

# PROJECT DESIGN: OVERVIEW

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|                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                   |                         |
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| <b>Name of Project: Building Balloon Vehicle</b>                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Duration:</b>                                                                                                                  |                         |
| <b>Subject/Course: Force/Motion</b>                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>Teacher(s): O. Bitar</b>                                                                                                       | <b>Grade Level: 8th</b> |
| <b>Other subject areas to be included, if any:</b>                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                   |                         |
|                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                   |                         |
| <b>Key Knowledge and Understanding</b><br>(CCSS or other standards)                                                  | Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.                                                                                                                                                                                                                                                                                                                         |                                                                                                                                   |                         |
| <b>Success Skills</b><br>(to be taught and assessed)                                                                 | Critical Thinking/Problem Solving<br>Students will adjust the variables to change the result.                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                   | Self-Management         |
|                                                                                                                      | Collaboration<br>Students will be given a list of roles to identify as within their groups.                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                   | Other:                  |
| <b>Project Summary</b><br>(include student role, issue, problem or challenge, action taken, and purpose/beneficiary) | In this project, you will use Newton's 3rd Law of Motion to design a vehicle. This vehicle must travel forward (reaction) 1.5 meters by pushing backwards on the floor, the air, or some other object (action).<br>At the end of this project, you will demonstrate your vehicle's motion. You will explain how the vehicle's motion demonstrates Newton's 3rd Law of Motion. You will also include evidence of Newton's 1st Law. |                                                                                                                                   |                         |
| <b>Driving Question</b>                                                                                              | How can we make a vehicle that moves 1.5m?                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                   |                         |
| <b>Entry Event</b>                                                                                                   | Mythbuster/Tractor Pull Video/Roller Coaster/Demolition Derby<br><a href="https://www.youtube.com/watch?v=r8E5dUnLmh4">https://www.youtube.com/watch?v=r8E5dUnLmh4</a><br>Penny Drop from Empire State Building (USB/work/15-16/14-15/Supplemental)                                                                                                                                                                               |                                                                                                                                   |                         |
| <b>Products</b>                                                                                                      | Individual:<br>Contribution of roles for the larger project<br>Research                                                                                                                                                                                                                                                                                                                                                           | Specific content and success skills to be assessed:<br>Student analyzing skills<br>formative assessment strategies (exit tickets) |                         |

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|                                                                                                                                            | Team:<br>Vehicle                                                                                                                              | Specific content and success skills to be assessed:<br>Newton's Third Law, 21st Century Skills (collaboration, communication) |                                                                                                                                                   |  |
|                                                                                                                                            |                                                                                                                                               |                                                                                                                               |                                                                                                                                                   |  |
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| <b>Making Products Public</b><br>(include how the products will be made public and who students will engage with during/at end of project) | Displaying the vehicles, add the videos on my blog, have kids write about the project and upload to blog for parents to see.                  |                                                                                                                               |                                                                                                                                                   |  |
|                                                                                                                                            |                                                                                                                                               |                                                                                                                               |                                                                                                                                                   |  |
| <b>Resources Needed</b>                                                                                                                    | On-site people, facilities:                                                                                                                   |                                                                                                                               |                                                                                                                                                   |  |
|                                                                                                                                            | Equipment: computers, promethean board,                                                                                                       |                                                                                                                               |                                                                                                                                                   |  |
|                                                                                                                                            | Materials: Balloons, straws, tape, pencils, markers/colored pencils, other individual project needs, chart paper (gallery walk), sticky notes |                                                                                                                               |                                                                                                                                                   |  |
|                                                                                                                                            | Community Resources: Ford Experts, UM Engineering Students                                                                                    |                                                                                                                               |                                                                                                                                                   |  |
|                                                                                                                                            |                                                                                                                                               |                                                                                                                               |                                                                                                                                                   |  |
| <b>Reflection Methods</b><br>(how individual, team, and/or whole class will reflect during/at end of project)                              | Journal/Learning Log: Packet                                                                                                                  |                                                                                                                               | Focus Group: Alternate Groups and Bounce ideas off each other to bring back and help develop vehicle                                              |  |
|                                                                                                                                            | Whole-Class Discussion: ford engineers/UM engineering students/Reteach                                                                        |                                                                                                                               | Fishbowl Discussion                                                                                                                               |  |
|                                                                                                                                            | Survey: Peer Evaluation                                                                                                                       |                                                                                                                               | Other: At the end, Google Form survey, how can I improve the implementation of this; liked most? liked least? What could I have provided more of? |  |

**Notes:**

## PROJECT DESIGN: STUDENT LEARNING GUIDE

**Project:**

**Driving Question:**

| <b>Final Product(s)</b><br>Presentations,<br>Performances, Products<br>and/or Services | <b>Learning Outcomes/Targets</b><br>knowledge, understanding & success skills needed<br>by students to successfully complete products | <b>Checkpoints/Formative Assessments</b><br>to check for learning and ensure<br>students are on track | <b>Instructional Strategies for All Learners</b><br>provided by teacher, other staff, experts; includes<br>scaffolds, materials, lessons aligned to learning outcomes<br>and formative assessments |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (individual <b>and</b><br>team)                                                        |                                                                                                                                       | Small Group Formative Check for<br>complete and correct (check in with me)                            | Video<br>Authentic Audience<br>Sentence Stems<br>Articles (leveled texts)                                                                                                                          |
|                                                                                        |                                                                                                                                       |                                                                                                       |                                                                                                                                                                                                    |
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