

Y10 Science Revision

www.deepspace.com T.Mander 7/11/14

v2.1

- Two hours
- Use blue or black pen or pencil even for diagrams. NEVER use a red pen.
- Use a ruler for any straight lines
- Do not give up!
- Test will be given one of four possible grades
 - Not Achieved (<30% if marked normally)
 - Achieved (30-60%)
 - Merit (60-85%)
 - Excellence (the top 5-10% of students)

Bio- Living Together

Bio- Variation

Physics- Forces and Motion

Physics- Electricity

Physics- Earth the Active Planet

Chem- Atoms, Molecules, and Ions

Chem- Acids and Bases

Living Together

Respiration and photosynthesis word equations

Label a diagram of the human respiration system

What happens when we breathe - what moves where?

Living things and MRS GREND

Adaptations: behavioural vs functional

Abiotic factors: temperature, light, altitude, weather

Biotic factors: parasites, pathogens, predators, competitors, human influence

Environmental effects on population, eg. Deforestation, predators, volcanoes

Carbon cycle and the creation of carbon stores underground, in the ocean, in the air.

Parasites vs decomposers

Primary vs secondary consumers

Food webs and population pressures

Food chains (note arrow direction) vs. Food Webs

Definitions: Habitat, niche, producer, primary consumer, secondary consumer, carnivore, herbivore, omnivore, decomposer, prey, predator, transect, quadrat

Variation

Label the reproductive organs of the human body and flowers.

Human fertilisation: Where, What, Why?

What are gametes and where are they formed?

Understand basic human reproduction/development from fertilization to birth

Explain the entire Menstrual Cycle including - ovulation and fertility times.

Importance of variation for species, ie. How variation helps survival

"How do populations change (evolve)? Geographic isolation allows genetic differences in a population to build up, eg. The Kiwi looks different from related birds like the ostrich. Mutations can also build up in isolated populations. NZ had quite a few flightless birds because there were few mammal predators to eat them. This meant little pressure from natural selection to reduce their numbers or make them go extinct. Having a long beak and an easy to access diet available in insects and worms may have actually encouraged their population ahead of flying birds. Natural selection preserves the best and kills off the worst reducing genetic diversity (variation). Mutations change and corrupt the genetic code. Big changes can kill or make the individual sick."

Forces and Motion

Convert km/h into m/s

Contact vs noncontact forces

Speed (velocity) = acceleration \times time

Unbalanced forces vs balanced forces

Average speed = total distance / total time

Acceleration = change in velocity / change in time

Descriptions of motion = know the shape of graphs: d/t v/t a/t

Weight Force (N) = mass (kg) \times acceleration of gravity ($g = 10 \text{ m/s}^2$)

Sources of friction - Ways of reducing friction - turbulence in air and water

Types of forces and drawing them as vectors, eg. friction, weight, support, lift

Electricity

$V=IR$ and $P=IV$

Circuits and Symbols

Insulators vs conductors

Ammeters vs voltmeters and units

Series and Parallel, advantages and disadvantages

Drawing basic circuits, eg. To control bulb brightness

Does series or parallel produce brighter bulbs and why

What happens to the second component if the first component breaks (series vs parallel)

Static electricity - two materials rubbing electrons from one to the other - similar charges repel - breakdown of insulation (could be air) when charge difference (voltage) gets too high and a spark jumps across the gap

Earth the Active Planet

Parts of a volcano

Earth structure and composition

Plate tectonics, cause and effect

Seismograph and types of ground waves (P, S)

Weathering: chemical vs mechanical/physical

Discuss how lava, mud, and ash from volcanos can cause damage

Atoms, Molecules, and Ions

Electron configuration

Elements vs compounds

Protons, Neutrons, Electrons.

Atoms, elements, and their symbols.

Why do elements have equal numbers of protons and electrons?

Ionic compounds - Formulas and Equations, eg. Magnesium burning in oxygen

Acids and Bases

Proportions of H^+ ions and OH^- ions.

pH scale: 1-14: 1 acid, 7 neutral, 14 base

Litmus paper: blue in base, red in acid

Universal Indicator: green is neutral, what are the other colours?

Common reactions, eg. What happens when you mix an acid with a metal

Antacids and how they work: Antacid is a base that you mix with an acid to become neutral.

The H^+ ions balance the OH^- ions and turn into water (pH 7). A salt is also left behind. This is neutralisation.

Give two examples of neutralisation reactions, eg. How antacids for upset tummies

Common names and formulas of common acids and bases.

HCl acid

HNO_3 acid

H_2SO_4 acid

$Al(OH)_3$ base

NaOH base

NH_3 base (ammonia)



Tests for gases produced can test what kind of reaction has occurred:

oxygen, carbon dioxide, hydrogen

Toothpaste is basic so it neutralises acids in our mouth that are made from bacteria.

Excellence Level questions involve discussions and full sentences

Practise questions (one example from each topic):

Describe what happens when magnesium burns in air.

Magnesium metal reacts with Oxygen gas and burns to leave a white powder. The magnesium metal loses 2 electrons from its outer shell to become a 2+ ion. The Oxygen gains 2 electrons to become a 2- ion. The two ions join to produce an ionic compound MgO (the white powder).

Discuss the advantages and disadvantages of parallel or series circuits for Christmas lights.

In series you need less wire and it's easier to connect up. But if one bulb blows then all the bulbs will stop working.

In parallel the other bulbs will keep working if one blows. The current draw from the supply will be greater in parallel. Each bulb in parallel will get the full voltage from the supply which should make them brighter.

Not needed for 2014 but interesting anyway:

Discuss how metamorphic rocks are formed.

An existing sedimentary or igneous rock is changed in form due to pressure and high temperature without melting. This occurs deep underground, eg. in a subduction zone between tectonic plates.

Discuss how a permanent magnet can be made stronger or weaker with respect to domains.

Stroking it with another strong magnet will align the domains and magnetise it. Hitting the magnet with a hammer or dropping it will misalign the domains and weaken the magnet.

Discuss metamorphosis of a frog.

This is complete metamorphosis. Each stage of its life allows the frog to live in a certain habitat. Each stage offers specific benefits. Adult frog can use the larger food source of insects to support its size and can reproduce. As a tadpole it has gills to enable it to stay underwater.

Discuss how you survey an area. Include the words "counting, transect, quadrat, samples, random."

Instead of counting every individual in a large area, random samples are taken across the area. A transect line is laid across the area and the quadrat is placed at random points along it. The individuals under the quadrat are counted and their location in the grid is also recorded.