

## **Lesson Title: Plants and Environmental Resources**

### **Part 1**

Peace, mercy and blessings of God to you.

My name is Sarah Zahid. I teach science in Al-Waheda wa Al-Ishreen middle school in Dammam, Saudi Arabia. It is my great pleasure to be with you in this lesson. I would like to introduce my animated character which will continue this journey with you through the world of plants. There are plants everywhere on the surface of the earth, but - as we have seen – there are different plant species. Can you guess the number of plant species on earth?

### **Part 2**

Good work all, and well done for the group who had the nearest answer.

The estimated number of plants that have been discovered so far is between 260,000 (Two hundred sixty thousand) to 300,000 (Three hundred thousand) species. These species have some characteristics in common, but differ in others.

Activity # 1: Let us do this activity together (Cooperative Learning)

Work in groups to discover the difference between the samples of the plants presented by your teacher, and then answer the following question:

How many types are plants are classified according to their tissue structure?

### **Part 3**

Well done, again. Scientists classify plants into two main groups: Vascular plants and nonvascular plants. The word vascular means tubes, and their function is to conduct water, food and other substances throughout the plant.

Activity # 2: Come on and let us do this activity together (Cooperative Learning)

Collaborate with your group members for the next challenge: How can you balance a science book on a vertical juice straw?

### **Part 4**

Thank you for your creative efforts to overcome the previous challenge.

The stem is one of the parts of vascular plants and one of its functions is carrying branches, leaves, and reproductive structures. In some plants, reproductive parts such as flowers develop into fruits.

Discuss the following question with your group members:

As you know, Plants make food through photosynthesis. What percent is the food to the plant weight?

- a) 30%
- b) 40%
- c) 10%
- d) 100%

## **Part 5**

Well done, but in fact there is no specific percent for the food weight photosynthesized by the plant. The contents of a plant cell include a variety of chemical mixtures (carbohydrates, aromatic oils, liquid substances, solutes in solutions, toxic substances, in addition to bitter-taste compounds, acidic chemicals and other substances)

### Activity # 3

Work with your group members to identify as many samples as possible from the ones that will be presented by your teacher and then answer the following questions: Do the samples have distinctive odors? What if we put each sample into hot water? Do the samples produce odors? Are these odors similar? Please, write -at least- three of their uses.

## **Part 6**

Thank you for your great efforts to answer the previous questions. Yes, plants have been used for medical treatment since ancient times and of the best known is the willow plant, which was used by the Pharaohs as a painkiller. It contains a chemical called salicylic acid, which is the main constituent of aspirin used as a painkiller and to treat fevers.

### Activity # 4

Suggest and write down –as groups- solutions for this problem: What should you do if you get a headache while you are on a journey through a forest without a pain reliever?

Let us make Aspirin.

Work in groups to remove phloem from a stem of a willow plant using an anatomy knife and then put two teaspoons of phloem in a cup of boiling water and then let it cool. By the end of this procedure, you will have made a painkiller.

## **Part 7**

Thank you for your cooperation.

As we have mentioned earlier, plants have been used in medical treatments. This is because they contain chemicals that react with the pathogens in our bodies. Some plants also contain oils such as corn, olive, sunflower and others. Conduct a questionnaire among your students to answer the following question:

Are plant oils used as car fuels?

### **Part 8**

Well done, Most of the energy we use comes from fossil fuels such as coal, oil, and natural gas. Since burning fossil fuels causes pollution, researches have been conducted for alternate resources of energy to reduce fossil fuel use, and one of these solutions is using plant oils as car fuels.

Work in groups to compare the use of gasoline with the use of corn oil as a car fuel.

### **Part 9**

Well done

The use of plant oil as fuel must undergo certain processes to be ready for use. Let us see together how bio-fuel can be manufactured from a plant origin.

Video (Biodiesel - How It's Made)

### **Part 10**

Plants are factories of food, medicine and fuel. What else can they make for us?

