



4Rs Quiz Answer Sheet

1. **e**
Can your students think of other names for “garbage?” Brainstorm ideas for talking about the meaning of garbage: something worthless or meaningless. Should recyclable material be considered garbage?
2. **a**
Garbage has been around a long time. Today we must think about what we throw away more and more as populations grow, landfills become full and more natural resources are used to meet the consumer demands of a larger population.
3. **c**
Approximately six million pounds of garbage per day are sent from the Davis St. Transfer Station to the Altamont Landfill. Measure D, approved by the voters in Alameda County in 1990 mandated that by the year 2010, 75% of municipal solid waste be diverted from the landfill. Today’s landfills are not considered “dumps.” They are designed with several layers of clay and gravel, as well as protective layers of plastic and piping to catch pollutants: liquid runoff known as leachate and methane gas.
4. **a**
Paper accounts for about 35% of municipal solid waste. Organic matter, consisting of mostly food and yard waste accounts for another 24%. Next are plastics at about 11%, metals at 8% and glass at 6%. A large majority of our garbage can be kept out of the landfill by recycling or composting.
5. **c**
The average amount of garbage generated by one person in one day is estimated to be about 4.5 pounds. About 30% of this is estimated to be from packaging alone. This is twice as much packaging waste as 10 years ago. How much does the entire class produce in one day? In one week? In a month? In one year?
6. **False**
Recycling is but one step in the hierarchy of reducing what goes to the landfill. Preferably we will reduce the amount of solid waste by first *reducing* our packaging and the amount of raw materials we use in manufacturing products today. Then we try to *reuse* items such as plastic bags, bottles, fabric etc. Next we can *recycle* paper, plastic, metals and glass or *rot* (compost) organic materials such as food or plant debris.
7. **False**
When we dispose of garbage in the landfill it may be out-of-sight, out-of-mind, but it takes a long time for it to break down. Sanitary landfills are designed to limit the amount of air, water and light that reach the garbage. This limits the decomposition, which produces leachate and methane gas. Plastic grocery bags may take 20 years to break down while glass may take over one million years.
8. **True**
Discuss some items that can be recycled and examples of new products that are made from recycled materials. For example, aluminum cans are made into new cans, plastic soda bottles are made into fleece jackets and plastic bags can be made into “poly-lumber.”
9. **e**
Glass, aluminum, steel, paper and plastic are all commonly recycled in Alameda County. Discuss with students whether they recycle at home, at school, or elsewhere. What do they recycle at home? Can they recycle more?

10. **a**
Natural resources are what we use to make the products we use. Some resources are renewable (can be replenished), like trees and water, while others are non-renewable (there is a finite amount on earth) like metals and oil. Discuss how paper comes from trees and recycling can lead to cutting down less trees; and how plastic comes from oil which will run out some day (perhaps within a couple hundred years) and so recycling is a way to conserve natural resources.
11. Reduce, reuse, recycle, rot. See answer #6 for the importance of the 4Rs hierarchy.
12. **c**
Composting is nature's way of recycling. Any organic matter, meaning anything that was once alive (i.e. paper from trees, grass, food scraps) will be decomposed by fungus, bacteria and invertebrates, such as worms, if exposed to air and water.
13. **a**
Almost one quarter of all our waste can be composted and returned to the soil as an amendment. Are students aware of, or do they have experience with yard and food waste bins in Alameda County? How about at home compost bins? Sign up for the Wonders of a Worm Bin classroom program if you are interested in learning more about composting and worm bins.
14. **b**
Recycling paper makes new paper products, saves water, conserves energy, and reduces the amount of harvested trees. Have students look at different paper products to find out what percentage of the content comes from recycled paper.
15. **c**
Plastics come from oil, which must be drilled from the ground. The world's supply of oil is finite as we extract it at a rate much faster than it is produced. Oil is made in the earth's crust from decomposed organic matter. This process takes millions of years to occur.
16. **d**
Recycling not only saves raw materials (natural resources) but also requires less energy and water than manufacturing a brand new product. Producing new glass from virgin materials takes 30% more energy than making glass from crushed, recycled glass. Aluminum beverage cans may return to the grocer's shelf as a new, filled can in as little as 90 days after collection, re-melting, rolling, manufacturing and distribution.
17. **c**
More than 30 million trees are cut down to produce a year's supply of newspaper.
18. **c**
An aluminum can will be in the landfill for 200-500 years. Also, throwing away a single aluminum can is like pouring out six ounces of gasoline. Americans throw away enough aluminum cans to rebuild an entire commercial air fleet every three months.
19. **c**
Municipal solid waste is defined as waste generated in residential and commercial (businesses and schools) settings, as well as industrial non-hazardous waste. Through materials recovery (the removal of items from the waste stream for recycling and composting), over 50% of solid waste is currently diverted from the landfill in Alameda County, and by 2010 the goal is to divert 75%. Schools account for approximately 4% of the total waste stream in Alameda County and can play a vital role in meeting Alameda County's waste reduction goals.