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|   | **MARBLE SORTING RUBRIC** |
| Performance & Programming | * Machine takes less than 2:00
* Separation process fully automated
* Machine sorts up to 25 marbles correctly into individual sorting bins
* At least three sensors used in design
* No marbles fallout, get stuck, and hopper never jams
* Transport, sensing, hopper, and bins are comprised of only VEX or 3D materials.
* At least two motors used in design
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| Structural | * Product is of high quality
* Students do not adjust machine in motion
* Product is of high quality
* Wiring is secure
* Pieces and parts are within building platform
* At least two 3D parts are incorporated into solution
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| Cover Page  | Document must be kept in a google drive accessible by instructor. All of the following are included on title page: * Title
* Name
* School
* Class
* Date
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| Revision History | Revision history must include:* Initial research
* Prototype designs (brainstorming)
* Decision matrix
* Initial design and test results
* Final design and test results
* Reflection
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| Detailed Drawings | * Drawings are carefully done
* Prototype drawings need to be at a quality that the design is properly presented and easily understood
* Use of straight edge or CAD software for initial design and CAD software for final design
* Detailed drawings are labeled identifying parts
* Proportional in nature
* Final product matches final design
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| Research, Design, and Decision Matrix | * Schedules
* Design statement/requirements
* Six criteria over at least two designs
* Prototype drawing for each design
* Effectively justify the decision
* Depth and complexity of ideas support by rich, engaging pertinent details.
* Uses examples that indicate substantial research including at least five different resources
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| Program, parts description, and operation narrative | * A copy of the flow chart and program is included
* A parts list including every part and quantity is accurately described
* Uses language that is fluent and content-specific with awareness of purpose and sentence structure
* Clearly written step-by-step documentation of the operation with sufficient description
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| Journal Entries | * Appendix to document
* Each day of work is documented including identify student doing the task
* Details include individual assignments and expected and actual completion dates and evidence of teamwork
* At least 3 Pictures are included with appropriate labeling
* Careful organization is present
* Problems and resolutions are documented
* Any changes to machine are accurately sketched, documented, and explained (identified with revision history)
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| Reflection | * Changes/modifications are accurately described (the why)
* Successes and failures and how they were overcome are well documented
* Evidence analysis, reflection, and insight
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