STUDENT REVIEW SHEET INVERT II

PHYLUM ECHINODERMATA: please examine the demos

A. Starfish

1) external structures: central disk, arms (rays) oral surface, mouth, ambulacral grooves, aboral surface, madreporite, spines, dermal branchiae, pedicellariae (use a dissecting scope for the last two items)

2) internal structures: water-vascular system, coelom, stone canal, radial canal, tube feet, ampullae, calcareous endoskeleton, hepatic caeca, pyloric & cardiac stomach, gonads,

3) reproduction: refer to reproduction lab

B. Urchin

1) external structures: tests (calcareous endoskeleton consists of a series of intercalating plates.

2) Sea urchin fertilization: a very rapid process, examine several stages (this may be done in the reproduction lab).

PHYLUM ARTHROPODA: please examine the demos

A) Arthropod development:

1) Incomplete metamorphosis (direct or gradual development, or hemimetabolous) e.g., cockroach egg----> nymph------>adult

2) Complete metamorphosis (holometabolous), e.g., Drosophila

egg------>*larva------>pupa------>*adult (*motile)

B) external features: Metameric (segmented), Chitinous exoskeleton, growth via molting, highly cephalized, true coelom (replaced by hemocoel), , jointed legs, head, thorax, abdomen 3 pairs of legs (all on thorax) 1 pair of antennae

C) Class Insecta, fruit fly & cockroach

i) external features

1. Fruit fly (Drosophila), adult

**Head with mouth parts, incl. proboscis, 3 simple eyes; 2 compound eyes with many ommatidia & 1 pair of antennae

**Thorax with wings & 3 pairs of legs

**Abdomen

2. Fruit fly, larval stage (maggots): note **Tracheal tubules, **Pair of reddish spiracles this stage lacks real legs

3. Fruit fly, pupae

4. Cockroach,

i) external features: **Head, antennae, compound eyes, mouth parts, **Thorax, wings, legs, **Abdomen, cerci, spiracles

ii) internal features: open **circulatory system = dorsal vessel, hemocoel, haemolymph; **Respiratory system = spiracles, trachea & tracheoles; **Digestive system = mouth, esophagus, crop, gizzard, digestive caecum, midgut, hindgut; **Excretory system = Malpighian tubules; **Reproductive system = female--ovary and ovarioles, male--testes (not easily seen), conglobate gland; **Nervous system = nerve cord & ganglia

D. Class Crustacea

1. Crayfish,

i) external features: chelae, antennae, walking legs

ii) internal features: Respiratory system = gills; Circulatory system = heart, pericardial sinus (blood carries O_2 and CO_2, in contrast to insects, but uses the copper-containing compound hemocyanin); Reproductive system = female--ovaries & male--testes, specialized swimmerets; Digestive system = mouth, stomach, gastric mill, intestine, digestive glands; Excretory system = green glands