

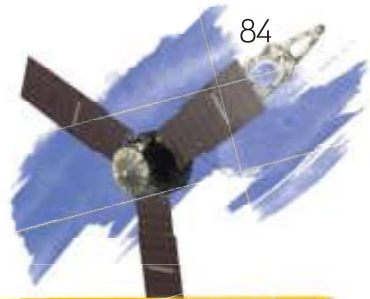


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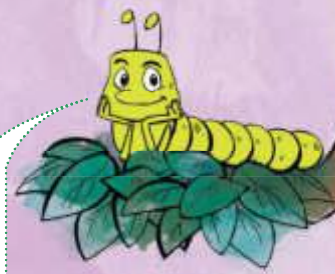
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Out of this world!

Hi! Here's Knowy again.
Let's begin our trek through Quiz Land this year with a quick recap of some of the amazing records. How many of these can you name correctly?



Sputnik 1: the first artificial satellite placed in the earth's orbit



U.S. Apollo Lunar Roving Vehicle used in three missions on the moon in 1971 and 1972



Lake Baikal: the deepest freshwater lake



Caspian Sea: the largest inland sea



Angel Falls: the highest waterfall



Ojos del Salado: the highest active volcano

1. The hottest planet: _____
2. The densest planet: _____
3. The first satellite launched in space: _____
4. The first pair to climb to the top of Mount Everest: _____
5. The largest ocean: _____
6. The largest volcano in the solar system: _____
7. The longest river: _____
8. The biggest island: _____
9. The largest hot desert: _____
10. The tallest grass: _____
11. The biggest seed: _____
12. The longest seaweed: _____
13. The largest living animal: _____
14. The biggest living fish: _____
15. The bird with the longest wingspan: _____
16. The most spoken language: _____
17. The largest country: _____
18. The longest mountain chain: _____
19. The tallest bird: _____



The mighty dinosaurs



Let's explore the world of dinosaurs.

One of the largest herbivorous dinosaurs, **Brachiosaurus** lived 150–130 million years ago. It weighed nearly 80 metric tonnes and was 25 m long. Standing at a height of 12 m, it had an immensely long neck and a short tail. Its nostrils were located above its eyes. Having longer forelimbs enabled it to browse through the branches of tall trees.



A herbivore, **Stegosaurus** is also known as a 'roof lizard'. It had two rows of bony plates along its back, which helped it regulate its body temperature and also defend against carnivorous dinosaurs. It had short forelimbs, and walked with its head close to the ground with its spiked tail held up in the air.



Also known as the 'king of the tyrant lizards', **Tyrannosaurus rex** was a bipedal carnivorous dinosaur. It attained a maximum height of 6.5 m and a length of 12 m. Its jaws were powerful enough to crush bones and extract bone marrow. It had one of the most powerful bites with the force equivalent to 3 tonnes. Having extremely enhanced predatory characteristics, such as good sense of smell and excellent hearing capabilities, helped it become one of the fiercest predators.



Velociraptor, a carnivorous dinosaur, existed 99–65 million years ago. Having hollow bones enabled it to run at a speed of 39 kmph. It possessed extremely large claws on each foot and its tail helped it balance while it slashed at its prey. With a length of 1.8 m and weight of 45 kg, **Velociraptor** was an agile predator of small herbivores.

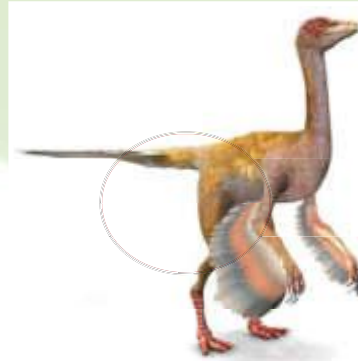




Also known as the 'giant southern lizard', **Giganotosaurus** existed 95 million years ago. Considered to be the king of dinosaurs by some, the *Giganotosaurus* grew to a length of 15 m. Believed to have hunted in packs, it preyed on herbivorous dinosaurs. It had a powerful jaw with teeth having serrated edges.



Caudipteryx is also known as the 'feathered dinosaur' as it looked like a bird. Its arms were covered in feathers and it had a fan-like tail. The small dinosaur could grow up to 1 m in length and 0.7 m in height. It possessed sharp claws and a beak with sharp teeth.



Titbits

Scientists have found a way to measure the age of dinosaurs by studying their bones. They study the growth rings inside the fossilized bones, a technique similar to the one used to measure the age of trees. But it is not a foolproof method for all species because, in the case of some species, their bones grew continuously without any neat growth rings.

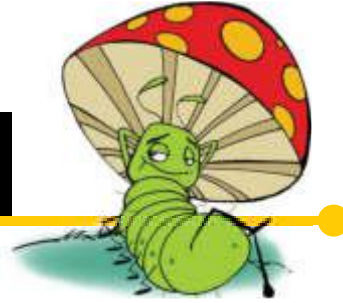
Quick quiz

Fill in the blanks.

1. _____ was the first dinosaur to be described and named.
2. _____ coined the name 'dinosaur' in 1842.
3. The extinction of dinosaurs happened about _____ million years ago.
4. A _____ studies fossils of animals.



Ruling the world



Find below 9 ruling monarchs. By using the answer options given in the help box, identify the countries they belong to.



SIR HAJI HASSANAL BOLKIAH
MU'IZZADDIN WADDAULAH

1. _____



QABOOS BIN SAID

2. _____



KING SALMAN

3. _____



SHEIKH TAMIM IBN
HAMAD AL THANI

4. _____



JIGME KHESAR NAMGYEL
WANGCHUCK

5. _____



ABDULLAH II

6. _____



QUEEN MARGRETHE II

7. _____



FELIPE VI

8. _____



KING HAMAD BIN
ISA AL KHALIFA

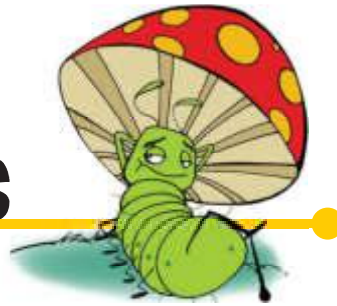
9. _____

Bhutan	Oman	Denmark	Saudi Arabia	Qatar
Brunei	Bahrain	Spain	Jordan	





Sports legends



Let us read about legendary sportspeople whose performances have thrilled us and inspired millions of others to strive hard and excel.



1. Nicknamed 'Lightning Bolt', Jamaican sprinter **Usain Bolt** won three gold medals (in the 100 m race, the 200 m race, and the 4 × 100 m relay race) in an unprecedented three straight Olympic Games (2008, 2012, and 2016), and he is widely considered the greatest sprinter of all time.



2. **Pelé**, famous as 'Black Pearl', was gifted with great vision, speed, and balance. He led the Brazilian national football team to three world cup victories, in 1958, 1962, and 1970. He mastered control over the ball and could score precisely using either foot or even his head. Throughout his career he played 1,363 matches in total and was able to score 1,281 goals.



3. **Michael Schumacher** is a German race-car driver, who holds the record of winning the most Formula 1 (F1) Grand Prix race victories (91) and F1 series championships. He won five consecutive F1 world championships (2000–2004) and seven in total.



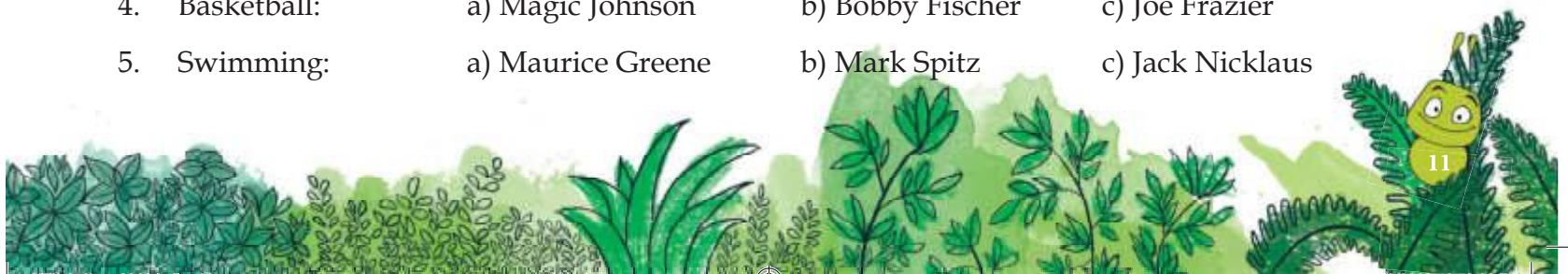
4. American basketball player **Michael Jordan**, nicknamed as 'Air Jordan', is among the greatest players in the history of the game. Jordan was the top scorer of the National Basketball Association (NBA) for a record-breaking ten seasons. He was named the NBA's most valuable player (MVP) in 1988, 1991, 1992, 1996, and 1998.



5. American swimmer **Michael Phelps** is the most successful athlete in Olympic history. At the 2008 Beijing Olympics, he won eight gold medals. At the 2016 Olympic games in Brazil, he won five gold medals and one silver medal. In his entire career he has won 28 medals, which include 23 gold.

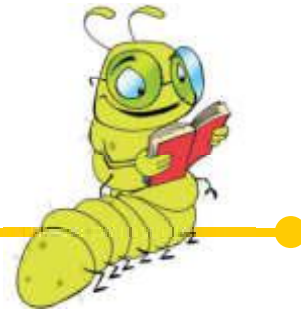
Can you identify the sportspersons who have been exceptional in the sports given below?

- | | | | |
|---------------------|-----------------------|--------------------|-------------------|
| 1. Track and Field: | a) Tiger Woods | b) Lance Armstrong | c) Jesse Owens |
| 2. Football: | a) Hank Aaron | b) LeBron James | c) Diego Maradona |
| 3. Boxing: | a) Sugar Ray Robinson | b) Carl Lewis | c) Jim Thorpe |
| 4. Basketball: | a) Magic Johnson | b) Bobby Fischer | c) Joe Frazier |
| 5. Swimming: | a) Maurice Greene | b) Mark Spitz | c) Jack Nicklaus |





Awesome body facts

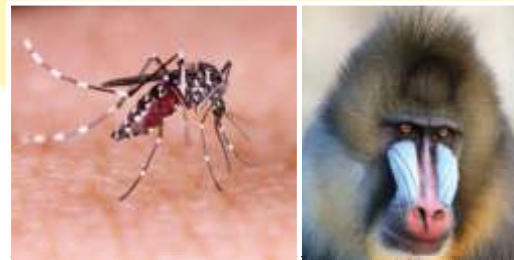


Read about the wonderful body parts of animals, and how animals use them to suit their specific needs.

Insects have compound **eyes**, which do not provide them with a clear picture of the world but enable them to detect movement very easily. This is why it is difficult to catch a fly without disturbing it. Cats and some other hunting animals have eyes facing forward, enabling them to look at an object with both eyes at the same time. The brain of a cat superimposes the image from each eye and provides an accurate picture of the position of its prey. Animals that hunt at night have more rods or light-sensitive cells in their retinas, which work better when the light is poor.



An elephant's **nose** is joined with its upper lip, forming the trunk. An elephant sucks water through its trunk and uses it to pour water into its mouth or over its body to take a shower. In some insects, an elongated sucking tube called proboscis is present. The shape of a dog's nose affects its ability to detect scents. Dogs with longer and broader noses make the best trackers. Some animals have colourful noses to communicate with each other. The male mandrill has a brightly coloured nose with scarlet along the bridge and end. This feature helps other mandrills to determine its sex.



Hawks are predators which are known for their sharp **vision**. They catch their prey by chasing it. Chasing takes both effort and time to make a successful capture. So, it is necessary for predators to concentrate on species that will provide enough nutrition to compensate for the energy loss while chasing. This is the reason why hawks prefer to eat birds and rodents rather than insects.



A male rhinoceros beetle has been aptly named because it has horns much like those of the rhinoceros.



Some animals use their **tongues** for hunting. The alligator snapping turtle from North America lays motionless and waits for a fish to swim into its mouth, and then closes its jaws. The fish are lured by the turtle's tongue, mistaking it to be a worm. Chameleons have long tongues, which they can shoot out of the mouth to catch insects with great accuracy and speed. Cats use their tongues like a ladle, expanding them at the tip to lap up their drink easily. Their tongues have a rough surface which helps to remove dead hair while grooming.

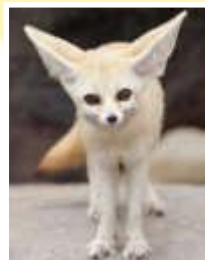




The alligator hunts its prey by lying still and waiting. This method requires very little energy and effort. The chances of getting food are minimum, but enough to meet energy demands of the **cold-blooded** alligator, who can get by with infrequent meals. Most ambush hunters are generally small because a successful hunt depends upon their not being detected.



Blue whales produce sounds that can travel for hundreds of miles. The large **ears** of the fennec fox helps it to detect its prey in a desert, where food may be very scarce. In some mammals, such as the African elephant, the earflaps are very large. The elephant flaps its ears to stay cool.



Quick quiz

Here are some questions on the human body. Answer them correctly.

1. What are the three main kinds of joints? _____
2. What are floating ribs? _____
3. A horseshoe-shaped bone is situated between the chin and the thyroid cartilage in the anterior midline of the neck. What is it known as? _____
4. What are the small finger-like projections which line the small intestine called? Through these projections, the basic nutrients in the food are taken up by the body. _____
5. In 1628, who proved that blood circulates through the body and that the heart is responsible for this circulation? _____
6. What are the branched projections present in a neuron, responsible for electrochemical stimulation between nerve cells, called? _____



Life in the desert



Identify these desert plants and animals which have adapted themselves to desert conditions. You can pick your answers from the help box on the next page.



1. All cacti are succulents, which means they store water in their leaves, stems, or roots. This cactus is one such succulent that stores water. On storing water, its weight increases so much that a large specimen can weigh up to several hundred pounds. _____

2. This cactus gets its name from the wisps of whitish hair along its stem, which provide shade and prevent water loss. _____



3. Since this cactus, like many desert plants, stores water in its spongy tissues, animals like to eat it for the moisture. The thorns keep these plants safe from many animal predators. _____

4. This animal has widely spread hooves and feet, adapted to walking on soft sand. It is also equipped with a highly reflective coat and an ability to extract all the water it needs from plants. _____



5. The hook-shaped spines of this cactus help divert heat and provide shade to the growing tip of the plant. _____

6. This desert rat has remarkably efficient kidneys. It obtains water from the leaves of the salt bush. When food is abundant, it accumulates a layer of fat in its body and obtains energy from this fat when food is scarce. _____



How did these areas become deserts?

Titbits

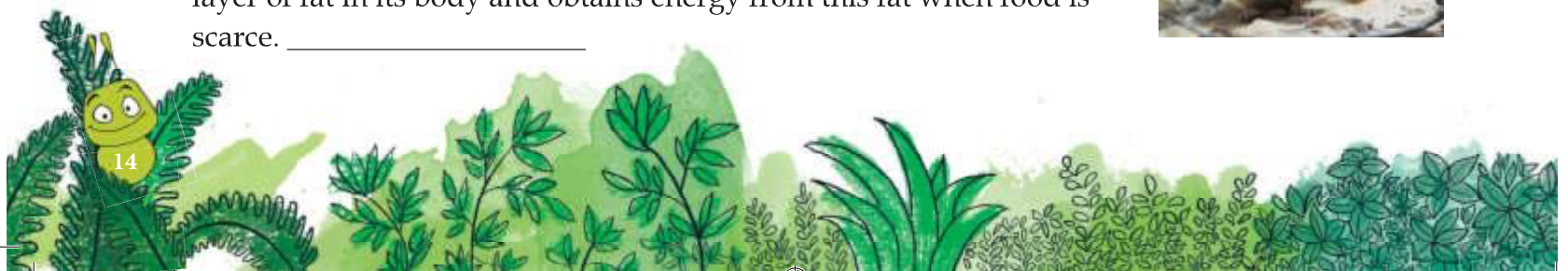


Many ancient rock paintings in African and Asian deserts show giraffes, antelopes, and other grazing animals, that could not have survived in the present desert conditions. This suggests that those areas were once fertile.

Evidence of ancient lakes and forests can also be found in the world's deserts.



An ancient rock painting in the Sahara Desert





7. This slow-growing, large cactus has a spongy inner layer that helps it to evenly distribute the moisture. It has shallow and wide-ranging roots, through which it can collect moisture from a large area. As it grows slowly, it expends less energy, food, and water. _____



8. This creature is a fox-like animal that lives in the Sahara and hunts at night. It is characterized by its large ears, small size, and a thick, long, whitish to sand coloured fur with a black-tipped tail. _____

- | | | | |
|--------------|---------------------|-----------------|----------------|
| fat sand rat | prickly pear cactus | fishhook cactus | barrel cactus |
| fennec | addax | saguaro | old man cactus |

How much do you know about these desert people? You can choose your answers from the help box.



1. These people of the Kalahari Desert survive by hunting and gathering edible plants and insects. They rarely drink water and get most of the water they need from plant roots and desert melons.



2. These are nomadic people of the Sahara Desert, living in the northern reaches of Mali, near Timbuktu and Kidal. They are called 'blue men of the desert' because of their blue-coloured veils, which protect them from the harsh desert wind and sand.



3. They are the nomadic tribes from the Arabian Peninsula, mainly Saudi Arabia. They are excellent trackers and can recognize animal and human tracks. They can find their way in the desert and do not need a map or compass.

- | | | |
|----------|------------|---------|
| Bedouins | San people | Tuaregs |
|----------|------------|---------|



In the desert, sound travels a long way because there is little other noise. Animals that hunt here usually have very large ears. This helps them to trap sound waves and track down food easily.





In your genes



Do you and your mother have the same eye colour? Is your hair as curly as your father's? Such similarities may be explained through genetics. Genetics is the study of heredity, or how certain characteristics pass from parents to their young ones.

Write T for the sentences which are true and F for those which are false.

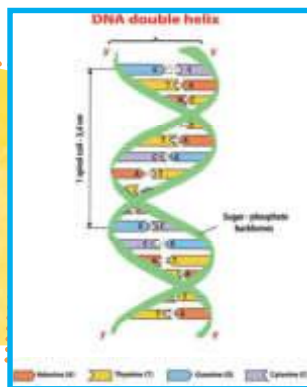
1. Genes exist in our cells.
2. All genes of a person are equally dominant.
3. Humans usually have 48 chromosomes.
4. In genetics, cloning is the process of creating an organism that is an exact replica of another.
5. The cell is the smallest self-contained, living unit.
6. Austrian botanist Gregor Mendel studied garden pea plants to establish his laws of inheritance.



Gregor Mendel—pioneer of classical genetics

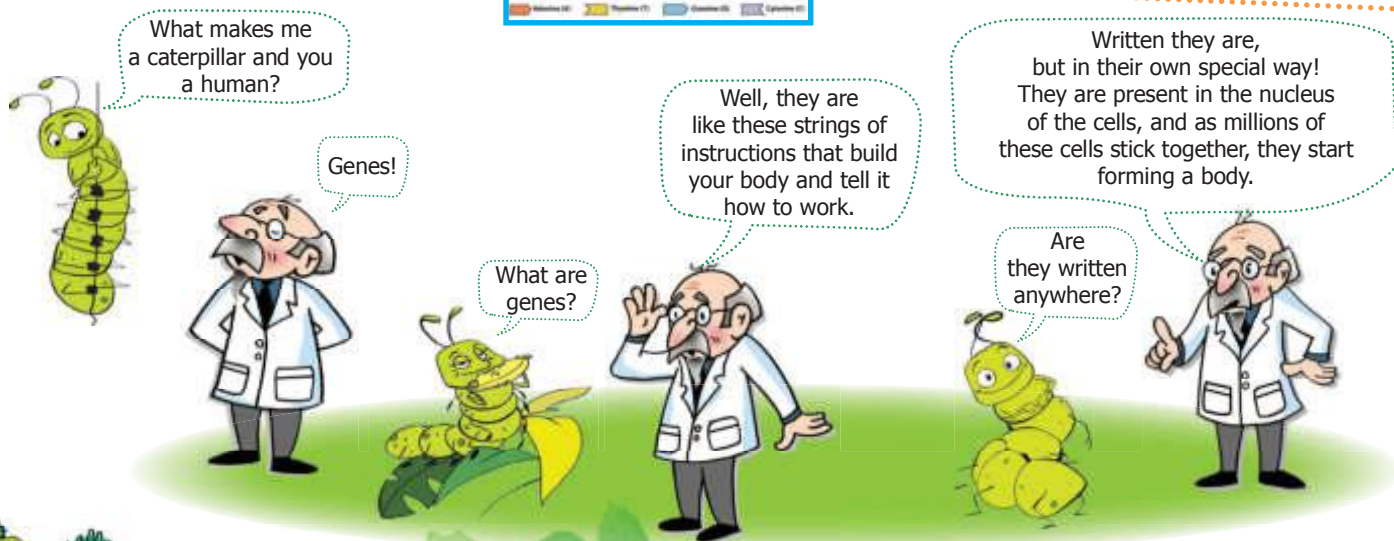
Titbits

DNA is stored in the cell nucleus. Its structure is like a twisted ladder with four different types of rungs. The rungs are made up of four different molecules called bases, occurring in fixed pairs.



Titbits

In 1953, James Watson and Francis Crick started studying the basics of how genes work and how they copy themselves. They discovered the structure of DNA, which works like a computer program and stores the information about formation of new cells.





Fill in the blanks. Choose your answers from the help box.

1. In the middle of a cell is its control centre, the _____. It sends instructions to the rest of the cell.
2. Cells of the same type group together to form _____.
3. _____ is a red-coloured liquid tissue.
4. _____ is stored in the cell nucleus.
5. Even though you have an _____ twin, your DNA is unique.
6. Inside the nucleus the DNA is found in thread-like structures called _____.
7. A chromosome is a thread-like structure inside the cell that controls _____.
8. DNA, one of the largest known molecules, consists of two long thin strands that are wound around each other to form a spiral. This special structure is called a _____.
9. _____ was the first cloned sheep.
10. _____ are unique to each person, even identical twins.

Titbits...

Humans are 99.9% genetically identical—only 0.1% of our genetic make-up differs.

chromosomes	identical
tissues	double helix
fingerprints	blood
nucleus	heredity
Dolly	DNA

Titbits...

Genetic terms

Base: A building block of DNA

Gene mapping: Locating the positions of genes in a chromosome

Mutation: An inheritable change resulting from an alteration in DNA

Dominant: Greater influence by one of a pair of genes that affect the same inherited character

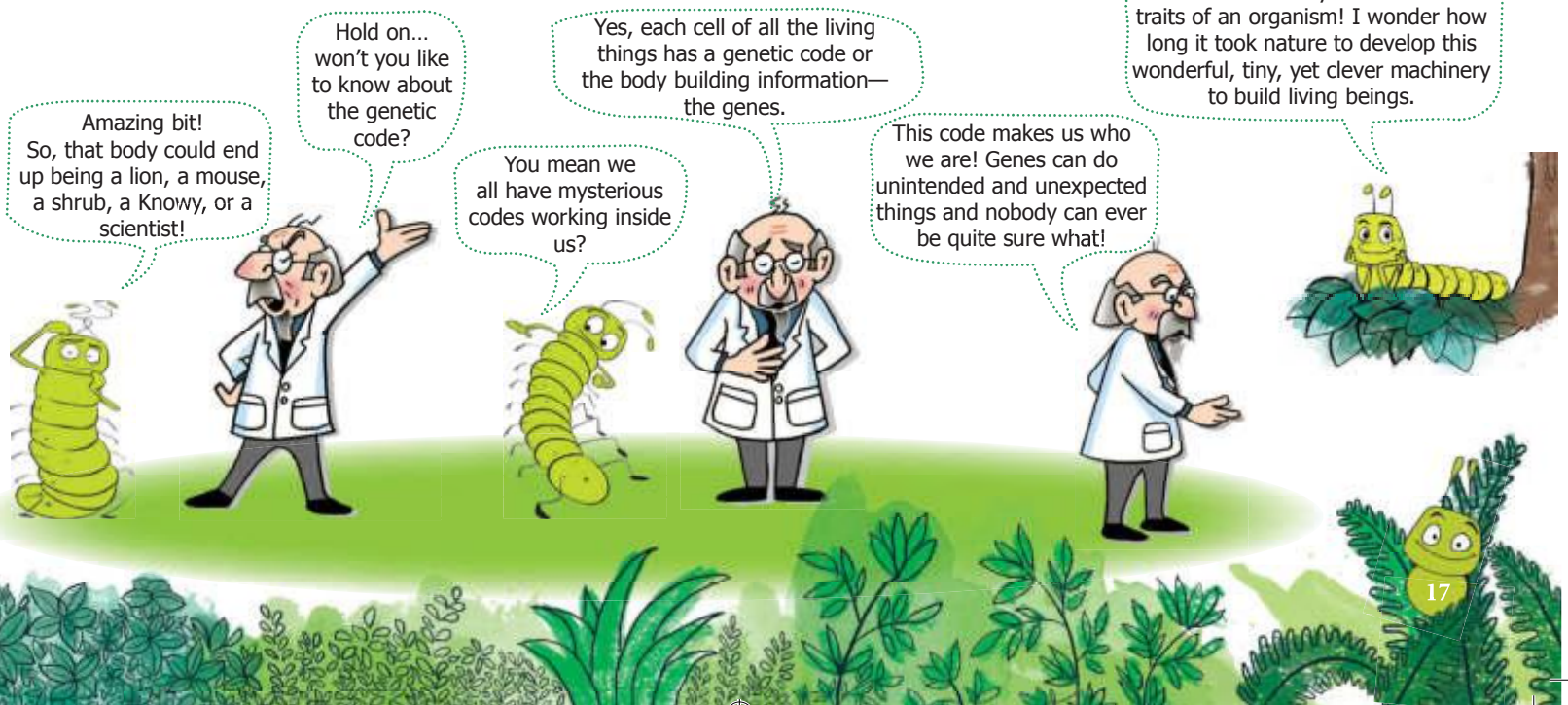
Recessive: The failure of one of a pair of genes present in an individual to express itself because of the greater influence, or dominance, of its opposite-acting partner

Titbits...

Sometimes a gene does not work as it should, or it works in a harmful way. The result may be a defect in a part of the body or a disease. The condition called albinism is an example. *Find out what it is.*

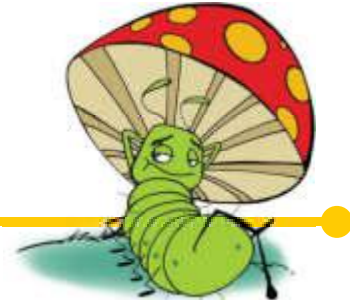


An albino tiger





...and the Oscar goes to



Answer the following questions.

1. In which year were the Academy Awards presented for the first time? _____
2. Who was the first person in history to win both a Nobel Prize and an Oscar? _____
3. Who was the first African American to win an Academy Award? _____
4. For which 1982 film did Linda Hunt win the best supporting actress Oscar for her performance as a male character? _____
5. Marlon Brando famously refused his best actor Oscar for *The Godfather* (1972) in protest. What was he protesting against? _____
6. Which film tied for the record of having received 14 nominations with *All About Eve* and *Titanic*, the most for a single film, in 2017? _____
7. Walt Disney holds the record for being the most nominated person for the Academy Awards. How many times was he nominated? _____
8. *Crouching Tiger, Hidden Dragon*, in 2000, won four Academy Awards, including best foreign language film. In what language was it filmed? _____



Linda Hunt



Marlon Brando



Walt Disney

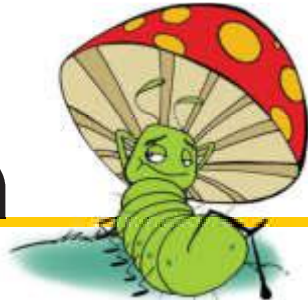
Titbits

Lord of the Rings: Return of the King (2003) is the only film in the history of Oscars to get nominations in 11 categories and win the Academy Award for all the 11 categories, including best direction, best screenplay, and best picture.





Plugged in



Do you always feel the need to 'be connected' or 'plugged in' to information sources? Why?

Try this quiz to brush up your knowledge of the world of computers.

- The invention of the transistor, or semiconductor, led to the personal computer revolution. Which company invented the transistor in 1947?
a) Xerox b) Bell Laboratories c) IBM
- Who invented the first computer mouse?
a) Ted Nelson b) Douglas Engelbart c) Tim Berners-Lee
- Computer systems Apple II and CP-M were not PC compatible until IBM introduced its first personal computer. When did IBM roll out its first PC?
a) 1980 b) 1981 c) 1979
- What was the memory storage capacity of the first hard drive?
a) 100 MB b) 5 MB c) 75 MB
- Which two numbers together form the 'binary language' used in computers?
a) 0 and 9 b) 1 and 3 c) 0 and 1
- Name the first computer designed by Apple with a mouse and a graphical user interface (GUI). It cost \$10,000.
a) Lisa b) Cray I c) ENIAC
- What is the name of India's first indigenously designed supercomputer?
a) Kalki b) Pushpaka c) Param
- Which of these puzzle games was specially released for Facebook in 2012?
a) Pokémon Go b) Candy Crush Saga c) Second Life
- Which of these is a computer programme designed to infiltrate a user's computer for malicious purposes?
a) malware b) white hat c) spam
- Which of these terms describes someone who likes to show up and wreak havoc on internet forums and newsgroups?
a) trolls b) elves c) gnomes

Can computers get any smaller?

Titbits



As computer memory chips became tinier, their connecting circuitry became so narrow that their width is now measured in atoms. These circuits are susceptible to radiations and temperature changes in the atmosphere, resulting in loss of data or program crashes. Also, the new microprocessors have millions of switches connected into them which generate a lot of heat and this has become a serious problem today. Due to some of these reasons, many researchers feel that future of computer hardware might not be in miniaturization but in new innovative computer designs.

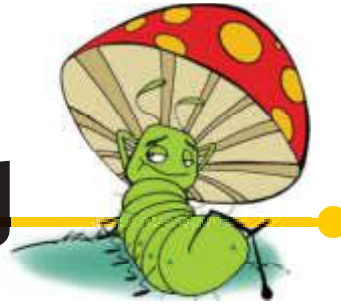


What do you know about the information superhighway?





In the 20th century



Take up this quiz on the history of the 20th century.

1. He was the British prime minister during the Second World War. _____
2. This former barrier walled off West Berlin to keep East Germans from escaping to the West. Built in August 1961, it remained a symbol of the Cold War, till it was demolished in 1989. Which barrier was this? _____
3. In which country was a civil war fought and the communist government, under chairman Mao, came to power? _____

Mobile phones first appeared in 1979, 103 years after the first telephone of 1876!



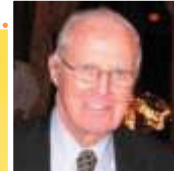
Titbits

With the invention of the television, historic events, such as the landing on the moon in 1969, were seen by viewers 'live' as they took place.



Titbits

Norman Borlaug, an American agronomist, is credited for developing high-yield and disease-resistant wheat varieties. This discovery revolutionized the agriculture industry in developing countries. In recognition of his contribution to the world food supply, he was awarded the Nobel Peace Prize in 1970. He is also referred to as 'the father of the Green Revolution'.



4. Sir Alexander Fleming's discovery in the field of medicine, which he called penicillin, became one of the most effective life-saving drugs in the world. What is it a type of? _____
5. In which year did the UN adopt the Universal Declaration of Human Rights and introduce voting rights for women into international law? _____

6. Which country in the Middle East became independent on 14 May 1948? _____
7. Iraq fought a war with its neighbour for eight long years with no territorial annexations. Which country was this? _____
8. Name the country which became independent in 1918 after the collapse of Austria-Hungary and remained a geographical and political unit till 1 January 1993, after which it split into two new political states: the Czech Republic and Slovakia. _____
9. The United States of America fought a war with this country in Asia which lasted approximately ten years. The US had to finally admit defeat and withdraw. _____

Titbits

Louise Brown, born in 1978, was the first 'test-tube' baby. She was conceived outside her mother's body.





Read the clues and guess which famous personality of the 20th century we are talking about.

- Among the finest thinkers of the 20th century, his theory of relativity revolutionized ways of thinking about space, time, energy, matter, and gravity. E S
- He is known as the 'great soul'. His idea of winning a battle with non-violence is legendary. He led to the end of British rule in India without striking a single blow. T D
- He revolutionized the world of the internet and introduced the World Wide Web, the single most popular mass medium for the 21st century. T E -L
- He proposed that the universe is expanding and came up with a theory to indicate the age and size of the universe. He also observed spiral nebulas and showed that they were actually distant galaxies rather than objects in our own galaxy. W B
- A distinguished economist from India and the winner of the Nobel Prize, he is known for his contribution to welfare economics. A S
- This former president of the United States lifted his country out of the grip of a worldwide financial depression. Many of his ideas of government are still part of the law of the land. N D O V
- Born Cassius Clay, he was one of the greatest heavyweight boxing champions and an iconic figure of the 20th century. M M L

Titbits

One of the significant movements of the 20th century was decolonization. This meant that many British colonies in Asia, Africa, and Latin America attained independence from their foreign rulers.

Name these prominent personalities of the 20th century.



One of the greatest and most influential painters of his time

1. _____



He revolutionized the art of animated films.

2. _____



He introduced classical music of India to Western audiences.

3. _____



One of the greatest physicists of the 20th century

4. _____



The king of rock 'n' roll

5. _____



One of the most influential poets of his time

6. _____



The chief architect of the Indian Constitution

7. _____



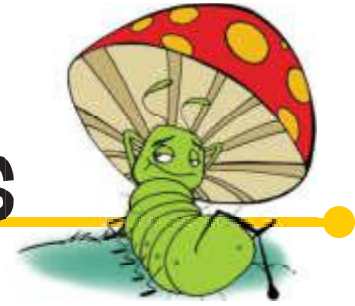
The first human in space

8. _____





Sobriquets of Indian cities



Name the Indian cities which are also known by the following nicknames.

1. City of Nawabs _____
2. Pink City of India _____
3. Financial Capital of India _____
4. Silicon Valley of India _____
5. Orange City _____
6. City of Joy _____
7. Coal Capital of India _____
8. City of Lakes _____
9. Steel City of India _____
10. Manchester of India _____
11. Tea City of India _____
12. Queen of the Arabian Sea _____
13. Diamond City of India _____
14. Scotland of India _____
15. Garden of Spices of India _____
16. City of Pearls _____
17. Health Capital of India _____
18. The Sun City _____
19. The City of Destiny _____
20. The Abode of Clouds _____



Hyderabad



Srinagar



Jaipur



Lucknow



Mumbai

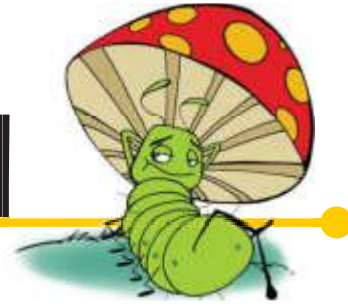


Kerala





Traditional foods of the world



Match the following delicacies with the countries they belong to by writing the correct letters in the boxes given at the end of each question.

1. **Panna cotta** is a traditional dessert. It is made with thickened cream and is flavoured with fruit or coffee.



South and North Korea

2. **Goulash** is a traditional soup-style dish made of meat and vegetables. It is cooked with spices.



England

3. **Sheermal** is sweetened flatbread. It is baked in an oven and is usually eaten with kebabs.



Thailand

4. **Trifle** is a traditional dessert with layers of cream, fruit, sponge, and custard.



Italy

5. **Kimchi salad** is a pickled salad of cabbage. It is served with all main-course dishes.



Iran

6. **Tom yum** is spicy and sour soup. It is made of vegetables, spices, and herbs.



Hungary





WORD GAME



Towards a greener earth


We all deserve a greener, cleaner earth. Some environment-related words, explained in each clue on the next page, are hidden in this word grid. Can you find and circle them?

R	E	D	U	C	E	R	E	U	S	E	R	E	C	Y	C	L	E	C
E	C	B	V	S	O	L	A	R	E	N	E	R	G	Y	K	B	P	O
N	O	T	G	V	G	H	I	T	D	K	L	J	X	Y	M	K	B	N
E	S	R	C	O	R	G	A	N	I	C	J	C	F	I	E	N	G	S
W	Y	E	D	T	O	T	N	F	J	K	D	K	T	D	T	H	C	U
A	S	E	O	E	A	R	T	H	D	A	Y	L	V	U	H	D	A	M
B	T	S	C	U	K	V	N	A	T	U	R	A	L	G	A	S	R	E
L	E	G	O	N	T	H	Y	D	R	O	G	E	N	X	N	G	B	R
E	M	H	Y	D	R	R	O	Z	O	N	E	L	A	Y	E	R	O	S
E	C	O	L	O	G	I	C	A	L	F	O	O	T	P	R	I	N	T
N	T	S	U	S	T	A	I	N	A	B	L	E	U	R	A	L	D	M
E	E	F	O	S	S	I	L	F	U	E	L	S	O	G	E	N	I	E
R	M	K	Y	O	T	O	T	R	E	A	T	Y	N	E	L	A	O	R
G	R	E	E	N	H	O	U	S	E	G	A	S	F	O	O	T	X	S
Y	B	I	C	I	B	I	C	Y	C	L	E	E	B	L	E	M	I	T
D	E	F	O	R	E	S	T	A	T	I	O	N	E	L	S	E	D	E
F	U	E	L	C	E	L	L	T	T	O	P	S	O	I	L	R	E	R
S	E	F	Q	P	E	N	T	M	T	D	Q	N	E	L	S	S	D	S
B	H	Y	B	R	H	Y	B	R	I	D	C	A	R	C	A	R	E	T





CLUES:

1. It is a kind of energy that can be used and reused any number of times.
 2. It is the most toxic greenhouse gas emission, common around landfills and farms.
 3. It is a synonym for buyers. They have the power to influence the kind of products sold in stores.
 4. It is an electrochemical cell, that produces electricity from a replenishable fuel tank by combining hydrogen and oxygen. It can be used in cars.
 5. It is an efficient, environment-friendly mode of transport with two wheels.
 6. These living beings consume carbon dioxide, convert it into food, and produce oxygen.
 7. It is a mixture of flammable gases, mainly the hydrocarbons methane and ethane, which occur beneath the surface of the earth.
 8. It is the extensive clearing of forests, usually causing ecological harm.
 9. It is a car, that uses more than one source of power to move around.
 10. Started in 1970, this day is celebrated all over the world on 22 April every year.
 11. It is food that has been produced without using synthetic fertilizers, chemicals, or hormones.
 12. It is a complex set of relationships among the living resources, habitats, and residents of an area, including plants, birds, fish, animals, microorganisms, soil, water, and humans.
 13. It refers to surface soil that usually includes the organic layer in which plants have most of their roots. Over time, it is washed away because of erosion or intensive agriculture.
 14. It is that part of the earth's atmosphere that repels the sun's ultraviolet rays.
 15. It is the full form of the 3 R's that can help us lessen the harmful impact on the environment and create a more sustainable world.
 16. It is an international treaty that gave countries a timeline to reduce their emissions of greenhouse gases.
 17. It is a tool to measure a human being's impact on the environment.
 18. It is the name given to gases that trap heat and cause global warming.
 19. It is one of the most abundant gases present on earth, which can be used as a fuel source.
 20. It is a resource that can be used such that it is not depleted or exhausted permanently.
 21. It refers to the type of fuel that is used most abundantly by human beings. It is found underground and is non-renewable.
 22. It is the most abundant energy source that can be harnessed by human beings.
- 



Mountains of smoke and fire



Since the late 1700s, volcanoes have caused more than 2,50,000 deaths. Let's find out about the worst volcanic eruptions in the history of mankind.

The largest volcanic eruption at **Mount Tambora** occurred in 1815, on Sumbawa Islands, now a part of Indonesia. The explosive eruption and the subsequent tsunamis killed about 10,000 people. Deposition of thick ash resulted in agricultural losses and a rise in the death toll to 82,000 as a result of famines and diseases.



The second largest eruption occurred in 1883 at **Krakatoa** (Krakatau) in Indonesia. Krakatoa is a volcano on a small uninhabited island between Java and Sumatra. As a consequence of this outburst, the 23 sq km area of the island disappeared. The explosion pushed the ash to a height of 80 km. The force of this outburst was equivalent to that of 10,000 atomic bombs.



In 1902, on the island of Martinique in the Caribbean Sea, **Mount Pelée** violently erupted. Within minutes, some 29,000 inhabitants lost their lives due to smoke and fire.

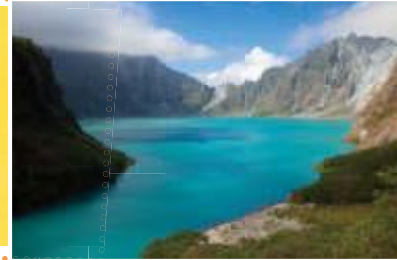
In 1985, a relatively small eruption of **Mount Ruiz**, in the Andes Mountains of Colombia, killed around 25,000 people. At an elevation of 5,400 m, this volcano is tall enough to have a glacial ice cap. The magma caused the melting of ice and snow caps, which mixed with the mud, ash, and water and raced down the volcano's eastern slope burying the town of Aemero, built on the lower plain.





Titbits

In 1991, Mount Pinatubo in the Philippines spewed an enormous cloud of ash to the height of more than 30 km. The ash falls caused massive devastation, leaving about 1,00,000 people homeless, and killing about 300 people. It led to the closing of US-leased Clark Air Base, located 16 km east of the volcano. It is regarded as the largest eruption of the 20th century.



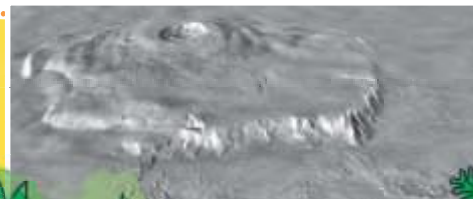
Answer the following questions.

1. Name the world's largest volcano, located on the island of Hawaii. It means 'long mountain' in Hawaiian. _____
2. Name the tallest active volcano in Italy, Europe. It has recorded eruptions for millennia, including a blast in 1669, causing death of 20,000 people. _____
3. Name the ancient volcano in Indonesia which exploded around 71,000 years ago, causing the largest volcanic eruption in the history of mankind. Its eruption led to a worldwide decline in temperature by 3-5°C and sent the planet into a severe Ice Age. _____
4. In 1912, the eruption of the Novarupta and Mount Katmai in Alaska lead to the creation of a valley. Name the valley. _____
5. The powerful eruption of this volcano, in 1982, in Mexico destroyed most of the villages within 8 km and left behind a crater which is now an acidic lake. _____
6. Name the volcano which is known as the 'Lighthouse of the Pacific' for its frequent glowing activity. Its series of eruptions started in 1770. _____
7. Name the volcano which is considered the highest and most sacred point in Bali, Indonesia. It is traditionally considered 'a throne of the gods' and 'the centre of the world'. _____
8. Name the only active volcano in India, which is located in the Andaman Sea. _____



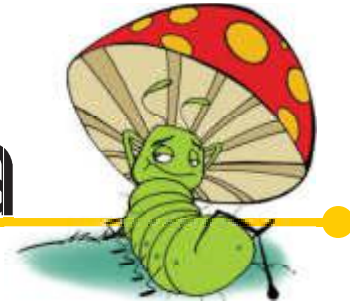
Titbits

Olympus Mons, located on Mars, is the largest known volcano in our solar system. It is 25 km high and 700 km across.





Union territories of India



Try this quiz to brush up your knowledge of the union territories of India.

1. How many union territories are there in India?
2. What is the capital of Dadra and Nagar Haveli?
3. Which two states surround the union territory of Dadra and Nagar Haveli?
4. Which country ruled Dadra and Nagar Haveli before its liberation in 1954?
5. Which union territory is located on the western coast of India, along the Arabian Sea?
6. What is the capital of Lakshadweep?
7. Which is the principal spoken language of Lakshadweep?
8. Which two union territories have legislative assemblies?
9. Who ruled Puducherry for 138 years before it was handed over to the Indian Union?
10. Name the only union territory that is also the capital of two states.
11. When was Chandigarh, along with some areas surrounding it, constituted as a union territory?
12. When did Delhi become a union territory?
13. When was Delhi designated the National Capital Territory?
14. Which two states adjoin Delhi?
15. What is the capital of Andaman and Nicobar Islands?



Delhi



Puducherry



Lakshadweep



Chandigarh



Andaman



Daman and Diu





QUIZ YOURSELF I



1. Who is the author of the book *Business Sutra: A Very Indian Approach to Management*, which explains management approaches with the help of Indian mythology? _____
2. Which gas gives Neptune its faint blue colour? _____
3. What type of waves are radio waves? _____
4. Who among these is a bestselling author of cookbooks – Chitra Banerjee Divakaruni, Suketu Mehta, Tarla Dalal? _____
5. Which Indian river is also called Kalindi? _____
6. What is the full form of EEU, a political and economic union between Armenia, Belarus, Kazakhstan, Kyrgyzstan, and Russia, which came into effect in January 2015? _____
7. What metal is used in SIM cards? _____
8. Which spacecraft of NASA entered the orbit of Ceres in 2015, becoming the first such spacecraft to visit a dwarf planet? _____
9. Which country was earlier known as Persia? _____
10. In the Mahabharata, three Kaurava warriors attacked the Pandava camp on the 18th night of the Kurukshetra war. Who were they? _____
11. In bright light, how is a camera's aperture adjusted? _____
a) widened b) contracted c) shut
12. Which automobile brand was indicted in September 2015 of intentionally rigging the diesel emission tests? _____
13. Who is the new governor of the Reserve Bank of India? _____
14. On which planet other than Earth has liquid water been found? _____
15. In which country is Ankara located? _____
16. How many cakes of soap measuring 7 cm × 5 cm × 2.5 cm can be placed in a box of size 56 cm × 0.4 m × 0.25 m? _____
17. Numismatics is the study of stamps. Is this true or false? _____
18. What is the full form of DNA? _____
19. What colour bin is commonly used for biodegradable waste? _____
20. Who became the first Indian to win the Mr World title, in 2016? _____

How many did you answer correctly?

What your score means: 16-20: 😄 ; 11-15: 😊 ; 6-10: 😐 ; 0-5: ☹️





Women of substance

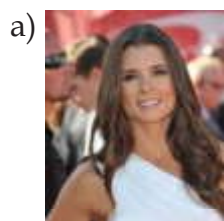


These are some women who are noted for their remarkable achievements. Match their pictures with the clues by writing the correct answer options in the boxes.

1. She was an engineer and the first woman space tourist to fly to the International Space Station.
2. She is the chief operating officer of Facebook, and the author of a book, *Lean In*, which is also a support group for women at workplaces.
3. She was a member of the British royal family, who was known for her philanthropic work.
4. In 2008, she became the first woman to win an IndyCar race.
5. This Mexican artist survived childhood polio and started painting as an escape from her pain. She is considered as one of the greatest artists of the 20th century.
6. An anthropologist, known for her study of Samoan culture, she is hailed for her studies on the people of Oceania.
7. She became the chancellor of Germany in 2005.
8. She is an Indian author and a political activist, who wrote the novel *The God of Small Things*, which won the Man Booker Prize.

Titbits

The year 2009 was a record-breaking 'Nobel' year for women, with five women winning the Nobel Prize. They were Elinor Ostrom (Economics), Herta Müller (Literature), Elizabeth H Blackburn and Carol W Greider (Medicine), and Ada E Yonath (Chemistry).



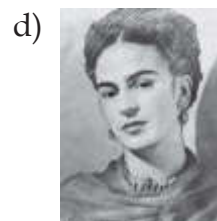
a) Danica Patrick



b) Margaret Mead



c) Princess Diana



d) Frida Kahlo



e) Anousheh Ansari



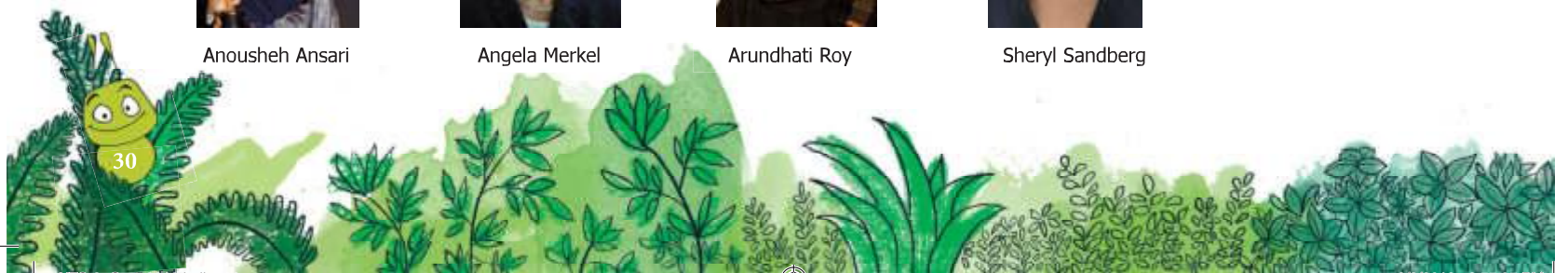
f) Angela Merkel



g) Arundhati Roy



h) Sheryl Sandberg





Bringing fantasy alive



We all get fascinated by films that are based on fictitious themes. The stunning visual effects in these films turn the unreal into real. Read the statements below, and name the films that have won awards for best visual effects.

1. In this 2014 sci-fi film by Christopher Nolan, some space researchers go out on a mission to find a planet where humans can survive. The visual effects of this film helped the viewers imagine the experience of black holes. _____



2. This 2013 film was director Alfonso Cuarón's attempt to portray life in zero gravity conditions. The film uses graphics and massive LED effects to show how two stranded astronauts float and survive in different directions in space. _____

3. This 2015 film was Alex Garland's directorial debut. The film, based on artificial intelligence, depicts the story of a beautiful robot that possesses certain human characteristics, such as self-awareness and consciousness. _____



4. It is James Cameron's path-breaking idea of the existence of human-like aliens – the Na'vi people – and their fight for their planet, Pandora. Much of the film's budget was spent on cutting-edge visual effects. _____

5. The 1999 film, directed by Lilly and Lana Wachowski, brought in incredible action sequences, the best example being the amazing bullet timing. The film portrays a futuristic world where humans are controlled and enslaved by machines. _____



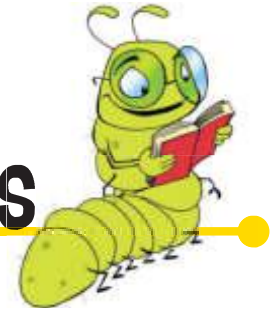
6. Director David Fincher's 2008 film was based on a disease called progeria. In this film, the hero, a progeria patient, ages backwards. _____

Titbits

Nowadays, films are not just about seeing but also about experiencing with other senses. 3-D films create an illusion of three-dimensional depth. A 3-D film on an IMAX (Image MAXimum) screen gives an exciting and larger-than-life experience. New 4DX technology, through its customised effects, can even provide a close to real-life experience while watching a film in a theatre. You can experience special effects such as fog, wind, light, mist, and scents seen on the screen, while comfortably seated on a high-tech motion seat that moves in synchronization with the action on screen. Imagine what an immersive experience that can be!



Traditional musical instruments



The **balalaika**, a stringed musical instrument of the lute family, was developed in the 18th century in Russia and Central Asia. It is made in six sizes, from piccolo to double bass, and has a flat back and a triangular belly that tapers to the neck. The instrument was usually used in folk music but was also employed in large balalaika orchestras in the 20th century.



The **ektara** is a rhythmic folk instrument with a stretched single string, a spherical resonator covered with animal skin, and a split bamboo cane as a neck. The name literally means 'one-stringed'. This instrument is used mainly in India, Pakistan, and Bangladesh. This instrument is also known as a **gopichand**.



The **erhu** is a bowed, two-stringed Chinese vertical fiddle. The strings of the erhu are stretched over a wooden drum-like resonator covered by a snakeskin membrane. In performance, the erhu is held upright on the performer's thigh while the bow is moved horizontally over the strings. The erhu is played both as a solo instrument and in an orchestral setting.



The **gusla**, also known as the **gusle**, is a bowed, stringed musical instrument used mostly in southeastern Europe. It comprises of a skin belly, a round wooden back, and one horse hair string at the top of the neck. It is kept in a vertical position and played using a deep curved bow. There is no fingerboard and the string is stopped by the sideways pressure of the player's fingers. It is traditionally used by epic singers of the region.





The **aeolian harp** is a type of wooden sound box on which sounds are produced by the movement of wind over its strings. The strings can be made of different materials or thicknesses. The aeolian harp was very popular in Germany and England during the late 18th and 19th centuries.



The **glass harmonica**, or **armonica**, consists of a set of graduated, tuned glass bowls, which are played by rubbing moistened fingers on the glass bowl's rims. It was invented by American printer, author, and inventor Benjamin Franklin. He called this instrument *armonia*, based on the Italian word *armonia*, which means 'harmony'.



Titbits

Have you heard about singing sand? Sand dunes in deserts can create loud, resonant notes that can be heard up to six miles and last up to 15 minutes. How the sound is created is still uncertain. However, some studies suggest that, during an avalanche, sand grains collide with each other and move together down the dune, making a stream of millions of 'little sounds'.

Quick quiz

Name the musical instruments played by these Indian musicians.



Hariprasad Chaurasia



Ustad Zakir Hussain



Pandit Ravi Shankar



Pandit Shivkumar Sharma

1. _____ 2. _____ 3. _____ 4. _____

santoor sitar flute tabla



Making a zoetrope

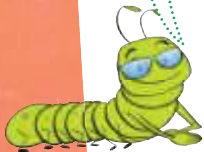
Before cinema was invented, children played with a toy called a zoetrope – a cylinder with slits which has pictures on the inside. If you spin the cylinder around and look through the slits, it appears as if the pictures inside are moving. Here is how you can make a zoetrope.

TO DO

Things you will need

You will need black and yellow chart paper, scissors, a plastic plant pot or a big tumbler, a pin, glue, and a sequence of about 12 images. You can create these images yourself – just make sure that the images give an impression of movement if they are arranged in sequence.

When you see a sequence of pictures at the rate of more than 13 frames per second, the brain puts them together to make it seem like a moving image.



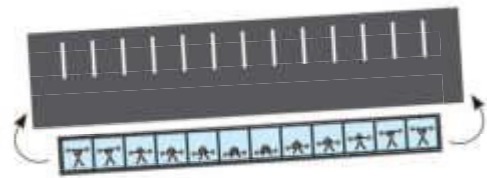
To do



1. Place the images in sequence. Measure the combined length. Cut a piece of the black chart paper of the same length. Paste the prints on the piece in sequence.



2. Cut another strip a little longer and twice as wide. Cut 13 equally spaced slits on it, as shown. Each slit should be about 5 mm wide and about half the height of the strip. Now paste the strip with the images on this longer piece of chart paper, neatly below the slits.



3. Glue the ends of the wide strip together to form a cylinder. You can put the yellow chart paper over the black cylinder, as shown, to give it extra support.
4. Cut a circular piece of chart paper the same size as the base of the cylinder. Tape it as the base of the cylinder.
5. Push a pin through the centre of the base and into the bottom of the upturned plastic plant pot.



Your zoetrope is ready. Sit on the floor and spin the cylinder. Look at the pictures through the slits. As the zoetrope moves around, the images inside should appear to move. By trial and error method, find out the spinning speed which will give the best effect.

In 2008, Sony built a zoetrope 10 m wide and 10 ton in weight, called the BRAVIA-drome, with 64 images of the Brazilian footballer Kaká inside it. This zoetrope can move up to 50 km per hour. This has been declared the largest zoetrope in the world by Guinness World Records.