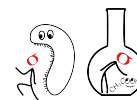




Sigma Tournament

Day 2: Biology & Chemistry



Tour 1

1) The numbers in the first column represent a human, an elephant, a bat, a mouse and a carp. Which number indicates which organism?

Number	Body temperature (°C)	Resting heart rate (beats/minute)	Maximal speed of locomotion (m/s)
1	1-30	30-40	1.5
2	38	450-550	3.5
3	31	500-660	14
4	36.2	22-28	11
5	36.6	60-90	10

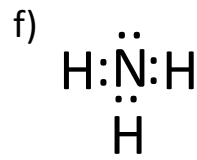
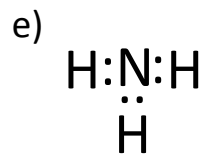
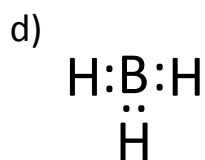
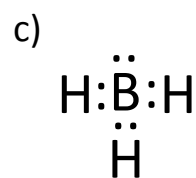
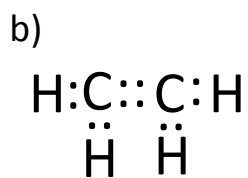
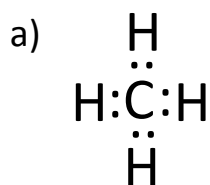
2) The birdhouse was nailed to the tall tree at the height of 2 meters in March. The tree grows with the constant rate of 10 cm per year. At what height will this birdhouse be in five and a half years?

3) There are 2 ponds, which are equal by area, depth, etc. However, one has significantly more plants growing in its waters. In which of two ponds will a short-term drop in oxygen level in the water be more likely to occur? At what period of the day or night will this happen?

4) The first two periods of the periodic table are:

H							He
Li	Be	B	C	N	O	F	Ne

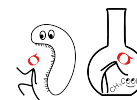
Below are structures of six chemical compounds. Identify all structures with errors.





Sigma Tournament

Day 2: Biology & Chemistry



Tour 2

Experimental problem!

(4 points for a complete solution)

You have four test tubes with transparent odorless solutions. The markings on those test tubes have been wiped out by accident, however we know that two test tubes contain identical solutions. You have test tube racks, a sharpie, an empty glass beaker and an unlimited amount of empty and clean test tubes. Identify the test tubes with identical solutions.