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COMBINED SCIENCE

PAPER 1 3102/1

Wednesday **29 MAY 2024** 12:00 NOON–1:15 P.M.

No additional materials required.

MINISTRY OF EDUCATION NATIONAL EXAMINATIONS

BAHAMAS GENERAL CERTIFICATE OF SECONDARY EDUCATION

INSTRUCTIONS FOR CANDIDATES

Do not open this booklet until you are told to do so.

Write your school number, candidate number, surname and initials in the spaces provided on this question booklet.

There are **FIFTY** questions on this paper.

Attempt **ALL** questions.

For each question, there are **FOUR** possible answers labelled **A, B, C** and **D**. Choose the **ONE** you consider correct and record your choice by circling the **LETTER** next to the answer of your choice in the booklet.

A copy of the Periodic Table is printed on page 2.

Calculators are permitted, however **NO** graphing calculators are allowed.

FOR EXAMINER'S USE ONLY

Total Marks



This question paper consists of 16 printed pages.



The Periodic Table of the Elements

Group																							
I	II											III	IV	V	VI	VII	0						
1 H Hydrogen																							
3 7 Li Lithium	4 9 Be Beryllium											5 11 B Boron	6 12 C Carbon	7 14 N Nitrogen	8 16 O Oxygen	9 19 F Fluorine	2 4 He Helium						
												13 27 Al Aluminium	14 28 Si Silicon	15 31 P Phosphorus	16 32 S Sulphur	17 35.5 Cl Chlorine		10 20 Ne Neon					
11 23 Na Sodium	12 24 Mg Magnesium											31 70 Ga Gallium	32 73 Ge Germanium	33 75 As Arsenic	34 79 Se Selenium	35 80 Br Bromine	36 84 Kr Krypton						
19 39 K Potassium	20 40 Ca Calcium	21 45 Sc Scandium	22 48 Ti Titanium	23 51 V Vanadium	24 52 Cr Chromium	25 55 Mn Manganese	26 56 Fe Iron	27 59 Co Cobalt	28 59 Ni Nickel	29 64 Cu Copper	30 65 Zn Zinc	49 115 In Indium	50 119 Sn Tin	51 122 Sb Antimony	52 128 Te Tellurium	53 127 I Iodine	54 131 Xe Xenon						
37 85 Rb Rubidium	38 88 Sr Strontium	39 89 Y Yttrium	40 91 Zr Zirconium	41 93 Nb Niobium	42 96 Mo Molybdenum	43 98 Tc Technetium	44 101 Ru Ruthenium	45 103 Rh Rhodium	46 106 Pd Palladium	47 108 Ag Silver	48 112 Cd Cadmium	81 204 Tl Thallium	82 207 Pb Lead	83 209 Bi Bismuth	84 209 Po Polonium	85 210 At Astatine	86 210 Rn Radon						
55 133 Cs Caesium	56 137 Ba Barium	57 139 La Lanthanum	72 178 Hf Hafnium	73 181 Ta Tantalum	74 184 W Tungsten	75 186 Re Rhenium	76 190 Os Osmium	77 192 Ir Iridium	78 195 Pt Platinum	79 197 Au Gold	80 201 Hg Mercury												
87 Fr Francium	88 226 Ra Radium	89 227 Ac Actinium																					
* 58-71 Lanthanoid series † 90-103 Actinoid series																							
140 Ce Cerium 141 Pr Praseodymium 144 Nd Neodymium 150 Sm Samarium 152 Eu Europium 157 Gd Gadolinium 159 Tb Terbium 162 Dy Dysprosium 165 Ho Holmium 167 Er Erbium 169 Tm Thulium 173 Yb Ytterbium 175 Lu Lutetium																							
232 Th Thorium 238 U Uranium 238 Pa Protactinium 238 Np Neptunium 238 Pu Plutonium 238 Am Americium 238 Cm Curium 238 Bk Berkelium 238 Cf Californium 238 Es Einsteinium 238 Fm Fermium 238 Md Mendelevium 238 No Nobelium 238 Lr Lawrencium																							

a

X

b

Key

a = relative atomic mass
X = atomic symbol
b = proton (atomic) number

1. When John shined a flash light in Sarah's eyes, her pupils constricted.

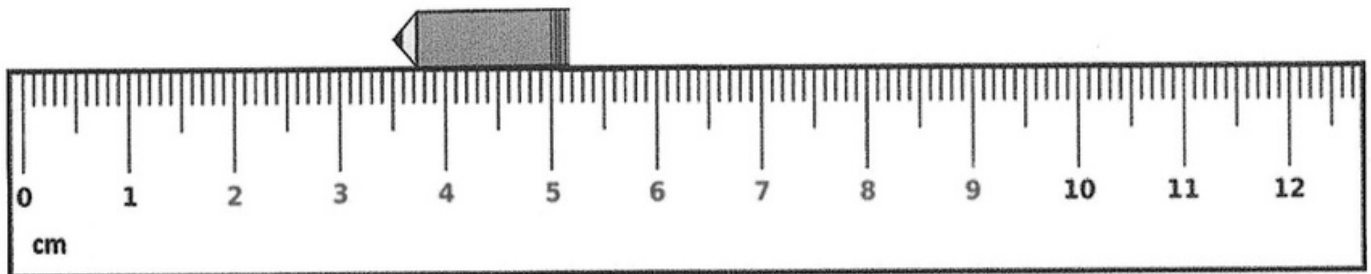
Which characteristic of living things does this show?

- A. excretion
- B. growth
- C. irritability
- D. respiration

2. Which row in the table correctly describes what happens when a solid becomes a liquid and a gas becomes a liquid?

	Solid becomes a liquid	Gas becomes a liquid
A.	heat energy decreases	heat energy increases
B.	heat energy decreases	heat energy decreases
C.	heat energy increases	heat energy decreases
D.	heat energy increases	heat energy increases

3. What is the length of the pencil shown?



- A. 1.7 cm
- B. 3.5 cm
- C. 5.0 cm
- D. 5.2 cm

4. Mushroom, mould and mildew are examples of fungi.

Which is another example of a fungus?

- A. alga
- B. amoeba
- C. fern
- D. yeast

5. Which statement about a neutron is **not** correct?

- A. It can be present in different numbers in atoms of the same element.
- B. It has no electrical charge.
- C. It is always found in the nucleus of an atom.
- D. It has much less mass than the proton.

6. A rock has a volume of 4.0 cm^3 and a density of 3.0 g/cm^3 .

What is its mass?

- A. 0.75 g
- B. 3.0 g
- C. 4.0 g
- D. 12.0 g

7. Which part of the cell is responsible for controlling the activities of the other parts of the cell?

- A. cell wall
- B. cytoplasm
- C. nucleus
- D. vacuole

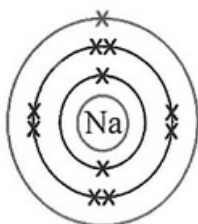
8. Which process is used to obtain a liquid solvent from a solution?

- A. chromatography
- B. combustion
- C. distillation
- D. filtration



9. Weight is an example of which quantity?
- A. acceleration
 - B. force
 - C. mass
 - D. power
10. Which is the loss of water from the leaf of the plant?
- A. evaporation
 - B. translocation
 - C. transpiration
 - D. wilting

11. The diagram shows the electron structure of a sodium atom.



When an atom of sodium becomes an ion it will have the same electron structure as which element?

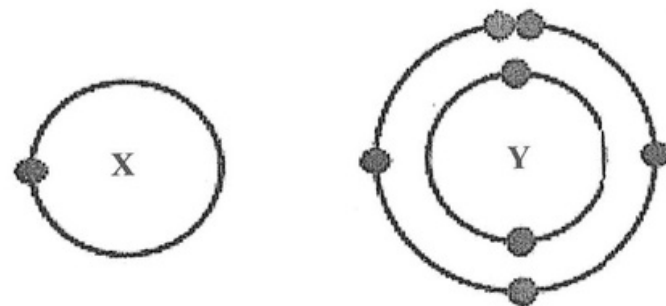
- A. argon
 - B. chlorine
 - C. magnesium
 - D. neon
12. The cooling fins of a refrigerator are painted black.
- Which method(s) of heat transfer does this improve?
- A. conduction and convection
 - B. conduction only
 - C. convection only
 - D. radiation only



13. Which process occurs when undigested components of food are removed from the anus?

A. absorption
B. assimilation
C. egestion
D. excretion

14. The diagram shows the electron structure of atoms X and Y.



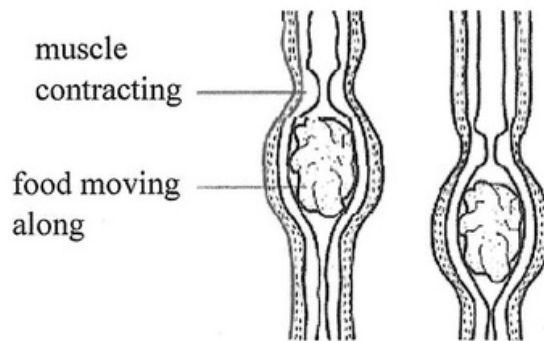
A. YX
B. YX₃
C. YX₅
D. Y₃X

15. Which of the following units is equivalent to 1 J/s?

A. meter
B. newton
C. volt
D. watt



16. The diagram shows a ball of food (bolus) in the oesophagus.



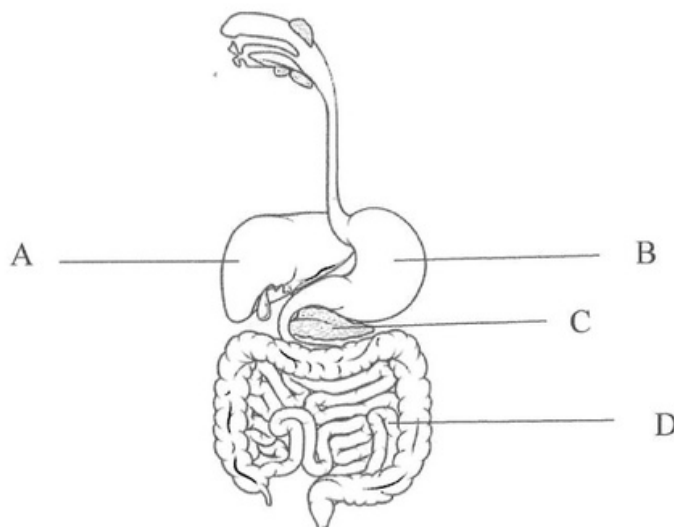
What process is occurring in the diagram?

- A. absorption
 - B. assimilation
 - C. excretion
 - D. peristalsis
17. A word equation is shown:



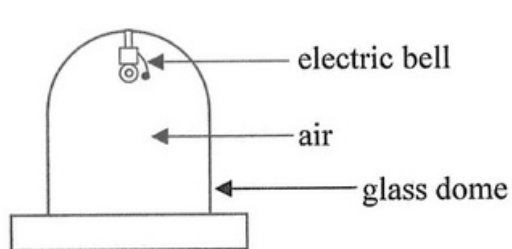
What is represented in this word equation?

- A. a chemical reaction between iron and iron oxide in which oxygen is produced
 - B. a chemical reaction between iron and oxygen in which iron oxide is produced
 - C. a physical change between iron and oxygen that forms a red colour
 - D. a physical change in which nothing new is formed
18. The diagram below shows structures found in the human body. Which labelled structure is responsible for the formation of urea?

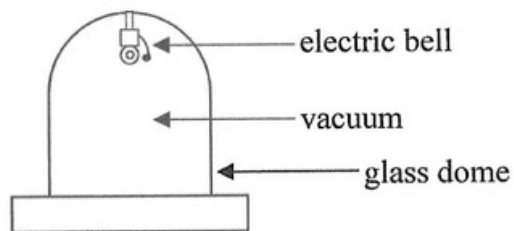


19. A bell is rung under a glass jar.

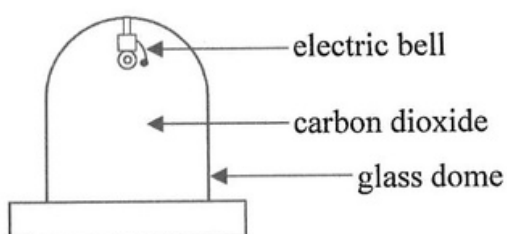
Which bell will make the quietest sound?



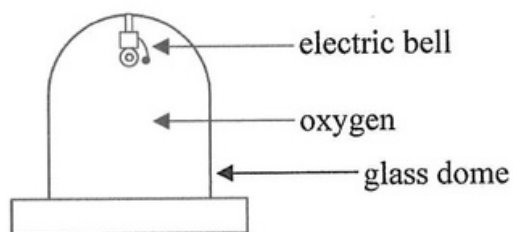
A



B

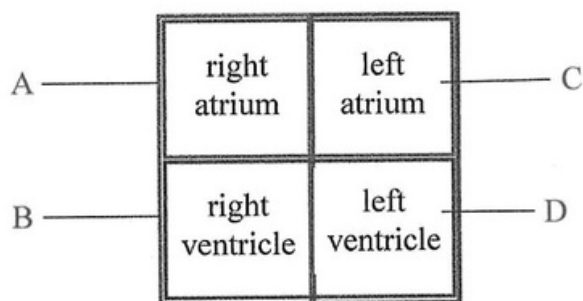


C



D

20. Which chamber in the human heart has the thickest wall?



21. Which shows the components of a solution?

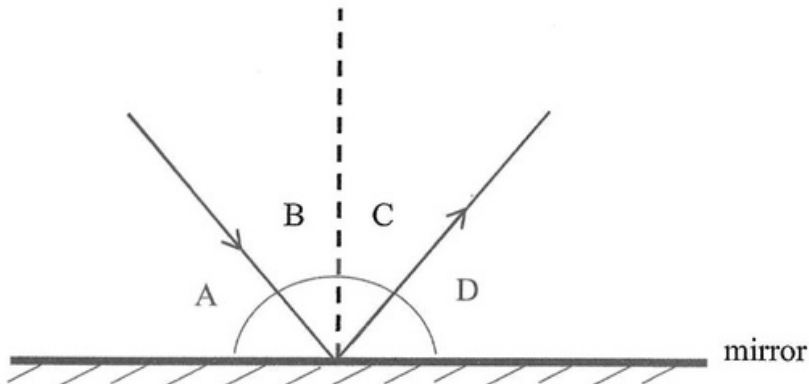
- A. a filtrate and a residue
- B. a solvent and a solute
- C. mixtures and compounds
- D. solids and liquids



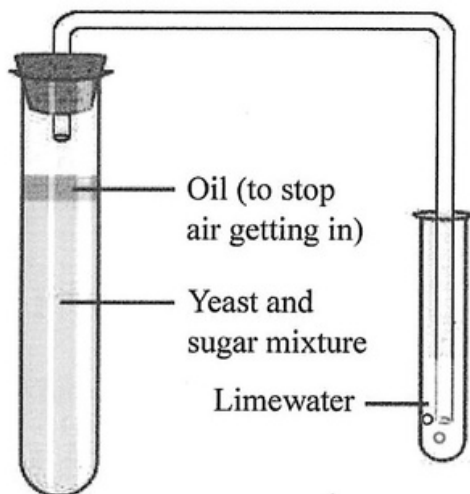
22. What is the name of the gas that must be present in order for aerobic respiration to take place?

- A. carbon dioxide
- B. nitrogen
- C. oxygen
- D. water vapour

23. Which is the angle of reflection for the light ray?



24. The diagram shows an experiment which is used to demonstrate anaerobic respiration in yeast.



What would be the conclusion of this experiment if fermentation occurs?

- A. Carbon dioxide is produced turning limewater cloudy/milky.
- B. Ethanol is produced, limewater will remain clear.
- C. Glucose is produced turning limewater cloudy/milky.
- D. Lactic acid is produced.

25. What name is given to a mixture of metals?

- A. alloy
- B. compound
- C. ore
- D. salt

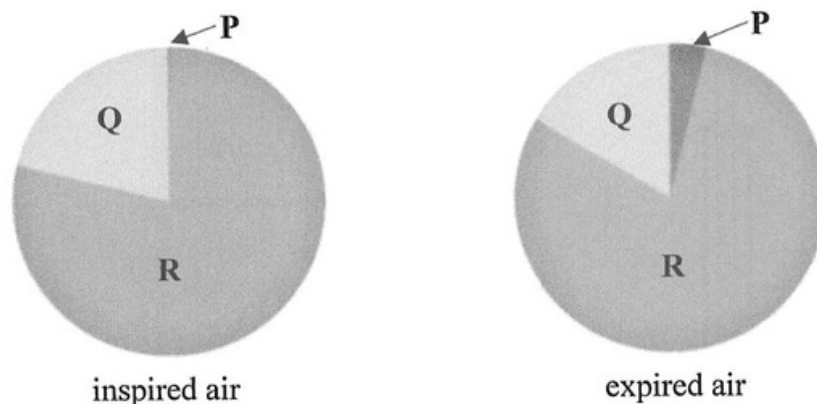
26. Which is an example of a physical change?

- A. sugar cube cut into pieces
- B. formation of manure from leaves
- C. formation of a salt from an acid and a base
- D. ripening of a fruit

27. Which shows the products of the complete combustion of methane?

- A. carbon + water
- B. carbon dioxide + water
- C. carbon monoxide + water
- D. water

28. The diagram show the percentage of three gases in inspired and expired air.



Which gas does **P** represent?

- A. argon
- B. carbon dioxide
- C. nitrogen
- D. oxygen



29. What is refraction?

- A. the bending of waves that occurs during a change in medium
- B. the bending of waves that occur when a barrier is encountered
- C. the bouncing back of waves when a barrier is encountered
- D. the spreading out of waves around obstacles and gaps

30. Which organ is correctly matched to its function?

	Organ	Function
A.	bladder	transports urine from the body
B.	kidney	breaks down toxins
C.	ureter	connects the bladder to the kidneys
D.	urethra	stores urine temporarily

31. Some properties of substance X are listed.

- It conducts electricity when molten.
- It has a high melting point.
- It burns in oxygen and the product dissolves in water to give a solution with pH11.

What is X?

- A. a covalent compound
- B. a metal
- C. a non-metal
- D. an ionic compound

32. Which body organ responds to temperature?

- A. ear
- B. eye
- C. heart
- D. skin

33. Which particles flow in a circuit to generate current?

- A. protons
- B. neutrons
- C. atoms
- D. electrons

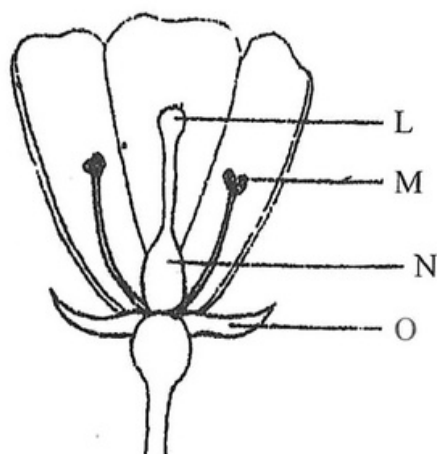


34. Which structure connects a bone to bone?
- A. cartilage
 - B. ligament
 - C. muscle
 - D. tendon
35. When a mixture of substances reacts chemically, what does an increase in temperature indicate?
- A. Bonds in the reactants are broken.
 - B. Heat energy is being absorbed during the reaction.
 - C. The products contain less energy than the reactants.
 - D. The reactants contain less energy than the products.
36. Which is **not** an effect of alcohol consumption?
- A. liver damage
 - B. loss of muscle coordination
 - C. poor self-control
 - D. stimulation of the nervous system
37. Which group contains only good electrical conductors?
- A. air, graphite, plastic
 - B. air, gold, mercury
 - C. copper, graphite, mercury
 - D. copper, gold, plastic



38. The diagram shows a section cut through a flower.

Identify where fertilisation and pollination occur on the diagram?



	Fertilisation	Pollination
A.	L	M
B.	M	N
C.	N	L
D.	O	L

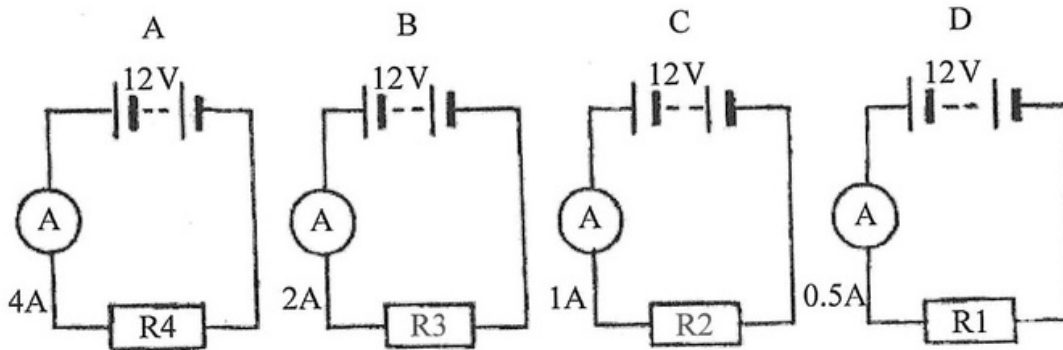
39. Sulphur dioxide, carbon monoxide and oxides of nitrogen are common gaseous pollutants found in air.

Which pollutants contribute most to acid rain?

- A. carbon monoxide and oxides of nitrogen
B. carbon monoxide and sulphur dioxide
C. oxides of nitrogen and sulphur dioxide
D. oxides of nitrogen only
40. What is the name of the structure which allows exchange of materials between mother and foetus?
- A. cervix
B. fallopian tube
C. placenta
D. uterus wall

41. The circuit diagrams show a 12 V battery connected to a resistor and an ammeter. The ammeter reading for each circuit is shown.

Which circuit has the lowest resistance?



42. Which group of organisms break down and feed on dead and decaying organisms?
- A. carnivores
 - B. decomposers
 - C. herbivores
 - D. producers
43. Which of the following pairs of substances are necessary for a piece of iron to rust?
- A. air and water
 - B. air and iron oxide
 - C. carbon dioxide and iron oxide
 - D. carbon dioxide and water
44. What may cause the rapid growth of plants in a lake?
- A. excess fertilisers
 - B. excess herbicides
 - C. low water pH
 - D. low water temperature



45. Which electrical symbol represents a device whose function is to measure the potential difference across a component?

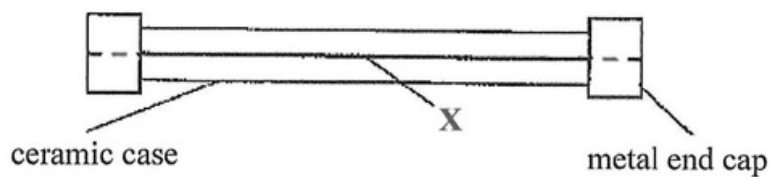
			
A.	B.	C.	D.

46. Which is **not** a respiratory condition caused by air pollution?

- A. asthma
- B. bronchitis
- C. emphysema
- D. gonorrhea

47. The diagram shows the structure of a fuse.

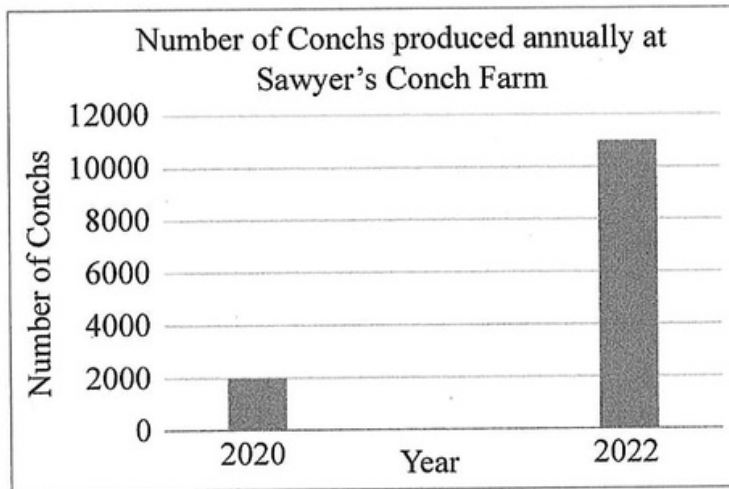
What is the purpose of the wire labelled X?



- A. to connect the end caps
 - B. to ground the appliance
 - C. to increase resistance
 - D. to melt when current becomes too large
48. Which named plant is native to The Bahamas?
- A. aloe vera
 - B. banana
 - C. casuarina
 - D. mahogany

49. Mr. Sawyer started a conch farm business in 2020.

Use the information from the graph to determine how many more conchs were produced in 2022 than in 2020?



- A. 8500
B. 9000
C. 9500
D. 10500
50. Which is a way to prevent an electrical accident?
- A. have contact with live wires
B. repair faulty power cords
C. use electrical equipment around water
D. use overloaded outlets

