

Sadiq Public School



Distance Learning for H1

August-September 2020



Sadiq Public School

Do the right, fear no man

Distance Learning

July, 2020

Dear students and parents,

Assalam o aleikum.

Inshallah all of our students and their families are staying home, staying safe, and protecting themselves and their communities in this most unusual situation. We understand as well as anyone how difficult it is to be living in such a situation. If we all follow the government's very simple guidance the situation will improve very soon, as it has in many countries around the world, and our lives can get back to normal.

The Government has announced that Schools will likely be allowed to re-open on September 15th, 2020. Let me be clear – Sadiq Public School is planning for a full school year from September 15th 2020, i.e. with the appropriate number of school days to ensure our students complete their normal syllabuses well in time for their annual examinations without compromising too much on the remainder of our unique, holistic curriculum that includes sports, clubs, and community service – and self-discipline (doing the right thing at the right time).

After a considerable amount of thought and planning, after considering the many factors associated with distance learning including health and safety risks to children of being online for too long and unsupervised, costs of technology/devices/software, and the expected/likely outcomes, we have decided to offer a package of distance learning activities for students to do some school work. These activities are NOT intended to replace in-school, teacher-student learning activities and they are NOT compulsory for students to complete. The team of education experts at Sadiq Public School very strongly believe that education, i.e. meaningful learning, happens best when teachers and students interact, face to face, spontaneously.

This booklet has been prepared by a small team of subject teachers with help from the IT Department's staff. I am very grateful for their efforts!!

We also understand that the Sadiq Public School family is very diverse and what will work well for a K2 student living in Bahawalpur probably will not for a K2 student living in Quetta or a P6 student living in

Karachi. This is a self-contained, age-specific package of learning material prepared by SPS teachers for SPS students. You will not need to use the internet and you will not need textbooks or any other material except a normal, lined school notes book (a separate one for each subject) which you will bring back to school when lessons resume. We decided to create an e-booklet so it can be published and distributed to students and parents without needing to be printed and sent by post/courier out of concern for our environment. (There is an interesting hypothesis that the coronavirus outbreak is due to deforestation.)

Everyone's health is the top concern right now. Learning some mathematics right now is less important than protecting your health and your family's health. Not just your physical health, but also your mental health. We understand that these last few and next few months have been and will be difficult. It is very normal for everyone to be feeling worried and anxious. In such times, it is important to recognise your anxiety, understand what is causing it, and learn how to manage it by being kind to yourself, patient with others, eating well, sleeping well, doing some physical activity (there's a whole section about this later in the booklet), and trying to maintain a positive outlook. The virus outbreak will pass. We will all return to our normal lives. Inshallah!

Be happy. Not because everything is good, but because you can see some good in everything.

Yours Sincerely,

Mr Peter Giddens

Principal

Contents

How to achieve academic success at Sadiq Public School

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How to achieve academic success at Sadiq Public School

Our approach to teaching and learning is based on the knowledge that learning only occurs when cognitive effort is generated to the extent that information is made into a long-term memory that can be readily recalled. We use traditional teaching methods informed by current research in education and pedagogical practices.

The Sadiq Public School approach is based on:

1. Teachers impart knowledge and skills using a variety of media – talking/lecturing, written notes and diagrams on a whiteboard, demonstrations, initiating practical activities for students to experience what is being learnt.
2. All lessons are taught on the assumption that as the course unfolds, students are creating their own class notes.
3. Students use one standard textbook for each subject; the book recommended by the School. Students possess and use one lined or gridded copy book per subject, into which class notes are created. (Thinner books with less pages are preferable, to minimise the weight being carried from lesson to lesson. If students require, additional copy books should be used – but always a separate book for separate subjects.
4. A student's class notes are created from a combination of teacher-guided media and student-created media.
5. The class notes should replicate/mirror the course outline and the textbook chapter headings so that students can clearly see that their class notes match the course and the examination.
6. Teachers will show students how to use note-taking/making techniques such as underlining, using different colours, diagrams, lists, boxes, etc.
7. In general, the first half of the copy book is for class notes and the second half, indicated with some form of marker is for practice activities, e.g. homework tasks, the questions at the end of a textbook chapter, etc.
8. Students MUST keep a complete and neatly presented set of class notes. If a student misses a lesson, it is his/her responsibility to add in missed work. This may be done by copying another student's copy book.

9. Frequently, teachers will check students' copy books for completion, neatness, accuracy, etc., and to write personalised / individualised feedback to students.
10. Occasional paper handouts may be trimmed and pasted neatly into a copy book, but this should be kept to a minimum because the act of writing/drawing the class notes into the copy book is the student's first step in learning the material being taught by the teacher. Pasting handouts into copy books teaches students how to use a glue stick and scissors; it does not teach a student anything about the material on the handout.

Writing class notes is the basis of our teaching and learning – but of course this is supported by other experiences such as demonstrations, practical activities, etc.

Examination preparation

In the weeks before examinations, students would typically use the class notes and text book to create a set of study notes by re-writing, often in short-hand/note form, using diagrams and mnemonics etc. Doing this reinforces and consolidates the student's class notes. Students would also complete the questions at the end of each chapter on their own. They would attend lessons and, under the teacher's supervision, complete individual exam questions from past papers, in such a way that the teacher 'unpacks' a question, clarifies the demands of the question, and students and teacher collectively create 'perfect' exam answers – all of which models how a student would take an examination, i.e. read the question, unpack the requirements of the question, clarify key terms/vocabulary in the question, pause, think, plan an answer, and then write an answer.

If you can, now is a good time to buy and prepare your notes books for each subject, ready for when you return to school.

You can use these notes books to write your answers/essays/responses to the activities in this booklet.

1. Mathematics

Topic: Pure Mathematics

Q1) The curve has an equation $y = kx^2 + 1$ and a line has equation $y = kx$, where k is non-zero constant.

- i) Find the set of values of k for which the curve and the line have no common points.
- ii) State the value of k for which the line is a tangent to the curve and, for this case, finds the coordinates of the point where the line touches the curve.

Q2) Solve the following:

a) $x^{3/2} = 2\sqrt{x}$

b) $x^{-\frac{2}{3}} = 9$

Q3) Solve the equation:

a) $x^{2/3} - 6x^{1/3} + 8 = 0$

b) $4^{2x} \times 8^{x-1} = 32$

Q4) The equation $x^2 - kx + 4 = 0$ has 2 roots. Deduce as much as you can about value of k .

Q5) Solve the pair of simultaneous equations:

$$y = 3x - 11, \quad x^2 + 2xy + 3 = 0$$

Q6) Solve the equation:

$$\sqrt[3]{t^2} - 3\sqrt[3]{t} = 4$$

Q7) Solve the equation:

$$z\sqrt{32} - 16 = z\sqrt{8} - 4 \text{ and give the answer in the form } k\sqrt{2}$$

Q8) Solve the equation:

$$3^t \times 9^{t+3} = 27^2$$

Q9) Solve the equation:

$$\frac{3^{5x+2}}{9^{1-x}} = \frac{27^{4+3x}}{729}$$

Q10) Express the following in Completing Square Form:

a) $7 - 8x - 4x^2$

b) $2x^2 + 5x - 3$

Q11) For what values of k is the line $y = 2x + k$ tangent to the curve $3x^2 + y^2 = 12$?

Q12) Solve the inequality:

$$x - x^2 < 0$$

Q13) Solve the inequality:

$$x^3 \geq 6x - x^2$$

Q14) The line $y = 2x + 3$ intersects the y -axis at A. The points B and C on this line are such that $AB = BC$.

The line through B perpendicular to AC passes through the point D (-1, 6).

Calculate

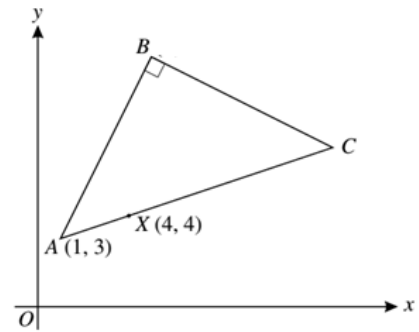
- a. the equation of BD
- b. the coordinates of B
- c. the coordinates of C

Q15) Gradient of line $\overline{AB} = \frac{3}{4}$, C is the mid point of \overline{AB} such that $|AC| = |CB| = 5$. Find coordinate of A and B.

Q16) The diagram shows a triangle ABC in which A has coordinates (1, 3) and angle ABC is 90° .

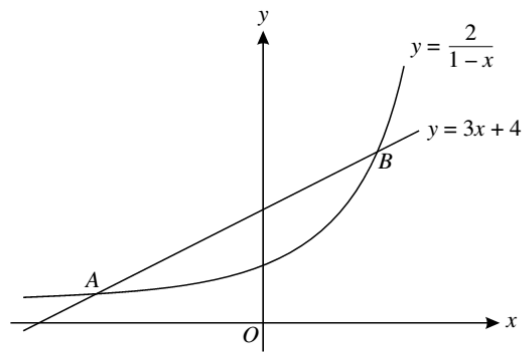
The point X (4, 4) lies on AC.

- (i) If Area of AXB: Area of BXC = 1: 3, find coordinates of C.
- (ii) If gradient of AB = 3, find the coordinates of B.

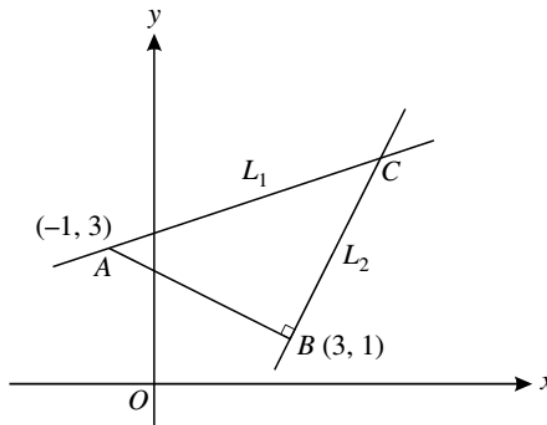


Q17) The diagram shows part of the curve $y = \frac{2}{1-x}$ and the line $y = 3x + 4$. The curve and the line meet at the point A and B.

- i) Find the coordinates of A and B.
- ii) Find the length of the line AB and the coordinates of the midpoint of AB.



Q18) In the diagram, A is the point (1, 3) and B is the point (3, 1). The line L_1 passes through A and is parallel to OB. The line L_2 passes through B and is perpendicular to AB. The lines L_1 and L_2 meet at C. Find the coordinates of C.



Q19) The line L_1 passes through the point A (2,5) and B (10,9). The line L_2 is parallel to L_1 and passes through the origin. The point C lies on L_2 such that AC is perpendicular to L_2 .

Find

- i) The coordinates of C
- ii) The distance AC

Q20) Three points have coordinates $A(0,7)$, $B(8,3)$ and $C(3k, k)$. Find the value of constant k for which

- i) C lies on the line that passes through A and B
- ii) C lies on perpendicular bisector of AB

Q21) The function f is defined by $f: x \mapsto 2x^2 - 6x + 5$ for $x \in \mathbb{R}$

- i) Find the set of values of p for which the equation $f(x) = p$ has no real roots.

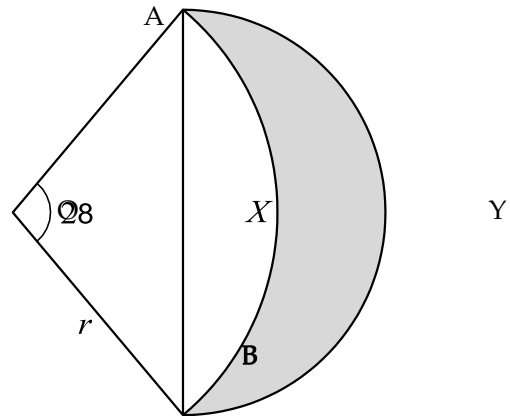
The function g is defined by $g: x \mapsto 2x^2 - 6x + 5$ for $0 \leq x \leq 4$.

- i) Express $g(x)$ in the form $a(x + b)^2 + c$, where a , b and c are constants.
- ii) Find the range of g .

The function h is defined by $h: x \mapsto 2x^2 - 6x + 5$ for $k \leq x \leq 4$, where k is a constant.

- iii) State the smallest value of k for which $h(x)$ has an inverse.
- iv) For this value of k , find an expression for $h^{-1}(x)$

Q22) In the diagram, AYB is a semicircle with AB as diameter and $OAXB$ is a sector of a circle with Centre O and radius r . Angle $AOB = 2.8$ radians. Find an expression, in terms of r and π , for the area of the shaded region.



Q23) A tourist attraction in a city centre is a big vertical wheel on which passengers can ride. The wheel turns in such a way that the height, h m, of a passenger above the ground is given by the formula $h = 60(1 - \cos kt)$. In this formula, k is a constant, t is the time in minutes that has elapsed since the passenger started the ride at ground level and kt is measured in radians.

- i) Find the greatest height of the passenger above the ground. One complete revolution of the wheel takes 30 minutes.
- ii) Show that $k = \frac{1}{15}\pi$.
- iii) Find the time for which the passenger is above a height of 90 m.

Q24) Given that $f(x) = \sqrt{x}$, write down the equation of the image of $f(x)$ after:

- a) Reflection in the x-axis, followed by translation $\begin{pmatrix} 0 \\ 3 \end{pmatrix}$, followed by translation $\begin{pmatrix} 1 \\ 0 \end{pmatrix}$, followed by stretched parallel to x-axis with stretch factor 2.

- b) Translation $\begin{pmatrix} 0 \\ 3 \end{pmatrix}$, followed by a stretch parallel to the x-axis with stretch factor 2, followed by a reflection in x-axis, followed by translation $\begin{pmatrix} 1 \\ 0 \end{pmatrix}$.

2. Physics

Topic Kinematics

It is the study of motion of objects without referring to force.

Thinking Distance:

It is the distance travelled by the vehicle during the driver's reaction time.

Braking Distance:

It is the distance in which the vehicle stops after the brakes have been applied.

Stopping Distance:

Sum of thinking distance and braking distance is called stopping distance.

Q. What would be the effects on the thinking distance and the braking distance of each of the following conditions when:

- (i) the road is wet
- (ii) and the driver is not fully alert?

Uniform Acceleration

A body is said to be moving under uniform acceleration if the magnitude of the acceleration is constant and along the same direction.

FIRST EQUATION OF MOTION

$$V = U + at$$

SECOND EQUATION OF MOTION

$$S = Ut + \frac{1}{2} at^2$$

THIRD EQUATION OF MOTION

$$2aS = V^2 - U^2$$

Where U is the initial speed (velocity), V is the final speed (velocity), S is the distance (displacement), a is acceleration and t is the time.

Q. A car is decelerating uniformly. Its velocity changes from 30 m s^{-1} to 15 m s^{-1} in 75 m. How much further will it travel before it comes to rest?

Q. A train travels on a straight track passing signal A at 20 m s^{-1} . It accelerates uniformly at 2 m s^{-2} and reaches signal B 100 m farther than A. Find the velocity of the train at B.

Q. A car decelerates uniformly from a speed of 30 m s^{-1} to rest in 20 s. Find the distance traveled by the car in the first 10 s.

Q. A car starts from rest and accelerates uniformly for 8 s. The distance traveled during this period of acceleration is 48 m. Determine the acceleration.

Q. A body of mass 4 kg falls vertically through air. When the magnitude of the air resistance is 30 N. What is the acceleration of the body?

Q. A particle travels a uniform velocity of 20 m s^{-1} along the circumference of a circle. What is the change in its velocity as it reaches a diametrically opposite point?

Q. A train covers first half of the distance with a speed 10 m s^{-1} and 2nd half of the distance with a speed of 15 m s^{-1} . Find its average speed.

MOTION UNDER GRAVITY

If there is no resistance, all objects, irrespective of mass, shape and size, fall towards the earth with the same acceleration known as the acceleration of free fall or the acceleration due to gravity. It is denoted by g . This motion is known as free fall.

If the distance fallen is smaller than the radius of the earth, the acceleration g can be assumed constant.

- On the surface of earth, the value of g is 9.8 m s^{-2} .
- If a body falls freely then the value of g is $+ 9.8 \text{ m s}^{-2}$ throughout the motion.
- If a body is thrown upward then the value of g is $- 9.8 \text{ m s}^{-2}$ throughout the motion.

Q. (a) State uniform acceleration.

(b) A car of mass 850 kg tows a trailer in a straight line along a horizontal road, as shown in Fig. 1.

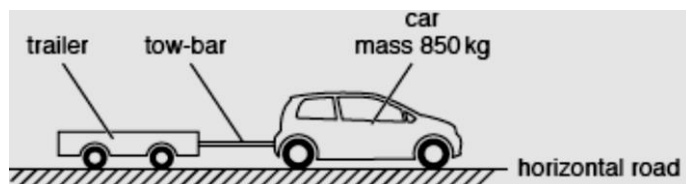


Fig. 1

The car and the trailer are connected by a horizontal tow-bar.

The variation with time t of the velocity v of the car for a part of its journey is shown in Fig. 2.

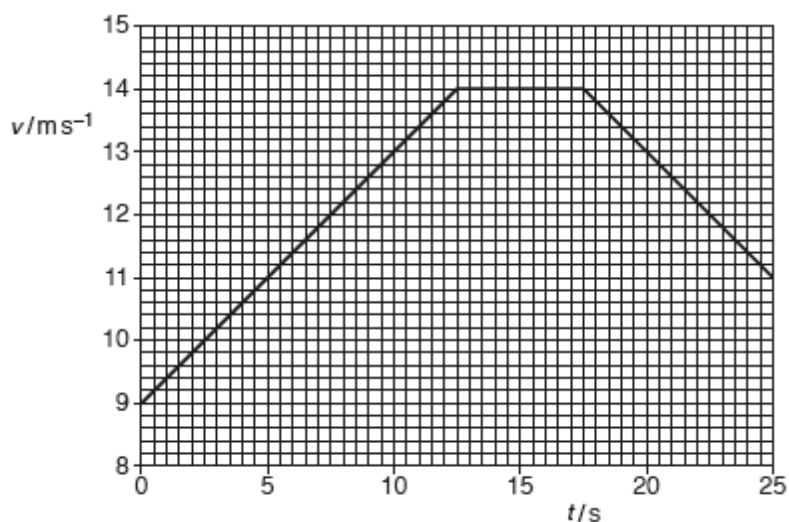


Fig. 2

(i) Calculate the distance travelled by the car from time $t = 0$ to $t = 10$ s.

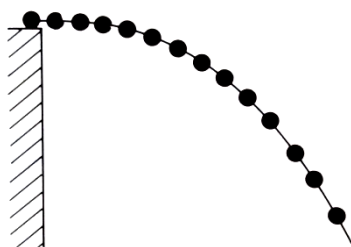
(ii) At time $t = 10$ s, the resistive force acting on the car due to air resistance and friction is 510 N. The tension in the tow-bar is 440 N.

For the car at time $t = 10$ s:

1. Use Fig. 2 to calculate the acceleration

2. and calculate the retardation.

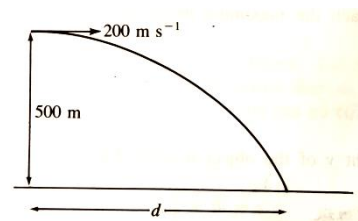
Projectile or Two Directional Motion



When a body is projected off at an angle θ to the horizontal, it travels with a uniform velocity in the horizontal direction and accelerates uniformly downwards due to gravity. Such a motion is called projectile motion and its path is called the projectile (trajectory) path.

As the horizontal velocity remains constant so horizontal acceleration remains zero and the acceleration due to gravity has no component in the horizontal direction.

Q. An aero plane, flying in a straight line at a constant height of 500 m with a speed of 200 m/s drops an object. The object takes a time t to reach the ground and travels a horizontal distance d in doing so. Taking g as 10 m s^{-2} and ignoring air resistance, what are the values of t and d ?



Q. Water shoots out from a horizontal pipe which is at a height of 52 cm from the floor. If the horizontal distance travelled by the water before it hits the floor is 100 cm, what is the velocity of the water when it leaves the pipe?

Q. A bomber flies with a constant velocity of 50 m s^{-1} at a constant height of 1000 m such that it will fly above a target on the ground. What is the horizontal distance of the bomber from the target so that a bomb released from it will hit the target?

Q. A stone is thrown with a horizontal velocity of 20 m s^{-1} from the top of a cliff 15 m high.

The path of the stone is shown in Fig.1.

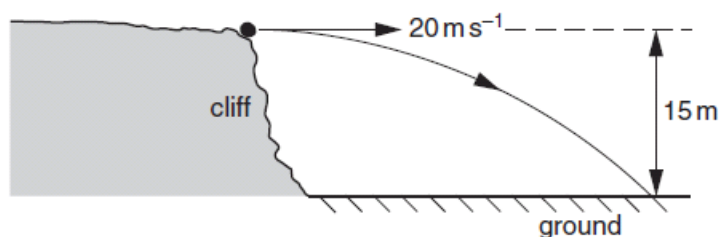


Fig.1

Air resistance is negligible.

For this stone:

(i) Calculate the time to fall 15 m.

(ii) Calculate the magnitude of the resultant velocity after falling 15 m.

(iii) Describe the difference between the displacement of the stone and the distance that it travels.

3. Chemistry

Read thoroughly the contents of Cambridge Syllabus 9701 (online) for 2020-21,

In AS, there will be three papers: Paper1 MCQs, Paper 2 Structured and Paper 3 Practical.

Read thoroughly the given topics in Chapter 1:

Atomic Mass, Relative Molecular Mass, Isotopes, Empirical and Molecular Formula and Ions

Activity 1: Recall how many ions with charges do you remember correctly?

Write all ions (Cation and Anions) you remember.

Activity 2: Try to form their correct possible formulae e.g.: Ammonium Hydrogen Phosphate = $(\text{NH}_4)_2\text{HPO}_4$.

Activity 3: Try to calculate their correct Mr or Formula Mass.

Chemical Formula Writing Worksheet

Determine the chemical formula for each cation and anion combination. Write your answers in each box.

Set 1 (The combining power of silver is 1 and zinc is 2)

Cations +	Anions -	chloride	oxide	iodide	hydride	sulfide	nitride
	Sodium						
Potassium							
Magnesium							
Calcium							
Copper(II)							
Iron(II)							
Iron(III)							
Silver							
Zinc							
Aluminum							

Set 2

Cations +	Anions -	bromide	oxide	fluoride	astatide	selenide	phosphide
	Lithium						
Barium							
Cesium							
Strontium							
Copper(I)							
Copper(II)							
Lead(II)							
Lead(IV)							
Gallium							
Nickel(II)							

Chemical Bonding: Look around to find out Ionic and Covalent Compounds and make a list of them.

Activity: Draw the Dot and Cross Diagrams of Simple Ionic Compounds and Covalent Compounds (as many as you can to become perfect). Classify elements responsible for making these bonds.

Chemical Energetics:

Reactions are classified on the basis of Thermal Changes/Enthalpy Changes as

Exothermic and Endothermic.

Activity: Find out various examples of such reactions involving heat changes and make a list of all possible Exothermic and Endothermic reactions.

ACID BASE and SALTS:

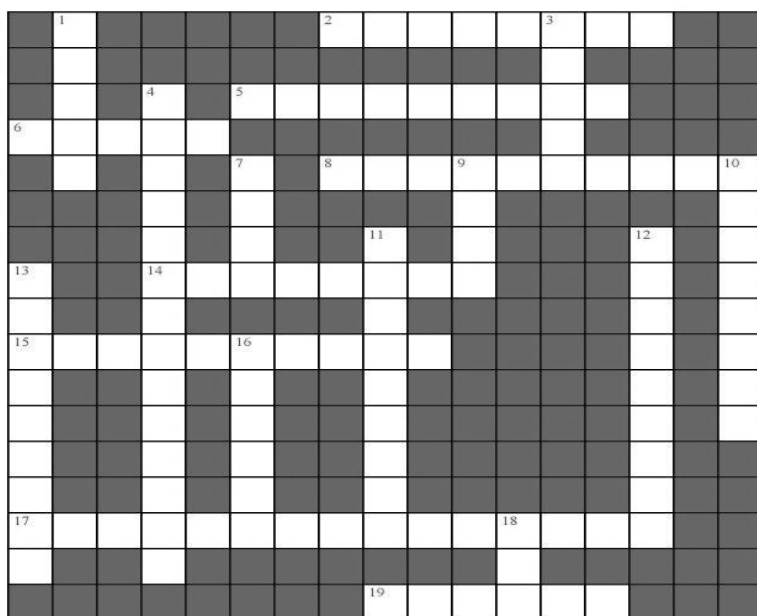
Read and understand

- ACID BASE and SALTS which covers Inorganic Portion of AS-level, their physical and chemical properties, and their effects on indicators and pH papers,
- Oxides as acidic, basic, neutral and amphoteric,
- Calculations involving titration of acid and bases.

Activity: a. Prepare some charts for pH scale common acids and bases with their uses.

b. Try to solve

Acids, alkalis and salts



Across

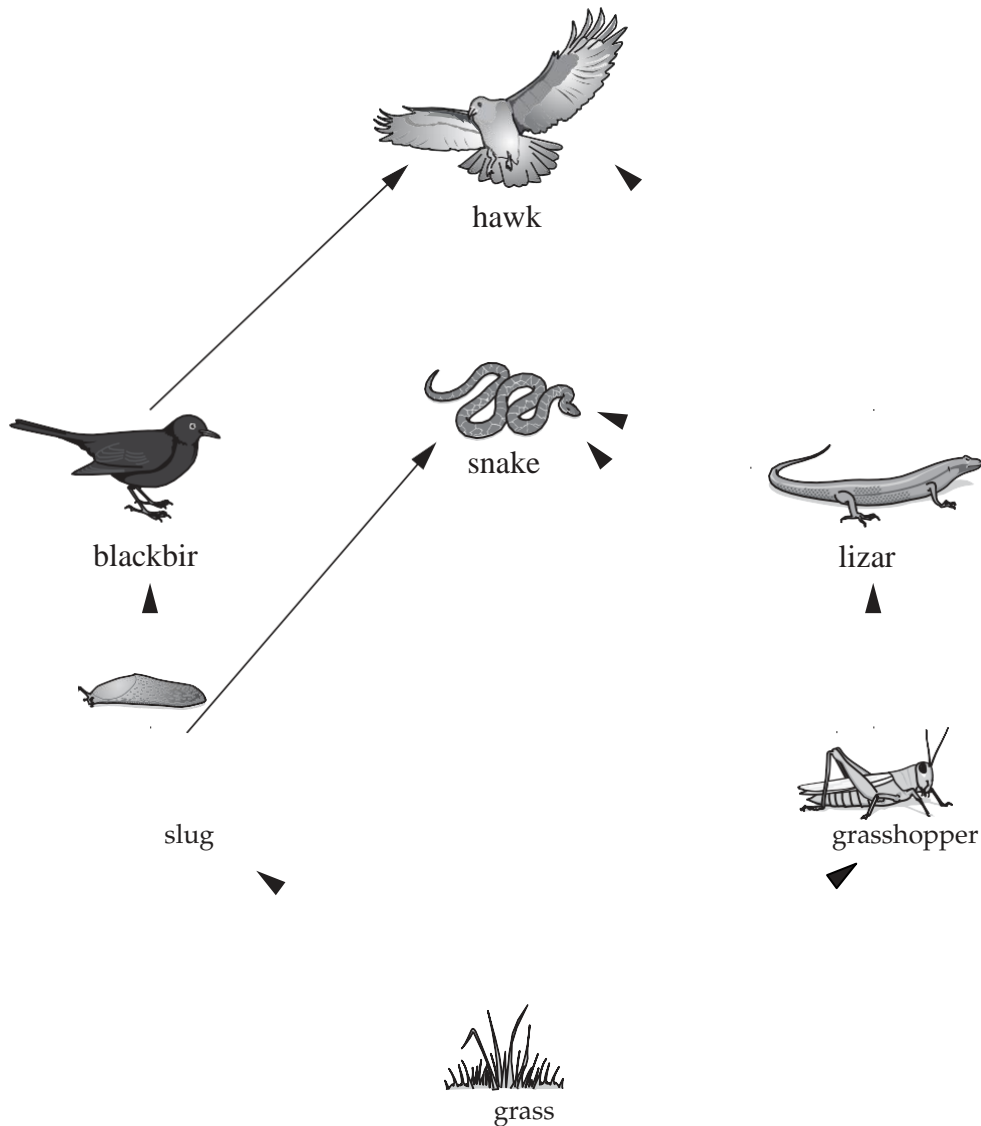
- Ions produced by acids in aqueous solution (8)
- Hydrochloric acid makes these salts (9)
- A Star Trek Voyager Borg? The pH of a neutral solution (5)
- These salts produce carbon dioxide when they react with acids (10)
- Describes a solution with a pH greater than 7 (8)
- These substances change colour in acids and alkalis (10)
- The salt made when ammonia reacts with nitric acid (8,7)
- Describes a solution with a pH less than 7 (6)

Down

- Acids and alkalis react together to produce salts and ... (5)
- Universal indicator is this colour in neutral solutions (5)
- Anagram of US Italian tenor – the reaction between an acid and an alkali (14)
- Phenolphthalein indicator is this colour in alkaline solutions (4)
- A metal oxide or metal hydroxide (4)
- Sulfuric acid makes these salts (8)
- Anagram of attrition – method to find the concentration of an acid or alkali (9)
- These ions are produced by alkalis in aqueous solution (9)
- A galactoc indicator? (9)
- A soluble base (6)
- Blue litmus turns this colour in acidic solutions (3)

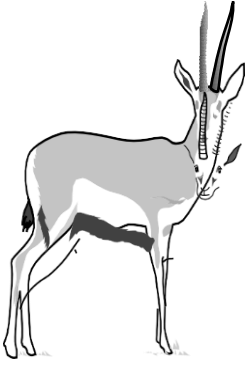
4. Biology

Q1. The given figure shows part of a food web.

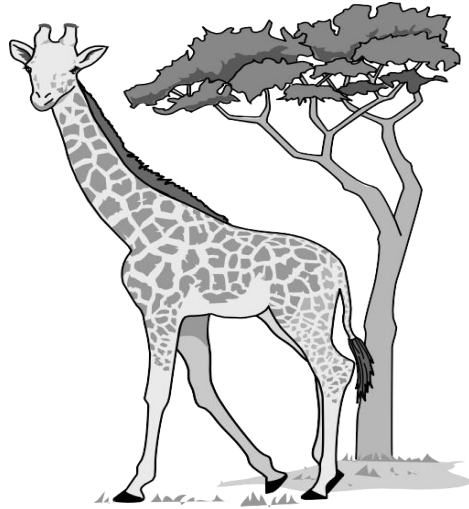


- a)
 - (i) State the principal source of energy for this food web.
 - (ii) Explain what do the arrows on the figure represent?
 - (iii) Name the organism that is **both** a secondary and a tertiary consumer.
- b) State what would happen to the number of hawks if the snakes in this food web are all dead?
- (i) The food web shown in the figure changed when eagles moved into the area.
- (ii) Eagles eat snakes and lizards. Add this information to the figure. You do **not** need to draw an eagle. State **one** factor that will increase the eagle population and **one** factor that will decrease the eagle population.
- (iii) Define the term population.

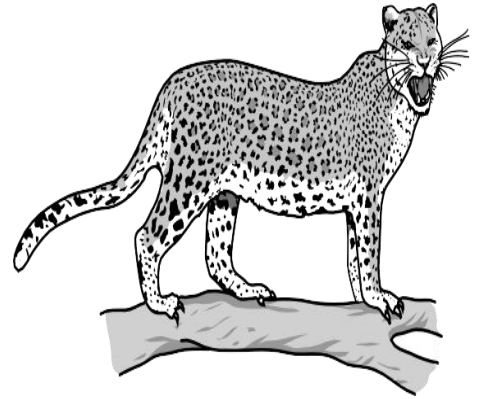
Q2: In the figure, three mammals are shown.



Gazelle



Giraffe



Leopard

a) For each mammal, choose **one** adaptive feature visible in the figure and outline how it helps the mammal to survive in its environment.

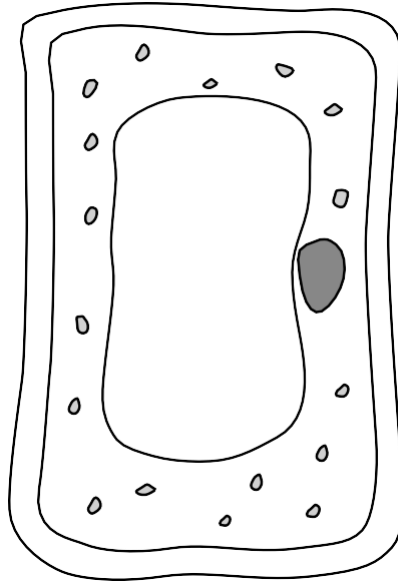
b) Choose a **different** feature for each mammal.

Q3.

name of mammal	adaptive feature	how feature helps the mammal to survive in its environment
gazelle		
giraffe		
leopard		

(i) Define the term *chromosome*.

(ii) On the given figure of plant cell, draw a line labelled **W** to show where chromosomes are found in this cell.



(b) In mice the allele for black fur (**B**) is dominant to the allele for white fur (**b**).

A mouse with black fur was mated with a mouse with white fur.

The mouse with black fur had the genotype **Bb**.

Complete the figure to show how fur colour is inherited by the offspring of this mating.

<i>parental phenotypes</i>	black fur	white fur		
<i>parental genotypes</i>		
<i>gametes</i> + +		
<i>Punnett Square</i>				
<i>offspring genotypes</i>
<i>offspring phenotypes</i>
<i>ratio</i> black : white			

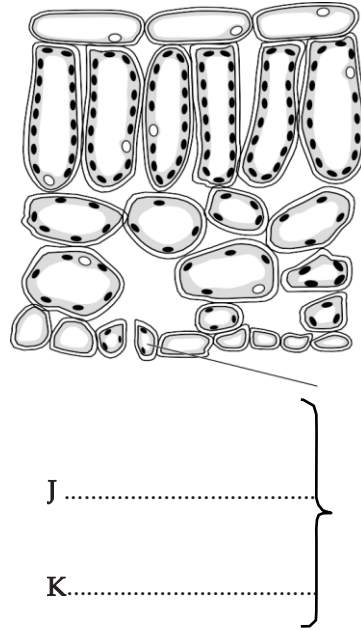
(c) Sex inheritance in mice is the same as in humans.

State the sex chromosomes of a male mouse and a female mouse.

Q4: The figure shows a section through a leaf.

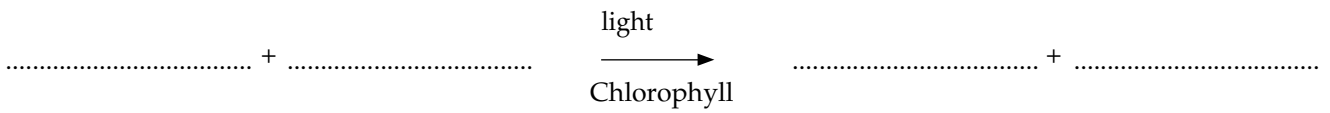
(a) Name the structures labelled J and

K. Write your answers on the figure.



(b) Leaves carry out photosynthesis.

Write the word equation for photosynthesis.



5. Sociology

Task1: Read the following key concepts:

- **Inequality and opportunity:** Inequality has a major influence on people's opportunities and life choices. Sociologists study the different forms of inequality (age, ethnicity, gender, class), seeking to understand why inequality exists and how it affects different sections of society.
- **Power, control and resistance:** Power is important in understanding how order and control are achieved in society. There are many different theories about who holds power and how power is used to shape human behavior. Sociologists are also interested in the ways people oppose and resist the exercise of power.
- **Social change and development:** Understanding how societies have changed and developed helps sociologists to make sense of the way people live today. The change from traditional society to modern industrial society is particularly important. The terms 'modernity' and 'post-modernity' are used to reflect on this transition and on contemporary issues, such as how societies are affected by globalization and the digital revolution in technology.
- **Socialization, culture and identity:** Sociologists believe that people learn how they are expected to behave through socialization. The norms and values learned through socialization may vary between cultures, impacting on social identity. The study of different social identities is central to contemporary sociology.
- **Structure and human agency:** A central debate in sociology concerns the relationship between the individual and society: is behavior shaped by wider social forces or is the social world shaped by the actions of individuals? Structural theories focus on how people's behavior is constrained by social systems and institutions. Action theories emphasize on how individuals establish meaning through social interaction and how this impact on the behavior of social groups and institutions.

Task 2: Search "The Sociological Perspective" online to find out the names of the famous sociologists and their contributions in the field of sociology.

Task 3: Read "Consensus, Conflict and Feminist Theories" online and summarize them in your own words

Task 4: Short answers.

1. How would you define sociology to someone who knows nothing about it?
2. What are the benefits of studying sociology?
3. Describe the differences between micro-level and macro-level theories. Illustrate your point with examples.

Task 5:

Find the following terms in the given puzzle:

SOCIALISM RADICAL LIBERAL CONSENSUS CONFLICT THEORYINEQUALITY EQUALITY
 CAPITALISM BOURGEOISIE DIFFERENTIATIONIDENTITY AGE SOCIAL CLASS RACE MAX WEB
 ER EMILE DURKHEIMINTERSECTIONALITY ETHNICITY ROLES STATUS CUSTOMS VALUESNO
 RMS SOCIOLOGY SOCIALSTRUCTURE SOCIALACTION SOCIALSYSTEM SOCIETY DISCRIMINATION
 SOCIALIZATION PATRIARCHY FEMINISM GENDER MARXISM SOCIAL
 FUNCTIONALISM STRATIFICATION

(Introduction to Sociology)

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

6. Psychology

Cognitive Psychology:

Cognitive psychology is the science of how we think. It's concerned with our inner mental processes such as attention, perception, memory, action planning, and language. It is the study of higher mental processes.

Core Study (Andrade Doodling)

The Andrade study is based on the idea that doodling can assist a person's concentration and memory.

Social Psychology:

Social psychologists are interested in how we work in the social world; the role of culture and society affects our behavior and areas of interests which are prejudice, obedience and conformity.

Core Study (Milgram Obedience)

The Milgram study is based on the conflict between obedience to authority and personal conscience and how far a person would go in obeying an instruction if it meant harming another person. This includes considering dispositional and situational hypotheses.

Biological Psychology:

Biological psychologists are interested in how our biology affects our psychology. For example, roles of genetics, brain functions, hormones, and neurotransmitters have on our behavior. Areas of interests include origins of mental disorders, sleep, circadian rhythms and localization of brain functions.

Core Study (Canli et al. brain scans and emotions)

The Canli et al. study is based on the link between the amygdala and emotions. The experiment tested the connection between amygdala activation and emotions in long-term recall. This includes considering functional magnetic resonance imaging (fMRI).

Learning Approach:

Behaviorist psychologists are interested in ways in which humans and animals learn.

There are three main areas within this perspective:

Operant Conditioning (learning by consequences of our behavior)

Classical Conditioning (learning through association)

Social learning (learning through observation, imitation and modeling)

Core Study (Bandura *et al* aggression)

The Bandura et al. study is based on social learning theory. The study looked at whether a child would imitate aggressive behavior if they witnessed such behavior in an adult.

Research Methods

Experiments:

Laboratory Experiments: These take place in a situation or environment that is artificial to the participants in the study (laboratory).

Field Experiments: These are the experiments that take place in the participants own natural environment rather than in an artificial laboratory (weather and time of the day).

Natural Experiments: This is when the researcher use the pre-existing IV (work place and hospital).

Ethical guidelines as used in psychological research, in relation to human participants:

- Informed consent
- Protection from harm (physical and psychological)
- Right to withdraw
- Lack of deception
- Confidentiality
- Privacy
- Debriefing

Ethical guidelines as used in psychological research, in relation to animals:

- Replacement
- Species and Strain
- Numbers
- Procedures
- Pain and Distress
- Housing
- Reward
- Deprivation and Aversive Stimuli
- Anesthesia
- Analgesia

Data Analysis

How to find a:

- Mean
- Median
- Mode
- Range

How to draw and interpret data from a:

- Bar Chart
- Histogram
- Scatter Graph

Read through the description of the study and answer the questions that follow.

Author (date): Bandura (1961)

Aim

Bandura (1961) conducted a controlled experiment study to investigate if social behaviors (i.e., aggression) can be acquired by observation and imitation.

Sample

Bandura, Ross, and Ross (1961) tested 36 boys and 36 girls from the Stanford University Nursery School aged between 3 to 6 years old.

The researchers pre-tested the children for how aggressive they were by observing the children in the nursery and judged their aggressive behavior on four 5-point rating scales.

It was then possible to match the children in each group so that they had similar levels of aggression in their everyday behavior. The experiment is, therefore, an example of a matched pairs design.

To test the inter-rater reliability of the observers, 51 of the children were rated by two observers independently and their ratings compared. These ratings showed a very high reliability correlation ($r = 0.89$), which suggested that the observers had a good agreement about the behavior of the children.

Method/Procedure

A lab experiment was used, in which the independent variable (the type of model) was manipulated in three conditions:

- Aggressive model is shown to 24 children
- Non-aggressive model is shown to 24 children
- No model shown (control condition) - 24 children

Stage 1: Modeling

In the experimental conditions children were individually shown into a room containing toys and played with some potato prints and pictures in a corner for 10 minutes while either:

1. 24 children (12 boys and 12 girls) watched a male or female model behaving aggressively towards a toy called a 'Bobo doll'. The adults attacked the Bobo doll in a distinctive manner - they used a hammer in some cases, and in others threw the doll in the air and shouted "Pow, Boom."
2. Another 24 children (12 boys and 12 girls) were exposed to a non-aggressive model who played in a quiet and subdued manner for 10 minutes (playing with a tinker toy set and ignoring the bobo-doll).
3. The final 24 children (12 boys and 12 girls) were used as a control group and not exposed to any model at all.

Stage 2: Aggression Arousal

All the children (including the control group) were subjected to 'mild aggression arousal.' Each child was (separately) taken to a room with relatively attractive toys.

As soon as the child started to play with the toys, the experimenter told the child that these were the experimenter's very best toys and she had decided to reserve them for the other children.

Stage 3: Test for Delayed Imitation

- The next room contained some aggressive toys and some non-aggressive toys. The non-aggressive toys included a tea set, crayons, three bears and plastic farm animals. The aggressive toys included a mallet and peg board, dart guns, and a 3 foot Bobo doll.
- The child was in the room for 20 minutes, and their behavior was observed and rated through a one-way mirror. Observations were made at 5-second intervals, therefore, giving 240 response units for each child.
- Other behaviors that didn't imitate that of the model were also recorded e.g., punching the Bobo doll on the nose

Results

- Children who observed the aggressive model made far more imitative aggressive responses than those who were in the non-aggressive or control groups.
- There was more partial and non-imitative aggression among those children who had observed aggressive behavior, although the difference for non-imitative aggression was small.
- The girls in the aggressive model condition also showed more physical aggressive responses if the model was male, but more verbal aggressive responses if the model was female. However, the exception to this general pattern was the observation of how often they punched Bobo, and in this case the effects of gender were reversed.
- Boys were more likely to imitate same-sex models than girls. The evidence for girls imitating same-sex models is not strong.
- Boys imitated more physically aggressive acts than girls. There was little difference in the verbal aggression between boys and girls.

Conclusion

The findings support Bandura's (1977) Social Learning Theory. That is, children learn social behavior such as aggression through the process of observation learning - through watching the behavior of another person.

This study has important implications for the effects of media violence on children.

Evaluation

There are three main **advantages** of the experimental method.

1. Experiments are the only means by which cause and effect can be established. Thus, it could be demonstrated that the model did have an effect on the child's subsequent behavior because all variables other than the independent variable are controlled.
2. It allows for precise control of variables. Many variables were controlled, such as the gender of the model, the time the children observed the model, the behavior of the model and so on.
3. Experiments can be replicated. Standardized procedures and instructions were used, allowing for replicability. In fact, the study has been replicated with slight changes, such as using video and similar results were found (Bandura, 1963).

Limitations of the procedure include:

- Many psychologists are very critical of laboratory studies of imitation - in particular because they tend to have low ecological validity. The situation involves the child and an adult model, which is a very limited social situation and there is no interaction between the child and the model at any point; certainly the child has no

chance to influence the model in any way. Also, the model and the child are strangers. This, of course, is quite unlike 'normal' modeling, which often takes place within the family.

- Cumberbatch (1990) found that children who had not played with a Bobo Doll before were five times as likely to imitate the aggressive behavior than those who were familiar with it; he claims that the novelty value of the doll makes it more likely that children will imitate the behavior.
- A further criticism of the study is that the demonstrations are measured almost immediately. With such snapshot studies, we cannot discover if such a single exposure can have long-term effects.
- It is possible to argue that the experiment was unethical. For example, there is the problem of whether or not the children suffered any long-term consequences as a result of the study. Although it is unlikely, we can never be certain.

Source: Simply Psychology, <https://www.simplypsychology.org/bobo-doll.html>

1. Summarise Bandura (1961) in 3-4 paragraphs.
2. Identify the research method used?
3. Identify three ethical considerations of this study.
4. To what extent can this study's conclusions be applied to people in general?
5. This study gave rise to the theory of Social Learning, that children learn by observation. To what extent does this study support the claim that children learn by observing others?

7. Business Studies

Entrepreneurship

Role of Entrepreneur

New business ventures started by **entrepreneurs** can be based on a totally new idea or a new way of offering a service. Entrepreneur is someone who takes the financial risk of starting and managing a new venture.

They have:

- had an idea for a new business
- invested some of their own savings and capital
- accepted the responsibility of managing the business
- accepted the possible risks of failure.

Characteristics of successful entrepreneurs

The personal qualities and skills needed to make a success of a new business venture include:

- Innovation
- Commitment and self-motivation
- Multiskilled
- Leadership skills
- Self-confidence and an ability to bounce back
- Risk taking

Case Study

Bangalore enterprise blossoms

Rama Karaturi gained the idea for his rose-growing business when he searched, without success, for a bouquet of roses for his wife in Bangalore. The city was a rose-free zone, so he decided to start growing them himself. Initially, he opened two greenhouses growing just roses. He used his own savings, so took a considerable risk, but his in the growth of flower-giving at times of major festivals encouraged other investors too.

He sold the flowers in India, but his business also became one of the first in India to start exporting flowers on a large scale. Rama worked long hours to make his business a success. The business, called Katuri Networks, has grown at a tremendous rate, helped by Rama's all-round business skills.

He recently bought out a large rose-grower in Kenya and his business is now the world's largest cultivator of roses – and Rama achieved this in a little over ten years.

1 Rama is an example of a 'business entrepreneur'. Explain what is meant by this term. [3]

2 Outline any **three** characteristics of Rama's personality that led to the success of his enterprise. [6]

Word match

Match each word from the first column with a word from the second column to give the characteristics of an entrepreneur.

opportunity
risk
decision
creative
self
strong

taker
motivator
spotter
communicator
thinker
maker

Identify the characteristics of a successful entrepreneur from the scrambled words below.

1 VAT in onion -----

2 Mint CT memo -----

3 Dell milk suit -----

4 Fenced icon -----

5 Date vomit -----

Social Enterprise

Social enterprises are not charities, but they do have objectives that are often different from those of an entrepreneur who is only profit motivated. Social enterprise: a business with mainly social objectives that reinvests most of its profits into benefiting society rather than maximising returns to owners.

Example: The KASHF Foundation in Pakistan provides micro-finance (very small loans) and social-support services to women entrepreneurs who traditionally find it very difficult to receive help. This enables the women to set up their own businesses in food production, cloth making and other industries. The loans have to be repaid with interest, but the interest rates are much lower than a profit-maximising international bank would charge.

Research Task

Find out about three social enterprises in your own country.

Describe the following:

- what goods/services they provide
- their main objectives
- the main sources of finance.

International Trade

What do the following acronyms stand for?

- 1 WTO
- 2 NAFTA
- 3 ASEAN
- 4 EU

Free trade blocs

Match the following countries to the correct free trade blocs.

- USA
- France
- Thailand
- Mexico
- Latvia
- Canada
- Brunei
- Vietnam

EU	NAFTA	ASEAN

Business structure

Word search

Terms are given to match each of the definitions below. Where there are two words this is shown in brackets after the question and the two words will be in different places in the word search.

- 1. This sector includes businesses owned and controlled by individuals or groups of individuals (Private)
- 2. Organisations accountable to and controlled by central or local government (Public sector)
- 3. Economic resources are owned and controlled by state (Command economy)
- 4. A business in which one person provides the permanent finance and has full control of the business (Sole trader)
- 5. A business owner's assets are potentially at risk (Unlimited liability)
- 6. A person or institution owning shares in a limited company (Shareholder)
- 7. A private limited company will have these initials after its name (Ltd)
- 8. A business that uses the name, logo and trading systems of an existing successful business (Franchise)

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

Business Stakeholders

Case Study: Tata Nano – Which Stakeholders Benefit From It?

It is three metres long, seats four, does 100 kilometres an hour and, when launched, aimed to revolutionise travel for millions. The 'People's Car' is also the cheapest in the world at 100,000 Rupees (US\$2,600) – about the same price as a DVD player in a Lexus. When Rattan Tata, the company chairman, unveiled the cute, snubnosed car it was believed that it would allow millions of Asia's emerging middle classes to buy a car for the first time. 'This will change the way people travel in India and Asia. This is a car that will be affordable to millions of consumers for the first time,' he said when the car was launched. However, sales levels are currently way below those forecast – just 554 units in December 2013. Customers are being put off by the car's poor safety record and the title 'the world's cheapest car'.

Tata plan to relaunch the car at a higher price with an improved specification under the advertising headline of 'celebrating awesomeness' – hoping to make the car profitable for shareholders once more.

The car is built in a factory in West Bengal, offering relatively well-paid factory employment to many workers for the first time. India gains export revenue when the car is sold abroad. The steel and other materials used in the car are purchased from Asian suppliers, which helps to boost local economies and suppliers.

The idea of millions of cheap cars on the road alarms environmental groups. Rajendra Pachauri, the UN's chief climate scientist, said that he was 'having nightmares' about the environmental impact.

Delhi, where air pollution levels are more than twice the safe limit, is registering 1,000 new cars a day.

Average speed of traffic at rush hour is only ten kilometres an hour and the government might be forced to spend much more on building new roads if Nano ownership becomes more widespread. Bus operators also fear increased competition from private car users.

- List the groups of people who benefit from Nano car production.
- List the groups of people who might be badly affected by the use of large numbers of small, cheap cars.
- Do you think Tata should attempt to reduce the potential conflicts between the interests of these groups?

Management and Leadership

Case Study: What Makes A Good Leader?

The question is eternal: what makes a good leader?

There is no definitive answer but one thing is certain: as business technologies evolve, new industries come and go and employee demographics change, the best leaders are those who can change with the times.

They're the ones with foresight and adaptability, who don't rule from a manual but customise their approach to suit to each company, its mission and the personality of its work force. Here are four quotes from, or about, famous chief executives:

- Ted Devine, Insureon: 'Having a completely open plan off ice says this about leadership: No walls, no barriers, no hierarchy. Everybody can talk to everybody. Everybody can participate in a decision. We work together, and that's very important in leadership.'
- Shelie Johnson, BET cable network: 'I want every one of my employees to look at me with dignity and respect. I want to be someone they are proud to work for.'
- Jeff Weiner, LinkedIn: As a manager, Weiner takes time to acknowledge relatively small

Points to think about:

- What do you think 'leadership' means?
- Do you think that all of the quotes above suggest 'good leadership'? Why?
- Do you think there is a difference between 'leading' people and 'managing' them? Explain your answer.

8. Accounting

Activity 1

Enter the following transactions in the ledger of A Baker and prepare a trial balance at 31 May, together with a calculation of the profit for the month and a balance sheet at 31 May.

May 1	Started in business with £1,500 in the bank and £500 cash
May 2	Purchased goods to the value of £1,750 from C Dunn, agreeing credit terms of 60 days
May 3	Bought fixtures and fittings for the bakery for £150, paying by cheque
May 6	Bought goods on credit from E Farnham for £115
May 10	Paid rent of £300 paying cash
May 12	Bought stationery – cash book and invoices – for £75 – paying by cash
May 14	Sold goods on credit, value £125, to G Harlem
May 20	Bought an old van for deliveries for £2,000 on credit from I Jumpstart
May 30	Paid wages of £450 net for the month by cheque, Inland Revenue deductions of £75 to be paid in the following month
May 31	Summarised cash sales for the month and found them to be £2,500. Took a cheque for £500 as own wages for the month. Banked £2,000 out of the cash sales over the month
May 31	Closing stock was £500

Activity 2

You are to open the books of F Polk, a trader, via the journal to record the assets and liabilities, and are then to record the daily transactions for the month of May. A trial balance is to be extracted as on 31 May 20X9.

20X9

May 1	Assets: Premises £34,000; Van £5,125; Fixtures £810; Stock £6,390. Debtors: P Mullen £140; F Lane £310. Cash at bank £6,240; Cash in hand £560. Liabilities: Creditors: S Hood £215; J Brown £460.
== 1	Paid storage costs by cheque £40.
== 2	Goods bought on credit from: S Hood £145; D Main £206; W Tone £96; R Foot £61.
== 3	Goods sold on credit to: J Wilson £112; T Cole £164; F Syme £208; J Allen £91; P White £242; F Lane £77.
== 4	Paid for motor expenses in cash £47.
== 7	Cash drawings by proprietor £150.
== 9	Goods sold on credit to: T Cole £68; J Fox £131.
== 11	Goods returned to Polk by: J Wilson £27; F Syme £41.
== 14	Bought another van on credit from Abel Motors Ltd £4,850.
== 16	The following paid Polk their accounts by cheque less 5 per cent cash discount: P Mullen; F Lane; J Wilson; F Syme.
== 19	Goods returned by Polk to R Foot £6.
== 22	Goods bought on credit from: L Mole £183; W Wright £191.
== 24	The following accounts were settled by Polk by cheque less 5 per cent cash discount: S Hood; J Brown; R Foot.

- == 27 Salaries paid by cheque £480.
- == 30 Paid business rates by cheque £132.
- == 31 Paid Abel Motors Ltd a cheque for £4,850.

Activity 3

A Blog, a building contractor, had a wooden store shed and a brick-built office which have carrying amounts in the books of £850 and £179,500 respectively. During the year, the wooden shed was pulled down at a cost of £265, and replaced by a brick-building. Some of the timber from the old store shed was sold for £180 and the remainder, valued at £100, was used in making door frames, etc., for the new store. The new brick-built store was constructed by the builder's own employees, the expenditure thereon being materials (excluding timber from the old store shed) £4,750; wages £3,510; and direct expenses of £85.

At about the same time, certain repairs and alterations were carried out to the office, again using the builder's own materials, the cost of which was: wages £290 and materials £460. It was estimated that £218 of this expenditure, being mainly that incurred on providing additional windows, represented improvements, 50% of this was wages, 50% materials.

Required:

Prepare the following four ledger accounts as they would appear after giving effect to all the above matters:

- (a) Wooden store shed account
- (b) Office buildings account
- (c) New store account
- (d) Office buildings repairs account

Activity 4

John Boggis saw a computer for sale in a local store for £1,499. This was much cheaper than he'd seen it for sale elsewhere. He needed five of these PCs and also needed the cabling to network them. Following negotiations with the retailer, he obtained the machines for a total of £7,000. However, the cost of the cabling was £300 and the supplier was going to charge £500 to install the network. If John paid the total amount due before installation, he would receive a discount of 2.5 percent. He liked this idea and paid immediately.

Subsequently, he purchased three printers costing £125 each and software costing £350, together with floppy disks and consumables costing a total of £250. The supplier gave a discount of £50 on the consumables due to the size of the order.

All of John's staff was sent on a customised training course organised by the retailer at a total cost of £500.

Required:

- (a) Calculate the amount capitalised in the balance sheet in respect of the computer equipment and also the amount to be charged to revenue accounts.
- (b) 'Materiality' is a concept which sometimes has an effect on the capitalisation of amounts within a balance sheet. Give examples of how this may be done.

Activity 6

Shah's garage

Salman Shah has been in business as a sole trader for many years, owning a small garage and petrol station. He has two sons and a daughter and they want to be involved in his business. Each of them is married and has a family. The garage supplies petrol and oil to local customers and some passing motorists. However, there is little profit in petrol retailing. The car-repair side of the garage is facing increasing competition from the large franchised operations of the major car manufacturers. Salman wants to expand the business so that his children can become involved – at present, the profits could not support more than one family. He is thinking of three possible ways to expand the business:

- Ayman, one of his sons, has bus- and taxi-driving licenses. There could be the chance of providing a taxi service with a new five-seater taxi.
- The local bus services are being withdrawn. There is a possibility of running a bus service to local factories and schools. The bus would therefore not be used all day and every day.
- Local shops have been closing because of competition from supermarkets. Salman could build a small extension to the petrol-station shop and stock it with groceries and everyday household items. His daughter Stella would be keen to manage this shop.

Questions:

1. Assume that Salman's garage is located in the area where you live. He can only afford to choose one of the possible ways of expanding. Which would you suggest and why?
2. For the option you have suggested in Q1, make and justify an assumption about how much capital you think the business will need.
3. Advise Salman on ways in which capital might be obtained, making clear the options open to him if he changed the form of business organisation.
4. Which form of business organisation would you suggest for Salman's business, and why?

9. Economics

Activity 1

New fashion Jeweler

New Fashion Jeweler is an independent jewelry shop that is located in Multan, Pakistan. The business owners design and make the jewelry in their workshop and it is sold to customers from its store and via the internet through the firm's website.

The following table shows examples of goods and services from the primary, secondary, and tertiary sectors that are necessary for New fashion Jeweler to operate successfully. The firms in each sector represent links in the chain of production.

Activity/Sector	Examples of goods/services required
Primary	silver, gold, and semi-precious stones
Secondary	Designers and jewelry makers to create jewelry products
Tertiary	Banking & Finance, Advertising, insurance, shops to sell jewelry, transport of finished goods, and website designers.

Refer to the case study above.

1 Identify the factors of production required by **New Fashion Jeweler** to operate its business.

2 Produce a table like the one above for:

- a mobile phone manufacturer
- a fast-food restaurant chain
- a shop selling kitchen equipment.

Activity 2

- 1 Make a list of the goods and services provided by the public sector of your country.
- 2 Identify the goods and services that are free to individuals and those for which you have to pay.
- 3 List which goods/services could be provided by a private firm as well as by the public
- 4 (Government) sector.
- 5 Compare and contrast the aims and objectives of a government-funded swimming pool and a private health and leisure

Activity 3

- 1 Make a list of your wants and needs.
- 2 Are there any needs that you could survive without?
- 3 Are there any wants that might be considered as needs?
- 4 Identify a shortage of any goods or services in your country. Explain why the shortage has occurred

Activity 4

Draw a table and write down the heading of some of the Factors of Production used in the Supply of Bread. Headings of the columns will be: Land Resources, Labour, Capital and Enterprise. Put the items in the list below into the correct

columns. Lorries, Bakers, Cash tills, Flour, Company chairperson, Ovens, Salt, bus drivers, Water, Mills, Shop keepers, Slicing machines, Baking trays, Shareholders

Activity 5

The most serious problem in Africa is posed by the failure of agriculture, which is the main cause of malnutrition, unemployment, and the growing number of imports. A great deal of hard work has gone into developing rice growing in West Africa, and output almost doubled between 1962 and 1977. But as consumption grew much faster than output, imports had to be stepped up at the same time. Few African countries have given priority in their investment programmes to agricultural development. Very small amounts of government expenditure were earmarked for agriculture since the lion's share went on administrative buildings and other equipment, the urban areas and industry. Food crops have received - and are still receiving - the least attention of all.

- (a) Why have African countries been importing (buying goods from abroad more and more)?
- (b) Give a possible reason for consumption growing faster than the supply of food in many African countries.
- (c) What kind of things have many African governments spent money on, and what has been the opportunity cost of that spending?
- (d) What would you expect to happen to the standard of living of agricultural workers in future years in Africa? Give reasons for your answer.
- (e) How does the economic problem of scarcity differ between West Africa and Western Europe?

Activity 6

We face scarcity as individuals. Each of us has a limited income and hence we cannot buy everything we want. And it's not just a question of what we can afford. Even the richest person has limited time. There are only 24 hours in a day and we will all die. So even if we had the money, we would not be able to enjoy every possible good we would like to consume or take part in every possible activity.

The same applies to nations. A nation has limited resources and hence cannot produce everything people would like. Our planet has finite resources, and the technology and human abilities to exploit these resources are also limited.

We thus have to make choices. If you choose to spend your time staying in and watching television, you are choosing *not* to go out. It's the same when you spend money. If you buy a CD for £10, you are choosing *not* to spend that £10 on something else. Likewise, if a nation devotes more of its resources to producing manufactured goods, there will be less to devote to the production of services or agricultural goods. What we give up in order to do something is known as its *opportunity cost*. Opportunity cost is the cost of doing something measured in terms of the best alternative forgone

To make sensible decisions we must *weigh up* the benefits of doing something against its opportunity cost.

Describe some problems involving opportunity cost that may have to be faced by:

- yourself in your weekly spending
- a young couple with little money who have just bought their own flat.
- a firm
- the government

10. Law

1. Read the newspaper articles and answer the questions that follow.

(a) The High Court has ordered an injunction to be served through Twitter for the first time. In yesterday's ruling, the court said issuing the writ over Twitter was the best way to get to an anonymous tweeter who was impersonating a right wing commentator. The Twitter account, Blaneys was impersonating Donal Blaney, a lawyer. The account which was opened last month features a photograph of Mr Blaney followed by a number of messages purporting to be by him. The Court said that the imposter should stop these activities and must reveal themselves to the Court. The owner of the fake account will receive the writ next time they enter the site.

(b) A newly married couple have successfully sued their wedding photographer after paying 1000£ for a woefully inadequate service. They were presented with a disc full of pictures from the big day with the heads chopped off, inattentive guests and random close up of vehicles. Out of the 400 images, only 22 met with their approval. They have now been awarded compensation by a Deputy District Judge against the photographer for the breach of contract. The Judge ordered to pay back 500£ from the 1000£ with 500£ in damages and 170£ for Court fees.

Questions

1. Look at the articles and identify which courts have been mentioned.
 2. Two different types of remedies have been identified. What are they?
 3. Give some examples other than the ones mentioned in the articles, where these remedies may be applied.
 4. Which of the 2 Courts mentioned is higher in the hierarchy.
2. Read the extract from the Judgment in the case of Hunter V Canary Wharf and then answer the questions given below.

Lord Justice Pill giving judgment said:

Counsel for the defendants submits that interference with television reception by reason of the presence of building is properly to be regarded as analogous to loss of view. To obstruct the receipt of television signals by the erection of a building is not in law a nuisance. I accept the importance of television in our lives. However in my judgment the erection or presence of a building in the line of sight between a television transmitter and other properties is not actionable as an interference with the enjoyment of land. The analogy with loss of prospect is compelling. The loss of a view which may be of great importance to many householders is not actionable and neither is the mere presence of building in the sight line to the television transmitter.

Questions

- 1 In respect of the interference with television reception, with what did Lord Justice Pill draw an analogy?
- 2 Do you think the Judge was right to make an analogy between the two situations? Give reasons for your answer.
- 3 By drawing the analogy, does it mean that the claimant won or lost the case?
4. Give some examples of actionable nuisance.

11. Computer Science

Assignment #1

Negative numbers are represented into computer's memory in their 2's complement form. 2's complement of a binary number is obtained by following 2 steps method:

- i. Toggle all the bits in binary number
- ii. Add 1 in the number obtained after step i.

e. g. 2's Complement of 00101100 is to be calculated as:

- i. Toggling the bits 11010011
- ii. Adding 1: 1
 11010100

Task 1.

Represent following binary numbers into their 2's complement form:

- i. 01011001
- ii. 00011110

Task 2.

Represent following denary numbers into binary (2's complement)

- i. -34
- ii. -29

Assignment2.

The current contents of a general purpose register (R) are:

R:

1	0	1	0	1	1	0	1
---	---	---	---	---	---	---	---

(a) The contents of R represent an unsigned binary integer.

Convert the value in R into denary.

(b) The contents of R represent an unsigned binary integer.

Convert the value in R into hexadecimal.

(c). Give two more interpretations of contents stored in R.

Assignment 3.

Many different types of plants are being grown and sold in a plant nursery. A computer is used to store plants details into four 1-D arrays (parallel arrays).

Array Name	Data Type
Plant_ID	Integer
LocalName	String

BotanicalName	String
Price	Real

1. Design an algorithm to search for a specific value in Plant_ID and, if found, to output the array index where the value is found. Output a suitable message if the value is not found.
2. Consider the difference between algorithms that search for a single or multiple instance of the value.
3. Extend the algorithm to output the corresponding values from the other arrays.
4. Write **program code** to produce a report displaying all the information stored about each plant for which Price is below a given level.

Assignment 4:

Computer programs have to evaluate expressions. Study the sequence of pseudocode statements given below.

- Give the value assigned to each variable.
- The statement may generate an error. If so, write ERROR.
- The & operator is used to concatenate strings.

DECLARE N1	:	INTEGER
DECLARE N2	:	INTEGER
DECLARE Answer	:	REAL
DECLARE Found	:	BOOLEAN
DECLARE IsValid	:	BOOLEAN
N1	←	3
N2	←	9
Answer	←	(N1 + N2) / 6
Answer	←	3 * (N1 - 2) + N2 / 2
IsValid	←	(N1 > N2) AND (N2 = 9)
Found	←	FALSE
IsValid	←	(N1 > N2 / 2) OR (Found = FALSE)
Answer	←	"1034" & " + " & "65"

Assignment 5.

A program is to simulate the operation of a particular type of logic gate.

- The gate has two inputs (0 or 1) which are entered by the user.
- The program will display the output (0 or 1) from the gate.

The program uses the following identifiers/variables in the pseudocode below:

Identifier	Data type	Description
P	INTEGER	Input signal
Q	INTEGER	Input signal
X	INTEGER	Output signal

```

01 INPUT P
02 INPUT Q
03 IF (P = 1 AND Q = 0) OR (P = 0 AND Q = 1) OR (P = 0 AND Q = 0)
04     THEN
05     X ← 0
06     ELSE
07     X ← 1
08 ENDIF
09 OUTPUT X
    
```

Task 1:

The programmer chooses the following four test cases:

Show the output (X) for each test case.

Test case	Input		Output X
	P	Q	
1	1	1	
2	1	0	
3	0	1	
4	0	0	

Task 2:

The selection statement (lines 03 – 08) could have been written with more simplified logic.

Rewrite this section of the algorithm in **pseudocode**.

Task 3:

Draw a circuit diagram to simulate a logic circuit for logic condition given in above pseudocode.

12. Critical Thinking

Thinking critically means to question new information before accepting it as true. If you are told something new or read something new, here are some questions that you can ask before accepting the new information as true...

What: -is the source of the information and is it a reputable and reliable source?
- are some alternative explanations/perspectives?

Who: -benefits (or could benefit) from this information?
-else have you heard discuss this?
-is this harmful to?
-would be best to ask for more information about this topic?
-is the person generating this information and what is their expertise in the matter?

Where: -could we search for supporting information or information to refute the information?
-are similar concepts/information available?
-has this information come from to you?

When: -was this information created?
-was the information received (compared to when it was created)?

Why: -is the information relevant to you/others?
-has the information been created and communicated?
-are people influenced by this information?
-is this information needed now?

How: -is this information similar to other information?
-can this information be used?

Read the following 3 news article and apply some critical thinking questions to answer the basic question: should I believe this new information? Which articles do you think are true, not true, not sure and would want more information before deciding? Does the source (where you receive information from) matter in your critical thinking?

Article 1:

The first Arab space mission to Mars has blasted off aboard a rocket from Japan, with its unmanned probe – called Al-Amal, or Hope – successfully separating about an hour after liftoff.

A live feed of the launch showed the rocket carrying the probe lifting off from the Tanegashima Space Centre in southern Japan at 6.58am (9.58pm GMT).

Almost exactly one hour later, the feed showed people applauding in the Japanese control room as the probe successfully detached.

In Dubai, the launch was met with rapturous excitement, with the UAE Mars mission’s deputy project manager Sarah al-Amiri declaring it “an indescribable feeling” to see the probe blasting off.

“This is the future of the UAE,” Amiri, who is also minister of state for advanced sciences, told Dubai TV from the launch site.

The Emirati project is one of three racing to Mars, including Tianwen-1 from China and Mars 2020 from the United States, taking advantage of a period when the Earth and Mars are nearest.

In October, Mars will be a comparatively short 38.6m miles (62m km) from Earth, according to Nasa.

Hope is expected to reach Mars’s orbit by February 2021, marking the 50th anniversary of the unification of the UAE, an alliance of seven emirates.

Unlike the two other Mars ventures scheduled for this year, it will not land on the planet, but instead orbit it for a whole Martian year, or 687 days.

While the objective of the Mars mission is to provide a comprehensive image of the weather dynamics in the red planet's atmosphere, the probe is a foundation for a much bigger goal – building a human settlement on Mars within the next 100 years.

The UAE also wants the project to serve as a source of inspiration for Arab youth, in a region too often wracked by sectarian conflicts and economic crises.

On Twitter, the UAE's government declared the probe launch a "message of pride, hope and peace to the Arab region, in which we renew the golden age of Arab and Islamic discoveries."

*Source: The Guardian (July 20, 2020),
<https://www.theguardian.com/science/2020/jul/20/uae-mission-mars-al-amal-hope-space>*

Article 2:

A couple living on the South Island's Otago Peninsula in New Zealand are not giving up hope of finding their beloved dogs – despite having spent \$20,000 (£10,400) and nine months scouring the country for them, to no avail.

Nine-year-old black poodle Dice and three-year-old fox terrier Weed went missing from Alan Funnell and Louisa Andrew's home in October last year.

Since then, Funnell has spent one weekend a month traversing the South Island searching for them.

He and Andrew say they have put up about 400 signs and spent at least NZ\$20,000 in their mission.

"Our dogs to us are like our family, we just know they are out there somewhere," Funnell said. "New Zealand is really not that big a place."

The saga started when Andrew went to feed the couple's chickens and let the dogs out of the car. They ran off, perhaps chasing a rabbit, and did not return.

"We called and called, and they didn't come," said Funnell. "We love our animals. They are great wee dogs. We are not going to give up until we find them."

Members of the public have helped with putting up signs which are now spread throughout country – from the tip of the North Island to the bottom of the South Island.

The couple have raised more than \$10,000 to help with the search from almost 300 donors. "We got a huge amount of support throughout New Zealand and we are lucky to have that," Funnell said.

Funnell thinks the dogs were picked up by tourists after a sighting came through of two dogs being tied to a campervan in the area.

"We have been through a rollercoaster of emotions in the process of it all. We are sure they are alive. We have come to being positive about things," said Funnell.

"We can feel them out there."

*Source: The Guardian (July 20, 2020),
<https://www.theguardian.com/world/2020/jul/20/new-zealand-is-not-that-big-a-place-the-nine-month-20000-search-for-two-lost-dogs>*

Article 3:

American Airlines To Phase Out Complimentary Cabin Pressurization

FT. WORTH, TX— Explaining that the costs of the service have grown too high in recent years, American Airlines announced Tuesday that it will no longer offer free cabin pressurization to passengers starting March 15. "Unfortunately, to stay competitive as a legacy carrier in today's air travel market, it no longer makes economic sense for us to provide breathable air at altitude," said American Airlines CEO Doug Parker, noting that despite the cutbacks, air pressurization would still be available to first- and business-class travelers as well as those willing to pay an additional fee. "While we regret any altitude sickness, blood problems, dimmed vision, or hyperventilation that

may result from air pressure less than a third normal levels, we remind our customers that such effects will diminish as soon as the aircraft descends below 10,000 feet." Parker added that the company is also planning to discontinue complimentary landing gear on flights under four hours.

The Onion (25 February, 2014)

<https://www.theonion.com/american-airlines-to-phase-out-complimentary-cabin-pres-1819576190>

Article 4:

Nutritionists Admit You Can Just Eat Hotdogs And Live Like That For Basically Decades

DENVER—Conceding that people can, in fact, survive indefinitely on a daily diet consisting solely of hotdogs, top nutritionists admitted Wednesday that you could just eat hotdogs and live for basically decades. "We put a lot of work into formulating dietary guidelines based on discoveries and advancements in the field of food science, but

honestly, if you just ate hotdogs three times a day every day, you'd be okay," said nutritionist Alison Lawler, noting begrudgingly that a supermarket hotdog contains sufficient proteins, carbohydrates, and minerals to sustain an average human well into their 80s. "You won't be healthy per se, but you'd last on hot dogs for years and years. You wouldn't feel great, you'd be a bit weak and tired, but that's about it. And you'd most likely be reasonably happy, because hot dogs are tasty and satisfying. Now, by no means are we recommending that you stock your pantry full of hot dogs, but we have to admit, that wouldn't be the end of the world." At press time, the nutritionists were not available for further comment as they had all gone out for hotdogs.

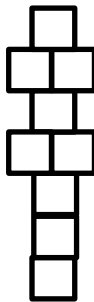
The Onion (20 July, 2020).

<https://www.theonion.com/nutritionists-admit-you-can-just-eat-hot-dogs-and-live-1844383727>

13. Sports

Sadiq Public School's curriculum is more than just academic subjects. This is one of the main ways that Sadiq Public School is so unique. We aim for all students to learn the value of team sports sportsmanship and good health through regular physical activity. You can learn some of these even while at home.

1. Choose 2-3 physical exercises and practice doing these every day. It may be press ups, step ups (walking up and down 3-4 stairs repeatedly), star-jumps, squats... You should do 2-3 of these every day for about 30 minutes every day. Early in the morning is probably better. You are aiming to make it a daily habit that you will still be doing when you're 50 years old. You can challenge yourself to do more each day or more in the 30 minute session. You can challenge your parents (but remember that they're very old and so be gentle with them).
2. Think of a skill-based physical activity that involves some coordination, such as juggling three balls or skipping rope. Now teach yourself how to do this. And when you're proficient, teach someone else. Why? Doing these things occupies your brain and that means you're not thinking about other things – so these activities become a good way to relax, distract your brain from things that are causing you stress (like exams!)
3. Ball games are good for reducing stress, and sneakily using up energy and so keeping you for and healthy and helping you to sleep properly. If you have brothers and sisters at home you can ball games like mini-cricket, catching & throwing, bouncing a ball against a wall and catching it (who knows you may be selected as wicket-keeper for the 1st XI).
4. Hop-sotch. You might have to ask your parents how to play this. With chalk, draw a grid of 9 squares on a paved area...



Stand at the bottom of the grid. Each square has a number 1-9 in it (I can't draw the number with my computer, but you can with chalk.) Use a small stone and slide it first to the 1st square. Hopping, jump over the square with the stone in it, continue hopping up the grid in the correct order, torn around, hop back to the 2 square, bend down and pick up the stone (you're not to put your other foot on the ground otherwise it's too easy), and then back to the start. If you succeed, now slide the stone to the 2 square and hop away, and back, bend down pick up the stone, hop to the start... etc. If you miss the square with you stone, or you put your non-hopping foot down your turn has ended and the next player starts. Yes, parents can play too, but not your neighbours or your cousins who live in Lahore because they're staying home and staying safe. If you don't like my rules, make your own. But once you make the rules, no cheating.

14. Community Service

Community service simply means serving our community – doing something to help the community. In the current situation we can all serve our community by staying at home / staying away from other people and washing our hands frequently with soap because when we do this we stop the virus being passed from one person to another. If we all do this, our whole community will be helped.

You can help the whole world's community by doing what you can to reduce plastic waste. You can do this by refusing plastic bags at shops. Make your own paper bags at home and take these to the shops and so not use plastic bags. Buy less (or even none) products that have plastic packaging. Glass can be recycled and so that's fine.

Bury biodegradable waste in your garden rather than send it by rubbish truck to a dump somewhere. Fruit, vegetable scraps, leftover food etc. will rot in your garden and so quickly convert back into soil and return nutrients to plants. Paper waste will do the same.

Turn off lights and other electricity-users when not needed and do not let water taps run needlessly.

Look for ways to help others. Practise saying, 'can I help you?' with family members and then helping will become part of who you are.

There is an interesting theory that the virus that has caused this current situation was passed to humans because animal habitats, especially forests, are being destroyed. Destroying forests, whether for the timber, for clearing land to use for agriculture, or simply to burn the wood as fuel, is called deforestation and it is the main cause of climate change. The next few pages will help you learn more about deforestation and its very bad effects on the planet and human life.

Lesson 2. Deforestation



Deforestation is the removal of forest from land which is then converted to agricultural or urban use. Most deforestation occurs in tropical rainforests such as the Amazon Rainforest.

Between 2000 and 2012, about 890,000 square miles of forests around the world were cut down. Only about 2.4 million square miles of the Earth's original 6 million square miles of forest remains. An area about size of a football field is cleared from the Amazon rainforest every minute for agriculture.

Deforestation is a significant contributor to global warming because it is responsible for about 20% of all greenhouse gas emissions.

According to the UN's Food and Agriculture Organization, almost 80% of all deforestation is driven by agriculture. The UN Framework Convention on Climate Change says the primary cause of deforestation is agriculture.

Subsistence farming is responsible for almost half of all deforestation (48%), with commercial agriculture (32%; logging (14%), and fuel wood (5%) the other causes.

The EU is a major importer of agricultural products, such as palm oil, soy, and cocoa, products commonly associated with agricultural land that was recently forested land. EU countries are keen to reduce the impact of their commercial activities on forests and deforestation. France's government, for example, announced it will 'encourage every actor (producers, businesses, investors, and consumers), to change their practices in order to reduce deforestation.' The French government passed a law stating that palm oil is not considered a biofuel.

In 2008, the EU agreed to stop global forest cover loss by 2030. The UN declared a Sustainable Development Goal of ending deforestation by 2030.

Which countries are worst affected by deforestation?

South & Central America

Large areas of Brazil's share of the Amazon rainforest is being destroyed by illegal logging, exacerbated by government corruption. Deforestation in Peru's share of the Amazon rainforest is due to illegal logging and clearing forests for use as agricultural land. Bolivia's large soya industry and cattle-ranching are the country's main causes of deforestation and the Bolivian government is unlikely to risk the country's food security. Mexico's avocado industry is responsible for the loss of tropical and pine forests.

Asia Pacific

Indonesia's palm oil industry has driven destruction of its rainforest and also its wetlands, with more than 5000 square miles cut down annually to supply palm oil. More than 2000 square miles of Russia's vast forests are lost to wildfires annually. Logging and the palm oil industry account for about 1000 square miles of trees lost in Papua New Guinea annually.

Africa

In Sudan, about 500 square miles of trees are cut down every year to be used as household cooking fuel and heating, and for commercial production of steam-generated electricity. Just 6% of Nigeria's original forests remain because of trees being cut for household cooking fuel and heating.

While these countries are where deforestation is occurring the most, all countries are affected by deforestation because it is a significant factor in global warming and therefore climate change.



Activities

1. Write the following words into your book and then write an explanation of the word.

deforestation
 agricultural
 rainforest
 greenhouse gas
 primary cause
 subsistence farming
 logging
 fuel wood
 palm oil
 sustainable
 corruption
 food security

2. Explain why deforestation is a problem for our environment.

3. Explain which countries/regions are most affected by deforestation.

4. Describe the main causes of deforestation.

5. Research: Explain how cutting a tree down contributes to green house gas emissions and therefore global warming.

6. Create: Write a letter to Bolivia's President asking for Bolivia's government to please stop deforestation.

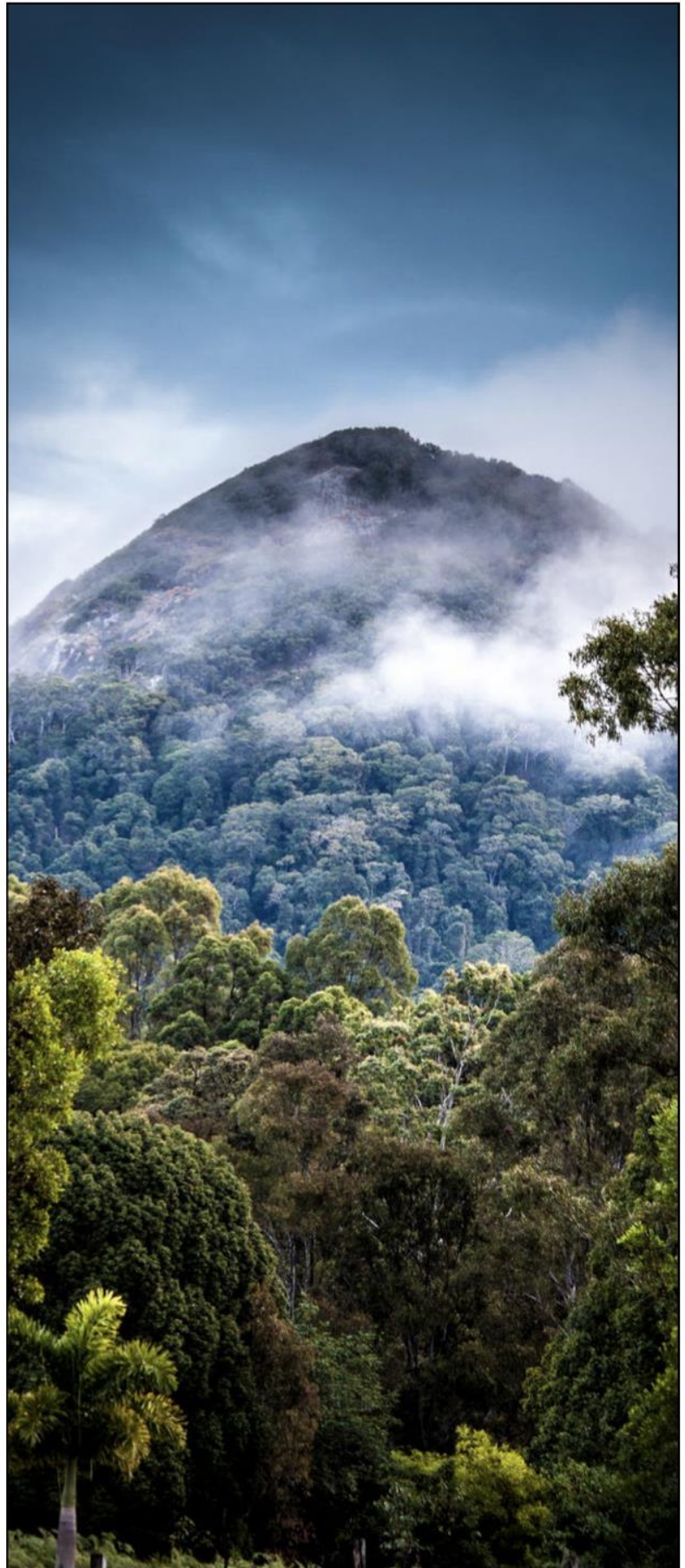
7. Critical thinking: Describe how might you check this article to be sure it is accurate.

8. Reflect: List at least three things you learnt about deforestation from this material.

9. List 3 questions related to information in this article to which you would like answers. Describe how could you find the answers to your questions and how you can be sure they are accurate.

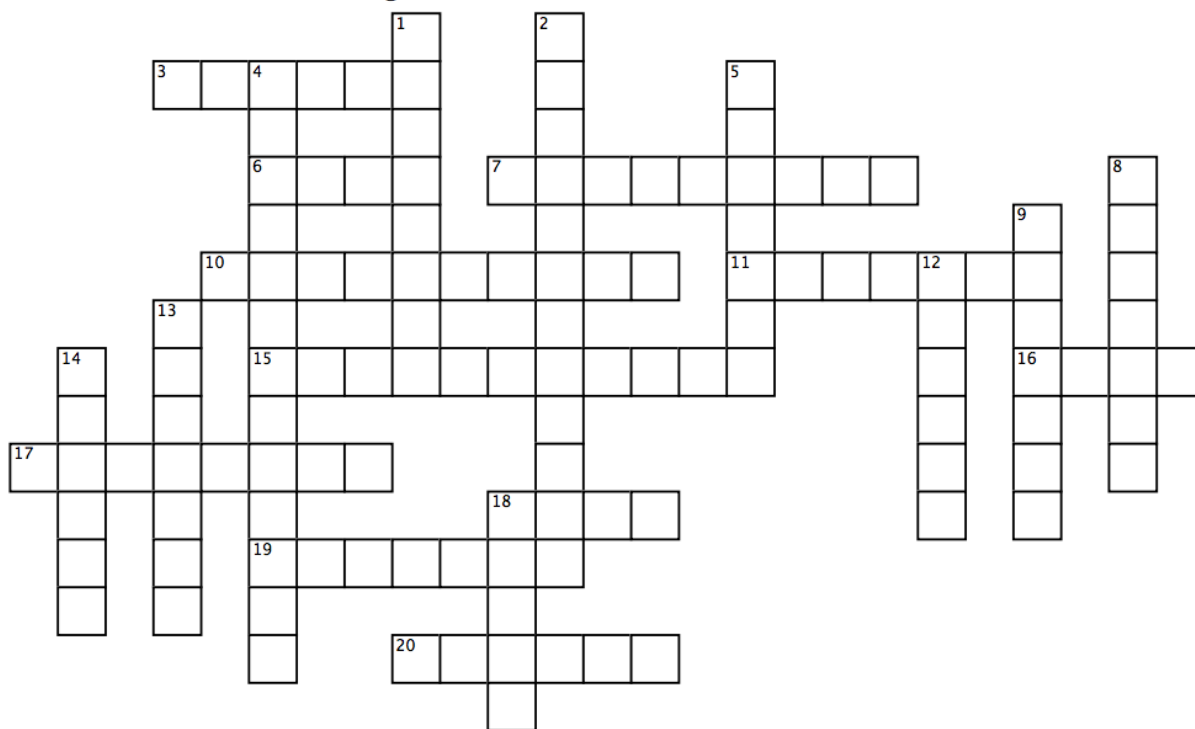
What can I do?

1. Learn more about the forests near where you live. Learn what plants and animals live in the forest. When you know about a forest, you will be more inclined to take care of it.
2. Ask your friends to visit a forest so they can learn about it. Is there anything you and your friends can do? Gathering plastic trash from the forest, for example.
3. Palm oil, soy, beef, and cocoa are the main agricultural products that are responsible for global deforestation. Use the internet to find out what products these ingredients are used to make, for example palm oil is used in the production of some low-quality chocolate and soap. Find out which companies use it and stop buying their products.
4. Write to the companies that use these products and tell them you have stopped buying their products because they are major causes of deforestation.
5. Use your social media accounts to tell your friends about deforestation, what its effects are, what causes it, and what they can do to help.
6. Send emails to government officials and tell them you do not want your country contributing to deforestation by buying these products.
7. Find a local organization that plants trees and help.
8. Grow seedlings and when they are big enough, plant them around your neighborhood. Encourage your teachers to start a program in your school in which students grow seedlings and plant them in an area that needs trees.



Deforestation 1

Answer the crossword using information from the article.



Across

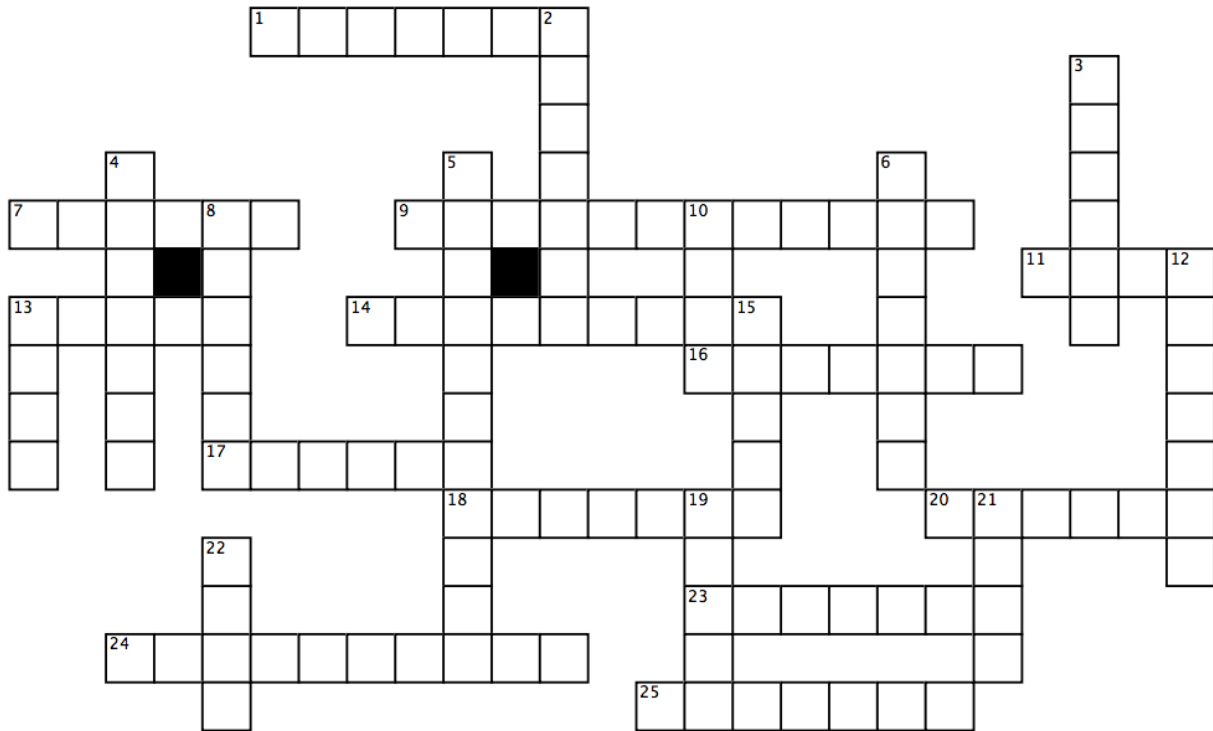
3. France's government announced it will 'encourage every actor (producers, businesses, investors, and consumers), to change their practices in order to _____ deforestation.'
6. In Sudan, trees are cut down to be used as household cooking _____ and heating, and for commercial production of steam-generated electricity.
7. More than 2000 square miles of Russia's vast forests are lost to _____ annually.
10. Deforestation is responsible for about 20% of all _____ gas emissions.
11. Mexico's _____ industry is responsible for the loss of tropical and pine forests.
15. _____ farming is responsible for almost half of all deforestation.
16. The UN declared a Sustainable Development _____ of ending deforestation by 2030.
17. An area about size of a _____ field is cleared from the Amazon rainforest every minute for agriculture.
18. The French government passed a law stating that _____ oil is not considered a biofuel.
19. Deforestation in Peru's share of the Amazon rainforest is due to _____ logging and clearing forests for use as agricultural land.
20. Only about 2.4 million _____ miles of the Earth's original 6 million _____ miles of forest remains.

Down

1. Indonesia's palm oil industry has driven destruction of its rainforest and also its _____.
2. The EU is a major importer of _____ products, such as palm oil, soy, and cocoa.
4. _____ is the removal of forest from land which is then converted to agricultural or urban use.
5. All countries are affected by deforestation because it is a significant factor in global warming and therefore _____ change.
8. The _____ cause of deforestation is agriculture.
9. Large areas of Brazil's share of the Amazon rainforest is being destroyed by illegal _____, exacerbated by government corruption.
12. Most deforestation occurs in tropical rainforests such as the _____ Rainforest.
13. Just 6% of Nigeria's original forests remain because of trees being cut for household cooking fuel and _____.
14. Deforestation is a significant contributor to _____ warming.
18. Logging and the palm oil industry account for about 1000 square miles of trees lost in _____ New Guinea annually.



Deforestation 2



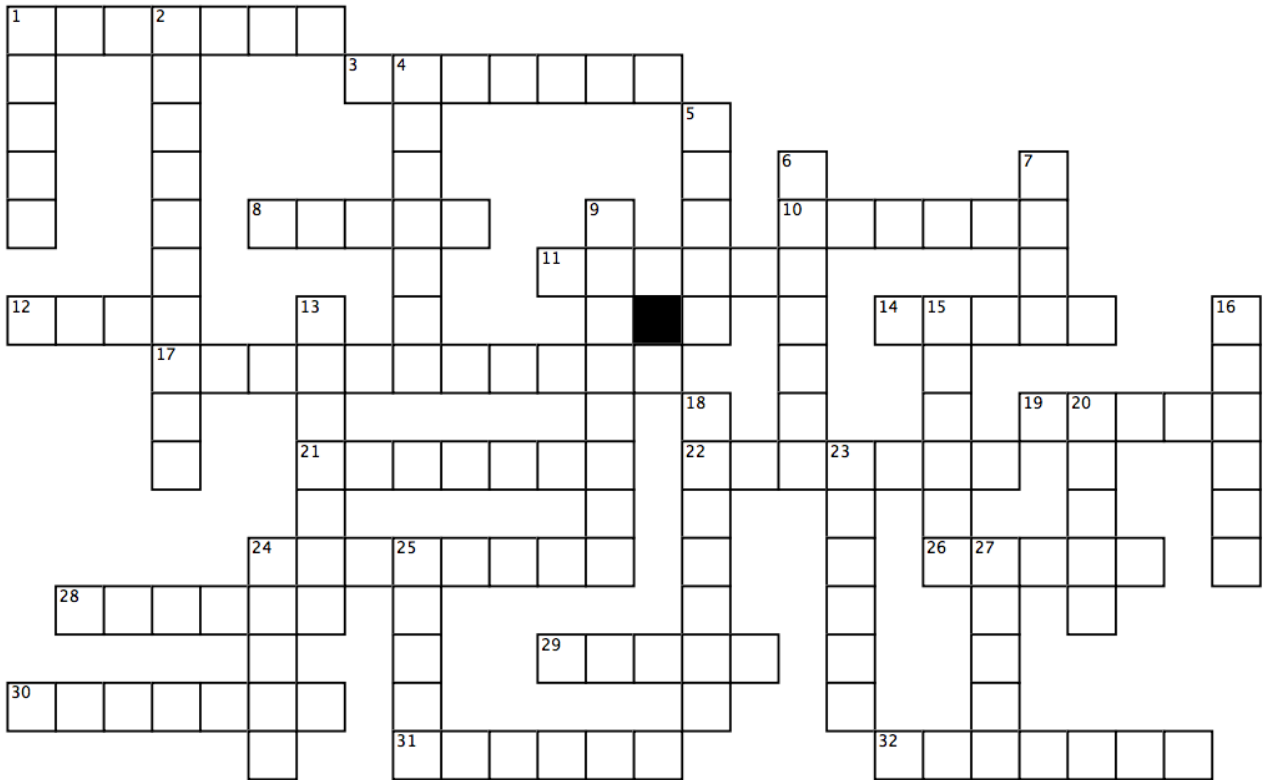
Across

1. 80% of all land _____ and plants live in forests.
7. Forests absorb greenhouse gases that would otherwise fuel _____ warming.
9. Deforestation occurs because people clear forested land to make space for _____ activities such as cattle ranching.
11. Forests keep the _____ moist by blocking the sun and inhibiting evaporation.
13. Cutting down _____ releases carbon dioxide into the atmosphere.
14. Deforestation of tropical rainforests adds more carbon dioxide to the atmosphere than all cars' and trucks' _____.
16. Forests absorb carbon _____ and release oxygen.
17. _____ has the largest area of land deforested.
18. Most deforestation occurs in rainforests which are concentrated in the _____.
20. Deforestation results in more than 1.5 billion tons of _____ dioxide being released into the atmosphere every year.
23. Forests absorb and store carbon, so that when trees are cut down, the carbon is released into the atmosphere contributing to the greenhouse effect which causes global warming which causes _____ change.
24. If the current rate of deforestation continues, 100 years from now there will be no more _____.
25. Deforestation occurs because people take wood for household fuel and _____.

Down

2. Forests are home to millions of plant and animal _____.
3. The _____ rainforest is one of the Earth's most threatened forests.
4. _____ are one of the main natural factors that regulate and determine the Earth's climate.
5. _____ is one of the most significant causes of deforestation.
6. Deforestation is the main cause of global _____ and therefore climate change.
8. Deforestation has a double effect: it releases carbon dioxide and there are less trees to _____ carbon dioxide.
10. Forests cover a large proportion of the world's _____ area, but large areas of forest are being lost each year.
12. Deforestation is caused by household fuel burning, agriculture, and unsustainable _____.
13. Deforestation is the loss of _____ cover, due to forests being cleared.
15. Forests are called 'carbon _____' because they trap or hold carbon.
19. Forests play a significant role in the water _____ by releasing water vapor into the atmosphere.
21. Although Brazil has lost the largest _____ of forest, Comoros has lost 50% of its forests.
22. Forests prevent _____ erosion.

Brazil



Across

1. Early sailors often called Brazil Terra di Papaga (Land of _____).
3. Rio de Janeiro is home to two well known _____, the Ipanema and the Copacabana.
8. The predominant religion throughout Brazil is _____ Catholic.
10. Brazil has been the world's largest producer of _____ for more than 150 years.
11. The Alchemist, by the Brazilian author Paulo _____ de Souza, has sold over 83 million copies, and so is one of the most sold books ever.
12. Brazil spans _____ time zones.
14. Sao _____ is the most populous city in the southern hemisphere.
17. Brazil's Itaipu Dam generates the most _____ - of all the world's hydroelectric plants.
19. In the 16th century Brazil's major export was _____, but in the 17th century it was gold.
21. Brazil is the largest country in South _____.
22. Rio de Janeiro hosted the 2016 _____ Games and 2016 Paralympic Games.
24. In September 1822 Brazil declared independence from _____ and declared Prince Pedro de Alcântara the first Emperor of the Brazilian Empire.
26. Most Brazilians _____ Portuguese.
28. The Iguazu Falls are on the Brazil-Argentina _____.
29. The Amazon River _____ includes the vast Amazon rainforest.
30. Brasilia was planned and developed in 1956 to move the capital from Rio de _____ to a more central location.
31. Deforestation of the _____ rainforest has a double-effect on the greenhouse effect and therefore climate change: living trees store CO₂ and dead trees release CO₂ into the atmosphere.
32. In 2014-2016 a severe _____, caused by El Nino, had a significant impact on Sao Paulo and Rio de Janeiro.

Down

1. In 1831, Brazil's Emperor, Pedro I abdicated, returned to Portugal, and passed the monarchy to his five year old son, _____ II who was eventually crowned in 1841.
2. The Amazon _____ has the greatest biological diversity in the world.
4. Brazil is the only country with the _____ and the Tropic of Capricorn running through it.
5. The final of the 2014 football _____ Cup was played at the Maracana Stadium in Rio de Janeiro.
6. Brazil's _____ is eighth-largest by GDP.
7. Brazil's currency, the _____, is pegged to the US dollar.
9. Brazil's national sport is _____ and the men's national team has won the World Cup 5 times.
13. Brazil borders all South American countries except _____ and Chile.
15. Brazil remained neutral in World War 2 until 1942, at which time it joined the _____.
16. The _____ the Redeemer statue overlooking Rio de Janeiro is 30 metres tall and was built in 1931.
18. The Amazon basin includes land in Brazil as well as _____, Colombia, Ecuador, Guyana, Peru, Suriname, and Venezuela.
20. 85% of Brazil's population live in _____ areas.
23. The Christ the Redeemer statue overlooking Rio de Janeiro is 30 _____ tall and was built in 1931.
24. In 1500 _____ Alvares Cabral claimed the area of Brazil for the Portuguese Empire and it remained a Portuguese colony until 1808.
25. Brazil's original official name was _____ da Santa Cruz (Land of the Holy Cross).
27. Brazil's capital city is Brasilia, but the largest city is Sao _____.