value for acceleration due to gravity. The pound-force is the product of one avoirdupois pound (exactly 0.45359237 kg) and the standard values of acceleration due to gravity. The pound-force is the product of one avoirdupois pound (lb) result in a pound-force equal to 32.174049 ft·lb/s2 (4.4482216152605 N).[b] 1 lbf = 1 lb × g n = 1 lb × 9.80665 m s 2 / 0.3048 m ft ≈ 1 lb × 32.174049 ft s 2 ≈ 32.17404 $\{ \{ b\} \} \ 9.80665 , \{ tfrac \{t\} \} \} \ 9.80665 , \{ tfrac \{t\} \} \ 9.80665 , \{ tfrac \{t\} \} \} \ 9.80665 , \{ tfrac \{t\} \} \ 9.80665 , \{ tfrac \{t\} \} \} \ 9.8066$ $sug \cdot ft s 2 \{\displaystyle {\begin{aligned} 1\, {\text{s}}^{2}}\}\$ Units of force vte newton dyne kilogram-force, kilopond pound-force poundal 1 N = 1 kg m/s2 = 105 dyn ≈ 0.10197 kp ≈ 0.22481 lbF ≈ 7.2330 pd 1 dyn = 10-5 N = 1 g·cm/s2 $\approx 1.0197 \times 10-6$ kp $\approx 2.2481 \times 10-6$ lbF $\approx 7.2330 \times 10-5$ pdl 1 kp = 9.80665 dyn ≈ 0.45359 kp = gn \times 1 lb ≈ 32.174 pdl 1 pdl ≈ 0.138255 N ≈ 13825 dyn ≈ 0.031081 lbF = 1 lb·ft/s2 The value of gn (9.80665 m/s2) as used in the official definition of the kilogram-force is used here for all gravitational units. Main article: Foot-pound-second system In some contexts, the term "pound" is used almost exclusively to refer to the unit of mass. In those applications, the preferred unit of mass is the slug, i.e. lbf·s2/ft. In other contexts, the unit "pound" refers to all gravitations, the preferred unit of mass is the slug, i.e. lbf·s2/ft. In other contexts, the unit "pound" refers to all gravitations applications, the preferred unit of mass is the slug, i.e. lbf·s2/ft. In other contexts, the unit "pound" refers to all gravitations applications, the preferred unit of mass is the slug, i.e. lbf·s2/ft. In other contexts, the unit "pound" refers to all gravitations applications applications applications applications applications are supplied to the unit of mass is the slug, i.e. lbf·s2/ft. In other contexts, the unit "pound" refers to all gravitations applications applications applications applied to the unit of mass is the slug, i.e. lbf·s2/ft. In other contexts, the unit "pound" refers to all gravitations applied to the unit of mass is the slug, i.e. lbf·s2/ft. In other contexts, the unit "pound" refers to all gravitations applied to the unit of mass is the slug, i.e. lbf·s2/ft. In other contexts, the unit "pound" refers to all gravitations applied to the unit of mass is the slug applied to the unit of mass is the slug applied to the unit of mass is (pound-mass) on Earth's surface is approximately equal to the force unit (pound-force). This is convenient because one pound mass exerts one pound force due to gravity. Note, however, unlike the other systems the force unit is not equal to the mass unit multiplied by the acceleration unit[11]—the use of Newton's second law, $F = m \cdot a$, requires another factor, gc, usually taken to be 32.174049 (lb·ft)/(lbf·s2). "Absolute" systems are coherent systems of units: by using the slug as the unit of mass, the "gravitational" FPS system (left column) avoids the need for such a constant. The SI is an "absolute" metric system with kilogram and meter as base units. Further information: thrust is the unit of mass, the "gravitational" FPS system (left column) avoids the need for such a constant. The SI is an "absolute" metric system with kilogram and meter as base units. Further information: thrust is the unit of mass, the "gravitational" FPS system (left column) avoids the need for such a constant. The SI is an "absolute" metric system with kilogram and meter as base units. an alternative name for pound-force in specific contexts. It is frequently seen in US sources on jet engines and rocketry, some of which continue to use the FPS notation. For example, the thrust produced by each of the Space Shuttle's two Solid Rocket Boosters was 3,300,000 pounds-force (14.7 MN), together 6,600,000 pounds-force (29.4 MN).[12][13] Foot-pound (energy) Ton-force Kip (unit) Mass in general relativity Mass in special relativity Mass in avoirdupois pound is defined to be exactly 0.45359237
kg. ^ IEEE Standard Letter Symbols for Units, Customary Inch-Pound Units, and Certain Other Units), IEEE Std 260.1™-2004 (Revision of IEEE Std 260.1™-2004 LCCN 77024142, archived from the original on 2019-12-06, retrieved 2017-08-03.:257 ^ "Mass and Weight". engineeringtoolbox.com. Archived from the original on 2010-08-18. Retrieved 2010-08-03. ^ Acceleration due to gravity varies over the surface of the Earth, generally increasing from about 32.1 ft/s2 (9.78 m/s2) at the equator to about 32.3 ft/s2 2018. Retrieved 16 February 2018. Thrust: combined thrust 29.36 MN SL (maximum thrust at launch reducing by 1/3 after 50 s) ^ Richard Martin (12 January 2001). "From Russia, With 1 Million Pounds of Thrust". wired.com. Archived from the original on 25 September 2019. Retrieved 25 November 2019. Obert, Edward F. (1948). Thermodynamics. New high stamina or energy can work for lengthy periods of time. In karate or boxing, we talk about force, work and energy and also about the work power energy formulas. Force and Its TypesA push or pull on an object is referred to as force. Force is utilised not just to move but also to halt an object. Force is used to affect an object's direction and position. It has the ability to change the speed of a moving object. (Image will be uploaded soon) There are several types of forces and some of which are explained below: Muscular Force: It is defined as any force applied by muscles such as the arms or legs. (Image will be uploaded soon) Frictional Force: The force exerted when two surfaces come into contact is known as friction. Friction acts on all moving things, however the force of friction always works in the opposite direction to the movement of the body. (Image will be uploaded soon) Gravitational Force: The force that pulls objects downwards towards the earth's core is known as gravity. It means all the objects try to move towards the centre of earth when allowed to fall freely. (Image will be uploaded soon) What is Work? Work is defined as everything that object(Image will be uploaded soon)Energy and Its TypesEnergy can be defined as the ability of an object to do work. It is of two types:Kinetic energy. Mathematically, we can write the kinetic energy expression as:\$K.E.=\dfrac{1} {2}mv^2\$Here, \$m\$ = mass of the moving body\$v\$ = velocity of the body due to its motionPotential Energy: The energy of the body possessed by virtue of its position is known as potential energy. Mathematically, we can express the potential energy as\$P.E.=mgh\$(Image will be uploaded soon)PowerIt is defined as the ratio of work done and time Mathematical, we can write it as $P=\d$ fracWthere, \$W\$ = work done\$t\$ = time during which work is done(Image will be uploaded soon)Work Energy Principle or Work Energy Of the body. Mathematically, we can write it asplication of work energy Principle or Work Energy Prin as\$W=\Delta K=\dfrac $\{1\}\{2\}$ mv 2 _f\dfrac $\{1\}\{2\}$ mv 2 _i\$Here, \$\Delta K\$ = change in kinetic energy, \$v\ i\$ = initial velocity of the body. Solved QuestionsWhat are the units of work and energy? Ans: The standard units of measurement for work and energy are the same i.e., Joule (J). As work can be written as a product of force and displacement, so we can also write the unit of work as Newton metre. What is the difference between force and energy? Ans: A force is any activity that tends to change a body's condition of rest or motion. Energy is a system attribute that measures a system's ability to accomplish work, for example potential and kinetic energy. While catching cricket ball of mass 100 g moving with a velocity of 10 m/s. find the work done in catching the ball, v_i = 10 m/sFinal velocity of the ball, v_i = 10 $dfrac\{1\}\{2\}mv^2_i$ \$After putting the values of the quantities, we get:\$W=\dfrac\{1\}\{2}\times (0.1) (0)^2\$W= 0- 5=-5J\$Hence, the amount of work done in catching a ball is -5J.Fun FactsEverything around us is controlled by some kind of force, for example, the revolution of Earth around the Sun and Moon around the Sun around us is controlled by some kind of force, for example, the revolution of Earth around the Sun and Moon around the Sun around the Sun around us is controlled by some kind of force, for example, the revolution of Earth around the Sun around the Sun around the Sun around us is controlled by some kind of force, for example, the revolution of Earth around the Sun around Earth is done in a proper orbit because of the presence of gravitational force. You are able to write on paper because of the presence of frictional force. SummaryIn this post, we have mentioned various concepts like work, force and its types and also about the concept of power. We have discussed the concept of work energy principle and also solved numericals on work energy theorem. Learning By DoingAt the railway station, you have noticed the coolie is putting up the luggage on his head. In that case, think about whether the work is done or not. If not then why? One of the fundamental laws of the universe is that energy is neither created nor destroyed — it only changes forms m\times v^2\) where KE is kinetic energy in joules, m is mass in kilograms and v is velocity in meters per second. Newton's three laws of motion form the basis for classical physics. The first law defines force as that which causes motion, and the second law relates the force acting on an object to the acceleration it undergoes. If a force (F) accelerates a body through a distance (d), it does an amount of work (W) equal to the force multiplied by the distance times a factor that accounts for the angle between them (θ, the Greek letter theta). As a mathematical expression, this means: \(W=Fd\cos {\theta}\) The metric units for force are newtons, those for distance are meters and those for work are newtonmeters, or joules. Energy is the capacity for doing work, and it is also expressed in joules. An object in motion possesses its energy of movement, which is equivalent to the work that would be required to bring it to rest. This is called its kinetic energy, and it is dependent on the square of the object's velocity (v) as well as one half of its mass (m). An object at rest in Earth's gravitational field possesses potential energy by virtue of its altitude; if it were to fall freely, it would gain kinetic energy equal to this potential energy. Potential energy is dependent on the object's mass, its height (h) and the acceleration due to gravity (g). Mathematically, this is: \(PE=mgh\) The calculation of energy in electrical systems depends on the amount of current flowing through a conductor (I) in amperes, as well as on the electrical potential, or voltage (V), driving the current, in volts. Multiplying these two parameters gives the amount of electrical energy in the system, in joules. The mathematical expression for electrical energy in a conducting circuit is: $(E_e=Pt=VIt)$ According to this relationship, leaving a 100-watt lightbulb burning for one minute expends 6,000 joules of energy. This is equivalent to the amount of kinetic energy a 1-kilogram rock would have if you dropped it from a height of 612 meters (ignoring air friction). The light we see is an electromagnetic phenomenon that has energy by virtue of the vibrations of packets of waves called photons. German physicist Max Planck determined that the energy of a photon is proportionality (h), which is called Planck's constant in his honor. The expression for the energy of a photon is thus: \(E_p=hf\) According to Albert Einstein's Theory of Relativity, each particle of matter has inherent potential energy proportional to the particle's mass and the square of the speed of light (c). The relevant expression is: \(E_m=mc^2\) Einstein's calculations were corroborated by the development of the atomic bomb. Deziel, Chris. "What Is The Formula For Energy?" sciencing.com, . 13 December 2020. APA Deziel, Chris. What Is The Formula For Energy? last modified August 30, 2022. When a force is applied over a certain distance, that force does mechanical work, \$W\$. If the force is constant \$F\$ and the object it is exerted on is moved by a distance \$\Delta x\$, then \$W=F\Delta x\$, t not important how long (in time) the force is exerted. E.g. a cup on a table will feel the constant force due to gravity but is won't move (because the table is pushing it upwards with an equal but opposite force) so there is no work done on that cup, meaning that its energy content won't change. Work is basically just energy change. Depending on how the quadratically, $x(t)=\frac{1}{2}at^2$. After a time t_1 , it went over a distance $x_1=x(t_1)=\frac{1}{2}at^2$. At time t_1 , it went over a distance t_2 , it went over a distance t_1 , it went over a distance t_2 , it went over a distance t_1 , it went over a distance t_2 , it long as you follow the license terms. Attribution — You must give appropriate credit, provide a link to the license, and indicate if changes were made. You must give appropriate credit, provide a link to the license, and indicate if changes were made. You must give appropriate credit, provide a link to the license, and indicate if changes were made. contributions under the same license as the original. No additional restrictions — You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits. You do not have to comply with the license for elements of the material in the public domain or where your use is permitted by an applicable exception or limitation. No warranties are given. The license may not give you all of the permissions necessary for your intended use. For example, other rights such as publicity, privacy, or moral rights may limit how you use the material. Work, Energy and Power are fundamental concepts of Physics. Work is said to be done when a force (push or pull) applied to an object causes a displacement of the object. We
define the capacity to do the work done per unit of time. This article discusses work, energy and power in detail. For work done by a force acting or an object is equal to the magnitude of the force multiplied by the distance moved in the direction of the force. Work has only magnitude and no direction. Hence, work is a scalar quantity. The work done by a force is defined to be the product of the component of the force in the direction of the displacement and the magnitude of this displacement. (\begin{array}{l}W=F\cos\Theta=\vec{f}\vec{d}\end{array} \) Where W is the displacement and F cos\theta is the displacement, there is no displacement, there is no displacement and F cos\theta is the displacement and F cos\theta is the displacement and F cos\theta is the displacement. We understand from the work done, F is the displacement and F cos\theta is the displacement and F cos\theta is the displacement. how large the force is. To summarize, we can say that no work is done if: the displacement is zero the force and displacement are mutually perpendicular to each other. Can the work done be negative? Watch the video and find out! The SI unit of work is Joule (J). For example, if a force of 5 newtons is applied to an object and moves 2 meters, the work done will be 10 newton-meter or 10 Joule. It should be noted that $1 J = 1 N \cdot m = 1 kg \cdot m^2/s^2$. An object is horizontally dragged across the surface by a 100 N force acting parallel to the surface. Find out the amount of work done by the force in moving the object through a distance of 8 m. Solution: Given: F = 100 N, G = 8 m Since F = 100 N, G = 8 m Since G = 100 N, G = 8 m Since G = 100 N, Gare in the same direction, θ = 0, [θ is the angle of the force to the direction of movement], therefore W = FdCos θ W = 100 x 8 x Cos 0 W = 800 J [Since Cos 0 = 1] Related Concepts Introduction To Work Energy Can neither be created nor destroyed, and it can only be amount of work done. Some other types of energy Radiant energy Mechanical energy Elastic energy The SI unit of energy Elastic Related Concepts Different Forms Of Energy Types of Energy Types of Energy Watch the video and solve NCERT exercise questions in the context and the available information. We can define power as the rate of doing work, and it is the amount of energy consumed per unit of time. As discussed, power is the rate of doing work. Therefore, it can be calculated by dividing work done by time. The formula for power doesn't have any direction, it is a scalar quantity. The SI unit of power is Joules per Second (J/s), which is termed as Watt. Watt can be defined as the power needed to do one joule of work in one second. The unit Watt is dedicated in honour of Sir James Watt. the developer of the steam engine. Read the article below to learn the SI unit of power in detail. A garage hoist lifts a truck up 2

J/s = 1308 W. Related Concept Electrical Energy and Power What is the relationship between work, energy and power? What happens to the energy as work is done? How does work affect an object's energy? How are work, energy and power related to

component of the force in the direction of force as follows $W = F \times d$ Unit The SI unit of work is the Joule (J) Definition Energy is defined as the capacity to do work. Formula The energy stored in an object due to its position and height is known as potential energy and is given by the formula: P.E. = mgh Unit The SI unit of energy is Joules (J). Definition Power is Watt (W). Work is the energy needed to apply a force to move an object a particular distance Power is the rate at which that work is done. The unit of energy is Joule. The unit of power is Watt. Power is a scalar quantities. Watch this fun and engaging rapid fire session based on the topic Work, Energy and Power! Work, Power and Energy is one of the important topics of JEE Main and JEE Advanced, watch the video and understand the type of questions asked from this topic! Stay tuned to BYJU'S and Fall in Love with Learning! Put your understanding of this concept to test by answering a few MCQs. Click 'Start Quiz' to begin! Select the correct answer and click on the "Finish" buttonCheck your score and answers at the end of the

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