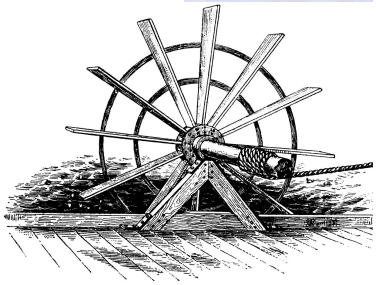
2020 DROP TOWER CHALLENGE
Paddle Wheel in Microgravity

In this challenge, high school students will research, design, propose, and, if selected, build an experiment related to water motion that will be tested in a NASA microgravity research facility.





Future long-duration space missions will require a better understanding of fluid behavior in microgravity. Surface geometry and thin films or coatings can impact how liquids behave on surfaces by either repelling or attracting the fluid. In some cases, the right design can lead to objects that move on their own when placed in microgravity! A simple way to demonstrate this is with a paddle wheel that is attracts water on the front, while repels water on the rear of each fin blade. “Superhydrophobic” (water-fearing) and “superhydrophilic” (water-loving) surfaces or coatings can be used to achieve a self-propelled paddle wheel.

For an introduction to motion in space, check out these videos:
https://www.youtube.com/watch?v=VNzP19J64jQ
https://www.youtube.com/watch?v=TLbhrMCM4_0
Meanwhile, educator resources with relevant classroom activities can be found at:
https://www.nasa.gov/audience/foreducators/spacelife/topics/habitats/index.html
Two social media options for following the ongoing research include:
https://twitter.com/NASAglenn
https://www.facebook.com/NASA-DIME-188345970210/

This is the fifth in a series of annual problem-based challenges in which student-developed microgravity experiments are conducted in NASA’s 2.2 Second Drop Tower. While the 2020 challenge details are still being developed, the program structure will be generally similar to the 2019 challenge, Plant Watering in Microgravity. While there are no guarantees for 2020, thus far all of the proposals submitted for this series of challenges have been selected for testing in microgravity!

This design challenge is for students in grades 9-12 in the U.S. and its territories, where teams will be favored over individuals in selection. Student proposals will be due in early Nov. 2019. Selected teams will be invited to build and ship their experimental hardware to NASA for microgravity testing in February and March 2020. Video results will be provided to the teams for their analysis and report writing. NASA will then invite the top-performing teams to present their results in a student poster session at the 2020 meeting of the American Society for Gravitational and Space Research (ASGSR).

QUESTIONS? The specifics of this challenge are still being developed, but those details should be available by September 2019 on the challenge website here:
https://www1.grc.nasa.gov/space/education-outreach/drop-tower-competition/

Furthermore, the challenge staff can be e-mailed at Ed-DropTower@lists.nasa.gov.