STATION #1 – Thursday- 16 TOTAL

PART I - Examine **Slide A**. To which **CLADE** does it belong? Coniferophytes (or conifers) **1**

Which **one** of the following terms **best** describes this structure:
Deduct 1 mark for each term incorrectly circled.

strobilus, seed cone, pollen cone **1**, inflorescence, flower, sorus

Circle the terms that apply to the structure on this slide (wrong answers will be penalized)

antheridium	**microphyll**
bract	**microsporangium 1**
compound cone	**microsporophyll 1**
endosperm	**ovary wall**
eusporangiate 1	**ovule**
integument	**ovuliferous scale**
leptosporangiate	**pollen 1**
megagametophyte	**root apical meristem**
megasporangium	**simple cone 1**
megasporophyll	**stamen**

Deduct 1 mark for each term incorrectly circled.

PART II

Examine **Slide B**. CLADE: Selaginellaceae **1**

Circle the terms that apply to this organism:
Deduct 1 mark for each term incorrectly circled.

eusporangiate, **1** leptosporangiate, homosporous, heterosporous, **1** megaphyllous, microphyllous, **1** protostelic, **1** siphonostelic

Compare and contrast the structures in slides A and B. (Give at least 2 similarities and 2 differences.) There are a number of possible answers for this question. Examples are given below, but other good answers should be considered. Note, just because the pollen cone produces one kind of spore does not mean the plant is homosporous!

SIMILARITIES **2 marks (one for each answer)**

- both are strobili
- both produce microspores
- sporangia associated with modified leaves

DIFFERENCES **2 marks (one for each answer)**

- A produces one type of spore, B produces 2
- sporangia of A sheds gametophytes (pollen), B sheds spores
- sporangia of A on abaxial side of leaf, sporangia of B on adaxial

STATION # 2 (Thursday) - 21 TOTAL

PART I	Plant A	Plant B	Plant C
Clade to which plant belongs	*Psilotaceae* **1**	*Angiosperm* **1**	*Coniferophyte* **1**
Type of primary xylem development in stem	*Exarch* **1**	*Endarch* **1**	*Endarch* **1**
Type of stele (rhizome/stem)	*Protostele* **1**	*Eustele* **1**	*Eustele* **1**
Circle the terms that apply **to the clade** (i.e. base your answers on your knowledge of plants in the clade). You can circle more than one for each organism. Incorrect terms will be penalized. Deduct ½ mark for each term incorrectly circled. Must have correct clade identified to get credit for rest of column	- archegonia½ - antheridia½ - eusporangia½ - fruit - leptosporangia - homosporous½ - heterosporous - secondary growth - seeds	- archegonia - antheridia - eusporangia½ - fruit½ - leptosporangia - homosporous - heterosporous½ - secondary growth½ - seeds½	- archegonia½ - antheridia - eusporangia½ - fruit - leptosporangia - homosporous - heterosporous½ - secondary growth½ - seeds½
If **this specimen** has a megasporangium circle its location and the term(s) that apply.	- on the strobilus - in the ovule - it is the nucellus - in the ovary - on the ovuliferous scale - on the megasporophyll Deduct 1 mark if anything in this box is circled	- on the strobilus - in the ovule½ - it is the nucellus½ - in the ovary½ - on the ovuliferous scale - on the megasporophyll ½ (bonus) Deduct ½ mark for each term incorrectly circled.	- on the strobilus½ - in the ovule½ - it is the nucellus½ - in the ovary - on the ovuliferous scale ½ - on the megasporophyll Deduct ½ mark for each term incorrectly circled.

PART II – Examine Plant B

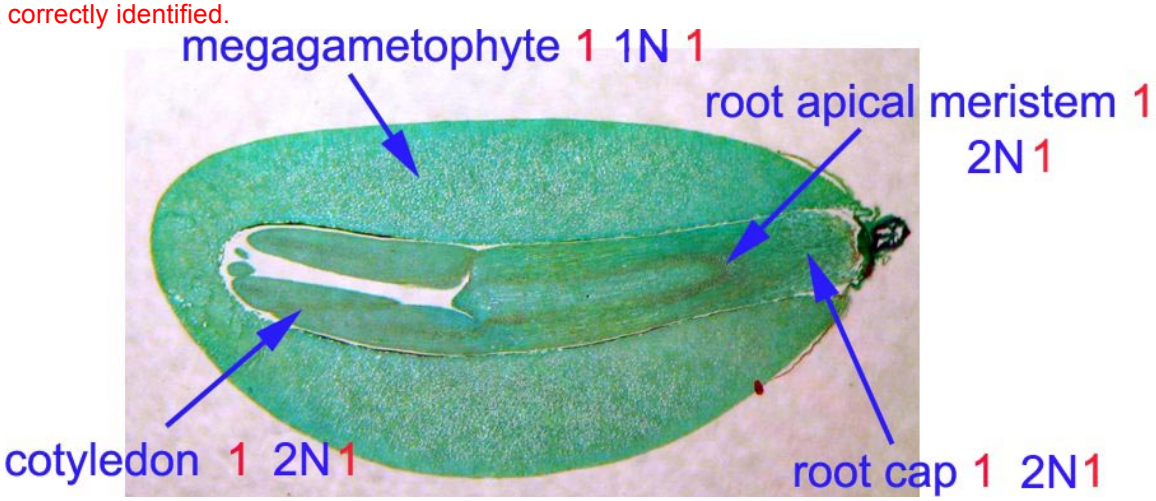
Circle the terms that apply to the of Plant B **and its reproductive structures (incorrect answers will be penalized):** Deduct ½ mark for each term incorrectly circled.

ovuliferous scale, actinomorphic½, zygomorphic, staminate, carpellate, perfect, ½ embryo sac, ½ microgametophyte½

STATION #3 – Thursday - 24 TOTAL

SLIDE A: CLADE Coniferophytes (or conifers) 1

Make a quick sketch of **Slide A**. Label with the following terms (not all apply; wrong answers will be penalized): cotyledon, ~~endosperm~~, megagametophyte, ~~microgametophyte~~, root apical meristem, root cap. Indicate the ploidy of labeled stuctures. Deduct 1 mark for each term incorrectly applied. No credit for ploidy if structure not correctly identified.



SLIDE B: CLADE Angiosperm 1

Name each structure and indicate its ploidy:

1. cotyledon 1 2N 1
2. shoot apex 1 2N 1
3. radicle (or root apex) 1 2N 1
4. embryo = germ 1 2N 1
5. ovary wall (pericarp) and seed coat = bran 1 2N 1
6. endosperm 1 3N (1 bonus)

Is this structure a seed or fruit? Explain your answer.
It is a fruit (developed from ovary). The ovary wall is fused to the seed coat. This fruit contains one seed. 1

Contrast the storage material in A and B (give at least one major difference).
One good answer - 2
- Storage material in A is haploid, while that of B has a higher ploidy

- Storage material in A is megagametophyte while that of B is endosperm (the product of fusion of sperm nucleus with polar nuclei

STATION #4 – Thursday - 23 TOTAL

PART A - Examine the flower of **Plant A**. A drawing of a longitudinal section through a flower is taped to the bench. In the spaces below, write the appropriate labels for each of the numbers on the diagram and the information requested.

	Name the Structure:	What is the function of each structure?
1.	Stigma **1**	Receptive site for pollen **1**
2.	Sepal **1**	Attracts pollinator (also can protect flower bud) **1**
3.	Petal **1**	Attracts pollinator **1**
4.	Hypanthium **1**	- fills with nectar (reward for pollinator) **1,** accept other good answers
5.	Ovary **1**	Becomes fruit - important in ovule/seed protection as well as seed dispersal **1**
6.	Ovule **1**	Becomes seed **1**
7.	Style **1**	Tissue through which pollen tube grows - elevates the stigma for pollen reception **1**
8.	Anther (or stamen) **1**	Produces pollen **1**

Fill in each blanks with the term that applies to the flower. Choose from: actinomorphic, axile, epigynous, hypogynous, inferior, parietal, perigynous, superior, zygomorphic. (Use of incorrect terms will be penalized)

Flower type: epigynous **1**

Ovary position: superior **1**

Placentation: axile **1**

Floral symmetry: actinomorphic **1**

PART B Examine the sample (do not eat).

Circle the terms that apply to the specimen B (wrong answers will be penalized):
Deduct 1 mark for each term incorrectly circled.

achene, accessory fruit, berry, **1** drupe, grain, hesperidium, legume, multiple fruit, pepo, **1** pome

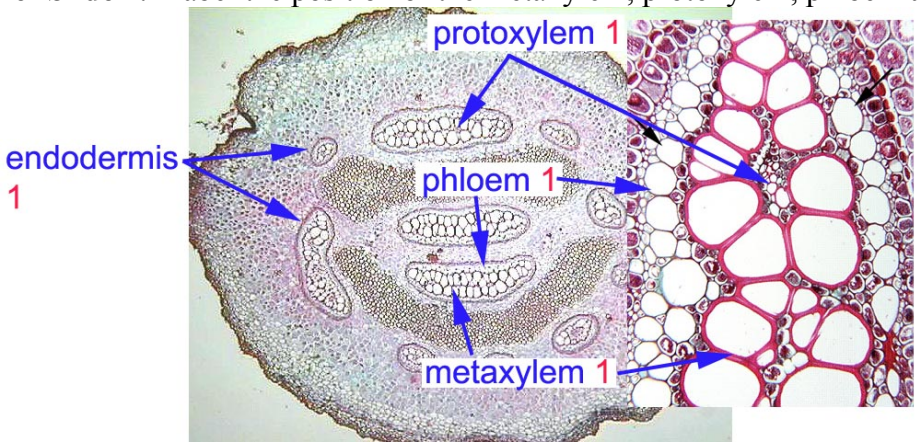
Did the ovary of the flower that produced this fruit contain more than one ovule? Explain your answer

Yes, you can tell because there are many seeds....each came from one ovule. **1**

STATION #5 – Thursday - 23 TOTAL

	PLANT A	PLANT B	PLANT C
Clade	Leptosporangiate fern 1	Equisetaceae 1	Lycoodiaceae 1
Circle the slide # that corresponds with each plant.	**1**, 1 **2, or none**	**1, 2, or none**1	**1, 2**, 1 **or none**
Heterosporous or Homosporous	Homosporous 1	Homosporous 1	Homosporous 1
Eusporangiate of Leptosporangiate	Leptosporangiate 1	Eusporangiate 1	Eusporangiate 1
Primary xylem development (stem)	Mesarch 1	Endarch 1	Exarch 1

Make a quick sketch of **Slide 1**. Label the position of the metaxylem, protoxylem, phloem and endodermis.



Circle the terms that apply to this organism (incorrect answers will be penalized.):
Deduct 1 mark for each term incorrectly circled.

amphiphloic siphonostele, **1** protostele, ectophloic siphonostele, dictyostele, **1** plectostele, atactostele

PART II:

Based on what you know and/or see, **contrast** the vegetative* features of Organism **A** and Organism **B**. Give at least 2 differences **not** based on information in the table above.

***Note**: vegetative refers to features that are not associated with reproduction (e.g. leaf structure etc).

There are a number of possible answers for this question. Give credit for good answers. Examples are given below.

DIFFERENCES **2 marks (one for each answer)**

- A has compound leaves, B has simple leaves
- B has fused leaves, A does not
- A's leaves are the main photosynthetic organ, B's are stems
- Leaves of B's are in whorls, leaves of A are not (spiral)
- B has silicated cell walls, A doesn't
- B's stem has a system of canals, A's does not