suggested TOPICS FOR DGD 3 Jan 28-Feb1, 2013
in addition to your questions....

1 **Review of basics that will teach us something about our oceans!**
a) Sea water is approximately 3.5% salt. Assume all is NaCl. How does it's osmotic pressure compare to yours?
b) How much salt would you get out of 1 ton of water?
c) What is the density of sea water? Calculate it!

Need MW NaCl. Na? Compared to carbon, Na is in next row in pt-> consider as 2 x carbon = 24; Cl also in next row = 2c = 24 -> NaCl = 48 round off to 50 [this approximation is from dgd #1]

3.5% = 3.5 g /100mL = 35 g/ L

35/ 50 = 0.7 Mol -> sea water is 0.7 M

You are 300 mOsm = 0.15 M -> Sea water will suck out your water!

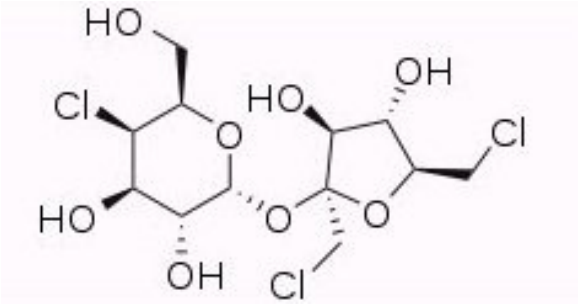
b)How much salt would you get out of 1 ton of water?
This is to review upper end of metric scale: 1 M^3 = 1000 L = 1000 KG
35 g/ L x 1000 L = 35,000 g = 35 Kg (About 17 lbs)

Possible follow up: estimate how many L of air are in the room that they are in...

c) What is the density of sea water?
Remember that you can add sugar to a full cup of coffee!
1L sea water = 1000 g water + 35 g salt -> Density = 1.03

2) Review sugars. Essay from 2010 Final exam

Use only words and the sugar names that you learned in class to describe this structure (it's a sweetener called Sucralose) in an unambiguous manner (unambiguous means that it could be drawn by one your colleagues from your description). FOR DGD 3, DO THIS FOR EACH SUGAR NOT THE BOND-YOU WILL NOT HAVE SEEN IT YET. Using the Haworth projection, draw the sugar on the right side of Sucralose in the pyranose form.



CORRECTION SCHEME USED FOR THIS QUESTION:
Grade = **4 for each sugar**, 0.5 for bond, 1.5 for pyranose drawing
the symbol / separates options

1 ring: aldo (0.5) pyranose (0.5) if they say galactose w/o aldo give full marks

1 ref C: D

0.5 configs: OOS / galactose/Left, left, Right **in fischer**/ L,L,D

1 anomer: alpha

0.5 substituent: 4-chloro

0.5 bond: furanosyl-pyranoside or glycoside(0.25) and 0.25 for : 1 of pyranose/sugar on left to 2 of furanose/ sugar on right//anomer to anomer/alpha to beta/

1 ring: keto (0.5) furanose (0.5) if say fructose w/o keto give full marks

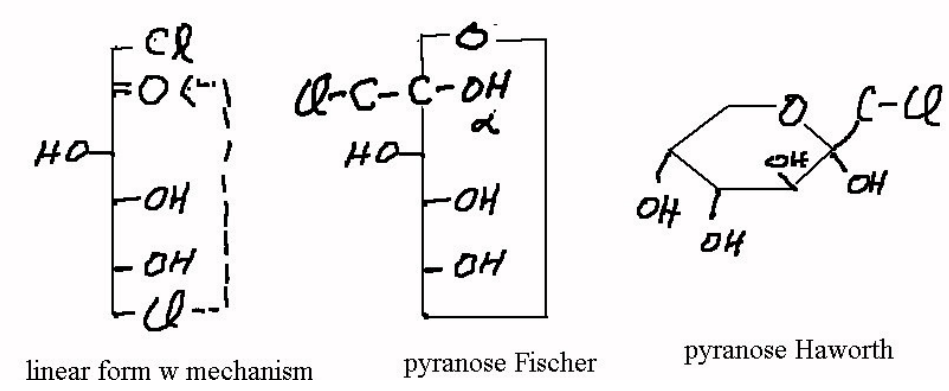
1 ref C: D

0.5 configs: OS / fructose/ left, Right **in fischer**/ L,D

1 anomer: beta

0.5 subs: 1,6-chloro

1.5 for *draw the pyranose form* full marks for structure on right (or other anomer)



linear form w mechanism pyranose Fischer pyranose Haworth

give give full marks if C6 still has the Cl on it

1.2 if ring is right but several configs are wrong

1.1 if Cl is the ring atom instead of O! 0.8 if C6 joined directly to C2

1.2 if they do pyranose as Fischer projection (middle structure)

1 if they just do linear form with mechanism (left structure)

0 if cyclization is C1 to C5

Give an EXTRA 0.5 to any that raise the issue of the anomer form of the pyranose and another EXTRA 0.5 if they draw or explain both anomers

For the naive description, like "*sugar on right: C1: O to C5 and O to right to next sugar, C2: OH to right, C3:OH to left, C4:Cl to left, C5: O to right, C6: an OH. sugar on left:* etc..." give 6 for a perfect description (complete the correction scheme or add other creative description that you read to it) and go down from there.

FYI: -The full IUPAC name is

1,6-Dichloro-1,6-dideoxy-β-D-fructofuranosyl-4-chloro-4-deoxy-α-D-galactopyranoside

but students do not have to say dideoxy coz I simplified IUPAC and said that substituents replace OHs

- the cyclization is on page S24 in lecture notes