

# 100 Important Facts you need to know to pass the Living Environment Regents Exam

## TOPIC 1

1. The ability of an organism to maintain internal stability is known as **homeostasis**.
2. **Metabolism**- the sum of all the chemical reactions that occur within the cells of an organism.
3. Organic molecules contain both **carbon** and **hydrogen**.
4. [**smallest**] Cells → Tissues → Organs → Organ Systems → Organism [**biggest**]
5. **Organelle**- small parts that make up a cell (each has at least one specific function)

Vacuoles-- stores waste and water (large in plant cells, small in animal cells)

ribosomes- located on the endoplasmic reticulum; they are where proteins are made (protein synthesis)

mitochondria-mighty mitochondria (where energy is made) aka: respiration  
glucose + oxygen → carbon dioxide + water + ENERGY (ATP)

chloroplasts-only in plant cells; where photosynthesis happens  
carbon dioxide + water → glucose + water + oxygen

nucleus-control center of the cell (brain); contains DNA

cell membrane-controls what comes in and goes out of the cell (selectively permeable)

## 6. Cell membrane-

1. separates the contents of the cell from the outside environment
2. controls the transport of materials into and out of the cell.
3. Recognizes and responds to chemical signals by using **receptor protein molecules**.
4. Draw the Fluid Mosaic Model:

7 **Passive Transport**- movement of molecules from areas of high concentration to areas of low concentration.

8. **Active Transport**- moving a molecule from **LOW** concentration to a **HIGH** concentration Uses **ENERGY (ATP)**

9. **DIGESTION**- breaking large molecules down into smaller molecules.

Proteins are broken down into **AMINO ACIDS**.

Starches are broken down into **SIMPLE SUGARS**.

Fats (**LIPIDS**) are broken down to **FATTY ACIDS & GLYCEROL**.

#### 10. Human Body Systems.

<b>Name of system</b>	<b>What it does</b>	<b>Organs</b>	<b>A malfunction</b>
Digestive	<b>BREAKS DOWN FOOD INTO NUTRIENTS &amp; PUTS THEM IN THE BLOOD STREAM</b>	<b>MOUTH, ESOPHAGUS, STOMACH, SMALL INTESTINE, LARGE INTESTINE, RECTUM</b>	<b>AN ULCER IS A HOLE IN THE LINING OF THE STOMACH</b>
Circulatory	<b>CARRIES GASSES AND NUTRIENTS THROUGHOUT THE BODY</b>	<b>HEART, ARTERIES, VEINS, CAPILLARIES</b>	<b>HEART ATTACK</b>
Respiratory	<b>EXCHANGES CARBON DIOXIDE WITH OXYGEN</b>	<b>LUNGS, DIAPHRAGM</b>	<b>EMPHYSEMA, AIR SACS IN THE LUNGS BECOME ENLARGED AND CANNOT FUNCTION PROPERLY</b>

Excretory	REMOVES WASTES FROM THE BLOOD AND THEN FROM THE BODY	KIDNEYS, URETER, BLADDER, URETHRA	KIDNEY STONE, A PAINFUL BLOCKAGE OF ONE PART OF THE EXCRETORY SYSTEM
Nervous	CONTROLS THE FUNCTIONING OF THE REST OF THE BODY	BRAIN, SPINAL CORD, NERVE CELLS	CYSTIC FIBROSIS

## **TOPIC 2**

11 Chemicals produced in the endocrine glands (**HORMONES**) and chemicals produced by nerve cells are primarily responsible for communication between cells.

12. **MITOCHONDRIA (RESPIRATION)**- uses oxygen to break down food molecules to release energy.

13 **TRANSPORT**-involves the movement of materials inside the cell as well as the movement between parts of a multicellular organism.

14 **EXCRETION**- the removal of all waste produced by the cells of the body.

15. Failure to maintain homeostasis can result in **SICKNESS** or **DEATH**

16. Photosynthesis- Storing energy

17. Formula for Photosynthesis: **CARBON DIOXIDE + WATER → GLUCOSE + OXYGEN + WATER**

18. Where is photosynthesis carried out? **CHLOROPLASTS OF PLANTS**

19. Respiration- Releasing energy (**ATP**)

20. Cellular respiration occurs in the **MITOCHONDRIA OF ALL ORGANISMS**

21. Formula for Respiration: **GLUCOSE + OXYGEN → CARBON DIOXIDE + WATER + ENERGY (ATP)**

22 **ENZYMES** -special proteins that affect the rate of chemical reactions.

23. Enzyme reaction rates are affected by

shape- **IF IT ISN'T THE CORRECT SHAPE IT WON'T WORK**

temperature- **EACH ENZYME WORKS BEST AT A SPECIFIC TEMPERATURE**

pH-- **EACH ENZYME WORKS BEST AT A SPECIFIC pH**

24. Dynamic Equilibrium- steady state-balance- aka: **HOMEOSTASIS**

25. Positive feedback- a change prompts a response to a greater change and a greater response

example- **AS YOU PUNCH ME HARDER; I PUNCH YOU HARDER (BOTH INCREASE OR BOTH DECREASE)**

26. Negative feedback-more common

example- **AS THE TEMPERATURE IN YOUR HOUSE GOES UP, THE THERMOSTAT TURNS OFF; AND THE TEMPERATURE GOES DOWN, THE THERMOSTAT TURNS ON (AS ONE GOES UP THE OTHER GOES DOWN) OR THE OPPOSITE**

27. When glucose levels are above normal the pancreas secretes **INSULIN**

This hormone prompts glucose to move from the blood into body cells, resulting in a lower glucose level in the blood. Another hormone secreted by the pancreas works in the opposite way. When the glucose level in the blood is too low, this hormone prompts the release of glucose stored in the **BLOOD**.

**(\*\*\*NEGATIVE FEEDBACK)**

### **TOPIC 3**

28. **CANCER** : certain genetic mutations in a cell can result in uncontrolled cell division.

29 **CIRCULATORY** system is the body's primary defense against disease-causing pathogens. **(IMMUNITY)**

30. **SURFACE RECEPTOR PROTEIN**- a molecule found on the outer surfaces of cells that the immune system recognizes as either part of the body or an outside invader.

31. **ANTIBODIES** are known as your body's army to fight diseases.

32. The diseases or pathogens are known as **ANTIGENS**

33. **HEREDITY**- is the passing of genetic information from one generation to the next through reproduction.

34. The hereditary information **DNA** is organized in the form of genes located in the **NUCLEUS** of each cell.

35. Differences between asexual and sexual reproduction

<i>Asexual reproduction</i>	<i>Sexual reproduction</i>
<b>IDENTICAL CELLS</b> <b>1 PARENT</b> <b>NO GENETIC VARIATION</b> <b>AMEBA, PARAMECIUM,</b> <b>FUNGI</b>	<b>NOT IDENTICAL CELLS</b> <b>2 PARENTS</b> <b>GENETIC VARIATION</b> <b>HUMANS, PLANTS</b>

36. Identical genetic copies are known as **CLONES**.

37. DNA is made of a **PHOSPHATE**, a **SUGAR** and a **BASE**

38. Draw a nucleotide here:

39. Bases are A, T, G, C

A IS PAIRED WITH T

G IS PAIRED WITH C

All Teachers  
Go Crazy

40. How does DNA make a protein?

**DNA IS STUCK IN THE NUCLEUS, SO IT SENDS A MESSENGER (SINGLE-STRANDED MESSENGER RNA) TO THE RIBOSOME WHERE THE RIBOSOME READS THE MESSAGE AND DIRECTS THE TRANSFER RNA (TRUCKS) TO BRING IT AMINO ACIDS. THE RIBOSOME THEN PUTS THE AMINO ACIDS TOGETHER IN THE CORRECT ORDER TO MAKE A**

## PROTEIN.

41. Any alteration of the DNA sequence is a **MUTATION** which changes the normal message carried by the gene.

Substitution- **ONE BASE IS PUT IN THE PLACE OF ANOTHER**

Deletion- **A BASE IS LEFT OUT**

Addition- **A BASE IS ADDED**

Inversion- **BASES ARE SWITCHED**

42. An organism's environment can affect the way that some genes are expressed.

Example- **HIMALAYAN RABBIT**

43 **GENETIC ENGINEERING**-- is a technology that humans use to alter the genetic instructions in organisms.

44 **SELECTIVE BREEDING** a process that produces domestic animals and new varieties of plants with traits that are desirable. (**ONLY PLANTING SEEDS FROM THE STRONGEST CORN**) **\*\*NOT CHANGING THE DNA!!**

45. Gene splicing- **CUTTING DNA AND PLACING IT INTO ANOTHER ORGANISM**

Example: Insulin- **PUTTING THE GENE FOR INSULIN INTO BACTERIA, AND THE BACTERIA PRODUCES INSULIN FOR HUMANS**

46 **SPECIES** is a group of closely related organisms that share certain characteristics and can produce new individuals through reproduction.

## **TOPIC 4**

47. Differences between mitosis and meiosis

<i>Mitotic division</i>	<i>Meiotic division</i>
asexual	sexual

<i>Mitotic division</i>	<i>Meiotic division</i>
ONE cell division	TWO cell divisions
# functioning cells 2	Male 4 SPERM and female 3 POLAR BODIES, 1 EGG
Genetic makeup IDENTICAL	Genetic makeup 1/2 OF ORIGINAL CELL
Function TO MAKE IDENTICAL CELLS	Function TO MAKE CELLS WITH 1/2 OF INFO

48. Gametes unite to form a ZYGOTE

49. If the gametes each have 23 chromosomes, then what does their zygote have?  
FORTY-SIX

50. DIFFERENTIATION- the process that transforms developing cells into specialized cells with different structures and functions.

51. female- ovaries, progesterone, estrogen, uterus, placenta, egg

52. male- testosterone, sperm

53. Reproductive technology

Artificial insemination: USING SPERM FROM A DONOR

Amniocentesis: REMOVING SOME OF THE CELLS FROM AROUND THE FETUS AND ANALYZING THEM

Karyotype: ARRANGING THE CHROMOSOMES IN SIMILAR PAIRS (HOMOLOGOUS PAIRS) BY SIZE TO SEE IF THE FETUS HAS ANY CHROMOSOMAL PROBLEMS LIKE DOWN SYNDROME (3 COPIES OF CHROMOSOME #21)

In vitro-fertilization: REMOVING EGGS FROM THE FEMALE AND SPERM FROM THE MALE, FERTILIZING THE EGG IN A PETRI DISH, THEN IMPLANTING IT INTO THE UTERUS.

## TOPIC 5

54. EVOLUTION- the process by which organisms have changed overtime-

simple, single-celled: complex-single-celled: complex, multicellular

55. Natural selection-**NATURE SELECTS THOSE INDIVIDUALS WHO ARE BEST FIT FOR THE ENVIRONMENT.**

56. overproduction-**MORE OFFSPRING ARE PRODUCED THAN CAN SURVIVE**

57. competition-**THE FIGHT FOR LIMITED RESOURCES**

58. Variation-**DIFFERENCES AMONG ORGANISMS IN A SPECIES (SEXUALLY REPRODUCING ORGANISMS HAVE MORE VARIATION THAN ASEXUALLY REPRODUCING ORGANISMS)**

59. Any trait that helps an organism survive and reproduce under a given set of environmental conditions is said to have **AN ADAPTIVE VALUE**

60. The failure to adapt to a changing environment may result in the **EXTINCTION** of a species.

61. **EXTINCTION** is the disappearance of an entire species.

62. Extinction occurs when the **ENVIRONMENT** changes, and the **SPECIES DOESN'T ADAPT**

## **TOPIC 6**

63 **ECOLOGY** is the study of how organisms interact with the living and nonliving things.

64. **BIOTIC** factors: plants, animals.

65. Abiotic factors- **NON-LIVING PARTS OF THE ENVIRONMENT (ROCKS, AIR, Ph, sunlight)**

66 A species' role in the environment-**NICHE** (it's **JOB** and what it **EATS**)

67. **POPULATION**- all the organisms of a species that live in the same area.

68. **COMMUNITY**- all the different populations in an area.



69 **BIOSPHERE**- all of earth's ecosystems

70 **COMPETITION**- is the struggle for resources among organisms.

71. Factors in the environment that limit the size of populations are known as **LIMITING FACTORS**

examples: **FOOD, SHELTER, MATES, SPACE, OXYGEN, ETC.**

72. The number of organisms of any species that an ecosystem can support is referred to as its **CARRYING CAPACITY**

73. **PREDATORS** kill and eat other organisms and **PREY** which are killed for food.

74. autotrophs-(**PRODUCERS**)**MAKE THEIR OWN FOOD BY PHOTOSYNTHESIS**

heterotrophs-**MUST EAT SOMETHING FOR FOOD (CONSUMERS)**

herbivores-**CAN ONLY EAT PLANTS**

carnivores-**CAN ONLY EAT ANIMALS**

omnivores-**CAN EAT PLANTS & ANIMALS (ALL humans!!!!)**

consumers-**SAME AS HETEROTROPHS**

decomposers- **BREAK ORGANISMS DOWN AND RETURN NUTRIENTS TO THE SOIL**

scavengers-**EXAMPLE: VULTURES...EAT DEAD ORGANISMS THAT THEY DID NOT KILL THEMSELVES**

parasites-**LIVE OFF OF ANOTHER ORGANISM (HOST) AND DO NOT KILL THEM USUALLY (THE PARASITE BENEFITS, THE HOST IS HARMED)**

producers-**SAME AS AUTOTROPHS**

75. Difference between a food chain and a food web **A FOOD CHAIN IS A COMBINATION OF MANY FOOD CHAINS TOGETHER (BECAUSE MOST ORGANISMS EAT MORE THAN 1 FOOD)**

76. What is the main source of energy on the earth? **THE SUN**

77. On an energy pyramid where is the most amount of energy located? **THE BOTTOM LAYER (THE PRODUCERS)**

78. On the energy pyramid, each level above gets smaller. Where does the energy go? **INTO THE ENVIRONMENT (LOST AS HEAT)**

### **TOPIC 7**

79. Recycling and reusing materials  
name the 3 cycles:

1. **CARBON CYCLE**

2. **WATER CYCLE**

3. **NITROGEN CYCLE**

80. **BIODIVERSITY** is a measurement of the degree to which species vary within an ecosystem.

81. As biodiversity increases, **STABILITY** of an ecosystem increases.

82. Name how man has affected biodiversity in some areas.

1. **CUT DOWN TREES (FOR WOOD)**

2. **PLANTED ALL OF THE SAME CROP IN AN AREA**

3. **REMOVED VEGETATION FOR HOUSES, PARKING LOTS, ETC.**

4. **KILLED ORGANISMS AND DESTROYED THE FOOD WEB (BECAUSE ALL ORGANISMS ARE LINKED TO ONE ANOTHER IN ONE WAY OR ANOTHER)**

83. Ecological succession in a rocky field: **ROCKS → MOSS → GRASSES →**

## SHRUBS → TREES

Ecological succession in a pond: POND → PLANTS AND ORGANISMS START TO DIE → SEDIMENT BUILDS UP → POND GETS SHALLOW → GETS SWAMPY → FIELD

84. renewable resources- RESOURCES THAT CAN REPLENISH THEMSELVES IF NOT ABUSED (LIKE TREES)

nonrenewable resources- RESOURCES THAT TAKE A LONG TIME TO REPLACE OR FORM (LIKE COAL, OIL)

85. Preserving our resources:

1. Reduce- CUT DOWN ON THE AMOUNT USED (SMALLER PACKAGING)
2. Reuse- USE IT FOR ANOTHER APPLICATION (OLD TIRES AS FLOWER PLANTERS)
3. recycle- CAN BE USED TO MAKE THE PRODUCT AGAIN (LIKE POP BOTTLES)

86 POLLUTION a harmful change in the chemical makeup of the air, water, or soil.

87. HUMAN ACTIVITIES AND THE LOSS OF DIVERSITY

1. Direct harvesting- THE DESTRUCTION OF AN ORGANISM
2. Land use- FINDING THE BEST WAY TO LIVE IN THE ENVIRONMENT- BUILDING AROUND TREES INSTEAD OF CUTTING THEM DOWN AND PLANTING NEW ONES.
3. habitat destruction- TEARING OUT A PART OF THE NATURAL ENVIRONMENT
4. deforestation- REMOVING FORESTS FOR PROFIT
5. imported species (invasive species or exotic species) example: PURPLE

## LOOSESTRIFE; ZEBRA MUSSELS; DANDELIONS

### 88. Impact of technology and industrialization

1. industrialization- increases pollution of air and water- uses more energy, water and fossil and nuclear fuels.
2. Water pollution- from sewage, wastes from homes and factories and animal wastes
3. Toxic wastes- DDT
4. Thermal pollution- **HEAT POLLUTION**
5. air pollution- burning fossil fuels  
acid rain- **CARRYING THE POLLUTANTS IN THE CLOUDS, THEN THE RAIN HAS A LOW Ph (acidic)**  
smog- **LOTS OF AIR POLLUTION, LOOKS “CLOUDY OR HAZY”**
6. global warming- **AN INCREASE IN THE EARTH’S TEMPERATURE CAUSED BY AN INCREASE IN GREENHOUSE GASES (GREENHOUSE EFFECT)**
7. ozone depletion- **HOLE IN OZONE LAYER (UV FROM THE SUN ISN’T BLOCKED; CAN LEAD TO SUNBURN, & CANCER!!!) \*\*this is not the greenhouse effect!!!**

### **TOPIC 8**

89. Independent variable: **THE ONE THAT “I CHANGED”**

90. Dependent variable: **THE ONE THAT CHANGES BECAUSE OF THE IV**

91. Control group: **THE GROUP THAT IS STUDIED UNDER THE NORMAL CONDITIONS**

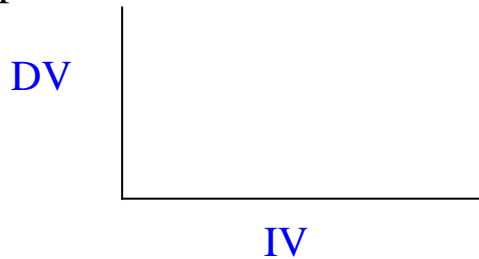
92. Controls: **EVERYTHING THAT STAYS THE SAME**

93. Organizing data

Where does the Independent variable go on a data table? What about the Dependent variable?

IV	DV

Where does the Independent variable go on a graph? What about the Dependent variable?



## **TOPIC 9**

94. Parts of the microscope:

**Eyeiece: THE PART THAT YOU LOOK THROUGH (CLOSEST TO THE EYE) USUALLY 10X**

**Objective: THE MAGNIFYING PART CLOSEST TO THE SLIDE (HIGH POWER=USUALLY 40X; LOW POWER=USUALLY 10X)**

**Fine adjustment knob: USED TO FOCUS ON LOW & HIGH POWER**

**Course adjustment knob: USED TO FOCUS ONLY ON LOW POWER**

**Stage: WHERE THE SLIDE IS PLACED**

**Stage clips: HOLD THE SLIDE IN PLACE**

**Diaphragm: CONTROLS THE AMOUNT OF LIGHT USED**

95. How to calculate total magnification: if a microscope has a 10X eyepiece, and 10X and 40X objectives.

**TOTAL MAG. ON LOW POWER:  $10 \times 10 = 100X$  (IT LOOKS 100 TIMES BIGGER THAN REAL LIFE)**

**TOTAL MAG. ON HIGH POWER:  $10 \times 40 = 400X$  (IT LOOKS 400 TIMES BIGGER THAN REAL LIFE)**

**Total Low power: 100X    Total High power: 400X**


96. How to make a wet mount slide:

**PUT THE CELLS ON THE CENTER OF A SLIDE, PUT A DROP OF WATER WITH A DROPPER ONTO THE CELLS (DO NOT TOUCH THE CELLS); LOWER A COVERSIP SLOWLY AT AN ANGLE (TO REDUCE THE NUMBER OF AIR BUBBLES)**

97. How to put stain on a slide without lifting the coverslip:

**PUT A DROP OF THE STAIN ONTO THE EDGE OF THE COVERSIP; PLACE A PAPERTOWEL ON THE EDGE OF THE OTHER SIDE OF THE COVERSIP, THE PAPERTOWEL WILL PULL THE WATER FROM UNDER**

## THE COVERSLIP, AND INTURN PULL THE STAIN ONTO THE CELLS

98. If you looked at  the letter under a microscope, what would it look like?

99. How do you spell your teacher's name? MRS. Connelly

100. What part of the exam can you use pen? What part of the exam can you use pencil?

**PEN** MUST BE USED FOR: THE HEADING ON THE PACKET; ALL OF THE SHORT ANSWER QUESTIONS (UNLESS IT IS A DIAGRAM OR A GRAPH); AND THE "I DO SO DECLARE..."

**PENCIL** MUST BE USED FOR: THE SCANTRON, ANY DIAGRAMS, AND THE GRAPH.

For the exam remember:

Eat a healthy dinner the night before

Go to bed at a reasonable time (before 11pm!)

Eat a healthy breakfast and lunch.

Bring lots of pencils (with erasers), and pens (blue or black).

Be on time to the exam!!!!



**Exam Date:** Wednesday, June 15th

**Time:** BE THERE BY 8:15AM AT THE LATEST...TRY TO BE THERE EARLIER

**Location:** to be announced.

Relax & take your time you have 3 hours to take the exam...make it the last time you ever take the exam!!