

Lesson Update and CRT Addendum	
Lesson/Activity Title: On Target	ID: 13-767
Product Number:	Grade: 6-12
URL for Lesson: https://www.nasa.gov/pdf/418005main_OTM_On_Target.pdf	
Subject: Design process, Newton’s First Law, acceleration, vectors, trajectory, potential and kinetic energy, measurement.	
Summary: Students are asked to design a vehicle to release a marble at a very specific point in order to hit a target.	
Materials for lesson: There are suggested materials in the activity, but teacher should allow for students to suggest others as available to personalize and increase design potential.	

Review and Recommendations	
ALIGNMENT TO STANDARDS	
NGSS	
Common Core State Standards in Mathematics	
CULTURAL RESPONSIVE TEACHING (CRT) RECOMMENDATIONS	
5E Lesson/Description	
1. Engage	Elicit students’ prior experiences and knowledge, (stopping suddenly in a vehicle, trying to drop something on target while moving, sports analogies...).
2. Explore	Create more open-ended questions to allow students to produce different paths to the desired results. Incorporate inferences that enable student to use prior knowledge and skills to aid in the project. Take out the specific suggestions included and create a dialogue with students to encourage the design process. Design, test, redesign, test...
3. Explain	Leave the explanation to the end of the project to allow open design process. Have students describe what happens and reason out the processes involved.
4. Expand/Enhance	The activity suggests some ways to “Extend the Challenge”. Have students compete for accuracy, set time challenges, smaller targets...

5. Evaluate

Collaborate with students to design graphs/charts to document results and compare data. Create a rubric with students to assess their work. Give students a pre and post-test of key concepts. Have students present their results.

Additional Resources:

<http://pbskids.org/designsquad/build/target/>