

SSRC

No.	Puzzle	Location/Physical Manifestation
1	<p>(A sign is pinned to the trunk of a tree 1.5m from the ground, 3 inches deep into the trunk.)</p> <p>Trees are known to tall and strong, essential members of ecosystems such as forests. Trees have interesting growth patterns, taking many years to reach impressive heights. Famously, trees are known to have growth rings, with scientists being able to estimate the age of trees, ecological changes, etc. from these structures. Trees grow an average of 24 inches per year</p> <p>This tree is about 3m tall and 15 years old. Considering these facts, and given the knowledge of the growth of trees, how high above the ground (in cm) will this sign be after 10 years? (give to 2s.f. With units)</p> <p>[200 points]</p> <p>Ans: 150cm. (Trees are eudicots and increase in height from their shoot apical meristem, which is right at the top of the tree. As such, anything placed below the apical meristem will not change in position as the tree does not grow from the base.)</p>	<p>Random tree at Block B + around benches</p> <p>*need to waterproof</p>
2	<p>1. What is a liquid at room temperature in its original state but solidifies when heated?</p> <p>[100 points]</p> <p>Ans: Egg</p> <p>2. We all know that if you weigh yourself on the moon, it is less than your weight on the Earth. But a balloon filled with something actually weighs more on the moon than on Earth. What is that something?</p> <p>[200 points]</p>	<p>Chill benches/walls</p>

	<p>Ans: Helium/Hydrogen/Methane/Ammonia/Water Vapour</p> <p>(Earth's atmosphere causes a helium balloon to float, thus making it impossible to weigh. On the moon, the lack of atmosphere causes the balloon to sink, allowing it to be weighed. It will only weigh a little bit, but will still be heavier than on earth.)</p>	
3	<p>Mr. Od-1 had just bought a new factory to start producing hydrogen gas for his alternatively fueled vehicles. For safety reasons, there could be no flammable materials in the factory, just steel and concrete. Nothing was even painted. He then hired a company to install a state of the art fire protection system. They had installed hundreds of highly sensitive smoke detectors throughout the factory. Each was linked to a sprinkler control unit so, if triggered, it would immediately open the sprinkler above the fire. Thus, it would save the whole factory from water damage in the event of a fire. After much testing, the system was working perfectly. But when Mr.Od-1 inspected the system, he couldn't believe the colossal mistake they had made. He called the designers of the system in and explained to them, "This is a hydrogen plant. There are no flammable materials allowed in the plant, and employees wear fire proof clothing while in the plant; the only thing that can catch fire is the hydrogen itself." Understanding their mistake, the system designers rebuilt the system.</p> <p>What had they done wrong?</p> <p>Hint: They installed _____ only, without a _____. (separate the all the words with only a spacing)</p> <p>[500 points]</p> <p>Answer</p> <p>They had installed smoke detectors only, with no heat detection system.</p> <p>(Burning hydrogen doesn't produce any smoke or fumes. There were no other flammable items allowed</p>	Toilets

	in the plant, so a fire could have burned for some time undetected by the smoke detectors.)	