



**CALIFORNIA STATE SCIENCE FAIR  
2010 PROJECT SUMMARY**

<b>Name(s)</b> <b>Christopher W. Gardner; Enoch Yang</b>	<b>Project Number</b> <b>S1709</b>
<b>Project Title</b> <b>The Effect of Ampicillin, Penicillin, Tetracycline, and Erythromycin, on the Growth of E. coli in Playground Soil</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose of this experiment was to compare the zones of inhibition of playground soil bacteria, Ampicillin, Penicillin, Tetracycline, and Erythromycin, with E. coli. Bacteria was extracted from the playground soil by immersing a small quantity in Tryptic Soy Broth(TSB). This solution was then spread unto 10 petri dishes containing nutrient agar and a disk of each antibiotic was placed in labeled quadrants of the dish. E. coli was transferred to nutrient agar plates, and the previous process was repeated. The dishes were placed in an incubator at 35°C for 48 hours. The zones of inhibition were measured, and a common bacteria from the soil plates was extracted. The antibiotic disk with the largest zone of inhibition, Tetracycline, was placed in the center of 10 new plates. These were placed in the incubator for 72 hours and the zones of inhibition were measured. On average the zones of inhibition from the soil were smaller than the E. coli, therefore the soil bacteria have some resistance to common antibiotics. Due to manufacturing of playground, toxins that leach from rubbers may affect the resistance bacteria in the soil have to antibiotics.</p> <p><b>Methods/Materials</b></p> <ol style="list-style-type: none"><li>1.Acquire a beaker with 50 mL of TSB and 10 sterile swabs. Label beaker.</li><li>2.Add 5g of playground soil to the TSB.</li><li>3.Mix solution for 30 seconds. Allow the beaker to sit for 30 minutes at room temperature.</li><li>4.Dip the tip of the sterile swab and press against beaker to remove excess solution.</li><li>5.T-streak 10 nutrient agar plates. Label each plate.</li><li>6.Divide the Petri dishes into four quadrants, and add one disk of Ampicillin, Penicillin, Tetracycline, and Erythromycin individually into the quadrants.</li><li>7.Label each quadrant with the corresponding antibiotic disk.</li><li>8.Place dishes in 36°C incubator for 48 hours.</li><li>9.Measure zones of inhibition after 48 hours and record the data.</li><li>10.Obtain 10 more nutrient agar Petri dishes.</li><li>11.Identify a common bacterial colony closest to the Tetracycline disks, throughout the plates.</li><li>12.Use sterile loops to t-streak new plates with the bacterial colonies closest to the tetracycline.</li><li>13.Using forceps, place one tetracycline disk in the center of each plate.</li><li>14. Label plates and place in 36°C incubator for 72 hours.</li><li>15.Measure the zones of inhibition after 72 hours and record the data.</li><li>16.Dispose of plates by spraying bleach on the agar and place in specified waste bag.</li></ol>	
<b>Summary Statement</b> The purpose of this experiment is to determine whether or not there is E. coli resistant to Ampicillin, Penicillin, Tetracycline, or Erythromycin in playground sand.	
<b>Help Received</b> Used lab equipment at the California Academy of Mathematics and Science under the supervision of Mr. Gonzales.	