

CHAPTER 1

Review questions:

- 1) Protons, neutrons, electrons 2) Protons and neutrons 3) Sharing of electrons. 4) 2
- 5) Water is polar because one side of the molecule is slightly positive and the other side is slightly negative.
- 6) Hydrogen bonding
- 7) The atoms in salt (sodium and chlorine) have an electrical attraction to water molecules.
- 8) the salt 9) substrates
- 10) Enzymes either tear things apart or they put things together. Each enzyme does only one job.
- 11) sucrose 12) sucrase 13) glucose and fructose 14) water
- 15) Water is necessary for tearing apart molecules. The OH and the H are used to patch up ragged ends.

CHAPTER 2

Review questions:

- 1) The water molecules pull at the solute molecules, destroying any crystals, and trap the solute molecules in water "cages."
(Answers can vary, as long as they express this general idea.)
- 2) no 3) cold 4) oxygen 5) up 6) nose
- 7) Benzoic acid is harmful to microorganisms but not to people. Benzoic acid might be harmful to people if it turns into benzene, a substance that might be carcinogenic. (Answers can vary as long as they contain this idea.)
- 8) microorganisms in their food
- 9) People like a like some sour "tang" as well as the sweet taste.
- 10) proton 11) hydroxide ion 12) acid 13) basic 14) alkaline 15) 7
- 16) water, a salt 17) Bacteria (germs) are killed.
- 18) Large fat globules are broken up so that all the fat globules are made the same size.
- 19) casein 20) peptidases 21) 20 22) NH₂ 23) glucose and galactose
- 24) sucrose 25) solution and colloid, milk is colloid

2.1

- 1) solutes 2) hydrogen bonding 3) pesticides 4) 6 5) 5 6) benzene 7) raw 8) carcinogens
- 9) potassium 10) vitamin C 11) phosphoric acid 12) hydroxide ion 13) water, salt 14) alkaline
- 15) pasteurized 16) homogenized 17) glycine 18) glycerol 19) micelles 20) peptidases
- 21) function 22) FDA 23) simple sugars 24) fatty acids 25) water 26) gas, liquid
- 27) pressure 28) Canada 29) bananas 30) glasses

Answers to "Interesting Fact about Ice Cream and Root Beer"

- 1) mashed potatoes 2) August 6 3) twelve 4) sorbet 5) 5 gallons
- 6) akutaq, moose fat, seal oi, snow, berries, fish 7) the churn 8) St. Louis 9) America, Australia, Norway
- 10) sassafras 11) medicine 12) sarsaparilla

2.2

- 1) seal 2) black rhino 3) sheep 4) rabbit 5) hippo 6) goat 7) whale 8) donkey 9) horse 10) wallaby

CHAPTER 3

Review questions:

- 1) carbon 2) smashes them, breaks them up 3) water 4) bacteria
- 5) curdles it 6) lactose 7) beta-carotene
- 8) any fruit or vegetable that is orange or yellow 9) A, retina 10) casein
- 11) micelles, negative, glycoproteins 12) curdled, vinegar, lemon juice, rennet, cows, bacteria
- 13) whey 14) cottage cheese 15) bacteria, mold 16) glycolysis, pyruvates
- 17) lactic acid, fermentation 18) carbon dioxide, yeast 19) ethanol
- 20) fungus 21) starch, glucose 22) amylase, yes 23) glutenin, gliadin
- 24) cysteine 25) zonulin 26) Maillard 27) an acid

3.1

Avenin	Buttermilk	Carboxyl	Disulfide
Enzyme	Fermentation	Gliadin	Hydrogen
Index	Juice	Kitchen	Lactate
Mitochondria	Negative	Orange	Phosphate
Question mark	Retinal	Starch	Threonine
Unloading	Vacuole	Whey	oxygen
Yarg	Zein		

3.2

Stinky cheeses:

1) Limburger	2) Camembert	3) Epoisses (Aye-pwahz)	
4) Taleggio	5) Stinking Bishop	6) Roquefort	
7) Raclette	8) Mimolette	9) Casu Marzu	10) Parmesan

Key words:

PROTEIN, BUTTERMILK, LIQUID, ZONULIN, REFLECTS, ETHANOL, RANCID, GOATS

CHAPTER 4

Review questions:

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|---|--------------------------|---|-----------------|-------------------|-------------------|
| 1) electrons | 2) emulsifier | 3) b | 4) 2, 1, 3 | 5) seeds, c | 6) stomata, guard |
| 7) palisade | 8) DNA, RNA | 9) phospholipids | 10) chlorophyll | 11) beta-carotene | |
| 12) heme | 13) magnesium | 14) carotenoids | 15) anthocyanin | 16) curcumin | |
| 17) antioxidants | 18) tannic acid | 19) To protect them from pests and from sun damage. | | | |
| 20) scurvy, beriberi | 21) d | 22) a | 23) c | 24) A and D | 25) D |
| 26) K | 27) coenzyme or cofactor | 28) cellulose, cellulase | | 29) no | |
| 30) To push food along, and also to feed the "good" bacteria that live in your gut. | | | | | |
| 31) spinach | 32) iceberg | 33) spinach | 34) endive | 35) spinach | |
| 36) spinach | 37) spinach | 38) iceberg | 39) no | 40) endive | |

4.2

Crossword:

ACROSS:	1) tannins	3) Funk	5) riboflavin	6) turmeric	11) hydrophobic	13) rickets
	14) spongy	15) photosynthesis	17) coenzyme	18) fruit	23) emulsifier	
	24) pyridoxine	26) resveratrol	27) cellulose	28) antioxidant	29) vacuole	
DOWN:	2) starch	3) fiber	4) thiamine	7) microbiome	8) chloroplast	9) polyphenols
	10) phospholipid	12) ascorbic	14) stomata	16) carotenoids	19) cuticle	
	20) heme	21) cellulase	22) magnesium	25) nucleic		

CHAPTER 5

Review questions:

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|---|----------------------------|--|------------------------------|------------------|
| 1) peppers (or hot peppers, or chili peppers), (a) heat | 2) animals-yes, birds-no | 3) ovary | | |
| 4) To provide nutrients for the new baby plant. | 5) a) proteins | 6) triglycerides | | |
| 7) glucose | 8) corn, rice, wheat, oats | 9) clump together | 10) carries oxygen molecules | |
| 11) lectins, b) sugar strings | 12) cook at high heat | 13) raffinose | 14) -ose, -ase | |
| 15) no | 16) potatoes | 17) TRUE | 18) potatoes | 19) sweet potato |
| 20) TRUE | 21) actin and myosin | 22) myoglobin ("heme" also acceptable) | 23) myofibril | |
| 24) carbon monoxide | 25) astaxanthin | 26) c) hydrogen atoms | 27) bacteria, nitrogen | |
| 28) yeast | 29) Maillard | 30) legume | | |

CHAPTER 5 (con't)

5.1

- | | | | |
|--------------------------|--------------------|-----------------------|---------------------------|
| 1) j, phytohemagglutinin | 2) k, solanine | 3) m, starch granules | 4) d, capsaicin |
| 5) c, cotyledon | 6) i, plumule | 7) e, endosperm | 8) l, alpha-galactosidase |
| 9) n, root tuber | 10) g, green | 11) a, actin | 12) o, oxygen |
| 13) a, astaxanthin | 14) f, fatty acids | 15) h, nitrogen | |

5.2

- | | | | | | | |
|------------------|------------|----------------|---------------------|-----------------|-------------------|----------------|
| 1) amino acid | 2) glucose | 3) enzyme | 4) micelle | 5) phospholipid | 6) cellulose | 7) chlorophyll |
| 8) beta-carotene | 9) phenol | 10) emulsifier | 11) oligosaccharide | 12) myoglobin | 13) triglycerides | |
| 14) starch | | | | | | |

CHAPTER 6

Review questions:

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|---|---|----------------------------|--------------------------------|---------------|
| 1) nutrition for the developing bird embryo | 2) The blastoderm grows into the chick embryo. | | | |
| 3) b) lecithin | 4) heat and physical force (beating, whipping) | 5) air bubbles | 6) denatured | |
| 7) soybean | 8) unsaturated fatty acid | 9) unsaturated fatty acids | 10) saturated fatty acids | |
| 11) more solid | 12) hydrogen | 13) no | 14) no, meat, eggs, vegetables | |
| 15) cow hooves, pig skins, fish | 16) triglycerides | 17) air bubbles | 18) agar and carrageenan | |
| 19) pectin | 20) False | 21) arrowroot, cassava | 22) no | 23) c) 50% |
| 24) c) pectin | 25) vitamins, minerals, phytochemicals such as flavonoids and polyphenols | | | |
| 26) heating, enzymes | 27) invert | 28) Maillard | 29) a) gelatin | 30) b) stevia |

6.2

- | | | | | | | | | | |
|------|-------|-------|------|-------|------|-------|-------|-------|--------|
| 1) 4 | 2) 10 | 3) 12 | 4) 7 | 5) 11 | 6) 6 | 7) 22 | 8) 18 | 9) 18 | 10) 27 |
|------|-------|-------|------|-------|------|-------|-------|-------|--------|

6.3

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|----------------------|------------------|------------------|---------------|-----------------|------------------|
| ACROSS: 1) hydroxide | 3) tannin | 5) amyloplast | 6) capsaicin | 12) proton | 14) triglyceride |
| 15) colloids | 17) betacarotene | 22) micelle | 23) nitrogen | 24) chlorophyll | 25) benzene |
| 26) endosperm | 27) sulfur | 30) emulsifier | 31) ethanol | 33) tuber | 34) sucase |
| DOWN: 1) homogenized | 2) vitamin | 4) ascorbid | 7) substrates | 8) lactase | 9) amylase |
| 10) mold | 11) anthocyanin | 13) fermentation | 16) casein | 18) electron | 19) starch |
| 20) cotyledons | 21) cellulose | 27) solute | 28) yeast | 29) water | 32) whey |

6.4

- Goat butter is white because of the way goats store beta-carotene. Their cells chop the beta-carotene in half to make two retinols, and they store the retinols. Retinol does not reflect as much yellow light as beta-carotene.
- No, not really. Only vegetative (nothing related to reproduction) parts count, such as leaves, stems and roots. Corn is a seed, so an ear of corn is technically a fruit. Anything with a seed is a fruit.
- Water is a polar molecule and oil is non-polar. Oil molecules are "hydrophobic" and want to stay away from water. Only polar molecules that have a positive and negative side will be attracted to water molecule.
- Carrots have beta-carotene which our bodies can chop in half to make molecules of retinol. Retinol is made into retinal which fits into a protein in the light sensing area of our eye.
- They use very high pressure and low temperatures (just above freezing).
- Cows have a special stomach called the rumen, which is full of bacteria. The bacteria digest the plants that the cow eats. The cow then absorbs the nutrients as well as digesting and absorbing the bacteria themselves.
- Brown rice still has the hull around the seed. The hull is full of phytonutrients and vitamins, and it has fiber which is good for the intestines. Brown rice takes longer to digest which gives it a lower glycemic index.
- Gluten isn't "bad." The problem is that some people's bodies see the string of proteins as a piece of information instead of simply nonsense amino acids. The information triggers the intestine cells to become "leaky."
- Crispy browning is caused by Maillard reactions, when sugars, fats and proteins get broken apart and then reform into a bizarre nonsense molecule that happens to smell and taste good.
- Trans fats have hydrogen atoms on opposite side of the long molecule. For some reasons, when they are in this shape they tend to get stuck in places they should not, such as along the insides of our blood vessels.
- People used to think that saturated fats like butter were worse for you than unsaturated products like margarine, but now in the 21st century, new studies have shown that saturated fats are not a problem. So go ahead and eat butter!
- Basically yes, just about any vegetable can be purple. We rarely see purple beans or corn or peppers, but they do exist.