

Hovercraft Project



- Purpose:** 1) To design a moving object that is capable of reducing friction.
2) To demonstrate Newton's three laws of motion

What To Do:

1. Use the resource materials in class and the website <http://scienceclass.net/hovercraft> to design and build a hovercraft.
2. Use the hovercraft to demonstrate:
 - a. **Newton's First Law of Motion**
 - i. An at rest hovercraft overcomes inertia to begin moving
 - ii. A hovercraft in motion overcomes inertia to stop moving
 - b. **Newton's Second Law of Motion**
 - i. An increased force causes greater acceleration
 - ii. Increased mass requires more force to accelerate
 - c. **Newton's third Law of Motion**
 - i. The hovercraft creates an action force
 - ii. The hovercraft creates a reaction force



Timeline

| Thursday 10.12 | Friday 10.13 | Monday 10.17 | Tuesday 10.18 | Wednesday 10.19 |
|-------------------|-----------------|--------------------|--------------------------------|---|
| Plan HC | Plan & Build HC | Build & Test HC | Test HC Answer questions | Demonstration of HC QUESTIONS DUE! |

How You Will be Evaluated

You may choose to work in a team (2 - 4 people) or by yourself - choose wisely because this project counts as two major grades.

Written explanation of the hovercraft & the laws of motion [individual major grade]
Physical demonstration of the hovercraft & laws [group major grade]

Written Explanation

Answer these questions on notebook paper. Use complete sentences.

1. Explain the effect of friction of motion.
2. Describe how your hovercraft reduces friction and the effect this has on the motion of the hovercraft.
3. Explain how increasing and decreasing the mass of your hovercraft affects acceleration.
4. Explain how increasing or decreasing the force used by your hovercraft affects acceleration.
5. Draw a diagram showing an action and reaction force in your hovercraft.

Demonstration Checklist

| Law of Motion | Excellent Quality 100 Points | Good Quality 90 Points | Average Quality 80 Points | Poor Quality 70 Points | HC Does not demonstrate law 0 Points | Grade |
|---|---------------------------------|---------------------------|------------------------------|---------------------------|---|-------|
| 1 st Law - Inertia | | | | | | |
| 2 nd Law - Force, Mass, Acceleration | | | | | | |
| 3 rd Law - Action-Reaction | | | | | | |
| Average | | | | | | |