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| **Annoying Lever--Sketching** |  | **Player: 001** | **Player: 002** | **Player: 003** |
| Physic Understanding | High | 63.7 | 25.5 | 2.67 |
|  | Medium | 32.7 | 45.3 | 26.3 |
|  | Low | 3.62 | 29.2 | 71.0 |
| Energy | High | 83.9 | 43.0 | 7.52 |
|  | Medium | 14.3 | 35.7 | 29.3 |
|  | Low | 1.79 | 21.3 | 63.1 |
| Torque | High | 60.1 | 17.4 | 0.77 |
|  | Medium | 34.8 | 41.8 | 11.5 |
|  | Low | 5.11 | 40.8 | 87.7 |
| Energy can transfer | High | 78.7 | 37.1 | 6.78 |
|  | Medium | 19.7 | 43.2 | 30.6 |
|  | Low | 1.58 | 19.8 | 62.6 |
| Properties of Torque | High | 85.4 | 28.9 | 1.44 |
|  | Medium | 14.4 | 61.0 | 40.0 |
|  | Low | 0.22 | 10.1 | 58.5 |

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| **Around Tree--Sketching** |  | **Player: 001** | **Player: 002** | **Player: 003** |
| Physic Understanding | High | 15.8 | 5.93 | 0.21 |
|  | Medium | 40.1 | 27.6 | 9.73 |
|  | Low | 44.0 | 69.5 | 90.1 |
| Force and Motion | High | 29.5 | 5.93 | 0.27 |
|  | Medium | 60.5 | 62.4 | 22.8 |
|  | Low | 9.99 | 31.7 | 76.9 |
| Energy | High | 23.0 | 4.52 | 0.28 |
|  | Medium | 42.9 | 31.4 | 8.66 |
|  | Low | 34.1 | 64.1 | 91.1 |
| Newton’s first law | High | 45.4 | 10.1 | 0.13 |
|  | Medium | 52.6 | 76.1 | 22.7 |
|  | Low | 1.88 | 13.8 | 77.2 |
| Energy can transfer | High | 17.5 | 3.49 | 0.22 |
|  | Medium | 48.0 | 33.3 | 10.2 |
|  | Low | 34.5 | 63.3 | 89.6 |

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| **Attic-Sketching** |  | **Player: 001** | **Player: 002** | **Player: 003** |
| Physic Understanding | High | 64.1 | 32.0 | 3.41 |
|  | Medium | 33.7 | 45.4 | 23.7 |
|  | Low | 2.21 | 22.6 | 72.9 |
| Linear Momentum | High | 95.6 | 58.6 | 7.20 |
|  | Medium | 4.34 | 34.3 | 38.3 |
|  | Low | 0.043 | 7.05 | 54.5 |
| Energy | High | 87.7 | 47.7 | 7.47 |
|  | Medium | 11.5 | 36.3 | 28.5 |
|  | Low | 0.78 | 15.9 | 64.0 |
| Conservation of Momentum | High | 94.0 | 36.1 | 1.71 |
|  | Medium | 5.91 | 50.5 | 20.9 |
|  | Low | 0.047 | 13.4 | 77.4 |
| Energy can transfer | High | 86.1 | 40.5 | 7.00 |
|  | Medium | 13.3 | 42.4 | 31.9 |
|  | Low | 0.66 | 17.1 | 61.1 |

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| **Caveman-Sketching** |  | **Player: 001** | **Player: 002** | **Player: 003** |
| Physic Understanding | High | 46.6 | 12.9 | 0.92 |
|  | Medium | 40.7 | 37.4 | 15.7 |
|  | Low | 12.7 | 49.7 | 83.4 |
| Force and Motion | High | 73.2 | 25.4 | 2.60 |
|  | Medium | 25.9 | 62.1 | 38.4 |
|  | Low | 0.85 | 12.5 | 59.0 |
| Linear Momentum | High | 77.3 | 21.7 | 1.24 |
|  | Medium | 21.4 | 51.7 | 25.2 |
|  | Low | 1.30 | 26.6 | 73.5 |
| Newton’s first law | High | 81.6 | 48.8 | 7.86 |
|  | Medium | 17.7 | 45.0 | 43.9 |
|  | Low | 0.77 | 6.15 | 48.3 |
| Conservation of Momentum | High | 58.0 | 4.28 | 0.041 |
|  | Medium | 40.0 | 48.2 | 4.89 |
|  | Low | 1.96 | 47.5 | 95.1 |

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| **Chocolate Factory-Sketching** |  | **Player: 001** | **Player: 002** | **Player: 003** |
| Physic Understanding | High | 2.96 | 1.24 | 0.21 |
|  | Medium | 27.6 | 20.5 | 9.73 |
|  | Low | 69.5 | 78.2 | 90.1 |
| Force and Motion | High | 5.93 | 2.32 | 0.27 |
|  | Medium | 62.4 | 51.7 | 22.8 |
|  | Low | 31.7 | 45.9 | 76.9 |
| Energy | High | 4.52 | 1.92 | 0.28 |
|  | Medium | 31.4 | 22.0 | 8.66 |
|  | Low | 64.1 | 76.1 | 91.1 |
| Newton’s first law | High | 10.1 | 3.26 | 0.13 |
|  | Medium | 76.1 | 66.8 | 22.7 |
|  | Low | 13.8 | 29.9 | 77.2 |
| Energy can transfer | High | 3.49 | 1.59 | 0.22 |
|  | Medium | 33.3 | 23.8 | 10.2 |
|  | Low | 63.3 | 74.6 | 89.6 |

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| **Balance-Manipulation** |  | **Player: 001** | **Player: 002** | **Player: 003** |
| Physic Understanding | High | 10.0 | 0.35 | 0.35 |
|  | Medium | 32.8 | 9.80 | 9.80 |
|  | Low | 57.1 | 89.8 | 89.8 |
| Force and Motion | High | 14.3 | 0.13 | 0.12 |
|  | Medium | 61.1 | 14.3 | 14.3 |
|  | Low | 24.6 | 85.5 | 85.5 |
| Newton’s first law | High | 27.9 | 0.93 | 0.93 |
|  | Medium | 57.6 | 23.6 | 23.6 |
|  | Low | 14.5 | 75.5 | 75.5 |
| Newton’s second law | High | 6.66 | 0.008 | 0.008 |
|  | Medium | 61.7 | 4.42 | 4.42 |
|  | Low | 31.6 | 95.6 | 95.6 |

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| **Bowtie-Manipulation** |  | **Player: 001** | **Player: 002** | **Player: 003** |
| Physic Understanding | High | 73.3 | 73.0 | 72.2 |
|  | Medium | 0.016 | 0.018 | 0.023 |
|  | Low | 26.7 | 26.9 | 27.7 |
| Force and Motion | High | 31.1 | 31.0 | 28.2 |
|  | Medium | 57.9 | 55.8 | 54.5 |
|  | Low | 11.0 | 13.3 | 17.2 |
| Torque | High | 39.3 | 31.1 | 37.1 |
|  | Medium | 37.0 | 46.2 | 36.5 |
|  | Low | 23.7 | 22.7 | 26.4 |
| Newton’s first law | High | 35.7 | 56.3 | 31.5 |
|  | Medium | 52.2 | 20.0 | 16.5 |
|  | Low | 12.1 | 23.7 | 52.0 |
| Static Equilibrium | High | 38.7 | 16.7 | 31.2 |
|  | Medium | 34.5 | 53.7 | 36.0 |
|  | Low | 26.8 | 29.6 | 32.8 |

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| **Collision-Manipulation** |  | **Player: 001** | **Player: 002** | **Player: 003** |
| Physic Understanding | High | 52.6 | 17.1 | 8.28 |
|  | Medium | 38.9 | 40.8 | 34.8 |
|  | Low | 8.55 | 42.1 | 56.9 |
| Force and Motion | High | 83.0 | 29.0 | 14.5 |
|  | Medium | 16.8 | 64.1 | 67.6 |
|  | Low | 0.17 | 6.89 | 18.1 |
| Linear Momentum | High | 84.0 | 33.6 | 18.3 |
|  | Medium | 14.7 | 46.5 | 46.8 |
|  | Low | 1.24 | 19.9 | 34.9 |
| Newton’s third law | High | 50.5 | 4.37 | 1.18 |
|  | Medium | 48.7 | 72.5 | 57.0 |
|  | Low | 0.87 | 23.1 | 41.8 |
| Conversation of Momentum | High | 69.9 | 21.1 | 11.6 |
|  | Medium | 25.8 | 42.2 | 32.4 |
|  | Low | 4.22 | 36.7 | 56.0 |

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| **Fireworks-Manipulation** |  | **Player: 001** | **Player: 002** | **Player: 003** |
| Physic Understanding | High | 38.2 | 25.0 | 6.40 |
|  | Medium | 39.6 | 38.0 | 26.7 |
|  | Low | 22.3 | 37.0 | 66.9 |
| Force and Motion | High | 62.1 | 42.0 | 11.5 |
|  | Medium | 33.7 | 46.6 | 51.5 |
|  | Low | 4.20 | 11.3 | 37.0 |
| Energy can Dissipate | High | 36.6 | 21.8 | 4.55 |
|  | Medium | 42.9 | 41.8 | 25.1 |
|  | Low | 20.5 | 36.4 | 70.4 |
| Newton’s third law | High | 31.6 | 15.6 | 1.85 |
|  | Medium | 58.3 | 60.5 | 33.1 |
|  | Low | 10.1 | 23.9 | 65.1 |

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| **Florida-Manipulation** |  | **Player: 001** | **Player: 002** | **Player: 003** |
| Physic Understanding | High | 36.9 | 13.5 | 6.00 |
|  | Medium | 44.1 | 39.1 | 30.7 |
|  | Low | 18.9 | 47.4 | 63.3 |
| Force and Motion | High | 62.5 | 27.4 | 13.8 |
|  | Medium | 35.0 | 57.9 | 58.4 |
|  | Low | 2.42 | 14.7 | 27.8 |
| Energy | High | 52.9 | 18.2 | 7.62 |
|  | Medium | 39.1 | 44.9 | 35.2 |
|  | Low | 8.01 | 36.9 | 57.1 |
| Newton’s third law | High | 32.3 | 12.1 | 5.71 |
|  | Medium | 56.3 | 54.5 | 44.3 |
|  | Low | 11.4 | 33.4 | 50.0 |
| Energy can Dissipate | High | 23.7 | 2.87 | 0.63 |
|  | Medium | 66.6 | 50.5 | 29.0 |
|  | Low | 9.74 | 46.6 | 70.4 |