Craigie High School

National 5 Biology

Unit 2

Multicellular Organisms

Ink Exercise One

Cell Organisation and Plant Transport

Name: _____

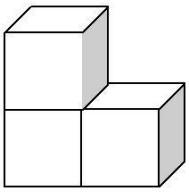
Class: _____

1. A root hair cell is adapted to
    a. Increase surface area
    b. Transport food
    c. Increase photosynthesis
    d. All of the above

2. A red blood cell is adapted to carry more oxygen because
    a. It has no nucleus
    b. It is very small in size
    c. It can pass through capillaries easily
    d. It cannot carry carbon dioxide

3. A group of cells working together is known as a(n)
    a. Organ
    b. Organism
    c. Tissue
    d. Specialised cell

4. What is the surface area to volume ratio of the shape below?
   Each side is 1cm



    a. 14 : 3
    b. 7 : 3
    c. 3 : 1
    d. 1 : 1

5. Which line in the following table correctly identifies the growth point of a plant?

	Growth Point	**Cells produced**
A	Meristem	Specialised
B	Stem cell	Unspecialised
C	Stem cell	Specialised
D	Meristem	Unspecialised

6. Which of the following options is true for phloem?
    a. Made of living cells and transports water
    b. Made of dead cells and transports water
    c. Made of dead cells and carries food
    d. Made of living cells and transports food

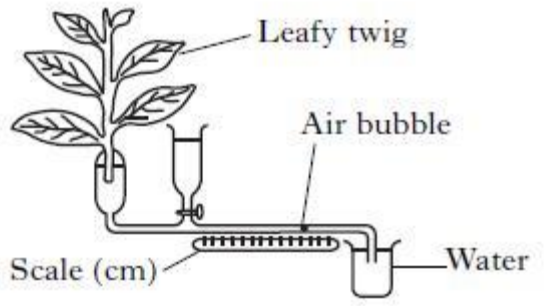
7. Which line in the following table correctly identifies the function of xylem?

	Transports	Direction
A	Food	Up and down
B	Food	Up
C	Water	Up and down
D	Water	Up

8. Under which of the following conditions would the rate of transpiration in a plant likely to be the highest?

	Wind speed	Air Temperature	Humidity
A	High	High	High
B	High	High	Low
C	High	Low	Low
D	Low	High	High

9. The apparatus shown below was set up to investigate the effect temperature has on the rate of transpiration in a leafy twig.



What would happen to the distance the air bubble travels when the air temperature is increased?

a. Decrease
b. Stay the same
c. Increase
d. None of the above

10. The pupil chose to investigate how temperature effects the rate of transpiration using a different type of leafy twig. Which of the following factors will **not** remain constant when the pupil repeats the investigation?

a. Temperature
b. Surface area of leaves
c. Time allowed for transpiration to take place
d. Length of leafy twig

11. Red the following passage and answer the questions based on it.

Soils

The type of soil in a particular area has a large effect on the plants growing in it. This affects the animals living there. Soil provides anchorage, nutrients and water for plants. Plant roots and other soil organisms need air to provide them with oxygen for respiration. A good soil will have plenty of air spaces.

Soil has six main constituents; mineral particles, humus, water, nutrient ions, air and living organisms. Soil is formed from rock. When rocks are weathered by wind, freezing and thawing, or by water flowing over them, they are broken down into small mineral particles. These particles are gradually colonised by lichens and mosses, and then by some flowering plants. As plants die and decay, their remains add organic materials to the mineral particles allowing other plants and animals to colonise the soil. Continued death and decay over thousands of years forms a good soil.

The size of the mineral particles in a soil is important. The smallest particles are called clay, while larger ones are called sand. Clay soil particles pack tightly together. Clay soils do not drain well, but have the ability to retain nutrients for long periods. This stops nutrients from being washed out of the soil by rain water. In wet conditions, the spaces between the particles fill up with water so there is no room for air.

A sandy soil contains larger particles. These cannot pack very closely together, so there are large air spaces between them. As a result, sandy soils are well aerated and drain very quickly. Sand particles do not hold nutrients in the same way that clay particles do. So nutrients are washed out of a sandy soil more quickly.

Loam is a soil which contains a good mixture of sand and clay particles. If the balance is right, it will hold water and nutrient ions very well, but will not get waterlogged too easily.

a. Name three ways in which soils provide good conditions for plant growth 1 _____

2 _____

3 _____ 1

b. Describe the process by which soil develops from small mineral particles into a good soil.

_____

_____

_____ 2

c. The table below summaries features of three different types of soil. Use words from the following list to complete the table

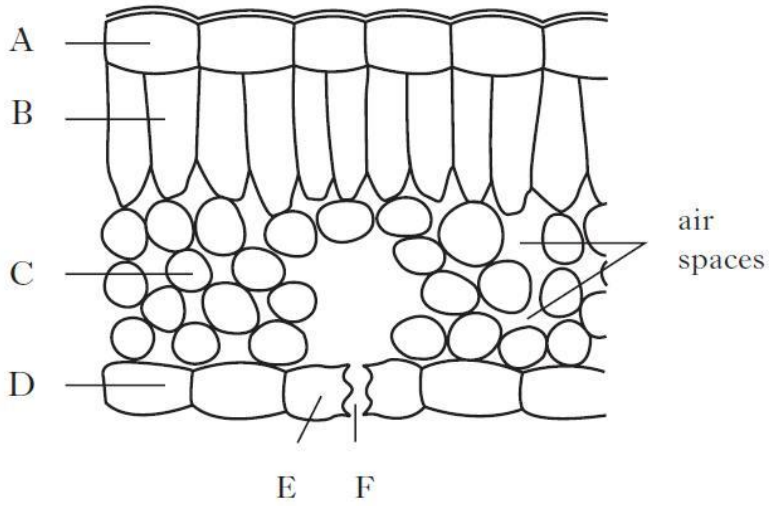
Each word should be used only once

small	high	fast	medium
slow	loam	mixed	low

Soil type	Particle size	Drainage	Nutrient content
Sandy	Large		
Clay			
		Medium	

2

12. The following diagram shows part of a leaf section.



a. Identify **one** example of each of the cells described below by using letters from the diagram to complete the boxes.

Each letter may be used **once**, **more than once** or **not at all**.

Cells which carry out photosynthesis ☐

Guard cells ☐

Mesophyll cells ☐

Waxy layer ☐

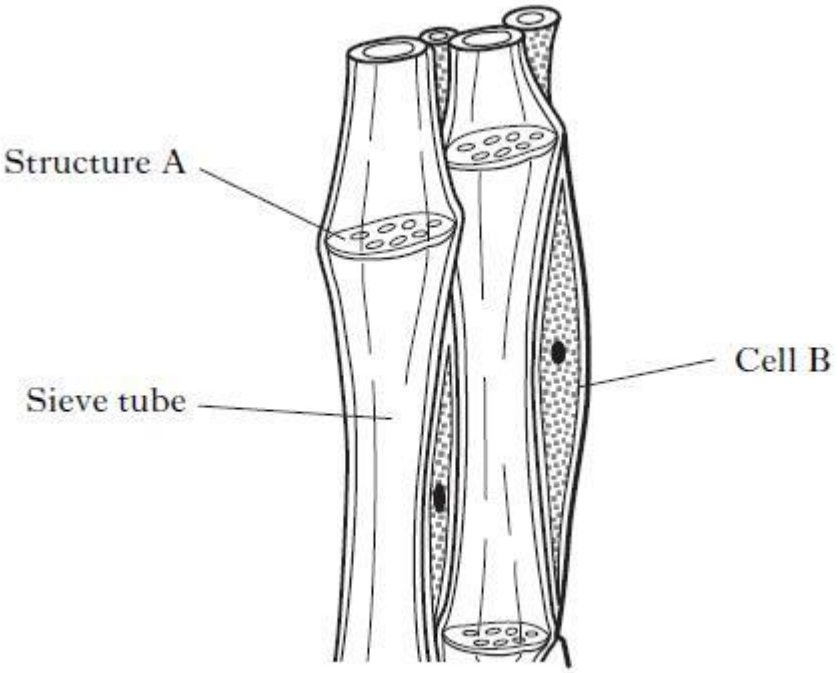
2

b. State the name of the loss of water through the evaporation through leaves.

_____

1

13. The diagram represents phloem tissue from the stem of a plant



a. Name Structure A and Cell B

Structure A: _____

Cell B: _____

2

b. State the function of phloem

_____

1

c. Name the leaf tissue where stomata are found

_____

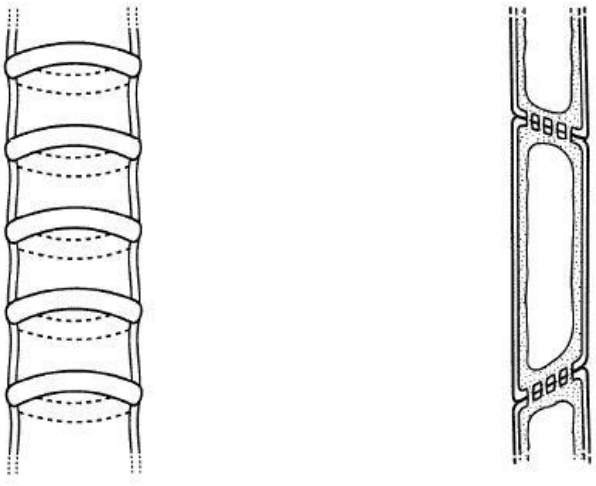
1

d. Name the cells which control the opening and closing of stomata

_____

1

14. The diagrams show two types of structures in plants.



A B

a. Which structure represents xylem tissue found in plants? 1

_____

b. What feature of xylem allows them to withstand changes in water pressure inside a plant? 1

_____

/25

Areas I need to work on: