Sustainable Solutions (Level 3)

Assessment Questions

Why All the Plastic?

1. What does "biodegradable" mean?
2. How can we reduce the effect of plastic on the environment?
   a) burn it
   b) bury it in the earth
   c) recycle plastic items, reduce our use of plastic items and replace them with other items
3. True or false: plastic is indestructible.
4. List two effects of plastic on the environment (hint: think of its effects on air, water bodies, animals, human health, etc.).
5. Imagine that your family buys 25 plastic items weekly. You have convinced them to reuse, reduce, replace, and recycle most plastic items. Now, your family only buys 5% of the previous number of plastic items. How many plastic items is your family still buying?
6. Give 3 reasons that make plastic so special and commonly used OR compare between plastic and other materials - what makes it special?
7. In a poor town, plastic shopping bags cannot be replaced because other materials are expensive. Suggest two things supermarkets can do to reduce the effect of plastic on the environment.
8. If you bury a fruit in the soil, what will happen to it after one week? Why?
9. Give one example of a different material we can use instead of plastic for each of the following:
   a) plastic shopping bag
   b) plastic water bottle
   c) plastic chips bag
10. If you have two shopping bags - one made of plastic and the other made of cloth, which one will you choose to use? Why?
11. If you visit your local landfill where most plastic waste is dumped, what will you notice about the plastic items compared to the non-plastic items?

Solar Water Heater

1. What are the three modes of heat transfer?
2. Which material, metal or plastic, is a better conductor of heat?

3. How does a thermometer measure temperature?
4. What is the purpose of using dark colors in a solar water heater?
5. Name one common insulator and one common conductor of heat.
6. Why does heat travel from higher temperatures to lower temperatures, and how does this principle apply to a solar water heater?
7. Why is it important to use both absorptive surfaces and insulators in the design of a solar water heater?
8. What are the environmental benefits of using a solar water heater compared to conventional methods of heating water?
9. Why do you think wearing dark clothes makes you feel hotter in the sun compared to wearing light clothes?
10. If you were designing a house in a very hot climate, what colors would you paint it to keep it cool and why?
11. Why do you think kitchen utensils often have wooden or plastic handles?
12. How do you think the properties of conductors and insulators are used in designing a refrigerator?

Digging into Soil Sciences

1. What are the main components of soil?
2. What is humus and why is it important for soil fertility?
3. What is soil erosion and what are its main causes?
4. What is pH and how does it affect soil health?
5. Name three types of soil based on particle size.
6. How would you differentiate between sandy soil and clayey soil based on water absorption?
7. Organize the steps you would take to test the pH of a soil sample.
8. Compare the properties of loamy soil with sandy soil in terms of suitability for plant growth.
9. Summarize the benefits of composting for soil health.
10. Discuss the impact of human activities on soil erosion and soil fertility.

The Plant Game

1. What is photosynthesis?
2. What are the raw materials required for photosynthesis?
3. What is chlorophyll and why is it important?
4. How would you demonstrate the process of photosynthesis using a simple experiment?

5. Compare the nutrition process in a green plant and an insectivorous plant.
6. Why are plants considered producers in the food chain?
7. If you could be any part of a plant, which part would you be and why?
8. Why do some plants have brightly colored leaves, and how does this affect their photosynthesis?
9. How would plants adapt if they lived in an environment with very little sunlight?
10. What would the world look like if plants could move around like animals?